Moss Lane East | Manchester

Drainage Strategy

10/10/2024

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Project Information

Project title: Moss Lane East | Manchester

Client: Alumno Group

Project no: G9448

Document Number: G9448-WRD-XX-XX-RP-C-00001

Document Control

Revision	Date	Description	Prepared By	Reviewed By
01	30/08/2024	Information	E Broussard	C Azhar
02	10/10/2024	Information	E Broussard	C Azhar

02 – Updated to planning comments reference document: CDN-24-0831. Section 2.6, Appendices A, B and E updated. Appendix I added.

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1 Introduction

1.1 Appointment & Brief

Will Rudd Davidson has been appointed by Alumno Group to provide Engineering Consultancy Services for new student accommodation at Moss Lane East, Manchester.

WRD have prepared this drainage strategy report to outline the proposed discharge of all foul and surface water generated by the development. The report also details the proposed SuDS measures to be adopted throughout the development for the sustainable management of surface water.

Proposals described in this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material deviation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

1.2 Relevant Documentation & Standards

Whilst considering the development's proposed drainage strategy, WRD have worked in accordance with the following documentation;

- CIRIA Manual C753-The SuDS Manual.
- CIRIA Manual C768-Guidance on the construction of SuDS.
- Flood and Water Management Act (2010).
- Flood Risk Regulations.
- Building Regulations (Part H).
- Flood Risk Assessment & Outline Drainage Strategy, RoC Consulting (Oct 2022)

The above list is not exhaustive, with general legislation relating to highways, environmental protection etc also adhered to during the development of the drainage proposals.

2 Site Description & Proposals

2.1 Site Location

The proposed site is located on Moss Lane East between Parkfield Street, to the West, and Heald Place, to the East (SJ848956) and is approximately 0.18ha. The site is currently occupied by two residential buildings and associated hardstanding/car parking to the site boundaries. The site has relatively flat ground levels and level tie-in to the surrounding area with vehicle access from Heald Place. The closest watercourse to the site is the Gore Brook approximately 1.3km to the Southeast.

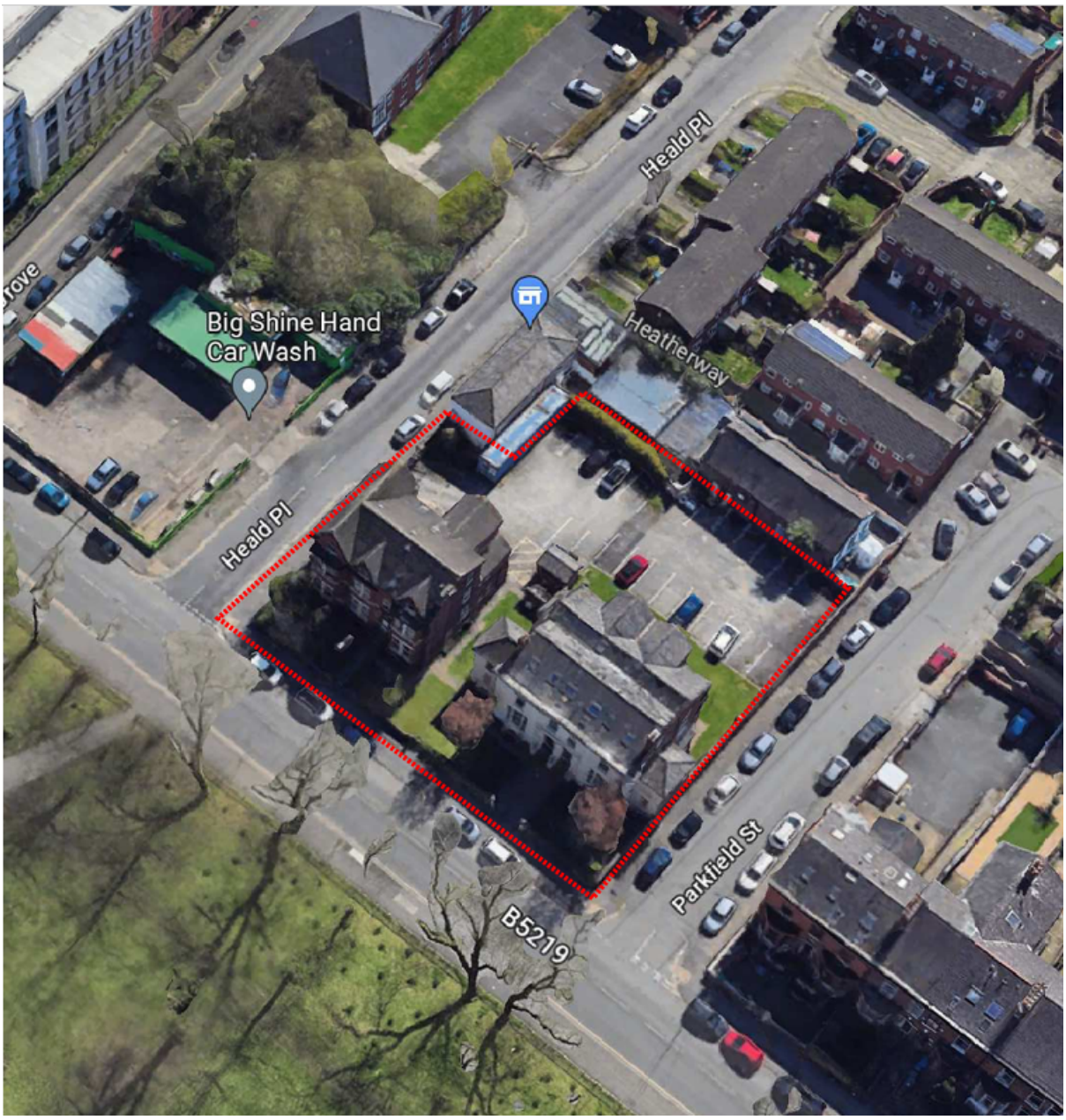


Figure 1 - Aerial of site location

2.2 Development Proposals

One of the existing buildings is Grade 2 listed and will be retained and renovated as part of the development. The other building will be demolished making way for a new purpose built student accommodation with associated landscaping and other works ancillary to the development.

The existing combined network associated with the listed building will be retained and reused as far as possible with some diversion to allow for the new building. The connection to the combined sewer on Parkfield Street will require to be relocated due to the internal diversion.

The new building will have separate foul and surface water systems, which will combine at the disconnection chamber and discharge to the existing connection to the combined sewer on Heald Place. The proposal will treat the hard-standing and roof drainage through filter trenches, and also attenuate the surface water below ground restricting the discharge rate to 5 l/s to meet United Utilities' PDE requirements. Refer to layout in Appendix A.

2.3 Existing United Utilities Sewer Layout

Review of the United Utilities (statutory sewer and water operator for the region) drawings reveal a network of existing combined sewers under Moss Lane East to the North with branches along Parkfield Street and Heald Place to the West and East of the site respectively.

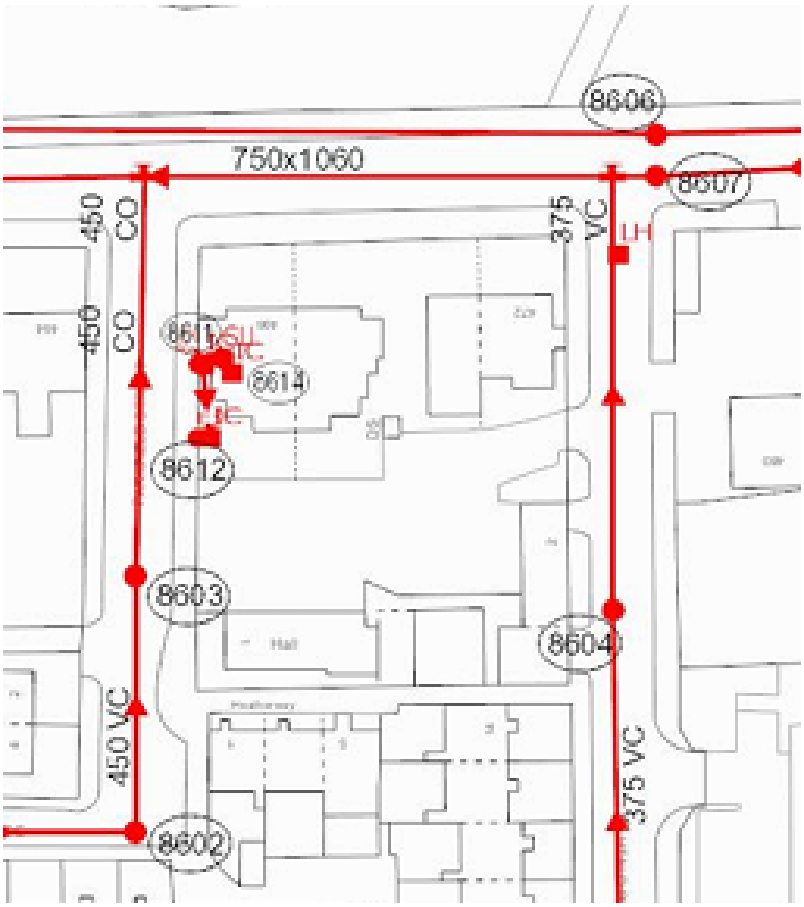


Figure 2 – Existing Drainage Plan

2.4 Existing Site Drainage from CCTV Survey

A drainage CCTV survey has been conducted for the site to allow the existing drainage network to be verified and provide an assessment of the condition for any potential reuse. Refer to Figure 3 and Appendix B for CCTV survey findings plan.

The existing private drainage system has been confirmed as two combined systems discharging into the existing sewers on Parkfield Street and Heald Place.

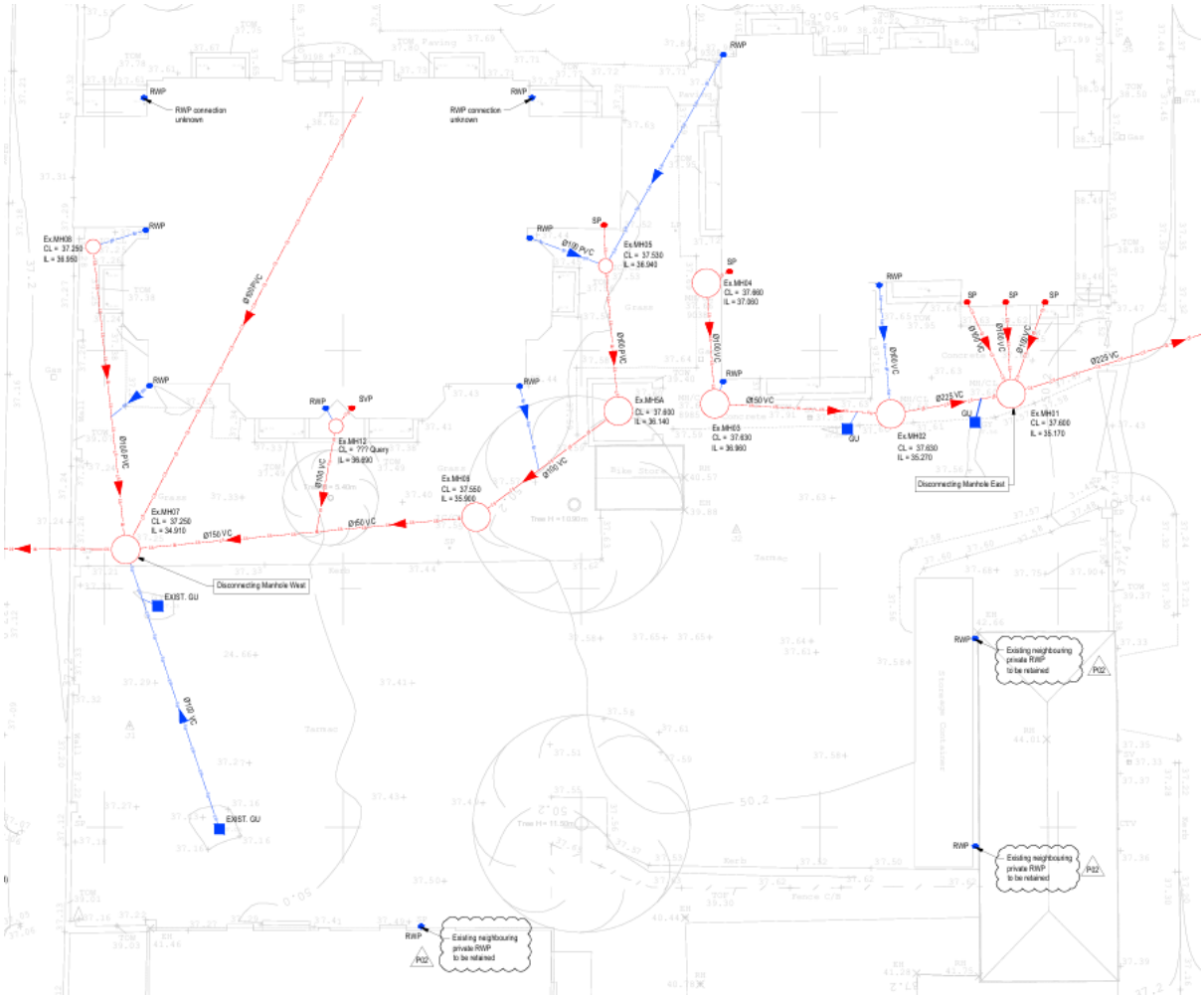


Figure 3 – Existing Site Drainage

2.5 Flood Risk Assessment

RoC Consulting prepared a site-specific Flood Risk Assessment and Outline Drainage Strategy in support of the planning application. Reference is made to their report 4453-ROC-XX-XX-RP-C-FRA001 V5 dated 13th October 2022 included in Appendix C.

It is concluded that the site is in an area identified as having a low probability of flooding on the Environment Agency Flood Map and is located in Flood Zone 1 and demonstrates that the development site is not at significant flood risk, nor does it increase flood risk off-site.

2.6 Geology and Hydrogeology

RoC Consulting's Flood Risk Assessment and Outline Drainage Strategy assessed the geology and hydrogeology of the site and concluded that infiltration was not practical.

Further site investigations were undertaken in February 2024 which included falling head permeability tests. These indicated a very low infiltration rate and confirmed the site was not suitable for the use of infiltration. The permeability test results are included in Appendix I.

3 Drainage Design

3.1 Foul Drainage

It is proposed to maintain the existing combined network currently serving the Class 2 listed building that is to be retained on site. In order to facilitate the construction of the new building to the South this line will require some local diversion within the site. This combined sewer will serve the retained building maintaining both the existing foul and surface water connections.

For the new building it is proposed to have separate foul and surface water networks within the site. The foul drainage from the South Western section of the new building will discharge to the existing (diverted) combined sewer currently serving the Class 2 listed building, ultimately discharging to the combined sewer on Parkfield Street. The foul drainage for Eastern section of the new building will discharge to the combined sewer on Heald Place via a disconnection manhole utilising the existing connection.

A pre-development enquiry has been submitted to United Utilities in order to confirm there is sufficient capacity in the network to serve the proposed development. The response to this has been received and capacity confirmed with the approval appended within Appendix D.

3.2 Surface Water

It is understood from the CCTV survey results that the existing drainage on the site is combined. As discussed in RoC Consulting's Flood Risk Assessment and Outline Drainage Strategy report the only feasible discharge point is to the combined sewers in Parkfield Street and Heald Place.

For the Class 2 listed building that is to be retained the existing surface drainage arrangement will be maintained and discharge to the combined sewer in Parkfield Street via the existing (diverted) combined network.

Surface water from the new building will be collected, treated and attenuated before discharging to the combined sewer on Heald Place through the existing connection.

As demonstrated in RoC Consulting's report, the discharge rate required to provide a 50% reduction in runoff rate compared to the existing rates would be 6.85 l/s. The proposed discharge rate of 5 l/s required by United Utilities significantly reduces the discharge of surface water from the site from its previous usage. To achieve this, below ground attenuation suitable to store surface water on site to a flood event of 1 in 100 years together with allowance of +45% for climate change increases will be provided. The surface water will also be treated prior to discharge via the use of filter trenches for the roof and hardstanding areas associated with the new building.

Proposed surface water calculations have been prepared to show the attenuation storage volumes required to effectively manage the 1 in 30 (+45% allowance for climate change) & 1 in 100 (+45% allowance for climate change) storm events. See Appendix E.

3.3 Overland Flows from Adjacent Sites

The overland flows within the site will be detailed within the hardstanding design to ensure surface water sheds away from buildings and directed to the surface water collection system to ensure positive drainage where required and prevent ponding. Refer to Appendix F.

It is not anticipated that a significant amount of water will distribute into the site from the surrounding sites. The site is bounded to the North, East and West buy roads which are designed to contain any excess surface water within their kerbs. To the south the adjacent site is bounded by walls and any additional surface water is anticipated to be contained within this area.

3.4 Exceedance

During an exceedance event the drainage network capacity is exceeded and the excess runoff surcharges above ground causing surface water flooding and indiscriminate flooding to property. Therefore, a strategy must be put in place to deal with this so that flooding can be controlled, overland flow paths are identified, and neighbouring properties remain unaffected.

In the case of an overload scenario in the attenuation crates, surface water runoff will backflow through the drainage network and travel up through the manholes located in the courtyard and South of the site and flood this area. Site levels have been designed to ensure exceedance flows are directed away from building entrances ensuring no risk to people and property. Adjacent buildings to the East and West are protected from flooding by the kerbs containing any flood water within the roadway. The adjacent property to the South of the development site is bounded by a wall protecting it from any surface runoff from the subject site. To the North is open parkland which can be considered as a low risk area in terms of exceedance flows.

It is worth noting that in addition to the volume of storage provided via attenuation crates, there will be further capacity within the upstream pipes and manholes which has not been accounted for at this stage and a further level of redundancy to the network will therefore be provided. Regular maintenance will minimise the risk of blockages, so the guidance in section 3.7 should be followed. Site drainage has been designed to accommodate high intensity rainfall events up to the 1 in 100 yr + CC, in accordance with national and local policy.

3.5 Proposed Surface Water Treatment

To ensure adequate treatment is considered for the surface water runoff from the roofs and hard landscaped areas, the Simple Index Approach was implemented.

The surface water from the roof and adjacent areas of hardstanding out with the footprint of the building will be collected and directed through filter trenches. There is no vehicle access to the site, therefore, this will provide a suitable level of treatment for the surface water runoff.

The Simple Index Approach tool used for this analysis is presented in Appendix G.

3.6 Safe Access & Egress

Safe access and egress are required to be provided for flooding from all sources, including surface water flooding.

The only event that will have surface water flooding will be the exceedance event that demonstrates water is contained within the car park, bounded by the kerbs - therefore any pedestrian access/egress can be maintained by the pavements. Water levels would not reach above kerb height and as demonstrated by the overland flow diagrams would therefore not prevent pedestrian access and egress from the site.

3.7 Maintenance

The drainage within the site will be private and therefore the maintenance will be responsibility of the site landowner. The operation and maintenance of the SuDS features will therefore be the responsibility of the landowner. Typically, a SuDS maintenance plan will include routine and occasional activities, along with long term remedial actions. A copy of the recommended maintenance schedules is provided in Appendix H.

3.8 Construction

General

During construction it is important that the risk of pollution from the site be kept to a minimum. The contractor must ensure that discharges of water run-off from that site to the water environment do not cause pollution.

Safeguards shall be implemented during the construction phase to minimise the risk of pollution and detrimental effects to the water environment. Prior to the commencement of construction, the contractor should prepare and submit method statements detailing how pollution prevention management will be implemented. Works on site shall generally follow the best practice guidelines outlined in Section 5 and 6 of CIRIA C532 – Control of Water Pollution from Construction Sites.

The works should be managed and sequenced to ensure that the risk of contaminated runoff or groundwater from the site entering the drainage systems is kept to a minimum. On site facilities for containment and controlled release of runoff and groundwater to the existing drainage system should be implemented. These facilities should be designed to trap debris and allow settlement and collection of silt.

Water Pollution Mitigation

It is recommended that the contractor adopts the following general mitigation measures:

i. Temporary foul drainage to serve the contractors welfare facilities to be provided;
ii. Hazardous and environmentally damaging chemicals and other materials should be managed and stored to ensure that they do not enter the existing drainage systems or cause local soil contamination. Storage areas to be provided should be located away from the site perimeter. Chemical or fuel storage shall comprise of impermeable boxes and appropriate bunding. Guidance on the handling and storage of materials on site is available from the Environment Agency. Materials which fall into this category include:
    - Petrochemicals (e.g. fuel, lubricants)

- Building materials (e.g. cement)
- General (e.g. excavation arising, mud, litter, site waste materials)

iii. Refuelling and maintenance of machines shall be strictly controlled, and oil storage tanks confined to locations remote from the perimeter of the site. All leaking or empty oil drums shall be immediately removed from site.

iv. Washing out of any concrete mixing plant or cleaning of ready-mix concrete tankers shall be strictly controlled. The effluent from such cleaning shall be tankered off site or suitably treated using sedimentation tanks before the run-off is discharged.

v. A strict waste management system will be incorporated to prevent the disposal of construction or domestic rubbish entering the adjacent marshland areas. Waste materials will be properly stored on site.

The timeline of construction activities is as per the contractor's programme, we would note that the sequence of works will mean that the permanent drainage measures and SuDS features will be in place ahead of the main building construction works and therefore provide appropriate measures to address the temporary water quality and flow. It is noted that all new drainage / SuDS features are shallow in nature and are well above the recorded water table on the site so would not impact on this.

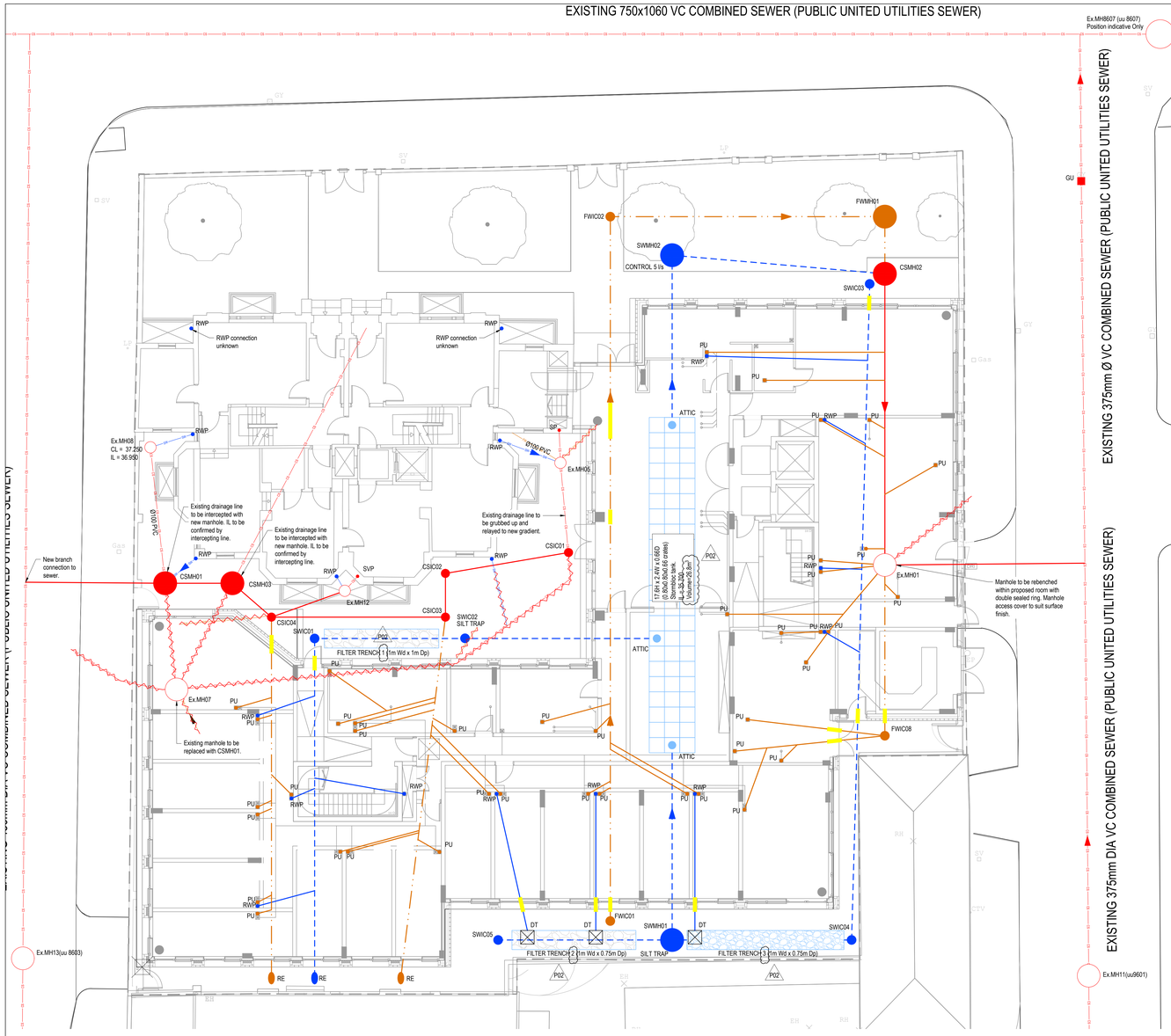
4 Conclusion

The drainage strategy for the proposed development will consist of maintaining the existing combined system for the Class 2 listed building, which will require to be diverted to accommodate the new building. This sewer will continue to discharge to the existing combined sewer in Parkfield Street.

For the new building a separate foul and surface water systems within the site is proposed. These will then be combined at the disconnection manhole and have a gravity connection to the existing combined sewer on Heald Place. Surface water will be attenuated below ground with site discharge limited to the agreed discharge rate of 5 l/s. This takes into account the worst-case flooding from a 1 in 100 year storm event plus 45% uplift for climate change.

We have received confirmation from United Utilities that the discharge for foul drainage can continue to be met by the existing sewer network along with a surface water discharge of 5 l/s.

Appendix A – Proposed Drainage Drawings



NOTE

Refer to Drg No. L047-WRD-17-02.FN-D-S-170001 for Tower Crane foundation information.

LEGEND

	Denotes existing combined sewer piperun.
	Denotes existing foul sewer piperun.
	Denotes existing surface water piperun.
Ex.CSMH1C	Denotes existing combined sewer manhole chamber.
	Denotes proposed combined sewer piperun.
	Denotes proposed foul sewer piperun - Private.
	Denotes proposed surface water piperun - Private.
CSMH01	Denotes proposed combined sewer manhole chamber.
FWMH01	Denotes proposed foul sewer manhole chamber - Private.
FWPPIC01	Denotes proposed foul sewer PP inspection chamber.
SWMH01	Denotes proposed surface water manhole chamber - Private.
SWPPIC01	Denotes proposed surface water PP inspection chamber.
PU	Denotes proposed Pop-Up location.
RWP	Denotes proposed Rain Water Pipe location.
RE	Denotes proposed rodding eye location.
GU	Denotes proposed gully.
DT	Denotes proposed distribution tank.
	Denotes proposed filter trench extent.
	Denotes proposed attenuation crates below hardstanding OR soft landscaping areas.
ATTIC01	Denotes attenuation crate system proprietary Inspection Chamber.
	Denotes existing piperuns to be made redundant / grubbed up.
	Denotes proposed filter trench extent with no under drain.
	Denotes rocker pipe sleeve.

GENERAL NOTES

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2. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
3. ALL LEVELS ARE IN METRES.
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7. REFER TO DRG No. L047-WRD-22-ZZ.ZZ-D-S-220050 FOR SPECIFICATION NOTES.

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MANHOLE SCHEDULE

MH No.	Cover Level (m)	Incoming Invert Level (m)	Incoming Pipe Dia (mm)	Outgoing Invert Level (m)	Outgoing Pipe Dia (mm)	Manhole Depth (m)	Manhole Type	Manhole Dia (mm)	Manhole Cover Type	Easting (m)	Northing (m)	Comment
CSIC01	37.547	36.834	150	36.834	150	0.713	PPIC	450	C250	384861.443	395658.835	Recessed Cover
CSIC02	37.417	36.686	150	36.686	150	0.731	PPIC	450	C250	384854.984	395657.738	Recessed Cover
CSIC03	37.418	36.635, 36.635	150, 150	36.635	150	0.783	PPIC	450	C250	384854.984	395655.443	Recessed Cover
CSIC04	37.360	36.483,36.561*, 36.483	150, 100, 150	36.483	150	0.877	PPIC	450	C250	384845.860	395655.443	Recessed Cover
CSMH01	37.262	36.831*, 34.130	100, 150	34.130	150	3.132	TYPE B	1200	C250	384840.283	395657.223	Recessed Cover - BD Connection
CSMH02	37.654	36.032, 35.427	150, 150	35.352	225	2.302	TYPE B	1200	C250	384878.034	395673.461	BD Connection
CSMH03	37.349	34.313*, 36.438	100, 150	34.189	225	3.160	TYPE B	1200	C250	384843.811	395657.223	Recessed Cover - BD Connection
Ex.MH01	37.450	35.170, 35.170	225, 150	35.170	XXX	2.280	EXISTING	1200	C250	384878.034	395658.177	
Ex.MH05	37.520	36.960*	100	36.940*	150	0.580	EXISTING	600	C250	384861.019	395663.541	
Ex.MH07	37.850	Ex.MH05, 36.058	100, 150	34.910	XXX	2.940	EXISTING	1200	C250	384840.885	395651.647	To be grubbed up
Ex.MH08	37.250	36.970*	100	36.950*	100	0.300	EXISTING	600	C250	384839.512	395664.353	
Ex.MH11(uu9601)	37.320	32.590	375	32.590	375	4.730	EXISTING	1200	C250	384888.729	395636.623	
Ex.MH12	37.370	36.710*	100	36.690*	100	0.680	EXISTING	600	C250	384849.708	395656.823	
Ex.MH13(uu 8603)	36.990	32.290	450	32.290	450	4.700	EXISTING	1200	C250	384832.820	395637.534	
Ex.MH8607 (uu 8607)	37.590	32.320	750	32.320	750	5.270	EXISTING	1500	C250	384892.486	395686.039	Position indicative Only
FWIC01	37.538	XX.XXX	XXX	36.938	150	0.600	PPIC	450	C250	384863.633	395639.493	
FWIC02	37.638	36.322	150	36.322	150	1.316	PPIC	450	C250	384863.633	395676.461	
FWIC08	37.415	XX.XXX	XXX	36.325	150	1.090	PPIC	450	C250	384878.034	395649.218	
FWMH01	37.697	36.082	150	36.082	150	1.615	TYPE B	1200	C250	384878.034	395676.461	
SWIC01	37.374	36.572	150	36.572	150	1.510	PPIC	450	C250	384848.124	395654.323	
SWIC02	37.449	35.786	150	35.786	150	1.659	PPIC	450	C250	384856.016	395654.329	SILT TRAP
SWIC03	37.659	XX.XXX	XXX	36.502	150	1.157	PPIC	450	C250	384877.241	395672.929	
SWIC04	37.517	36.080	150	36.080	150	1.437	PPIC	450	C250	384876.291	395638.496	
SWIC05	37.520	XX.XXX	XXX	36.065	150	1.455	PPIC	450	C250	384857.752	395638.496	
SWMH01	37.519	35.980, 35.980	150, 150	35.980	150	1.539	TYPE B	1200	C250	384866.875	395638.496	SILT TRAP
SWMH02	37.733	35.614	150	35.614	150	2.119	TYPE B	1200	C250	384866.875	395674.437	CONTROL 5 l/s

NOTES

All existing manhole covers to be replaced.

Fields marked with (*) denote existing IL to be confirmed on site.

ISSUE	DETAILS	DATE	BY	CHK
P02	UPDATED IN RESPONSE TO PLANNING	08/10/2024	WD	EB
C02	REVISED FOR CONSTRUCTION	30/08/2024	SC	CA
C01	CONSTRUCTION ISSUE	12/08/2024	SC	CA
P01	FIRST ISSUE.	12/04/2024	DJM	AY

STATUS:

PLANNING

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CLIENT:

ALUMNO GROUP

PROJECT TITLE:

MOSS LANE EAST
MANCHESTER

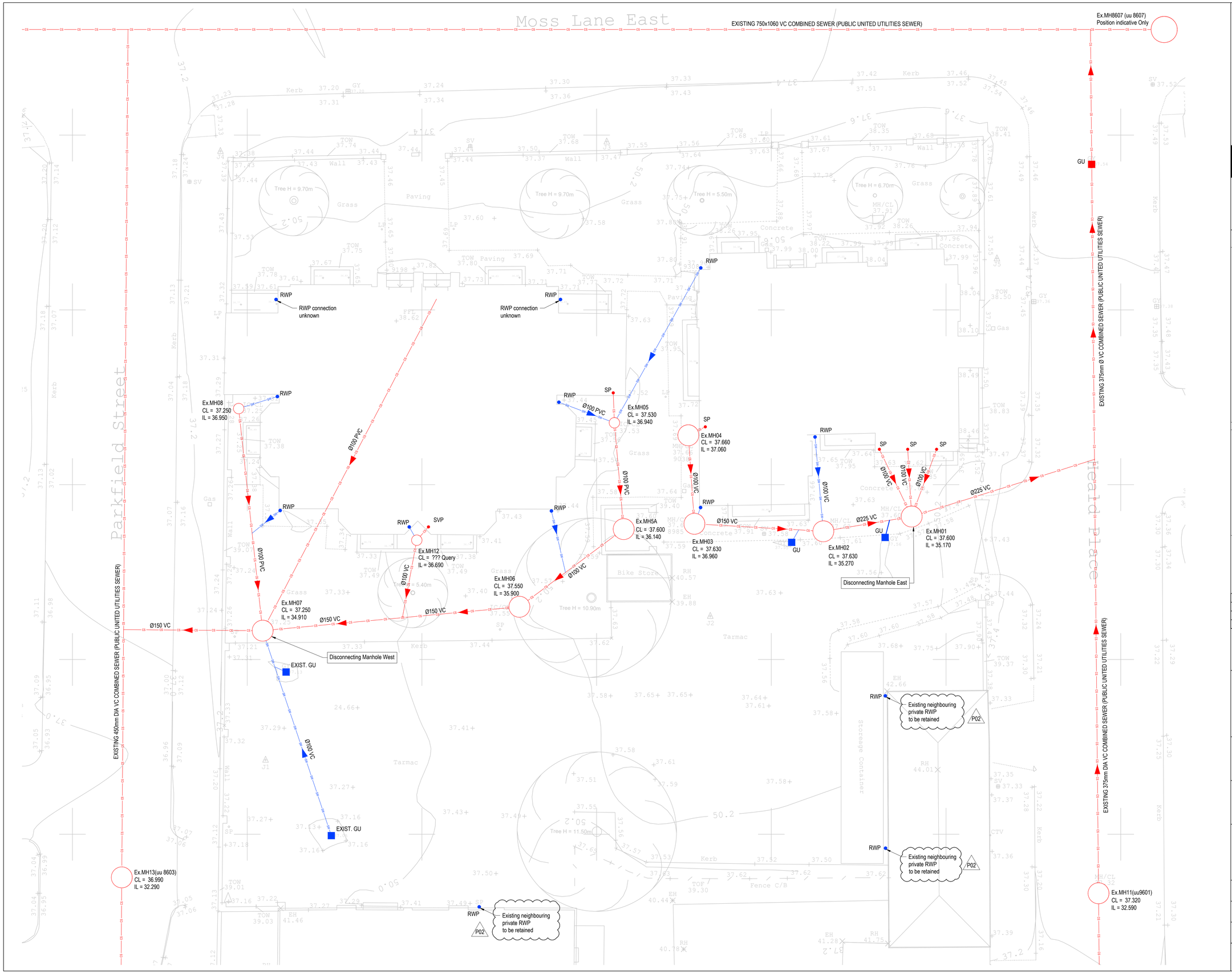
DRG TITLE:

PROPOSED DRAINAGE LAYOUT

DRAWN BY:	DJM	DATE DRAWN:	12/04/2024
CHECKED BY:	AY	DATE CHECKED:	12/04/2024
SCALES:	1:100	SHEET SIZE:	A0

PROJECT	ORIG.	FUNCT.	SPACE.	FORM DISC.	No.	REV
L047 -	WRD -	52-	EX.ZZ -	D -	C- 500003	P02

Appendix B – CCTV Survey



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LEGEND

CS	Denotes existing combined sewer piperun.
FW	Denotes existing foul sewer piperun.
SW	Denotes existing surface water piperun.
Ex.XX01	Denotes existing combined sewer manhole chamber. Location indicative.
Ex.FW01	Denotes existing foul sewer manhole.
Ex.XX02 / Ex.SW01	Denotes existing surface water manhole.
Exist. GU	Denotes existing gully
RWP	Denotes rain water pipe
SP	Denotes Soil Vent Pipe

NOTE

3rd Party Topographical Information provided by ACAD DESIGN & SURVEYS, dated 21 June 2022.

Existing drainage piperuns & structure locations based on United Utilities Water Limited record drawings and CCTV Survey carried out by Drain Alert, on August 2022.

All Cover Levels & Invert Levels are indicative, and based upon 3rd Party information above.

ISSUE	DETAILS	DATE	BY	CHK
P02	UPDATED RWP NOTE IN RESPONSE TO PLANNING	08/10/2024	WD	CA
C01	CONSTRUCTION ISSUE.	12/08/2024	SC	CA
P01	ISSUE FOR STAGE 3	28/03/2024	WD	CA

STATUS:

PLANNING

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CLIENT:

ALUMNO GROUP

PROJECT TITLE:

MOSS LANE EAST
MANCHESTER

DRG TITLE:

EXISTING DRAINAGE LAYOUT

DRAWN BY:	WD	DATE DRAWN:	04/03/2024
CHECKED BY:	CA	DATE CHECKED:	24/03/2024
SCALES:	1:100m	SHEET SIZE:	A1

PROJECT	ORIG.	FUNCT.	SPACE.	FORM DISC.	No.	REV
L047 -	WRD -	52 -	EX.ZZ -	D -	C - 500001	P02

Project

Project Name:	2022_07_22ROC Consulting(32770)Moss Lane East
Project Description:	Drainage Survey
Project Number:	32770
Project Status:	Complete
Project Date:	22/07/2022
Inspection Standard:	MSCC5 Sewers & Drainage GB (SRM5 Scoring)

Drain-Alert
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Tel. 01254 851500
service@drain-alert.co.uk

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Project Name	Project Number	Project Date
2022_07_22ROC Consulting(32770)Moss Lane East	32770	22/07/2022

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Scoring Summary P-2
Section Profile P-3
Section: 1; Branch A > MH 8 (Branch AX) 1
Section: 2; MH 8 > MH 7 (MH 8X) 2
Section: 3; MH 6 > MH 7 (MH 6X) 3
Section: 4; MH 7 > Sewer (MH 7X) 5
Section: 5; Branch A > MH 12 (Branch AX) 7
Section: 6; Branch B > MH 12 (Branch BX) 8
Section: 7; MH 12 > Main Line (MH 12X) 9
Section: 8; Branch A > MH 5 (Branch AX) 11
Section: 9; Branch B > MH 5 (Branch BX) 12
Section: 10; MH 5 > MH 5A (MH 5X) 13
Section: 11; MH 5A > MH 6 (MH 5AX) 15
Section: 12; MH 3 > MH 2 (MH 3X) 17
Section: 13; MH 2 > MH 1 (MH 2X) 18
Section: 14; Branch A > MH 4 (Branch AX) 19
Section: 15; Branch B > MH 4 (Branch BX) 20
Section: 16; MH 4 > MH 3 (MH 4X) 21
Section: 17; MH 1 > Sewer (MH 1X) 23

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Project Information

Project Name	Project Number	Project Date
2022_07_22ROC Consulting(32770)Moss Lane East	32770	22/07/2022

Client

Company: ROC Consulting
Contact: Andy Rain BEng(Hons) CEng MICE
Phone: 0161 2145390
Mobile: 07947 434859
Email: andy.rain@rocconsulting.com

Site

Company: ROC Consulting
Street: Moss Lane East
Town or City: Manchester
County: Gtr Manchester
Post Code: M14 4PJ

Contractor

Company: Drain-Alert
Contact: Mr Stephen Ormisher
Department: Director
Street: Cripplegate Lane
Town or City: Hoghton,Preston
County: Lancashire
Phone: 01254 851500
Fax: 01254 854004
Mobile: 07973 436145
Email: service@drain-alert.co.uk

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Scoring Summary

Project Name	Project Number	Project Date
2022_07_22ROC Consulting(32770)Moss Lane East	32770	22/07/2022

Structural Defects

Grade 3: Best practice suggests consideration should be given to repairs in the medium term.
Grade 4: Best practice suggests consideration should be given to repairs to avoid a potential collapse.
Grade 5: Best practice suggests that this pipe is at risk of collapse at any time. Urgent consideration should be given to repairs to avoid total failure.

Section	PLR	Grade	Description
3	MH 6X	5	Deformed sewer or drain, 20%
7	MH 12X	4	Broken pipe at joint from 10 o'clock to 2 o'clock

Service / Operational Condition

Grade 3: Best practice suggests consideration should be given to maintenance activities in the medium term.
Grade 4: Best practice suggests consideration should be given to maintenance activity to avoid potential blockages.
Grade 5: Best practice suggests that this pipe is at a high risk of backing up or causing flooding.

Section	PLR	Grade	Description
3	MH 6X	4	Deformed sewer or drain, 20%
4	MH 7X	4	Joint displaced, large
11	MH 5AX	3	Joint displaced, medium
16	MH 4X	4	Connection defective, connecting pipe is intruding at 12 o'clock, 100mm dia intrusion: 40%

Abandoned Surveys

Section	PLR	Description
11	MH 5AX	Survey abandoned
16	MH 4X	Survey abandoned

Information

These scoring summaries are based on the SRM grading from the WRc.

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Section Profile

Project Name	Project Number	Project Date
2022_07_22ROC Consulting(32770)Moss Lane East	32770	22/07/2022

Circular, 100 mm

Item No.	Upstream Node	Downstream Node	Date	Road	Material	Total Length	Inspected Length
1	Branch A	MH 8	22/07/2022	Manchester M14 4PJ	Polyvinyl chloride	2.30 m	2.30 m
2	MH 8	MH 7	22/07/2022	Manchester M14 4PJ	Polyvinyl chloride	3.40 m	3.40 m
5	Branch A	MH 12	22/07/2022	Manchester M14 4PJ	Polyvinyl chloride	0.10 m	0.10 m
6	Branch B	MH 12	22/07/2022	Manchester M14 4PJ	Polyvinyl chloride	0.20 m	0.20 m
7	MH 12	Main Line	22/07/2022	Manchester M14 4PJ	Polyvinyl chloride	7.80 m	7.80 m
8	Branch A	MH 5	22/07/2022	Manchester M14 4PJ	Polyvinyl chloride	2.30 m	2.30 m
9	Branch B	MH 5	22/07/2022	Manchester M14 4PJ	Vitrified clay	2.30 m	2.30 m
10	MH 5	MH 5A	22/07/2022	Manchester M14 4PJ	Vitrified clay	5.90 m	5.90 m
14	Branch A	MH 4	22/07/2022	Manchester M14 4PJ	Vitrified clay	5.60 m	5.60 m
15	Branch B	MH 4	22/07/2022	Manchester M14 4PJ	Vitrified clay	1.80 m	1.80 m

Total: 10 Inspections x Circular 100 mm = 31.70 m Total Length and 31.70 m Inspected Length

Circular, 150 mm

Item No.	Upstream Node	Downstream Node	Date	Road	Material	Total Length	Inspected Length
3	MH 6	MH 7	22/07/2022	Manchester M14 4PJ	Vitrified clay	13.80 m	13.80 m
4	MH 7	Sewer	22/07/2022	Manchester M14 4PJ	Vitrified clay	10.10 m	10.10 m

Total: 2 Inspections x Circular 150 mm = 23.90 m Total Length and 23.90 m Inspected Length

Circular, 225 mm

Item No.	Upstream Node	Downstream Node	Date	Road	Material	Total Length	Inspected Length
12	MH 3	MH 2	22/07/2022	Manchester M14 4PJ	Vitrified clay	2.90 m	2.90 m
13	MH 2	MH 1	22/07/2022	Manchester M14 4PJ	Vitrified clay	3.70 m	3.70 m
17	MH 1	Sewer	22/07/2022	Manchester M14 4PJ	Vitrified clay	8.60 m	8.60 m

Total: 3 Inspections x Circular 225 mm = 15.20 m Total Length and 15.20 m Inspected Length

Total: 15 Inspections = 70.80 m Total Length and 70.80 m Inspected Length

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Section Inspection - 22/07/2022 - Branch AX

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
1	1	22/07/22	10:29	Not Specified	Rain	Yes	BRANCH AX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
M Gostelow	PN17 AAK	P235 Flexi-Rod	Not Specified	Private Drain	Not Specified

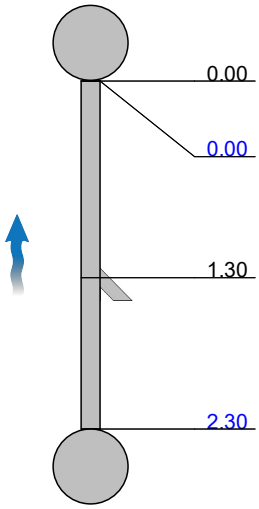
Town or Village:	Moss Lane East	**Inspection Direction:**	Upstream	**Upstream Node:**	BRANCH A
Road:	Manchester M14 4Pj	**Inspected Length:**	2.30 m	**Upstream Pipe Depth:**	
Location:	Verge	**Total Length:**	2.30 m	**Downstream Node:**	MH 8
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50

Depth: m
MH 8



Branch A

Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH 8	00:00:12		
0.00	WL	Water level, 0% of the vertical dimension	00:00:14		
1.30	JN	Junction at 9 o'clock, 100mm dia	00:00:26		
2.30	REM	General remark: internal rest bend	00:00:33		

Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0

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Section Inspection - 22/07/2022 - MH 8X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
2	1	22/07/22	10:31	Not Specified	Rain	Yes	MH 8X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
M Gostelow	PN17 AAK	P235 Flexi-Rod	Not Specified	Private Drain	Not Specified

Town or Village:	Moss Lane East	**Inspection Direction:**	Downstream	**Upstream Node:**	MH 8
Road:	Manchester M14 4Pj	**Inspected Length:**	3.40 m	**Upstream Pipe Depth:**	
Location:	Verge	**Total Length:**	3.40 m	**Downstream Node:**	MH 7
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

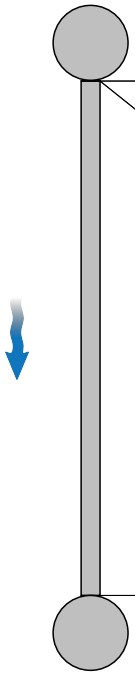
Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50

Depth: m

MH 8



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH 8	00:00:08		
0.00	WL	Water level, 0% of the vertical dimension	00:00:11		
3.40	LD	Line deviates down	00:00:27		

MH 7

Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0

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Section Inspection - 22/07/2022 - MH 6X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
3	1	22/07/22	10:33	Not Specified	Rain	Yes	MH 6X

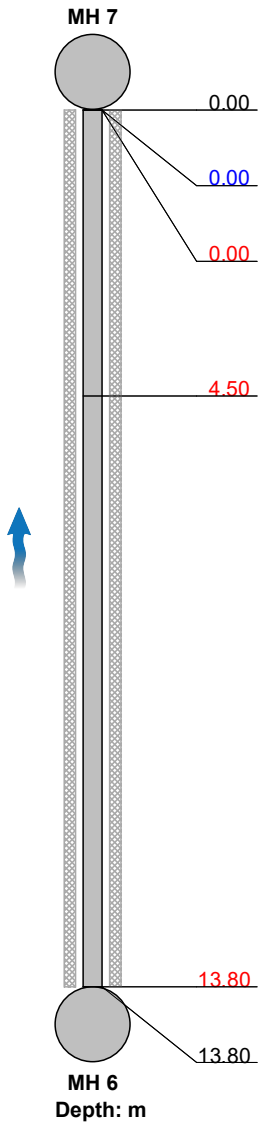
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
M Gostelow	PN17 AAK	P235 Flexi-Rod	Not Specified	Private Drain	Not Specified

Town or Village:	Moss Lane East	**Inspection Direction:**	Upstream	**Upstream Node:**	MH 6
Road:	Manchester M14 4Pj	**Inspected Length:**	13.80 m	**Upstream Pipe Depth:**	
Location:	Verge	**Total Length:**	13.80 m	**Downstream Node:**	MH 7
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:119



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: MH 7	00:00:11		
0.00		WL	Water level, 5% of the vertical dimension	00:00:15		
0.00	S01	FM	Fractures, multiple from 12 o'clock to 12 o'clock, start	00:00:17	MH 6X_ebb996d8-1894-	
4.50		D	Deformed sewer or drain, 20%	00:00:49	MH 6X_e9e49113-7296-	5 / 4
13.80	F01	FM	Fractures, multiple from 12 o'clock to 12 o'clock, finish	00:01:26		4 / 2
13.80		MHF	Finish node, manhole, reference: MH 6	00:01:29		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
2	245.0	93.1	1285.0	5.0	2	6.0	1.4	19.0	4.0

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Section Pictures - 22/07/2022 - MH 6X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
3	Upstream	MH 6X		

MH
6X_ebb996d8-1894-41e9-8f8f-f0ab780b3124_20220722_103329_570.jpg, 00:00:17, 0.00 m
Fractures, multiple from 12 o'clock to 12 o'clock, start

MH
6X_e6ce5356-d2a6-468c-b089-c998116cc21e_20220722_103343_598.jpg, 00:00:17, 0.00 m
Fractures, multiple from 12 o'clock to 12 o'clock, start

MH
6X_e9e49113-7296-4a2f-8f0a-f084eecb5a4c_20220722_103407_838.jpg, 00:00:49, 4.50 m
Deformed sewer or drain, 20%

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Section Inspection - 22/07/2022 - MH 7X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
4	1	22/07/22	10:36	Not Specified	Rain	Yes	MH 7X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
M Gostelow	PN17 AAK	P235 Flexi-Rod	Not Specified	Private Drain	Not Specified

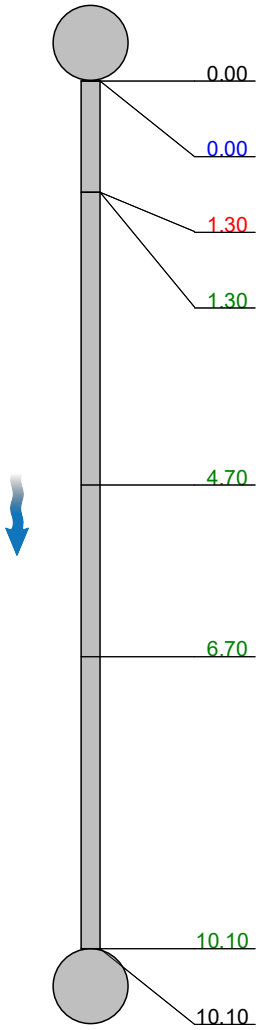
Town or Village:	Moss Lane East	**Inspection Direction:**	Downstream	**Upstream Node:**	MH 7
Road:	Manchester M14 4Pj	**Inspected Length:**	10.10 m	**Upstream Pipe Depth:**	
Location:	Verge	**Total Length:**	10.10 m	**Downstream Node:**	SEWER
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:88

Depth: m
MH 7



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH 7	00:00:12		
0.00	WL	Water level, 10% of the vertical dimension	00:00:15	MH 7X_ee1045f8-42b1-4	
1.30	JDL	Joint displaced, large	00:00:23	MH 7X_666e0cc9-3183-	1 / 4
1.30	LR	Line deviates right	00:00:27		
4.70	DES	Settled deposits, fine, 10% cross-sectional area loss	00:00:53	MH 7X_a7565f7d-30c4-4f	3
6.70	LD	Line deviates down	00:01:05		
10.10	LL	Line deviates left	00:01:28		
10.10	BRF	Finish node, major connection without manhole, reference: Sewer	00:01:31		

Sewer
Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
1	2.0	0.2	2.0	1.0	2	5.0	0.7	7.0	4.0

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Section Pictures - 22/07/2022 - MH 7X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
4	Downstream	MH 7X		

MH 7X_ee1045f8-42b1-481c-af9b-031247f28254_20220722_103626_994.jpg, 00:00:15, 0.00 m
Water level, 10% of the vertical dimension

MH 7X_666e0cc9-3183-4dc5-92a9-7255e744a067_20220722_103639_165.jpg, 00:00:23, 1.30 m
Joint displaced, large

MH 7X_a7565f7d-30c4-4f7e-8027-ba760a1e0e91_20220722_103715_033.jpg, 00:00:53, 4.70 m
Settled deposits, fine, 10% cross-sectional area loss

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Section Inspection - 22/07/2022 - Branch AX

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
5	1	22/07/22	10:40	Not Specified	Rain	Yes	BRANCH AX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
M Gostelow	PN17 AAK	P235 Flexi-Rod	Not Specified	Private Drain	Not Specified

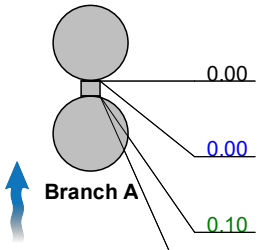
Town or Village:	Moss Lane East	**Inspection Direction:**	Upstream	**Upstream Node:**	BRANCH A
Road:	Manchester M14 4Pj	**Inspected Length:**	0.10 m	**Upstream Pipe Depth:**	
Location:	Verge	**Total Length:**	0.10 m	**Downstream Node:**	MH 12
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50

Depth: m
MH 12



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH 12	00:00:08		
0.00	WL	Water level, 0% of the vertical dimension	00:00:11		
0.10	LU	Line deviates up	00:00:19		
0.10	GYF	Finish node, gully, reference: Branch A	00:00:22		

Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 22/07/2022 - Branch BX

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
6	1	22/07/22	10:41	Not Specified	Rain	Yes	BRANCH BX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
M Gostelow	PN17 AAK	P235 Flexi-Rod	Not Specified	Private Drain	Not Specified

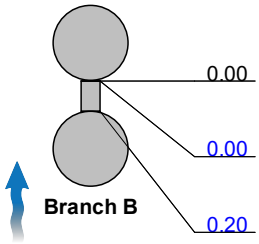
Town or Village:	Moss Lane East	**Inspection Direction:**	Upstream	**Upstream Node:**	BRANCH B
Road:	Manchester M14 4Pj	**Inspected Length:**	0.20 m	**Upstream Pipe Depth:**	
Location:	Verge	**Total Length:**	0.20 m	**Downstream Node:**	MH 12
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50

Depth: m
MH 12



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH 12	00:00:10		
0.00	WL	Water level, 0% of the vertical dimension	00:00:12		
0.20	REM	General remark: SVP Rest Bend	00:00:21		

Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0

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Section Inspection - 22/07/2022 - MH 12X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
7	1	22/07/22	10:42	Not Specified	Rain	Yes	MH 12X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
M Gostelow	PN17 AAK	P235 Flexi-Rod	Not Specified	Private Drain	Not Specified

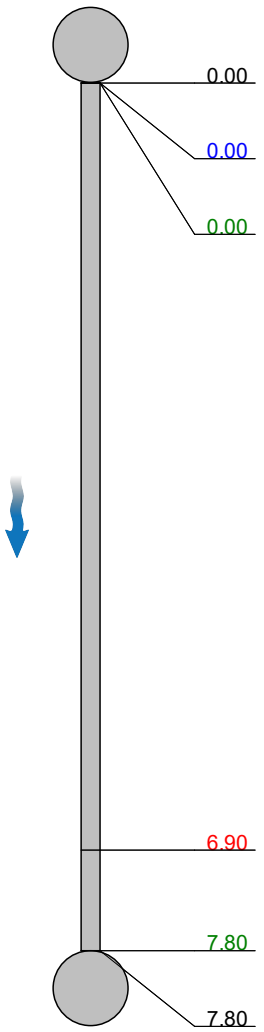
Town or Village:	Moss Lane East	**Inspection Direction:**	Downstream	**Upstream Node:**	MH 12
Road:	Manchester M14 4Pj	**Inspected Length:**	7.80 m	**Upstream Pipe Depth:**	
Location:	Verge	**Total Length:**	7.80 m	**Downstream Node:**	MAIN LINE
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:68

Depth: m
MH 12



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH 12	00:00:09		
0.00	WL	Water level, 0% of the vertical dimension: .	00:00:12		
0.00	LR	Line deviates right	00:00:15		
6.90	BJ	Broken pipe at joint from 10 o'clock to 2 o'clock	00:00:50	MH 12X_fc6d5c10-c22b-	4
7.80	LL	Line deviates left	00:01:01		
7.80	BRF	Finish node, major connection without manhole, reference: Main Line	00:01:04	MH 12X_58f98e87-405c-	

Main Line
Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
1	80.0	10.3	80.0	4.0	0	0.0	0.0	0.0	1.0

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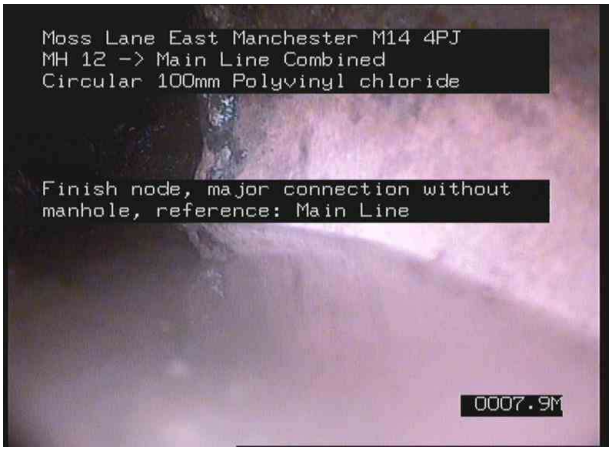
Section Pictures - 22/07/2022 - MH 12X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
7	Downstream	MH 12X		

MH
12X_fc6d5c10-c22b-4d23-9832-77d4aad19deb_20220722_104356_250.jpg, 00:00:50, 6.90 m
Broken pipe at joint from 10 o'clock to 2 o'clock



MH
12X_58f98e87-405c-48f5-93ff-3cb79acdd90f_20220722_104418_153.jpg, 00:01:04, 7.80 m
Finish node, major connection without manhole, reference: Main Line

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Section Inspection - 22/07/2022 - Branch AX

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
8	1	22/07/22	10:52	Not Specified	Rain	Yes	BRANCH AX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
M Gostelow	PN17 AAK	P235 Flexi-Rod	Not Specified	Private Drain	Not Specified

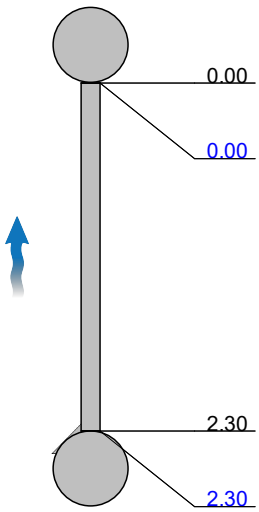
Town or Village:	Moss Lane East	**Inspection Direction:**	Upstream	**Upstream Node:**	BRANCH A
Road:	Manchester M14 4Pj	**Inspected Length:**	2.30 m	**Upstream Pipe Depth:**	
Location:	Verge	**Total Length:**	2.30 m	**Downstream Node:**	MH 5
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50

Depth: m
MH 5



Branch A

Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH 5	00:00:09		
0.00	WL	Water level, 0% of the vertical dimension	00:00:12		
2.30	JN	Junction at 3 o'clock, 100mm dia	00:00:39		
2.30	REM	General remark: SP Rest Bend	00:00:42		

Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0

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Section Inspection - 22/07/2022 - Branch BX

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
9	1	22/07/22	10:54	Not Specified	Rain	Yes	BRANCH BX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
M Gostelow	PN17 AAK	P235 Flexi-Rod	Not Specified	Private Drain	Not Specified

Town or Village:	Moss Lane East	**Inspection Direction:**	Upstream	**Upstream Node:**	BRANCH B
Road:	Manchester M14 4Pj	**Inspected Length:**	2.30 m	**Upstream Pipe Depth:**	
Location:	Verge	**Total Length:**	2.30 m	**Downstream Node:**	MH 5
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

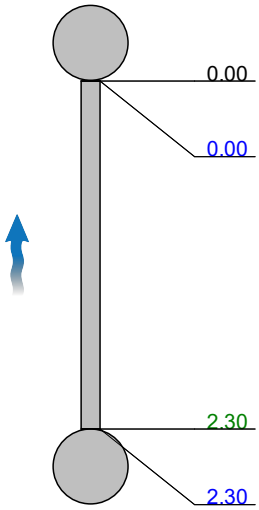
Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50

Depth: m

MH 5



Branch B

Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH 5	00:00:11		
0.00	WL	Water level, 0% of the vertical dimension	00:00:14		
2.30	LL	Line deviates left	00:00:28		
2.30	REM	General remark: limit of survey	00:00:31		

Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0

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Section Inspection - 22/07/2022 - MH 5X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
10	1	22/07/22	10:55	Not Specified	Rain	Yes	MH 5X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
M Gostelow	PN17 AAK	P235 Flexi-Rod	Not Specified	Private Drain	Not Specified

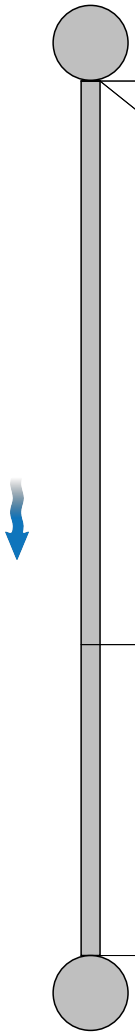
Town or Village:	Moss Lane East	**Inspection Direction:**	Downstream	**Upstream Node:**	MH 5
Road:	Manchester M14 4Pj	**Inspected Length:**	5.90 m	**Upstream Pipe Depth:**	
Location:	Verge	**Total Length:**	5.90 m	**Downstream Node:**	MH 5A
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:51

Depth: m
MH 5



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH 5	00:00:08		
0.00	WL	Water level, 5% of the vertical dimension	00:00:09		
3.80	RFJ	Roots, fine at joint	00:00:45	MH 5X_c79198 6b-9493-	2
5.90	MHF	Finish node, manhole, reference: MH 5A	00:01:19		

MH 5A
Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	1	1.0	0.2	1.0	2.0

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Section Pictures - 22/07/2022 - MH 5X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
10	Downstream	MH 5X		

MH 5X_c791986b-9493-4300-8da4-db4160bedd98_20220722_105655_926.jpg, 00:00:45, 3.80 m
Roots, fine at joint

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Section Inspection - 22/07/2022 - MH 5AX

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
11	1	22/07/22	11:08	Not Specified	Rain	Yes	MH 5AX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
M Gostelow	PN17 AAK	P235 Flexi-Rod	Not Specified	Private Drain	Not Specified

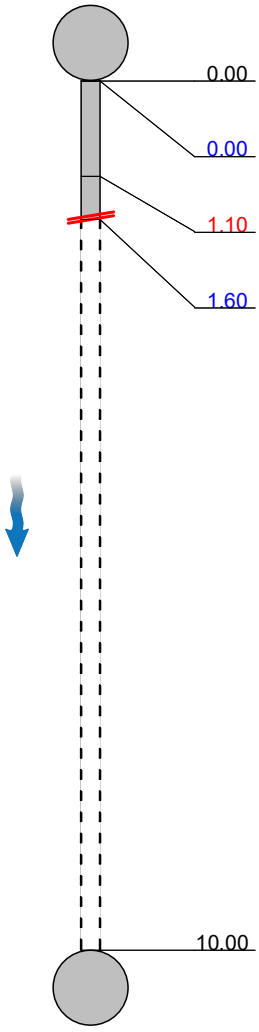
Town or Village:	Moss Lane East	**Inspection Direction:**	Downstream	**Upstream Node:**	MH 5A
Road:	Manchester M14 4Pj	**Inspected Length:**	1.60 m	**Upstream Pipe Depth:**	
Location:	Footway	**Total Length:**	10.00 m	**Downstream Node:**	MH 6
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:87

Depth: m
MH 5A



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH 5A	00:00:09		
0.00	WL	Water level, 0% of the vertical dimension	00:00:14		
1.10	JDM	Joint displaced, medium	00:00:27	MH 5AX_016c 1af5-e92e-	1 / 3
1.60	SA	Survey abandoned: due to displaced joint	00:01:05		
10.00		End of pipe			

MH 6
Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
1	1.0	0.1	1.0	1.0	1	2.0	0.2	2.0	3.0

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Section Pictures - 22/07/2022 - MH 5AX

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
11	Downstream	MH 5AX		

MH 5AX_016c1af5-e92e-470a-9afa-6b555907daaf_20220722_110845_003.jpg, 00:00:27, 1.10 m
Joint displaced, medium

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Section Inspection - 22/07/2022 - MH 3X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
12	1	22/07/22	12:22	Not Specified	Rain	Yes	MH 3X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
M Gostelow	PN17 AAK	P235 Flexi-Rod	Not Specified	Private Drain	Not Specified

Town or Village:	Moss Lane East	**Inspection Direction:**	Upstream	**Upstream Node:**	MH 3
Road:	Manchester M14 4Pj	**Inspected Length:**	2.90 m	**Upstream Pipe Depth:**	
Location:	Footway	**Total Length:**	2.90 m	**Downstream Node:**	MH 2
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

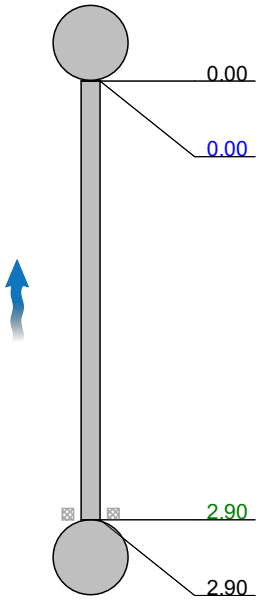
Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	225 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50

Depth: m

MH 2



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: MH 2	00:00:12		
0.00		WL	Water level, 0% of the vertical dimension	00:00:15		
2.90	S01	LU	Line deviates up, start	00:00:31		
2.90		MHF	Finish node, manhole, reference: MH 3	00:00:37		

MH 3

Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 22/07/2022 - MH 2X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
13	1	22/07/22	12:23	Not Specified	Rain	Yes	MH 2X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
M Gostelow	PN17 AAK	P235 Flexi-Rod	Not Specified	Private Drain	Not Specified

Town or Village:	Moss Lane East	**Inspection Direction:**	Downstream	**Upstream Node:**	MH 2
Road:	Manchester M14 4Pj	**Inspected Length:**	3.70 m	**Upstream Pipe Depth:**	
Location:	Footway	**Total Length:**	3.70 m	**Downstream Node:**	MH 1
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

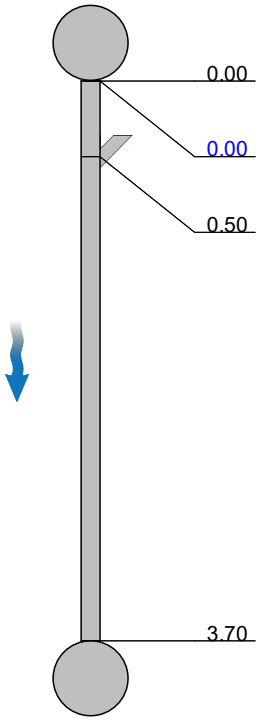
Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	225 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50

Depth: m

MH 2



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH 2	00:00:12		
0.00	WL	Water level, 0% of the vertical dimension	00:00:15		
0.50	JN	Junction at 9 o'clock, 150mm dia	00:00:24		
3.70	MHF	Finish node, manhole, reference: MH 1	00:00:52		

MH 1

Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 22/07/2022 - Branch AX

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
14	1	22/07/22	13:39	Not Specified	Rain	Yes	BRANCH AX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
M Gostelow	PN17 AAK	P235 Flexi-Rod	Not Specified	Private Drain	Not Specified

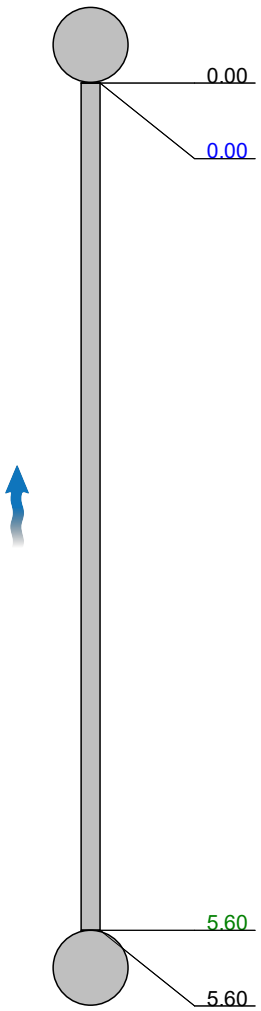
Town or Village:	Moss Lane East	**Inspection Direction:**	Upstream	**Upstream Node:**	BRANCH A
Road:	Manchester M14 4Pj	**Inspected Length:**	5.60 m	**Upstream Pipe Depth:**	
Location:	Footway	**Total Length:**	5.60 m	**Downstream Node:**	MH 4
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50

Depth: m
MH 4



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH 4	00:00:08		
0.00	WL	Water level, 0% of the vertical dimension	00:00:11		
5.60	LR	Line deviates right	00:00:35		
5.60	MHF	Finish node, manhole, reference: SVP Rest Bend	00:00:38		

Branch A

Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 22/07/2022 - Branch BX

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
15	1	22/07/22	13:40	Not Specified	Rain	Yes	BRANCH BX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
M Gostelow	PN17 AAK	P235 Flexi-Rod	Not Specified	Private Drain	Not Specified

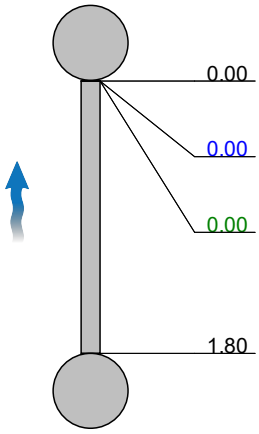
Town or Village:	Moss Lane East	**Inspection Direction:**	Upstream	**Upstream Node:**	BRANCH B
Road:	Manchester M14 4Pj	**Inspected Length:**	1.80 m	**Upstream Pipe Depth:**	
Location:	Footway	**Total Length:**	1.80 m	**Downstream Node:**	MH 4
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50

Depth: m
MH 4



Branch B

Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH 4	00:00:12		
0.00	WL	Water level, 0% of the vertical dimension	00:00:14		
0.00	LU	Line deviates up	00:00:18		
1.80	MHF	Finish node, manhole, reference: Internal Rest Bend	00:00:33		

Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 22/07/2022 - MH 4X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
16	1	22/07/22	13:42	Not Specified	Rain	Yes	MH 4X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
M Gostelow	PN17 AAK	P235 Flexi-Rod	Not Specified	Private Drain	Not Specified

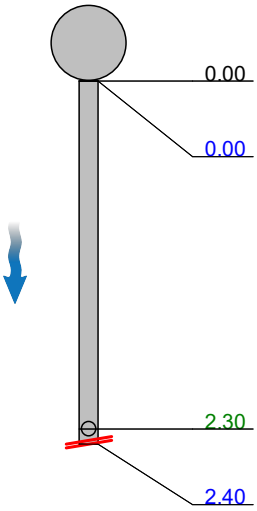
Town or Village:	Moss Lane East	**Inspection Direction:**	Downstream	**Upstream Node:**	MH 4
Road:	Manchester M14 4Pj	**Inspected Length:**	2.40 m	**Upstream Pipe Depth:**	
Location:	Footway	**Total Length:**	2.40 m	**Downstream Node:**	MH 3
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50

Depth: m
MH 4



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH 4	00:00:09		
0.00	WL	Water level, 0% of the vertical dimension	00:00:10		
2.30	CXI	Connection defective, connecting pipe is intruding at 12 o'clock, 100mm dia, intrusion: 40%	00:00:35	MH 4X_49a6f016-6f34-46	4
2.40	SA	Survey abandoned: due to connection	00:00:39		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	1	5.0	2.1	5.0	4.0

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Section Pictures - 22/07/2022 - MH 4X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
16	Downstream	MH 4X		

MH 4X_49a6f016-6f34-4664-8762-76469526b907_20220722_134537_924.jpg, 00:00:35, 2.30 m
Connection defective, connecting pipe is intruding at 12 o'clock, 100mm dia, intrusion: 40%

Drain-Alert
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Tel. 01254 851500
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Section Inspection - 22/07/2022 - MH 1X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
17	1	22/07/22	13:47	Not Specified	Rain	Yes	MH 1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
M Gostelow	PN17 AAK	P235 Flexi-Rod	Not Specified	Private Drain	Not Specified

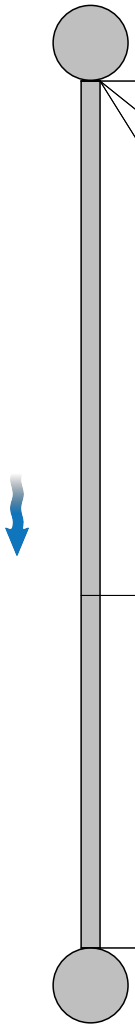
Town or Village:	Moss Lane East	**Inspection Direction:**	Downstream	**Upstream Node:**	MH 1
Road:	Manchester M14 4Pj	**Inspected Length:**	8.60 m	**Upstream Pipe Depth:**	
Location:	Footway	**Total Length:**	8.60 m	**Downstream Node:**	SEWER
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	225 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:75

Depth: m
MH 1



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH 1	00:00:10		
0.00	WL	Water level, 0% of the vertical dimension	00:00:14		
0.00	CL	Crack, longitudinal at 12 o'clock	00:00:16	MH 1X_a2d6b3c0-f1c0-4	2 / 2
5.10	LL	Line deviates left	00:00:39		
8.60	BRF	Finish node, major connection without manhole, reference: Sewer	00:01:21	MH 1X_2d7e1770-ffde-4	

Sewer
Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
1	10.0	1.2	10.0	2.0	1	1.0	0.1	1.0	2.0

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Section Pictures - 22/07/2022 - MH 1X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
17	Downstream	MH 1X		

MH
1X_a2d6b3c0-f1c0-44f4-bc3d-94a5009270e1_20220722_134746_265.jpg, 00:00:16, 0.00 m
Crack, longitudinal at 12 o'clock

MH
1X_2d7e1770-ffde-4613-a7cd-1d9af16ecad4_20220722_134901_153.jpg, 00:01:21, 8.60 m
Finish node, major connection without manhole, reference: Sewer

Appendix C – Flood Risk Assessment and Outline Drainage Strategy

Flood Risk Assessment & Outline Drainage Strategy

Moss Lane East

for

CS Moss Lane East Ltd

13/10/2022

COMPLEX CHALLENGES ...
MADE SIMPLE

Flood Risk Assessment & Outline Drainage Strategy

Moss Lane East

for

CS Moss Lane East Ltd

TITLE	NAME	SIGNATURE	DATE
Report Author	ANDY JAMES		**13.10.2022**
Approved By	MIKE NEWMAN		**13.10.2022**
Issue No.	**V5**		
Report Reference	4453-ROC-XX-XX-RP-C-FRA001		
Report Status	**FINAL**		

REVISIONS ONLY	DESCRIPTION	SIGNATURE	DATE
V2	UPDATED SURFACE WATER RUNOFF VOLUME AND APPENDICES		**24.08.2022**
V3	COMMENTS FROM RUSSELL BOLTON INCORPORATED		**01.09.2022**
V4	CCTV SURVEY DATA INCORPORATED		**16.09.2022**
V5	MINOR CORRECTIONS		**13.10.2022**

COMPLEX CHALLENGES ...
MADE SIMPLE

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1.0 Introduction

1.1 Appointment

RoC Consulting has been commissioned to provide a site-specific Flood Risk Assessment and Outline Drainage Strategy in support of a planning application for the redevelopment of an existing residential dwelling on Moss Lane East, Manchester.

1.2 Proposed Development

The Site comprises of land and property at 466-472 Moss Lane and is located within the Moss Side area of Manchester not far from the junction with Oxford Road and directly opposite Whitworth Park. Heald Place lies to the east with Parkfield Street to the west.

Two semi-detached buildings occupy the site comprising a number of self-contained apartments. One of the buildings is Grade 2 listed and will be retained and enhanced with the other demolished to make way for new flats.

The intention is to utilise the existing listed building as a hub for student amenities, including private study booths, collaboration space and lounges with up to 261 beds occupying the new build spread across 9 storeys.

The site is currently almost entirely hard surfaced with asphalt although some small areas of landscaping exist along the sites northern boundary and to the south of the existing buildings.

1.3 Aim of the Report

The aim of this report is to undertake a Flood Risk Assessment in accordance with the National Planning Policy Framework (NPPF) and current guidance to support a planning application for the site.

The detail and complexity of a Flood Risk Assessment should reflect the level of risk to the site. The NPPF is the official document and together with local planning standards regulates the assessment of flood risks and their appropriate mitigations to the planning process.

This report assesses flood risk to the site and any impact on flood risk to adjacent land and property as a result of the development proposals.

This report is intended to provide information and present proposals relating to the following:

- The existing topography, geology and hydrogeology across the development
- The existing surface and foul water drainage systems within the vicinity of the site
- Identify existing overland flow paths
- Assess the risk of flooding due to fluvial, tidal, groundwater, surface water, flows from surcharged sewers and risks for other possible sources
- Develop mitigation measures for flood risk if required
- Potential constraints imposed by the regulatory bodies including the Environment Agency, Local Water Authority and Lead Local Flood Authority
- Develop an outline foul and surface water drainage strategy

As part of the development of this FRA, information has been obtained from United Utilities (UU).

The flood mapping information contained within this report has been obtained from the Environment Agency (EA) online flood maps.

1.4 Limitations

This report has been prepared for exclusive use by the client for the purpose of assisting them in evaluating the potential risk of flooding associated with the site, potential constraints imposed by drainage and in making a planning application.

RoC Consulting accepts no liability for any use of this document other than by the client (or its representatives acting on behalf of the client) and only for the purposes, stated in the document, for which it was prepared and provided. No person other than the client may copy (in whole or in part) use or rely on the contents of this document, without the prior written permission of RoC Consulting. Any advice, opinions or recommendations within this document should be read and relied upon only in the context of the document as a whole.

RoC Consulting has endeavoured to assess all information provided to them during this appraisal. The report summarises from several external sources and cannot offer any guarantees or warranties for the completeness or accuracy of information relied upon.

The Flood Risk Assessment addresses the flood risk posed to and from the proposed development, the extent of which is shown on the CarsonSall Layout Plans within Appendix B. This report has been undertaken with the assumption that the site will be developed in accordance with the above proposals without significant change. The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.

Intrusive investigation works have not been completed for the site and it is therefore recommended that this is carried out prior to detailed design stage.

It is also recommended that further drainage investigations are undertaken to the public sewers in both Heald Place and Moss Lane East to establish their alignment and depth. This was unable to be determined during the initial survey work.

2.0 Policy & Guidance

In carrying out our assessment and preparing this report, regard has been taken of the provisions of the development plans and a range of other material considerations. However, it is the Governments National Planning Policy Framework, Manchester City Council's Strategic and Preliminary Flood Risk Assessments (PFRA/ SFRA), the Local Flood Risk Management Strategy, LLFA SuDS Requirements for New Developments, CIRIA Guidance and the Non-Statutory Technical Standards for SUDS which provides the most up to date and specific guidance on the scope of Flood Risk Assessments and surface water management.

2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published in England in March 2012, updated in July 2018 and most recently revised in July 2021.

The key aim of the NPPF is to ensure sustainable development through the planning process, taking into account the risks from climate change, flood risk and coastal change to avoid inappropriate development in areas at risk and directing development away from areas of high risk.

It advises that where development is necessary in areas of high risk, it should be safe, and that flood resilience should also be incorporated into the design. It also advises of the fact that new developments should not increase flood risk elsewhere and new developments should aid in mitigating flood risk to the wider area.

The NPPF's advice on climate change, flood and coastal change is set out in section 14 paragraphs 152-173, with the approach to planning for flood risk between paragraphs 159-169.

A Technical Guidance document was published in March 2012 to support the NPPF, which provided guidance on how flood risk should be assessed during the planning and development process. This document has been replaced online at www.gov.uk by the Planning Practice Guidance.

2.2 Planning Practice Guidance – Climate Change, Flood Risk & Coastal Change

The guidance on flood risk and coastal change is intended to help local planning authorities in the preparation of Local Plans, and neighbourhoods in preparing neighbourhood plans. It is also relevant to planning applications and, application for prior approval for certain types of permitted development.

For further guidance, it is recommended that the Environment Agency (EA) be contacted on applications where there is a risk of flooding i.e., sites within Flood Zones 2 and 3. There is also information on the role of Lead Local Flood Authorities (LLFA's) and when their advice may need to be sought in considering planning applications e.g. in critical drainage areas.

The document gives guidance on how flood risk should be assessed and accounted for within the context of the development:

- Flood zones - Table 1
- Flood risk vulnerability classification - Table 2
- Flood risk vulnerability and flood zone compatibility - Table 3
- The sequential test - if required
- The exception test - if required

2.3 Flood and Water Management Act 2010

This Flood Risk Assessment and Preliminary Drainage Strategy has been prepared in consultation with regulatory bodies and third parties. The views, advice and recommendations provided by the regulatory bodies and third parties represent their current standards and procedures.

The Flood and Water Management Act 2010 received Royal Assent on the 8th April 2010. This Act provides duties on the Environment Agency, Local Authorities, developers and other bodies to manage flood risks. The Act has significant planning and design implications for developers.

The main areas affecting developers are:

- The LLFA became responsible for developing, maintaining and applying local flood risk strategy, which must be consistent with national strategy and have input from the designated 'Flood Management Authorities' (FMA), which in addition to the council/unitary authority normally include the EA and local water company

- The LLFA is required to approve and may adopt sustainable urban drainage systems (SUDS). The LLFA may be either a Unitary or County Council

- Non-statutory technical standards have been produced by Defra for England and the Welsh government for Wales. There is a requirement that SUDS will be designed and constructed in accordance with these which are consistent with the SUDS Manual. A practice guidance document was produced by the LASOO advisory group in support of the Non-Statutory technical standards. In August 2019, LASOO was replaced with the Association of SUDS Authorities (ASA), the 'standards' remain current. A number of local authorities have also produced their own policy and guidance

- The SUDS approval process is with the LLFA and the planning authority as part of the planning application. It should be noted that not all planning authorities are the LLFA and as such approval would be required from both authorities.

2.4 Manchester City Council Strategic Flood Risk Assessment, 2011

Local Planning Authorities are required to produce Local Development Frameworks (LDF), which are a portfolio of local development documents that collectively deliver the spatial planning strategy for the authority area.

The LDF's undergo a Sustainability Appraisal which assists Planning Authorities in ensuring their policies fulfil the principles of sustainability. Strategic Flood Risk Assessments (SFRAs) are one of the documents to be used as the evidence base for planning decisions and are a component of the sustainability appraisal process. Therefore, SFRAs should be used in the review or production of LDF's.

SFRA's assess the risk associated with all types of flooding and provides the information required to identify the amount of development permitted in an area; how the drainage systems in the area should function and how the risks in vulnerable areas can be reduced and/or mitigated. The National Planning Policy Framework states that Regional Planning Bodies (RPB's) or Local Planning Authorities should prepare SFRA's in consultation with the Environment Agency.

Manchester City, Salford City and Trafford Councils in partnership with JBA Consulting, produced the Level 1 and Level 2 SFRA, User Guide and Maps across four separate report volumes.

The SFRA indicates that the site is located in Flood Zone 1. The site also lies within the Conurbation Core Critical Drainage area.

2.5 Manchester City Council Preliminary Flood Risk Assessment, 2011

The Flood Risk Regulations (the Regulations), which came into force on the 10th December 2009, and the Flood & Water Management Act (FWMA) which gained Royal Assent on the 8th April 2010 require all unitary authorities (such as Stockport Council) as designated Lead Local Flood Authorities to prepare a number of key documents including a Preliminary Flood Risk Assessment (PFRA) which focuses on local flood risk from surface water, groundwater, ordinary watercourses and canals.

The table below shows the elements of work required under the regulations.

Stage	Assessment of Plan	Description
1.0	Prepare a preliminary assessment report	The PFRA should focus on local flood risk from surface water, groundwater, ordinary watercourses and canals
2.0	Determination and identification of flood risk areas	Flood risk areas are of significant risk identified on the basis of the findings of the PFRA, national criteria set by the UK Government secretary of state and guidance provided by the Environment Agency
3.0	Prepare flood hazard maps and flood risk maps in relation to each relevant flood risk area	The hazard and risk maps will show the likely extent depth, direction, speed of flow and probability of possible floods and their consequences
4.0	Prepare a flood risk management plan in relation to each relevant flood risk area	The flood risk management plans will set out what the risk management objectives are, the measures proposed to achieve those objectives and how the measures are to be implemented

The PFRA completes the first two stages in the process. The identification of flood risk areas will establish where the final two stages of preparing hazard and risk maps and flood risk management plans are required.

The PFRA, maps and plans form part of the local Flood Risk Management Strategy that Manchester City Council as LLFA are required to prepare under the Flood and Water Management Act. This strategy sets out how the LLFA will manage local flood risk in their area and will cover areas not identified as being significant flood risk under the regulations.

2.6 Manchester City Local Flood Risk Management Strategy, 2014

As Lead Local Flood Authority, Manchester City Council has a duty to develop, maintain, apply and monitor a strategy for local flood risk management. The local strategy will complement and support the National Flood and Coastal Risk Management Strategy, published by the Environment Agency (2011) and updated in August 2019.

The Manchester City Local Flood Risk Management Strategy (2014) focuses on local flood risk from surface water, groundwater and ordinary watercourses but also considers flooding from rivers. It identifies responsibilities for flooding within the Borough and the action plan identifies flood management actions designed to address flood risk.

The objectives of the strategy are to:

- Ensure that local flood risk is properly managed by using the full range of options in a coordinated way
- Reduce the likelihood, severity and consequences of flooding from Ordinary Watercourses, from Groundwater, and from Surface Water runoff
- Seek opportunities to improve water quality and biodiversity through flood risk management activities

The LFRMS does not identify the development site as being one of the main areas specifically at risk from flooding.

2.7 SuDS Requirement for New Developments, Manchester City Council

The Lead Local Flood Authority have published a document that provides guidance on drainage and flood risk for new developments. A copy of this can be found in Appendix C of this report.

In order to avoid objection, the following three elements of evidence are required to be submitted:

1. Surface Water Management Statement for the site is submitted that is in line with the requirement of the NPPF Planning Practice Guidance
    - '*New development should only be considered in areas at risk of flooding if priority has been given to the use of sustainable drainage systems. Additionally, and more widely, when considering major development, as defined in the Town and Country Planning (Development Management Procedure) (England) Order 2015, sustainable drainage systems should be provided unless demonstrated to be inappropriate'*.
    - *The strategy should be accompanied by at least an outline layout of the proposed drainage systems with space allocation for the proposed attenuation in line with the relevant flow reduction requirements.*
2. Evidence that drainage hierarchy has been applied in line with NPPF PPG requirements. The aim should be to discharge surface water run-off as high up the following hierarchy of drainage options as reasonably practicable:
    - *into the ground (infiltration);*
    - *to a surface water body;*
    - *to a surface water sewer, highway drain, or other drainage system;*
    - *to a combined sewer.*

3. Evidence that one viable solution for draining the site is secured:
    - *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 (as follows) is required*.
    - *Where surface water is connected to Main Rover, any works within or adjacent to the river that would affect it would require consent from Environment Agency. An email of acceptance of proposed flows and/or new connection will suffice.*
    - *Where surface water is connected to the public sewer, agreement in principle from United Utilities is required that there is adequate spare capacity in the existing system taking future development requirements into account. An email of acceptance of proposed flows and/or new connection will suffice.*
    - *Where surface water is connected to the ordinary watercourse, agreement in principle from Manchester City Council as Lead Local Flood Authority is required. Please note that all new connections to the watercourses shall comply with reduction of flows to Greenfield runoff rates. An email of acceptance of proposed flows and/or new connection will suffice.*
    - *Where surface water is connected to ordinary watercourse, any works within or adjacent to the watercourse that would affect it would require consent from Manchester City Council as Lead Local Flood Authority.*

In order to avoid or discharge a drainage condition, the following evidence is required.

- Evidence of consideration of green SuDS solution wherever practicable and viable in line with NPPF PPG Paragraph 051. SuDS should be designed to:
    - *reduce the causes and impacts of flooding;*
    - *remove pollutants from urban run-off at source;*
    - *combine water management with green space with benefits for amenity,* recreation and wildlife wherever practicable.

- For Greenfield site developments, details of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment, i.e. to the Greenfield runoff rates;

- For Brownfield site developments, for all sites located within Conurbation Core Critical Drainage Areas, details of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment, i.e. at least a 50% reduction in runoff rate compared to the existing rates with an aim to reduce to Greenfield runoff rates wherever practicable;

- Where surface water runoff is to be disposed through infiltration, details of surface water attenuation that is adequate for infiltration capacity of the underlying soil is required. This capacity has to be assessed through site investigation carried out in line with Building Research Establishment Digest 365. Site investigations should be undertaken in locations and at proposed depths of the proposed infiltration devices. Half emptying time of proposed attenuation within 24 hours should be achieved.

- Evidence that the drainage system has been designed (unless an area is designated to hold and/or convey water as part of the design) so that flooding does not occur during a 1 in 100 year rainfall event in any part of a building; The NPPF suggests that 'for events with a return-period in excess of 30 years, surface flooding of open spaces such as landscaped areas or car parks is acceptable for short periods, but the layout and landscaping of the site should aim to route water away from any vulnerable property, and avoid creating hazards to access and egress routes. No flooding of property should occur as a result of a one in 100 year storm event (including an appropriate allowance for climate change)'.

- Assessment of overland flow routes for extreme events that is diverted away from buildings providing long and cross sections for the proposed drainage system and finished floor levels.

- Evidence that runoff volume in the 1 in 100 year, 6 hours rainfall shall be constrained to a value as close as is reasonably practical to the Greenfield runoff volume for the same event, but never to exceed the runoff volume from the development site prior to redevelopment;

- Hydraulic calculation of the proposed drainage system;

- Design construction drawings of proposed SuDS elements and flow controls;

- For sites where proposed development would cause unusual pollution risk to surface water (large car park areas (>50 parking spaces) or industrial estates), evidence of pollution control measures (preferably through SuDS) is required.

- Where an application is part of a larger site which already has planning permission it is essential that the new proposal does not compromise the drainage scheme already approved.

2.8 CIRIA Guidance Development & Flood Risk

The CIRIA Guidance publication "C624 Development and Flood Risk – Guidance for the Construction Industry" defines 3 levels of FRA which can be undertaken:

FRA Level	Description / Scope
Level 1	Screening Study to identify whether there are any flooding or surface water management issues related to a development site that may warrant further consideration. This should be based on readily available existing information, including the SFRA, Environment Agency Flood Map and Standing Advice.
Level 2	Scoping Study to be undertaken if the Level 1 FRA indicates that the site may lie within an area that is at risk of flooding or that the site may increase flood risk due to increased run-off. This Study should confirm the sources of flooding which may affect the site and should include the following: • an appraisal of the availability and adequacy of existing information • a qualitative appraisal of the flood risk posed to the site, and potential impact of the development on flood risk elsewhere • an appraisal of the scope of possible measures to reduce the flood risk to acceptable levels. The Scoping Study may identify that sufficient quantitative information is already available to complete a FRA appropriate to the scale and nature of the development.
Level 3	Detailed Study to be undertaken if the Level 2 FRA concludes that further quantitative analysis is required to assess flood risk issues related to the development site. The Study should include: • quantitative appraisal of the potential flood risk to the development • quantitative appraisal of the potential impact of development site on flood risk elsewhere • quantitative demonstration of the effectiveness of any proposed mitigation measures

This report will follow the format of a Level 2 Scoping Study.

2.9 C753 The SuDS Manual

This document provides best practice guidance on the planning, design, construction, operation, and maintenance of sustainable drainage systems (SuDS). This document provides detail on all the typical sustainable drainage systems and details on how they can be interconnected to not only provide the required drainage performance but also act as pollution control whilst enhancing the site wide Masterplan proposals.

SuDS should not be thought of as an individual component, but as an interconnected system designed to manage, treat, and make best use of surface water, from where it falls as rain to the point at which it is discharged into the receiving environment beyond the boundaries of the site.

A central design concept for SuDS is the SuDS Management Train. This describes the use of a sequence of components that collectively provides the necessary processes to control the frequency of runoff, the flow rates and the volumes of runoff, and to reduce concentrations of contaminants to acceptable levels. There are six specific functions provided by SuDS components. They are not independent, and one component may provide two or more functions.

2.10 Non-Statutory Technical Standards for SuDS, 2015

This document sets out the non-statutory technical standards for sustainable drainage systems. They should be used in conjunction with the National Planning Policy Framework and associated Planning Practice Guidance.

The technical standards prescribe requirements for both Peak Flow and Volume Control with an emphasis on ensuring that these do not exceed the pre-development case and, where practicable, should not exceed greenfield rates and volumes for the 1 in 1 year and 1 in 100 year rainfall events.

For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.

3.0 Site Context

The site is located within the Moss Side are of Manchester and comprises a roughly square plot of land currently occupied by two detached properties with basement structures in use as new flats.

The site is centred around NGR: SJ 84850 95667. The nearest postcode of M14 4PJ. The total red line site application boundary is approximately 0.18ha.

A Site Location Plan is within Appendix A of this report.

3.1 Site Characterisation / Land Use

Development Area		The gross site area is approximately 0.18ha. Under the current proposals the site will provide 261 beds across 9 storeys alongside amenity space, laundry facilities, gym, collaboration spaces etc.
Existing Surfacing and Current Use		The site is currently occupied by two existing residential apartment buildings and associated external hard and soft landscaping. The car park to the rear is surfaced in Asphalt with some turfed areas and planting to the front of the properties.
Boundaries	North	B5219 Moss Lane East beyond which lies Whitworth Park
	South	Existing car park beyond which lie further residential properties
	East	Heald Place and a hand car wash
	West	Parkfield Street which provides access to Gateshead Close and further residential properties.
Access	Vehicles	The site is accessible from Heald Place
	Pedestrians/Cycles	The site is accessible from Moss Lane East and Heald Place

A proposed site layout plan is within Appendix B of this report.

3.2 Topography

A topographic survey of the development site has been undertaken, a copy of which is within Appendix D of this report.

The topography of the site is generally level with a general fall from northeast to southwest. Levels in the northeast corner are around 37.78mAOD with levels in the southwest around 37.16mAOD.

3.3 Geology

Reference to the online British Geological Survey (BGS) map for the site indicates the following ground model:

Drift Geology: Till, Devensian - Diamicton
Solid Geology: Chester Formation – Sandstone

Soilscape England describes the soils as 'slowly permeable seasonally wet acid loamy and clayey soils with impeded drainage'.

A search has also been completed using the BGS Borehole Scans facility to establish what (if any) historic site investigation or borehole data may be available for the development. The table below details the two closest available scans.

BHID	Direction	Distance	Made Ground	Clay	Sandstone
SJ89NE38	East	170m	1.22	12.19	13.11
SJ89NW147	West	400m	0.91	10.67	Not Encountered

There are no geological faults or features indicated within 500m of the site.

3.4 Hydrogeology

Reference to the DEFRA 'Magic Map' online Aquifer Designation Map indicates that the underlying superficial deposits are classed as a Secondary Aquifer (undifferentiated). The underlying Bedrock Geology is described as a Principal aquifer.

Secondary Undifferentiated classification is assigned in cases where it has not been possible to attribute category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

Principal aquifers are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water

supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

3.5 Ground Water Protection Zones

The Environment Agency have defined Source Protection Zones (SPZs) for 2,000 groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk. The maps show three main zones (inner, outer, and total catchment) and a fourth zone of special interest, which the Environment Agency occasionally applies, to a groundwater source.

The proposed development site is located within Source Protection Zone 3 (Total Catchment).

The site is not located in close proximity to any sensitive groundwater abstraction points (e.g., for a potable water supply well). The nearest water abstraction point is indicated 996m to the northwest relating to Heineken UK Ltd. Water is abstracted from groundwater for use in general cooling associated with breweries.

The nearest surface water feature is indicated 915m to the southwest in the form of the Chorlton Brook. Water quality of this receptor (as indicated from a sampling point 969m to the south) indicates a GQA Grade of “B” (good) and a flow rate of less than 0.31 cumecs.

There are no active surface water abstractions at the site or within 500m of the site boundary.

The nearest discharge consent is indicated 131m to the north held by United Utilities for the release of storm sewage overflow into Malkin Brook Tributary Corn Brook.

No historic pollution incidents have been noted in close proximity to the site.

The development of the site would be undertaken in a manner to ensure that no contamination of groundwater occurred.

3.6 Watercourses, Land Drainage, and other Waterbodies

As noted above, the nearest surface water feature is Chorlton Brook which is located circa 915m to the southwest of the site and is culverted.

A historic record drawing from circa 1850 identifies what appears to be a watercourse through the site which is culverted further to the south. However, no evidence of this can be found on site or any other record of it. Further investigations will be undertaken as part of future site investigation work to try and determine whether this feature is culverted beneath the site.

Historic OS Map, Circa 1850

No other water features are present in the vicinity.

3.7 Existing Flood Defences and other Structures

There are no formal flood defences in the vicinity of the site.

3.8 Existing Public Sewers

United Utilities Sewer Records show that the highways surrounding the development site are well served by a network of existing sewers (refer to Appendix E), these include:

- 450 & 375mm diameter Combined Sewers in Parkfield Street and Heald Place
- 2250 & 750x1060mm Combined Sewers in Moss Lane East.

The combined sewers in Parkfield Street ad Heald Place both flow northwards and connect into the 750x1060 sewer in Moss Lane East which flows in westerly direction along with the 2250 brick sewer.

A small cluster of inspection chambers are indicated within the site itself, but no size information or connectivity is shown.

3.9 Existing Private Sewers

A drainage CCTV survey was undertaken by Drain Alert in July 2022. This indicates that the site comprises two separate combined drainage networks, each serving roughly half of the existing site and discharging to Parkfield Street and Heald Place respectively.

The outfall to Parkfield Street is 150mm diameter and Heald Place 225mm diameter. It was not possible to survey the sewers in Heald Place and Moss Lane East however, the sewer in Parkfield Street was surveyed at a depth of around 4.6mbgl.

Temporary traffic management will be required to carry our further works within the adopted highway and it is recommended that this is undertaken prior to works commencing on site.

A copy of the manhole records from the drainage survey are contained within Appendix E. Information from the survey, including assumed drainage areas, has been replicated on the drawing in Appendix G.

3.10 Historical Flood Records

No records of historical flooding in the vicinity are recorded in the SFRA.

An internet-based search uncovered a Manchester Evening News article from July 2019 which included a photograph of flooding on Moss Lane East near Whitworth Park following a period of extended heavy rainfall.

The image (provided below) shows water shooting out of a manhole cover presumably due to the system being severely surcharged. The image was taken at the junction with Heald Place opposite the hand car wash and based on United Utilities records and proximity of the manhole it appears to be affecting the existing 2250 diameter brick combined sewer.

Moss Lane East Flooding, Manchester Evening News, July 2019

No other flooding incidents were recorded at or in the vicinity of the site.

A pre-planning enquiry has been sent to United Utilities which included any records of DG5 sewer flooding. At the time of writing, a response was awaited and therefore details will be entered into a new revision of this report in the next design stage.

3.11 Flood Mapping

3.11.1 EA Flood Zone Map

The Environment Agency Flood Map indicates that the proposed development is located in Flood Zone 1 (low risk).

Flood Zone 1 is land designated as having a greater than 1 in 1,000 annual probability of flooding from rivers.

Flood zone designations ignore the presence of any flood defences and only considers flooding from fluvial and tidal sources.

3.11.2 SFRA Flood Zones Map

The Manchester City Council SFRA flood zone map also indicate the site is located in Flood Zone 1

3.11.3 SFRA Groundwater Flood Map

The Manchester City Council SFRA Groundwater Flooding map indicates that the site is not in an area at risk of groundwater flooding.

3.11.4 SFRA Surface water Flood Map

The Manchester City Council SFRA surface water flood maps indicate that the site is not in an area at risk of surface water flooding.

4.0 Surface Water Management

4.1 Introduction

The National Planning Policy Framework (NPPF) and accompanying Technical Guidance indicate that surface water run-off should be controlled as near to its source as possible through a sustainable drainage approach to surface water management.

Consideration should therefore firstly be given to using sustainable drainage (SuDS) techniques including soakaways, infiltration trenches, permeable pavements, grassed swales, ponds and wetlands to reduce flood risk by attenuating the rate and quantity of surface water run-off from a site. This approach can also offer other benefits in terms of promoting groundwater recharge, water quality improvement and amenity enhancements. Approved document Part H of the Building Regulations (2015) sets out a hierarchy for the disposal of surface water which encourages a SuDS approach.

4.2 Pre-Development Surface Water Runoff

The total area within the site boundary is approximately 0.18ha. This is currently primarily comprised of the two detached buildings, one of which is to be retained, and associated areas of hardstanding alongside some very minor areas of soft landscaping.

For the purposes of determining the existing rate of surface water runoff the site is considered to be brownfield and the drainage CCTV survey demonstrates that the surface water run-off is drained to both the public combined sewers in Parkfield Street and Heald Place. The sewer records indicate that these then discharge to the 750 x 1060 combined sewer in Moss Lane East.

The drainage survey has been used to help calculate the existing rate of run-off by modelling the system in Microdrainage. This method allows estimation of the amount of run-off that is likely to be generated from an urban area based on surveyed pipe sizes and invert depths.

Impermeable areas were measured from the topographic survey and can be found alongside a layout of the existing drainage on the drawing in Appendix G of this report.

The table below summarises the existing brownfield run-off rates for the development across a range of storm return periods.

NETWORK	OUTFALL	GROSS AREA	DRAINED. AREA	Q_1 (L/S)	Q_{30} (L/S)	Q_{100} (L/S)
1	Heald Place	0.187 ha	0.063 ha	7.0	20.0	25.8
2	Parkfield St		0.062 ha	6.7	19.5	25.2
Total				13.7	39.5	51.0

Existing run-off calculations are within Appendix H of this report.

4.3 Methods of Surface Water Management

There are three methods that have been reviewed for the management and discharge of surface water which are detailed below; these may be applied individually or collectively to form a complete strategy. They should be applied in the order of priority as listed.

- Discharge via infiltration
- Discharge to watercourse
- Discharge to public sewerage system

Discharge via Infiltration

Any impermeable areas that can drain to a soakaway or an alternative method of infiltration would significantly improve the sustainability of any surface water systems.

At the time of writing an intrusive investigation for the development site was not available to assess ground conditions. However, RoC Consulting has undertaken a Phase 1 Desk Study for the site which provides information on expected ground conditions from the British Geological Survey and nearby bore hole data.

These indicate Made Ground up to depths of 1.22m, underlain by clays for a further 10-12m. Sandstone bedrock was encountered in one borehole at over 13m.

Furthermore, the constraints of the site also limit the space available to place a suitably sized soakaway whilst maintaining the minimum distances to existing/ proposed buildings.

Taking this into consideration, infiltration is not expected to be a feasible method of surface water disposal for the development. However, it is recommended that some infiltration testing is

undertaken as part of any future site investigation works at the site so that this can be ruled out and satisfactory evidence provided to the LLFA and United Utilities as necessary.

Discharge to Watercourse

As indicated earlier in this report, the nearest watercourse to the site is Chorlton Brook which is located circa 915m to the southwest of the site and is culverted.

No other water features are present in the vicinity.

On this basis, this method of surface water disposal has not been considered further.

Discharge to Public Sewer

The only public sewerage infrastructure in the vicinity of the site are all combined sewers. On the basis that infiltration is not considered to be viable, there are no surface water sewers or watercourses in the vicinity and the existing development discharges to the public combined sewer network at two separate locations then this is the only viable solution.

It is therefore proposed that the development will mimic the existing drainage regime and discharge surface water to the combined sewer network in Heald Place subject to agreement with United Utilities and the Lead Local Flood Authority.

Further drainage investigation work will be required to establish the alignment and level of the existing public sewer however, based on the survey work undertaken to date it is expected to be deep enough to obtain a connection.
.
A pre-development enquiry has been submitted to United Utilities. At the time of writing, a response was awaited and therefore details will be entered into a new revision of this report in the next design stage.

4.4 Proposed Restricted Discharge Rates

Manchester City Council SuDS Requirement for Developers states that:

"For Brownfield site developments, for all sites located within Conurbation Core Critical Drainage Areas, details of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment, i.e. at least a 50% reduction in runoff rate compared to the existing rates with an aim to reduce to Greenfield runoff rates wherever practicable."

Given the small development footprint and limited space within which to incorporate SuDS features and attenuation it is not considered practicable to restrict flows to Greenfield run-off rates due to the extremely low flow rate.

It is therefore intended that discharge from the site will be restricted to 50% of the existing Q1 run-off rate subject to agreement with both United Utilities and the LLFA. This will ensure that the proposed development will not increase flood risk elsewhere.

Existing brownfield run-off rates have been calculated and are presented in Section 4.2 above. A 50% reduction on the Q1 discharge rate is presented in the table below.

GROSS AREA	IMP. AREA	Q_1 (L/S)	50% Q_1 (L/S)
0.187 ha	0.125 ha	13.7	6.85

4.5 Attenuation Requirements

The proposed restricted discharge rate above and development run-off generated by proposed impermeable areas results in a storage requirement during periods of intense rainfall.

The Microdrainage Source Control Quick Storage Estimate design software has been used to estimate the maximum storage volume required on-site for the Q_{30} and Q_{100}-year storm events plus an allowance for climate change.

Proposed impermeable areas have been measured from the architects layout.

Attenuation Volume				
Gross Area (ha)	Imp. Area (ha)	Max. Discharge (l/s)	Q_{30} Volume (m3)	Q_{100}+40% Volume (m3)
0.187	0.156	6.85	29	68

It should be noted that these figures are indicative only and should not be relied upon for contractual or cost commitment purposes.

Given the constraints of the site and requirement to pick up RWP connections from basement level, it is proposed that the attenuation tank will also need to be located beneath the basement with flows being lifted up to a higher level via a package pumping station.

Alternative solutions for locating the attenuation tank, with a view to also removing the package pumping station, will be explored at detailed design stage.

4.6 Surface Water Runoff Volume

It is a requirement of the Non-Statutory Sustainable Drainage Technical Standard that:

S5 *Where reasonably practicable, for developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100-year, 6-hour rainfall event, must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event.*

S6 *Where it is not reasonably practicable to constrain the volume of runoff to any drain, sewer or surface water body in accordance with* ***S5*** *above the runoff volume must be discharge at a rate that does not adversely affect flood risk.*

Where possible, to comply with the above SuDS techniques should be used to allow any additional volume to infiltrate naturally, therefore preventing this from discharging to receiving waters.

Where infiltration is not possible then the additional volume should be discharged at flow rates below 2 l/s/ha.

Compliance with the above can be technically difficult to achieve for sites of this nature and therefore the requirements for any long-term storage would need to be explored further at detailed design stage in consultation with the LLFA.

The LLFA could require discharge to be reduced to greenfield rates (Qbar) where long term storage cannot be provided. This would have the effect of increasing overall attenuation storage volumes with the Q100+40% figure increasing to circa 93m^3 from 68m^3.

5.0 Foul Water Management

5.1 Introduction

It is proposed to install a new foul drainage system to serve the development.

The foul water system will be designed and constructed in accordance with the current Building Regulations, BS EN:752 'Drainage and Sewer Systems Outside Buildings', the Local Authority Building Control specifications and requirements, Sewerage Sector Guidance (Appendix C) and the Civil Engineering Specification for the Water Industry.

5.2 Foul Water Capacity & Point of Connection

At the time of writing details of foul flow rates generated by the development were not available. However, as a rough estimate, based on the appliances shown on the architect's layout and in accordance with BS EN 12056-2:2000 the approximate peak foul flow would be in the region of 13.04 l/s.

A pre-development enquiry has been submitted to United Utilities based on the above. At the time of writing, a response was awaited and therefore details will be entered into a new revision of this report in the next design stage.

Based on the drainage CCTV survey it is not possible to utilise an existing connection to the public sewer network and therefore it is proposed to combine with the surface water at the final manhole and discharge to the 375mm diameter sewer in Heald Place.

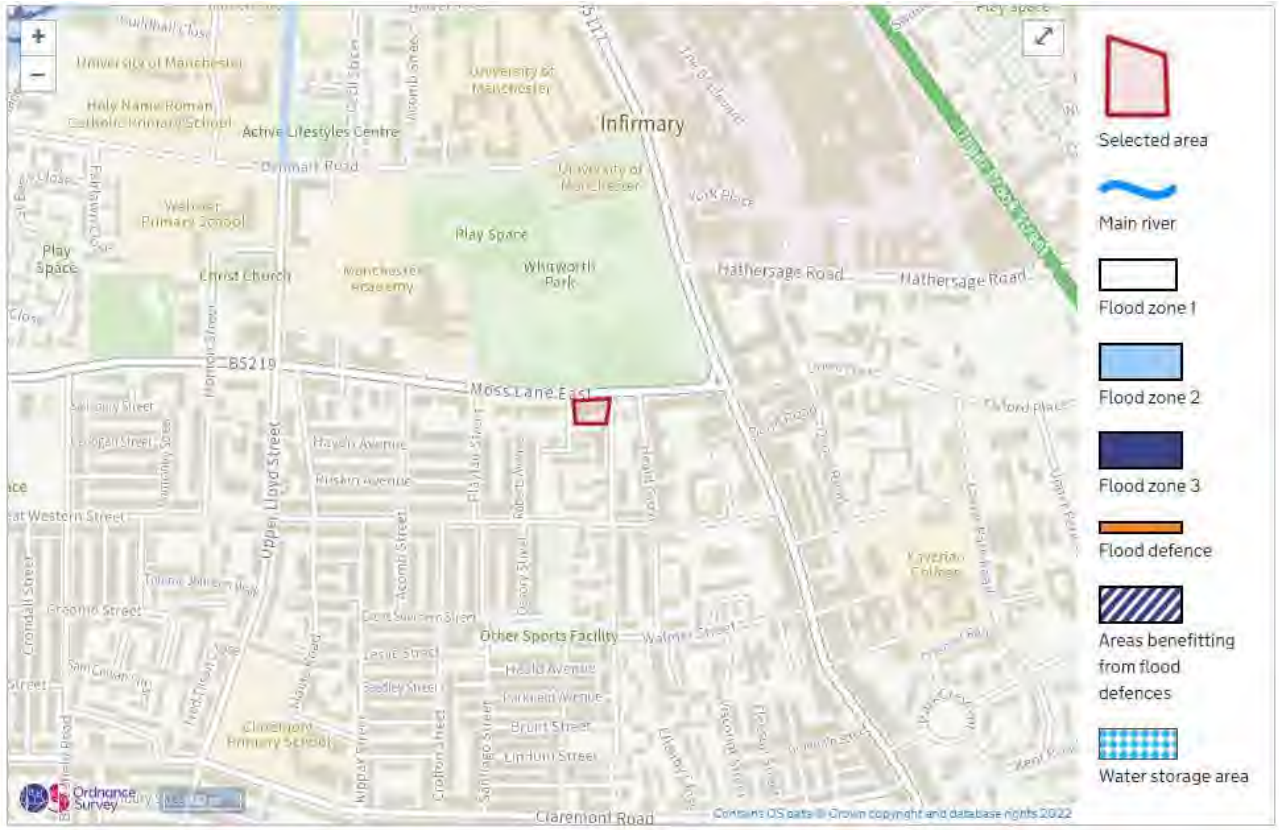
Similar to surface water, there are foul connections within the basement which need to be picked up and therefore it is currently proposed that a package pumping station will be provided to lift flows up to a higher level. From here they will be able to discharge via gravity.

It is intended that this will be reviewed further at detailed design stage with a view to limiting the amount of foul drainage that requires pumping.

6.0 Sources of Flood Risk

6.1 Fluvial Flood Risk

Information relating to fluvial flood risk at the site has been obtained via and Environment Agency online flood mapping.



Examination of the Environment Agency online flood map above indicates that the site is located in Flood Zone 1.

Flood Zone 1 is defined within the NPPF as a site to have a greater than 1 in 1000 (1-0.1%) probability of river flooding in any one year.

The nearest water feature to the development is the culverted Chorlton Brook which is located almost 1km away.

Taking the above into consideration, it is considered that the residual risk of fluvial flooding to the site is LOW.

6.2 Pluvial Flood Risk

Pluvial flooding is defined as flooding resulting from rainfall generated overland flow before run-off enters any watercourse or sewer.

It is usually associated with high intensity rainfall events but can also occur with low intensity rainfall or melting snow where ground is saturated, frozen, developed or otherwise has low permeability resulting in overland flow and ponding in depressions in the topography. Large catchment areas are particularly prone to this type of flooding.

The Environment Agency pluvial flood map indicates that the site is not an area potentially susceptible to pluvial flooding.

The only flows that are therefore likely to be present on site are from direct rainfall on areas of hardstanding.

Overland flow paths on site and exceedance events will be catered for within the detailed design/levels strategy. This in conjunction with a new drainage system would be sufficient to maintain a **Low** level of risk from pluvial flooding.

6.3 Tidal Flood Risk

The site is not considered to be at risk of tidal flooding due to its inland location.

6.4 Groundwater Flood Risk

In general terms, groundwater flooding can occur from three main sources, raised water tables, seepage and percolation, and groundwater recovery or rebound. If groundwater levels are naturally close to the surface, then this can present a flood risk during intense rainfall.

The Manchester City Council SFRA identifies that the site is not at risk of groundwater flooding.

An intrusive investigation should be undertaken in advance of detailed design stage to establish exact ground water levels and how they fluctuate seasonally. If required, measures would need to be introduced into the drainage scheme to deal with high groundwater to ensure that flooding to property does not occur. Given the development proposals include for the retention of an existing basement and construction of a new one then measures may be required prevent the ingress of groundwater.

It is considered that any groundwater issues can be mitigated as required, subject to further investigation, at the detailed drainage design stage. The risk to the site from groundwater flooding is therefore considered **Low**.

6.5 Artificial Source – Canal Flood Risk

Generally, canals are owned and operated by the Canals & Rivers Trust (CRT). Water levels are regulated between normal and statutory levels by means of weirs and sluice gates and whilst a breach or overtopping of the structure is unlikely, the possible flood risk needs to be assessed.

There are no canals in close proximity to the site.

There is not considered to be any risk of flooding to the site from canals.

6.6 Artificial Source – Sewer Flood Risk

Given the topography of the site and the surrounding area it is unlikely that flooding from existing surcharged public sewers would impact on the proposed development site as it would likely be limited to the surrounding highway network and directed away from the development.

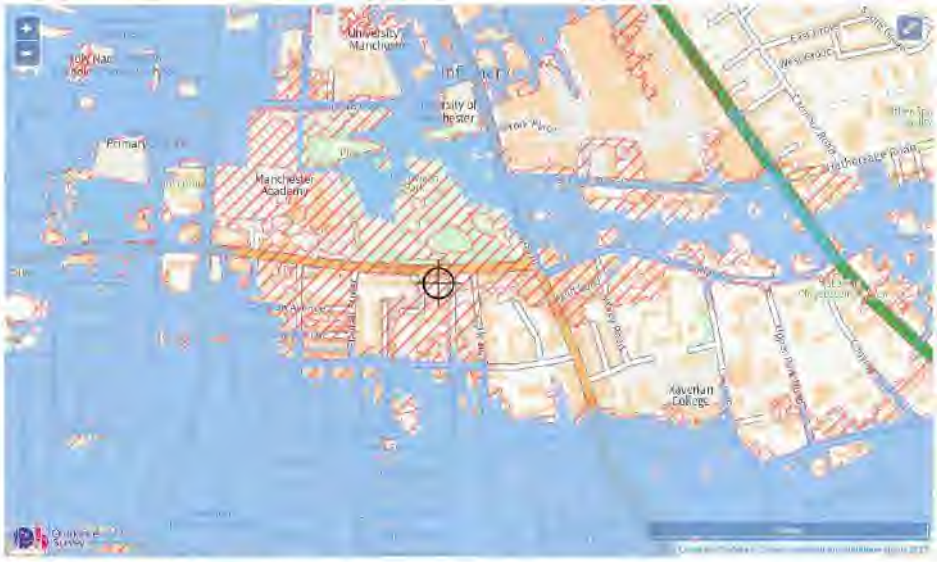
A response was awaited with respect to DG5 sewer flooding in the area however, an internet-based search did reveal that a sewer in Moss Lane East did surcharge during a period of extended heavy rainfall in July 2019. This is understood not to have affected the proposed development site and all flooding was contained within the highway.

The new development proposed site surface water drainage system will be designed to maintain surface water flows below ground for up to and including the 1 in 100 year return period as a minimum. Flows above this and up to 100 year plus 40% allowance for climate change will be retained safely within the site.

It is considered that the risk of flooding to the site from surcharged sewers can be considered as **Low.**

6.7 Artificial Source – Reservoir Flood Risk

Review of the below Environment Agency reservoir flood map indicates that the site could be affected by reservoir flooding should this also occur at the same time as River Flooding.



Maximum extent of flooding from reservoirs:

when river levels are normal | when there is also flooding from rivers | Location you selected

However, despite this the risk of reservoir flooding in the UK is very low as reservoirs are inspected regularly and any essential maintenance is carried out. Furthermore, the likelihood of this occurring at the same time as a fluvial flood event is experienced in the area are very remote. The risk of flooding from reservoirs is therefore considered **Low.**

6.8 Flood Risk Vulnerability Classification

The proposed development is primarily residential and can be considered as 'More Vulnerable' within Table 2: Flood Risk Vulnerability Classification in the NPPF.

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	✗	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	✗	✗	✗

Key: ✓ Development is appropriate
✗ Development should not be permitted

Table 3: Flood risk Vulnerability and flood zone 'compatibility'
*'Technical Guidance to the National Planning Policy Framework (NPPF)**

This type of development would be wholly appropriate for Flood Zone 1.

7.0 Residual Risks and Impacts

7.1 Flood Risk Management Measures

The surface water drainage management measures outlined above would ensure that run-off from the proposed development would not exceed the existing scenario and a betterment would be provided for larger return periods.

As a result of the restricted flow rate and proposed impermeable area, attenuation is required in the form of site control measures. Any new private drainage system will be designed in accordance with current design guidance and standards and attenuation will be provided along with potential SuDS measures such as permeable pavements and filter strips.

The use of SuDS measures, with controlled release of surface water to the combined sewer network will help to mitigate any potential flood risk impact from the development on the public sewer system.

.

Finished site levels will be engineered to provide positive drainage where required and prevent ponding. The accumulation of standing water will therefore not occur and thus not pose a risk.

Gradients of the hardstanding areas, where possible, will be designed to fall away from buildings such that any overland flow resulting from extreme events would be channelled away from entrances.

7.2 Off Site Impacts

The existing site primarily comprises two existing buildings and associated areas of hardstanding with limited soft landscaping. However, there will be a slight increase in impermeable area when compared to existing.

A survey of the existing drainage network will be undertaken in due course however, it is considered likely that the existing site will discharge flows unrestricted to the public sewer network.

To ensure that the proposed development will not increase flood risk elsewhere, surface water drainage discharge will be restricted. This restricted discharge in conjunction with surface water attenuation on site will mitigate against flood risk to other land.

By reducing the post development peak run-off prior to its point of discharge from the site, this will reduce the potential for surface water flooding on the downstream network.

7.3 Residual Risks

The development and its drainage system will be designed to cope with the intense storm events up to and including the 100 year return period rainfall event with an allowance for climate change. If an extreme rainfall event exceeds the design criteria for the drainage network, it is likely that there will be some overland flows which are unable to enter the system.

Any overland flows generated by the proposed development will be directed away from any adjacent existing properties surrounding the site and towards the road network where it can follow natural flow paths.

As with any drainage system, blockages within the surface water system have potential to cause flooding or disruption. An appropriate maintenance regime is to be scheduled with a management company appointed to carry out the works.

7.4 Pollution Control

In accordance with CIRIA C753 publication 'The SuDS Manual' (2015), residential roofs and other roofs have a very low and low pollution hazard level respectively.

No parking is to be provided on the site and so this has not been considered.

The table below indicates the pollution hazard indices which is based on Table 26.2 from the SuDS Manual.

Pollution Hazard Indices				
Land Use	**Pollution Hazard Level**	**Total Suspended Solids (TSS)**	**Metals**	**Hydrocarbons**
Residential Roofs	Very Low	0.2	0.2	0.05

Surface water treatment (removal of oils / silts, metals etc) may be required prior to discharge to the combined sewer system; this will be discussed further with United Utilities at detailed design stage.

If required, where possible, SuDS components will be used to provide the necessary level of treatment. Where this is not achievable then proprietary treatment systems will be included such as Bypass, Full Retention of Hydrodynamic Separators.

8.0 Summary

The proposed development proposes the demolition of an existing former apartment building and construction of new student accommodation comprising 261 beds alongside resident facilities across a gross site area of approximately 0.187ha.

The site is in an area identified as having a low probability of flooding on the Environment Agency Flood Map and is located in Flood Zone 1.

The Flood Risk Assessment (FRA) has reviewed all sources of flood risk to both the proposed development and to existing adjacent properties as a result of the development proposals, including fluvial, tidal, pluvial, groundwater, sewers and flooding from artificial sources. This report demonstrates that the development site is not at significant flood risk, nor does it increase flood risk off-site.

A pre-development enquiry has been submitted to United Utilities. At the time of writing, a response was awaited and therefore details will be entered into a new revision of this report in the next design stage.

The primary option for surface water disposal would ordinarily be via infiltration. However, based on anticipated ground conditions and constraints of the site this is not considered to be feasible and therefore discharge will be to the public combined sewer network as per the existing site regime. This will be subject to agreement in principle with UU and the LLFA.

Discharge from the site would be restricted to 6.85 l/s which represents the existing calculated Q_1 brownfield runoff rate with a 50% betterment applied in accordance with local planning policy.

Further drainage survey work will be required to establish the precise alignment and level of the existing public sewer in Heald Place.

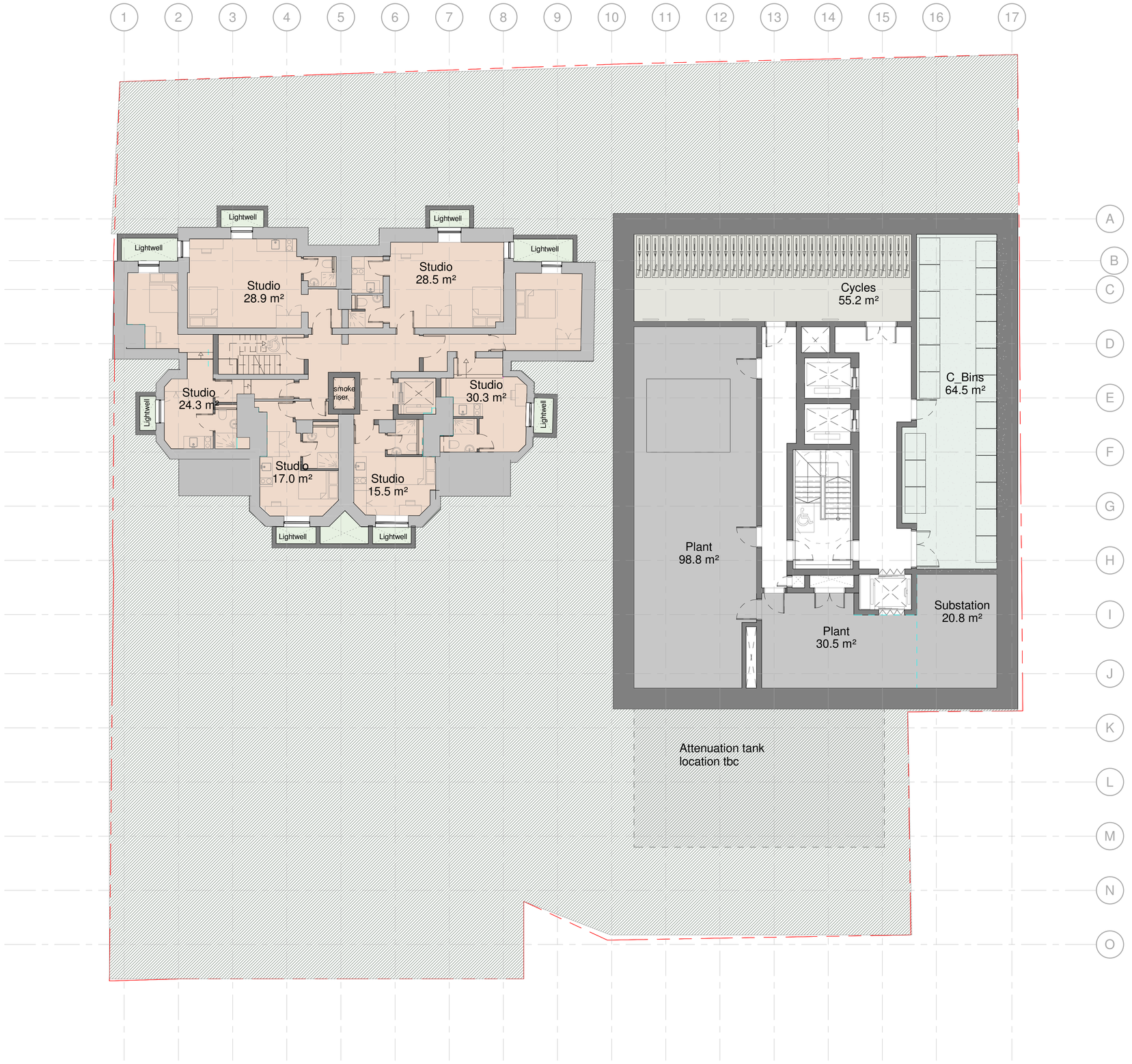
Foul water drainage is intended to combine with the surface water drainage system at the final outfall and will also discharge to the existing 375mm dia. sewer in Heald Place subject to UU approval.

This Flood Risk Assessment and Outline Drainage Strategy is considered to be commensurate with the development proposals and in summary, the development can be considered appropriate for Flood Zone 1 in accordance with the NPPF.

APPENDIX A – LOCATION PLAN

Site Location Plan

APPENDIX B – DEVELOPMENT LAYOUT



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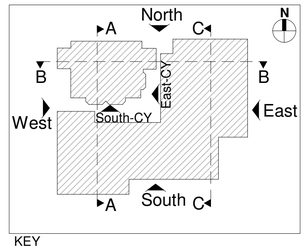

KEY

DRAFT

REV	DATE	NOTE	DWN	CHCK
R2	08/08/22	General update	CB	CS
R1	08/07/22	Layout amendments	CB	CS
	25/05/22	General update	CB	

Services:
Futureserv

Structures:
ROC Consulting

Client:
CS Moss Lane East Ltd

Project:
Moss Lane East
466-472 Moss Lane East, Manchester M14 4PJ

Drawing Title:
GA-Basement
Proposed GA plan

Project No:	Sheet No:	Stage:
1094	099	INFO
Scale: 1 : 100 1:200	Paper Size: A1 A3	Revision: REV 2
Drawn By: ND	Checked By: CS	Date of first Issue: 03/11/21

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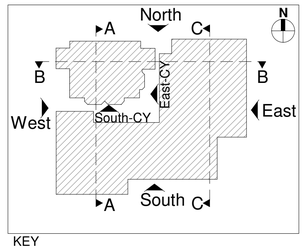

KEY

DRAFT

REV	DATE	NOTE	DWN	CHCK
R2	08/08/22	General update	CB	CS
R1	08/07/22	Layout communal amended	CB	CS
	10/06/22	DTM issue	CB	CS

Services:
Futureserv

Structures:
ROC Consulting

Client:
CS Moss Lane East Ltd

Project:
Moss Lane East
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Drawing Title:
GA - Ground Floor
Proposed GA plan

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APPENDIX C – LLFA SUDS GUIDANCE

Lead Local Flood Authority - Manchester City Council

SuDS Requirements for New Developments

The Government has strengthened planning policy on the provision of sustainable drainage systems (SuDS) for 'major' planning applications which is being introduced from 6 April 2015 (Paragraph 103 of National Planning Policy Framework and Ministerial Statement on SuDS).

Changes were made to the Town and Country Planning Policy and Guidance to give Local Authority Planning Departments the responsibility for ensuring that new developments are drained in a sustainable way, through the planning process, in consultation with the Lead Local Flood Authorities. As per the guidance issued by the Department of Communities and Local Government (DCLG), all 'major' planning applications being determined from 6 April 2015, must consider sustainable drainage systems.

Decisions about the suitability of sustainable drainage provision are made by the Local Planning Authority. However, under the new consultation arrangements Manchester City Council, in its role as Lead Local Flood Authority, is a statutory consultee for all major applications with regards to sustainable drainage. All 'major' planning applications submitted from 15 April 2015 are required to include a Surface Water Drainage Statement.

Developers submitting the planning application to Manchester City Council are advised to:

- Assess the suitability of sustainable drainage systems in accordance with: paragraphs 051, 079 and 080 of the revised NPPF Planning Practice Guidance (PPG) for Flood Risk and Coastal Change.

  Design sustainable drainage systems in line with national Non-Statutory Technical Standards for SuDS: *https://www.gov.uk/government/publications/sustainable-drainage-systems-non-statutory-technical-standards*

  and local policies DM1, EN08, EN14 and EN17 of the Core Strategy.

- Assess surface water attenuation requirements that offer a reduction in surface water runoff rate in line with the 'Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA, User Guide, Final, dated May 2010'. (Section 3.4.1 Critical Drainage Areas, page 31). Please note that all new connections to the watercourses shall comply with reduction of flows to Greenfield runoff rates.

  http://www.manchester.gov.uk/downloads/download/3871/strategic_flood_risk_assessment-manchester_salford_trafford

- Submit hydraulic calculations and drawings to support the design along with proposed standards of operation and maintenance in accordance with paragraph 081 of NPF (PPG).

- It will be essential that the type of sustainable drainage system for a site, along with details of its extent/position, is identified at the design stage of the whole scheme. This information will be required for both outline and full applications so it is clearly demonstrated that the SuDS can be accommodated within the development that is proposed. It will no longer be acceptable to leave the design of SuDS to a later stage to be dealt with by planning conditions.

- Surface water run-off should be controlled as near to its source as possible through a sustainable drainage approach to surface water management. SuDS seek to mimic natural drainage systems and retain water on or near to the site, when rain falls, in contrast to traditional drainage approaches, which tend to pipe water off-site as quickly as possible. SuDS therefore offer significant advantages over conventional piped drainage systems.

Applicants are strongly advised to discuss their proposals with relevant planning officers at the pre-application stage to ensure that an acceptable SuDS scheme is submitted.

Minimum requirements for approval

In order to avoid objection, the following three elements of evidence are required:

- Surface Water Management Statement for the site is submitted that is in line with requirement of NPPF PPG Paragraph 079:
    - "New development should only be considered appropriate in areas at risk of flooding if priority has been given to the use of sustainable drainage systems. Additionally, and more widely, when considering major development, as defined in the Town and Country Planning (Development Management Procedure) (England) Order 2015, sustainable drainage systems should be provided unless demonstrated to be inappropriate".
    - The strategy should be accompanied by at least an outline layout of the proposed drainage systems with space allocation for the proposed attenuation in line with relevant flow reduction requirements.
- Evidence that drainage hierarchy has been applied in line with NPPF PPG Paragraph 080. The aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:
    - into the ground (infiltration);
    - to a surface water body;
    - to a surface water sewer, highway drain, or another drainage system;
    - to a combined sewer.
- Evidence that one viable solution for draining the site is secured:
    - 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 (as follows) is required.
    - Where surface water is connected to Main River, any works within or adjacent to the river that would affect it would require consent from Environment Agency. An email of acceptance of proposed flows and/or new connection will suffice.
    - Where surface water is connected to the public sewer, agreement in principle from United Utilities is required that there is adequate spare capacity in the existing system taking future development requirements into account. An email of acceptance of proposed flows and/or new connection will suffice.

Where surface water is connected to the ordinary watercourse, agreement in principle from Manchester City Council as Lead Local Flood Authority is required. Please note that all new connections to the watercourses shall comply with reduction of flows to Greenfield runoff rates. An email of acceptance of proposed flows and/or new connection will suffice.

- Where surface water is connected to ordinary watercourse, any works within or adjacent to the watercourse that would affect it would require consent from Manchester City Council as Lead Local Flood Authority. Consent forms can be obtained on the website at:

http://www.manchester.gov.uk/downloads/download/5567/land_drainage_consent_and_guidance.com

Avoiding or discharging drainage condition

- Evidence of consideration of green SuDS solution wherever practicable and viable in line with NPPF PPG Paragraph 051. SuDS should be designed to:
  - reduce the causes and impacts of flooding;
  - remove pollutants from urban run-off at source;
  - combine water management with green space with benefits for amenity, recreation and wildlife wherever practicable.

- For Greenfield site developments, details of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment, i.e. to the Greenfield runoff rates;

- For Brownfield site developments, for all sites located within Conurbation Core Critical Drainage Areas, details of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment, i.e. at least a 50% reduction in runoff rate compared to the existing rates with an aim to reduce to Greenfield runoff rates wherever practicable;

- Where surface water runoff is to be disposed through infiltration, details of surface water attenuation that is adequate for infiltration capacity of the underlying soil is required. This capacity has to be assessed through site investigation carried out in line with Building Research Establishment Digest 365. Site investigations should be undertaken in locations and at proposed depths of the proposed infiltration devices. Half emptying time of proposed attenuation within 24 hours should be achieved.

- Evidence that the drainage system has been designed (unless an area is designated to hold and/or convey water as part of the design) so that flooding does not occur during a 1 in 100 year rainfall event in any part of a building; The NPPF suggests that 'for events with a return-period in excess of 30 years, surface flooding of open spaces such as landscaped areas or car parks is acceptable for short periods, but the layout and landscaping of the site should aim to route water away from any vulnerable property, and avoid creating hazards to access and egress routes. No flooding of property should occur as a result of a one in 100 year storm event (including an appropriate allowance for climate change)'.

- Assessment of overland flow routes for extreme events that is diverted away from buildings providing long and cross sections for the proposed drainage system and

finished floor levels;

- Evidence that runoff volume in the 1 in 100 year, 6 hours rainfall shall be constrained to a value as close as is reasonably practical to the Greenfield runoff volume for the same event, but never to exceed the runoff volume from the development site prior to redevelopment;

- Hydraulic calculation of the proposed drainage system;

- Design construction drawings of proposed SuDS elements and flow controls;

- For sites where proposed development would cause unusual pollution risk to surface water (large car park areas (>50 parking spaces) or industrial estates), evidence of pollution control measures (preferably through SuDS) is required.

- Where an application is part of a larger site which already has planning permission it is essential that the new proposal does not compromise the drainage scheme already approved.

SuDS Maintenance

Maintenance of SuDS is essential for its proper operation and a clear management and maintenance plan for the lifetime of the development is required as part of the planning application.

In considering a development that includes a sustainable drainage system, Manchester City Council as local planning authority will want to be satisfied that the proposed minimum standards of operation are appropriate and that there are clear arrangements in place for ongoing maintenance. Information sought by Manchester City Council would be no more than necessary, having regard to the nature and scale of the development concerned in line with NPPF Paragraph 081.

In some instances where no clear adoption of the drainage system is proposed, a drainage maintenance condition could be attached to the planning applications. In order to discharge this condition, the following evidence should be provided following *construction:*

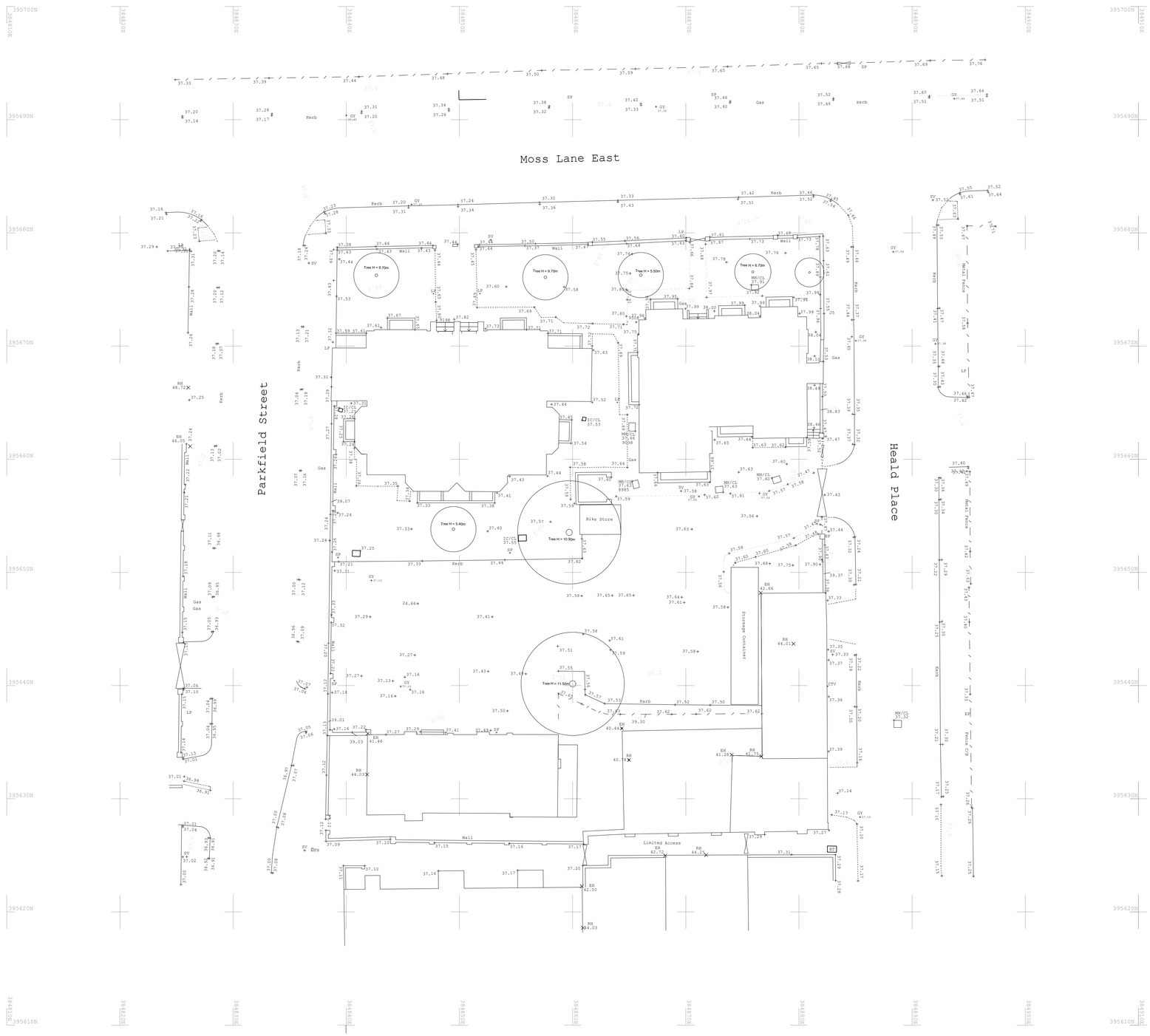
- Verification report providing photographic evidence of construction as per design drawings;

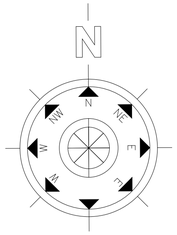
- As built construction drawings if different from design construction drawings;

- Management and maintenance plan for the lifetime of the development which shall include the arrangements for adoption by any public body or statutory undertaker, or any other arrangements to secure the operation of the sustainable drainage scheme throughout its lifetime.

Applicants are strongly advised to discuss their proposals with relevant planning officers at the pre-application stage to ensure that an acceptable SuDS scheme is submitted.

APPENDIX D – TOPOGRAPHIC SURVEY





ABBREVIATIONS

BOL	Bollard
BT	BT Cover
CB	Control Box
CH	Ceiling Height
CL	Cover Level
DK	Drop Kerb
EH	Eaves Height
FH	Fire Hydrant
FFL	Finished Floor Level
FP	Flag Pole
GAS	Gas Valve
GY	Gully
IC	Inspection Cover
LC	Lighting Cover
LP	Lamp Post
MH	Man Hole
PH	Parapet Height
RH	Ridge/Roof Height
RWP	Rain Water Pipe
SP	Sign Post
SV	Stop Valve
TF	Top of Fence
TL	Threshold Level
TP	Telegraph Pole
TS	Traffic Signal
TH	Top of Hedge
TW	Top of Wall
U/S	Under Side
WP	Water Pipe
WV	Water Valve

NOTE

The survey grid shown on this drawing is positioned on Ordnance Survey (OS) National Grid, obtained by multiple network RTK GPS observations

All levels are in metres and are above Ordnance Survey Newlyn Datum derived by multiple network RTK GPS observations

Levels defining edge of carriageway are observed at channel (bottom of kerb)

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DRAWING TITLE: TOPOGRAPHICAL SURVEY

ADDRESS: 466-470 MOSS LANE EAST, MANCHESTER, M14 4PJ.

CLIENT: RUSSELL BOLTON CONSULTING

PROJECT: 466-470 MOSS LANE EAST

DRAWN BY	SCALE	DATE	DRAWING NUMBER
JW	1/200@A1	21/06/2022	AC202380/01
CHECKED BY	REV.	DRAWING FILE	
PST		AC202380	

REV. NO.	DESCRIPTION TO REVISION	REV. BY	DATE

APPENDIX E – SEWER RECORDS

Scale: 1:1250 **Date:** 10/01/2022	**SEWER RECORDS**	United Utilities Water for the North West
Address or Site Reference:	466-468 MOSS LANE EAST, MANCHESTER, M14 4PJ	
Printed by:	Property Searches	

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

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Manhole Record Card

Number	MH1			Date Of Survey	18/07/2022
Status	PR	Function	C	Type	

Cover Details:

Square Recta ☐ Double Triang ☐ Single Triangl ☐ Circular ☐ Multiple ☐ Hinged ☐ Lockable ☐

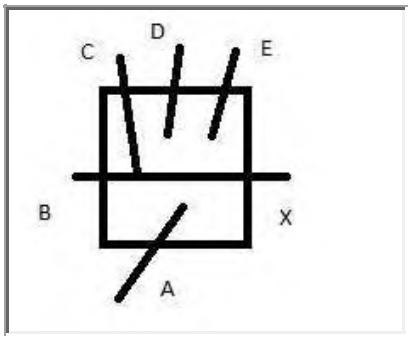
CoverLevel 37.60 Cover Load Class M

Cover	530 X 680	Chamber	1003 X 700	EvidenceOfSurcharge	☐		
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	☐		
Brick	☑	Precast Concrete	☐	PVC	☐	Segments	☐
No.RegCourses							
Reducing Slab	☐	Taper	☐	Side Entry	☐	No.Land	0
Step Irons	☑	Ladder	☐				

PlanPhoto

LocationPhoto

PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	DepthFr	UpstreamRef	Downstream	Pipe Sha	SizeHeight	SizeWidth	Pipe Material	Lining Material
A	36.470	1.13	Gully		C		100	VC	
B	35.190	2.41	MH2		C		225	VC	
C	35.300	2.30	int sp		C		100	VC	
D	35.300	2.30	int sp		C		100	VC	
E	35.300	2.30	int sp		C		100	VC	
X	35.170	2.43		sewer	C		225	VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.

Manhole Record Card

Number	MH2			Date Of Survey	01/08/2022
Status	PR	Function	F	Type	M

Cover Details:

Square Recta ☐ Double Triang ☑ Single Triangl ☐ Circular ☐ Multiple ☐ Hinged ☐ Lockable ☐

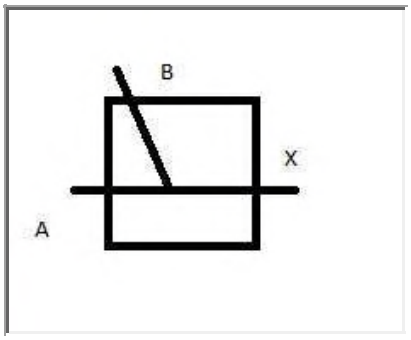
CoverLevel 37.60 Cover Load Class H

Cover	530 X 680	Chamber	1003 X 700	EvidenceOfSurcharge	☐		
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	☐		
Brick	☐	Precast Concrete	☑	PVC	☐	Segments	☐
No.RegCourses							
Reducing Slab	☐	Taper	☐	Side Entry	☐	No.Land	0
Step Irons	☑	Ladder	☐				

PlanPhoto

LocationPhoto

PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	DepthFr	UpstreamRef	Downstream	Pipe Sha	SizeHeight	SizeWidth	Pipe Material	Lining Material
A	35.300	2.30	MH		C		225	VC	
B	35.450	2.15	RWP		C		100	VC	
X	35.270	2.33		MH1	C		225	VC	

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Manhole Record Card

Number	MH3			Date Of Survey	18/07/2022
Status	PR	Function	C	Type	M

Cover Details:

Square Recta ☐ Double Triang ☑ Single Triangl ☐ Circular ☐ Multiple ☐ Hinged ☐ Lockable ☐

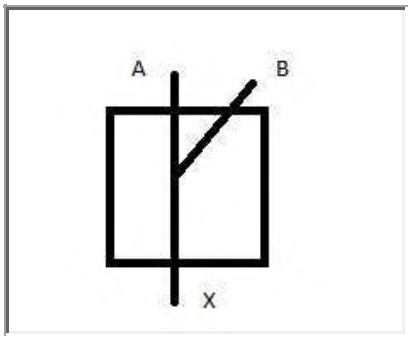
CoverLevel 37.63 Cover Load Class H

Cover	530 X 680	Chamber	1003 X 700	EvidenceOfSurcharge	☐		
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	☐		
Brick	☐	Precast Concrete	☑	PVC	☐	Segments	☐
No.RegCourses							
Reducing Slab	☐	Taper	☐	Side Entry	☐	No.Land	0
Step Irons	☑	Ladder	☐				

PlanPhoto

LocationPhoto

PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	DepthFr	UpstreamRef	Downstream	Pipe Sha	SizeHeight	SizeWidth	Pipe Material	Lining Material
A	36.990	0.64	INT SP		C		150	VC	
B	37.030	0.60	RWP		C		100	VC	
X	36.960	0.67		MH2	C		150	VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.

Manhole Record Card

Number	MH4			Date Of Survey	18/07/2022
Status	PR	Function	C	Type	M

Cover Details:

Square Recta ☐ Double Triang ☑ Single Triangl ☐ Circular ☐ Multiple ☐ Hinged ☐ Lockable ☐

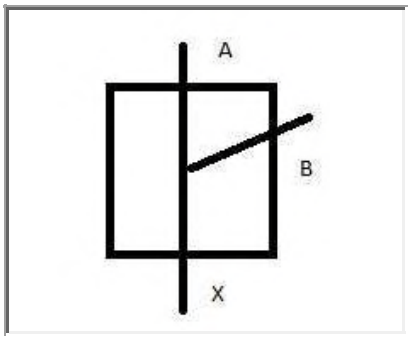
CoverLevel 37.66 Cover Load Class H

Cover	600 X 450	Chamber	1003 X 700	EvidenceOfSurcharge	☐		
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	☐		
Brick	☐	Precast Concrete	☑	PVC	☐	Segments	☐
No.RegCourses							
Reducing Slab	☐	Taper	☐	Side Entry	☐	No.Land	0
Step Irons	☐	Ladder	☐				

PlanPhoto

LocationPhoto

PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	DepthFr	UpstreamRef	Downstream	Pipe Sha	SizeHeight	SizeWidth	Pipe Material	Lining Material
A	37.090	0.57	SP		C		100	VC	
B	37.110	0.55	SP		C		100	VC	
X	37.060	0.60		MH3	C		100	VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.

Manhole Record Card

Number	MH5			Date Of Survey	18/07/2022
Status	PR	Function	C	Type	M

Cover Details:

Square Recta ☐ Double Triang ☑ Single Triangl ☐ Circular ☐ Multiple ☐ Hinged ☐ Lockable ☐

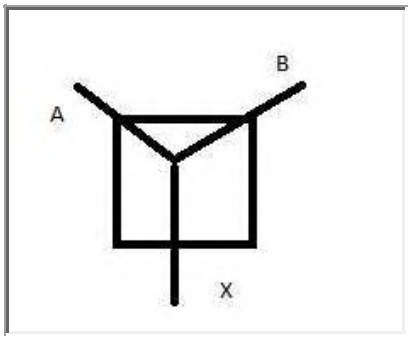
CoverLevel 37.53 Cover Load Class H

Cover	300 X 300	Chamber	225 X 0	EvidenceOfSurcharge	☐		
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	☐		
Brick	☐	Precast Concrete	☐	PVC	☑	Segments	☐
No.RegCourses							
Reducing Slab	☐	Taper	☐	Side Entry	☐	No.Land	0
Step Irons	☐	Ladder	☐				

PlanPhoto

LocationPhoto

PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	DepthFr	UpstreamRef	Downstream	Pipe Sha	SizeHeight	SizeWidth	Pipe Material	Lining Material
A	36.960	0.57	RWP		C		100	PVC	
B	36.960	0.57	SVP		C		100	PVC	
X	36.940	0.59		MH5A	C		100	PVC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.

Manhole Record Card

Number	MH6			Date Of Survey	18/07/2022
Status	PR	Function	C	Type	M

Cover Details:

Square Recta ☐ Double Triang ☑ Single Triangl ☐ Circular ☐ Multiple ☐ Hinged ☐ Lockable ☐

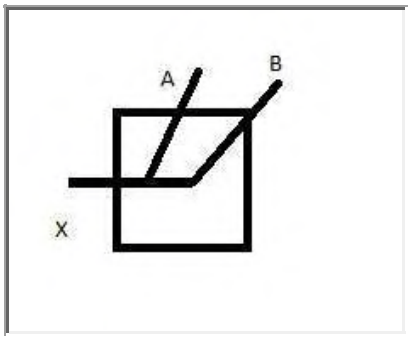
CoverLevel 37.55 Cover Load Class H

Cover	530 X 680	Chamber	1003 X 700	EvidenceOfSurcharge	☐		
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	☐		
Brick	☐	Precast Concrete	☑	PVC	☐	Segments	☐
No.RegCourses							
Reducing Slab	☐	Taper	☐	Side Entry	☐	No.Land	0
Step Irons	☐	Ladder	☐				

PlanPhoto

LocationPhoto

PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	DepthFr	UpstreamRef	Downstream	Pipe Sha	SizeHeight	SizeWidth	Pipe Material	Lining Material
A	35.950	1.60	RWP		C		100	VC	
B	35.970	1.58	MH5A		C		100	VC	
X	35.900	1.65		MH7	C		150	VC	

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Manhole Record Card

Number	MH7			Date Of Survey	18/07/2022
Status	PR	Function	F	Type	M

Cover Details:

Square Recta ☐ Double Triang ☑ Single Triangl ☐ Circular ☐ Multiple ☐ Hinged ☐ Lockable ☐

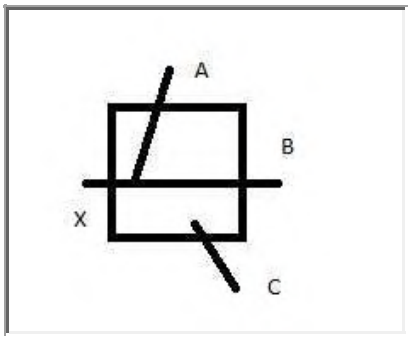
CoverLevel 37.25 Cover Load Class H

Cover	530 X 680	Chamber	1003 X 700	EvidenceOfSurcharge	☐		
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	☐		
Brick	☐	Precast Concrete	☑	PVC	☐	Segments	☐
No.RegCourses							
Reducing Slab	☐	Taper	☐	Side Entry	☐	No.Land	0
Step Irons	☑	Ladder	☐				

PlanPhoto

LocationPhoto

PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	DepthFr	UpstreamRef	Downstream	Pipe Sha	SizeHeight	SizeWidth	Pipe Material	Lining Material
A	34.970	2.28	MH8		C		100	VC	
B	34.950	2.30	MH6		C		150	VC	
C	36.450	0.80	GULLY		C		100	VC	
X	34.910	2.34		SEWER	C		150	VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.

Manhole Record Card

Number	MH8			Date Of Survey	18/07/2022
Status	PR	Function	C	Type	M

Cover Details:

Square Recta ☐ Double Triang ☑ Single Triangl ☐ Circular ☐ Multiple ☐ Hinged ☐ Lockable ☐

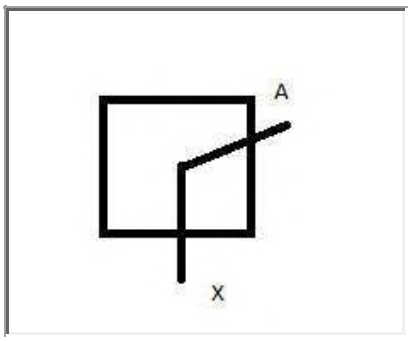
CoverLevel 37.25 Cover Load Class H

Cover	300 X 300	Chamber	225 X 0	EvidenceOfSurcharge	☐		
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	☐		
Brick	☐	Precast Concrete	☐	PVC	☑	Segments	☐
No.RegCourses							
Reducing Slab	☐	Taper	☐	Side Entry	☐	No.Land	0
Step Irons	☐	Ladder	☐				

PlanPhoto

LocationPhoto

PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	DepthFr	UpstreamRef	Downstream	Pipe Sha	SizeHeight	SizeWidth	Pipe Material	Lining Material
A	36.970	0.28	RWP		C		100	PVC	
X	36.950	0.30		MH7	C		100	PVC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.

Manhole Record Card

Number	MH12			Date Of Survey	18/07/2022
Status	PR	Function	C	Type	M

Cover Details:

Square Recta ☑ Double Triang ☐ Single Triangl ☐ Circular ☐ Multiple ☐ Hinged ☐ Lockable ☐

CoverLevel 37.33 Cover Load Class H

Cover	300	X	300	Chamber	225	X	0	EvidenceOfSurcharge	☐
Shaft	0	X	0	ShaftDepth	0			ToxicAtmosphere	☐

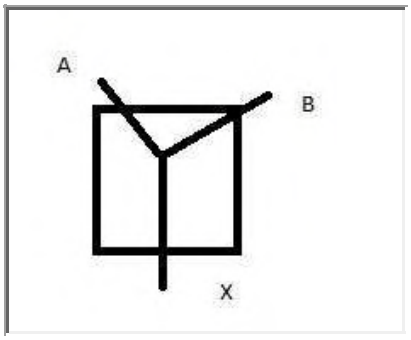
Brick ☐ Precast Concrete ☐ PVC ☑ Segments ☐ No.RegCourses

Reducing Slab ☐ Taper ☐ Side Entry ☐ No.Land 0 Step Irons ☐ Ladder ☐

PlanPhoto

LocationPhoto

PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	DepthFr	UpstreamRef	Downstream	Pipe Sha	SizeHeight	SizeWidth	Pipe Material	Lining Material
A	36.710	0.62	SP		C		100	PVC	
B	36.710	0.62	RWP		C		100	PVC	
X	36.690	0.64		main line	C		100	PVC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.

Manhole Record Card

Number	MH10			Date Of Survey	18/07/2022
Status	PR	Function	C	Type	M

Cover Details:

Square Recta ☑ Double Triang ☐ Single Triangl ☐ Circular ☐ Multiple ☐ Hinged ☐ Lockable ☐

CoverLevel 0.00 Cover Load Class H

Cover	530 X 680	Chamber	1003 X 700	EvidenceOfSurcharge	☐		
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	☐		
Brick	☐	Precast Concrete	☐	PVC	☐	Segments	☐
No.RegCourses							
Reducing Slab	☐	Taper	☐	Side Entry	☐	No.Land	0
Step Irons	☐	Ladder	☐				

PlanPhoto

LocationPhoto

PlanofManhol

Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

filled with debris, water main stop valve

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.

Manhole Record Card

Number	MH9			Date Of Survey	18/07/2022
Status	PR	Function	C	Type	M

Cover Details:

Square Recta ☐ Double Triang ☑ Single Triangl ☐ Circular ☐ Multiple ☐ Hinged ☐ Lockable ☐

CoverLevel 0.00 Cover Load Class H

Cover	530 X 680	Chamber	600 X 800	EvidenceOfSurcharge	☐		
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	☐		
Brick	☑	Precast Concrete	☐	PVC	☐	Segments	☐
No.RegCourses							
Reducing Slab	☐	Taper	☐	Side Entry	☐	No.Land	0
Step Irons	☐	Ladder	☐				

PlanPhoto

LocationPhoto

PlanofManhol

Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

blocked chamber (surcharged) water main stop valve

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.

Manhole Record Card

Number	MH13			Date Of Survey	18/07/2022
Status	PU	Function	C	Type	M

Cover Details:

Square Recta ☐ Double Triang ☑ Single Triangl ☐ Circular ☐ Multiple ☐ Hinged ☐ Lockable ☐

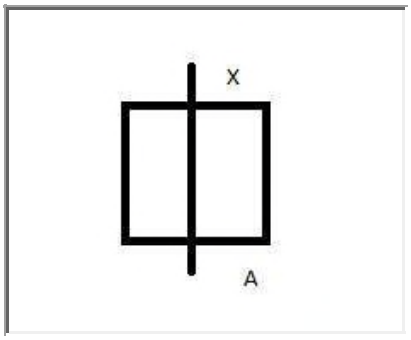
CoverLevel 36.96 Cover Load Class H

Cover	520 X 0	Chamber	600 X 950	EvidenceOfSurcharge	☐		
Shaft	0 X 0	ShaftDepth	0	ToxicAtmosphere	☐		
Brick	☐	Precast Concrete	☐	PVC	☐	Segments	☐
No.RegCourses							
Reducing Slab	☐	Taper	☐	Side Entry	☐	No.Land	0
Step Irons	☑	Ladder	☐				

PlanPhoto

LocationPhoto

PlanofManhol



Chamber Conditions:

Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

Pipe	Invert L	DepthFr	UpstreamRef	Downstream	Pipe Sha	SizeHeight	SizeWidth	Pipe Material	Lining Material
A	32.370	4.59	8602		C		450	VC	
X	32.340	4.62		8609	C		450	VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.

Manhole Record Card

Number	MH5A			Date Of Survey	22/07/2020
Status	PR	Function	C	Type	M

Cover Details:

Square Recta ☐ Double Triang ☑ Single Triangl ☐ Circular ☐ Multiple ☐ Hinged ☐ Lockable ☐

CoverLevel 37.60 Cover Load Class H

Cover	600	X	450	Chamber	1200	X	0	EvidenceOfSurcharge	☐
Shaft	0	X	0	ShaftDepth	0			ToxicAtmosphere	☐

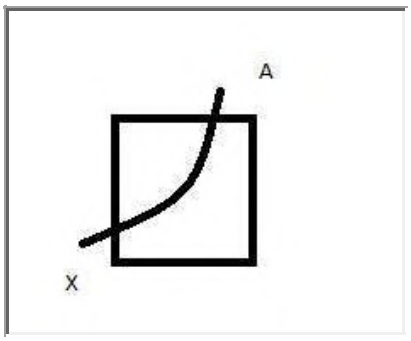
Brick ☐ Precast Concrete ☑ PVC ☐ Segments ☐ No.RegCourses

Reducing Slab ☐ Taper ☐ Side Entry ☐ No.Land 0 Step Irons ☐ Ladder ☐

PlanPhoto

LocationPhoto

PlanofManhol



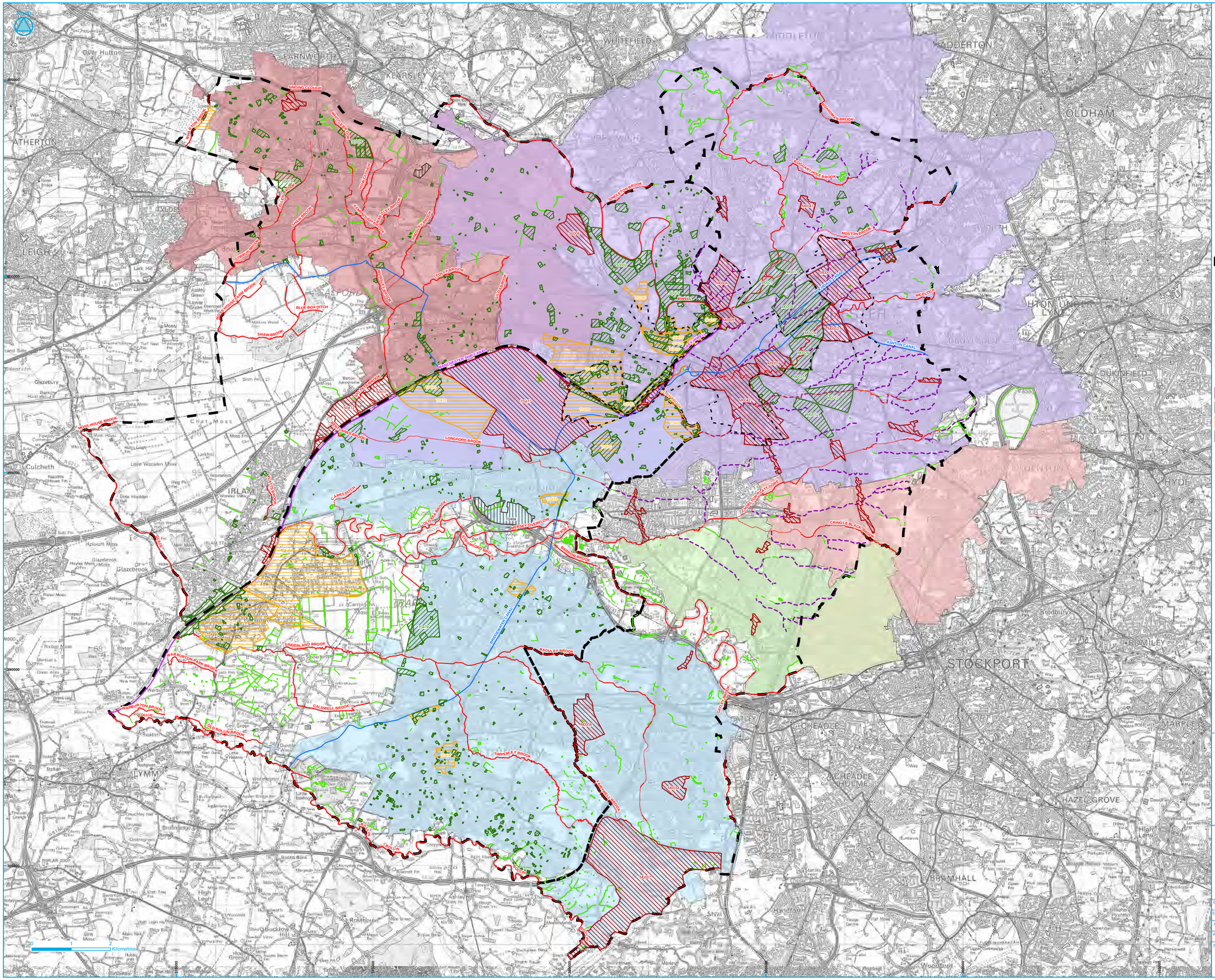
Chamber Conditions:

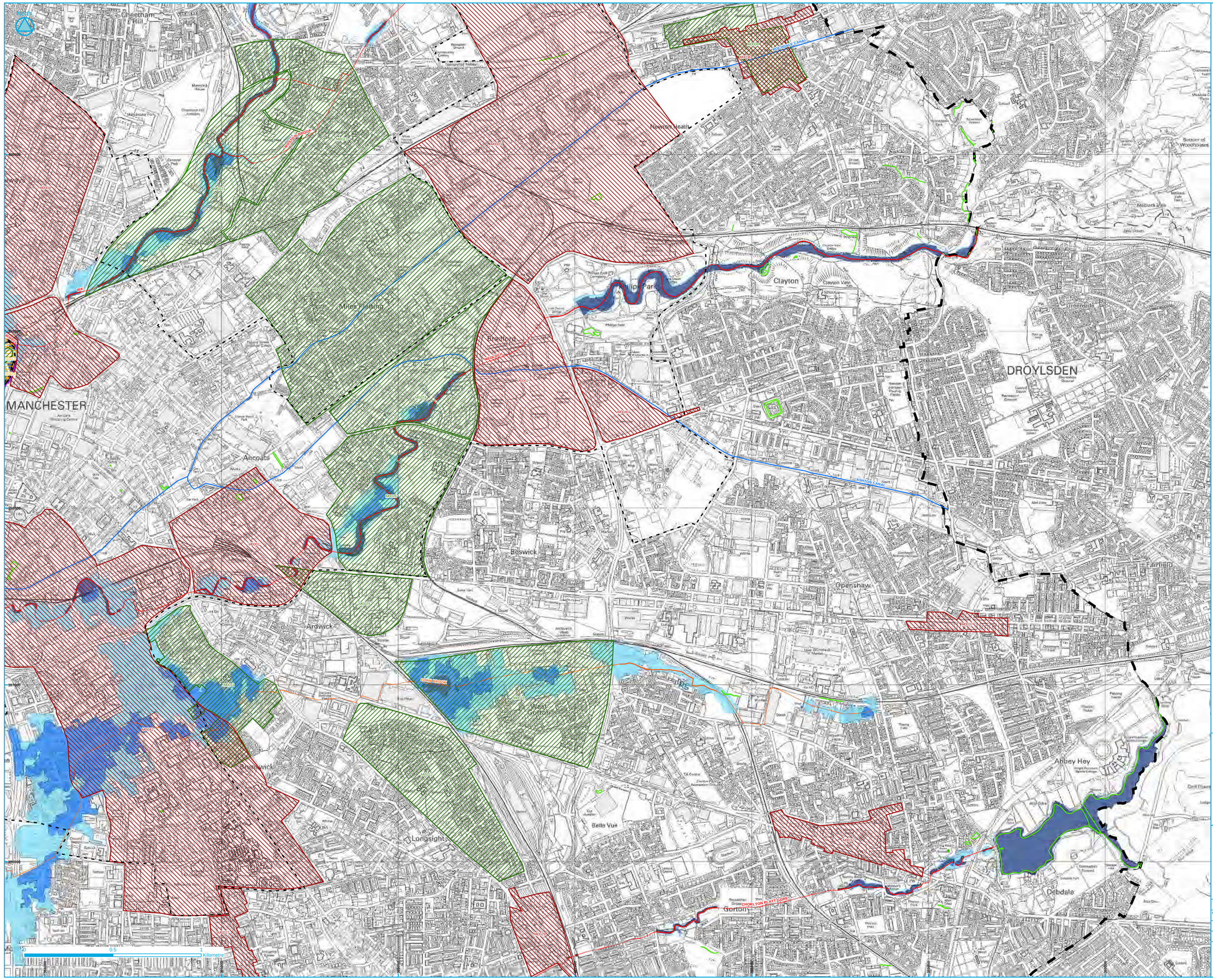
Cover	OK	Shaft	OK
Irons/Ladder	OK	Chamber	OK
Benching/Channel	OK		

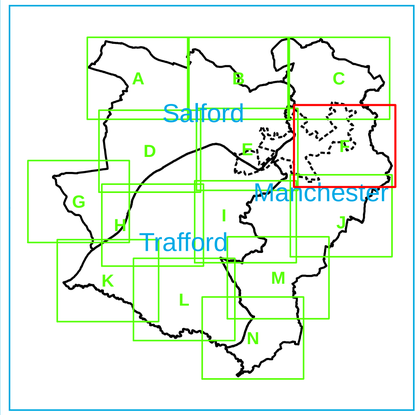
Pipe	Invert L	DepthFr	UpstreamRef	Downstream	Pipe Sha	SizeHeight	SizeWidth	Pipe Material	Lining Material
A	36.180	1.42	MH5		C		100	VC	
X	36.140	1.46		MH6	C		100	VC	

Disclaimer - Any dimensions and levels provided on this form should be checked before being relied upon. It is the responsibility of the customer to verify all information given with regards to the drainage prior to designing or commencing any work on site.

APPENDIX F – SFRA MAPS


ATHERTON
LEIGH
ALTRINCHAM
STRETFORD
IRLAM
CULCHETH
LYMM
STOCKPORT
CHEADLE
CHEADLE HULME
HAZEL GROVE
BRAMHALL
MARPLE
HYDE
DUKINFIELD
OLDHAM
ADDERTON
WHITEFIELD
KEARSLEY
FARNWORTH
Over Hutton
Glazebrook
Culcheth
Irlam
Bredbury
Romiley
Handforth
Poynton
Woodford
Styal
Bucklow Hill
Rostherne
Ashley
Dunham Massey
Little Woolston Moss
Chat Moss
Carrington Moss
Bollin Fm
Ashton Canal
Bridgewater Canal
Manchester Ship Canal
Mersey Overflow
Mersey
Bridgewater Canal
Longford Brook
Carrs Ditch
Cringle Brook
Cringle Black Brook
Sinderland Brook
Hagulley Brook
Timperley Brook
Bollin
Dunham Brook
Micker Brook
Moss House Brook
Moss House Farm Brook
Blue Box Ditch
Shaw Brook
Flixton Brook
Sinderland Brook
Warburton Brook
Dunham Brook
Bollin
Bollin Brook
Caldwell Brook
Timperley Brook
Bollin
Micker Brook
Bollin
Bollin
Bollin





Council Boundary

Flood Zones

- Flood Zone 3b (Functional Floodplain)
- Flood Zone 3a (V3.15)
- Flood Zone 2 (V3.15)

Potential Development Sites / Locations

- Employment
- Housing
- Mixed Use
- Other
- Regional Centre Boundary

- Ashton, Bridgewater and Rochdale Canals
- Manchester Ship Canal / Grey Irwell
- Other Waterbodies

Main Rivers (V8.0)

- Culverted
- Open

Digitised River Lines

- Culverted
- Open

This map has been produced in accordance with PPS25: Development and Flood Risk and its Practice Guide.

It is a Level 1 SFRA key output which shows Main Rivers, other watercourses and Flood Zones, including the Functional Floodplain (as defined in annex D table D.1 of PPS25), overlaid by previously allocated development sites or sites to be considered in the future.

PPS25 divides the country into three basic Flood Zones; Flood Zones 1, 2 and 3, corresponding to areas of low, medium and high flood risk, respectively. The Flood Zones provided are based upon the Environment Agency's Flood Map (version 3.15 issued in September 2009). They refer to the probability of flooding from rivers and ignore the presence of defences because these can be breached, overtopped or fail to operate during the lifetime of the development. They do not consider other forms of flooding and do not take account of climate change.

The Flood Zone maps also contain the undefended modelled outlines for the Manchester Ship Canal and outlines for the Grey Irwell. It is understood that the Grey Irwell outlines were integrated into the national Flood Map in March 2010 and the undefended model outlines for parts of the Sinderland and Timperley Brooks will become integrated into the national Flood Map in June 2010.

The Main River information shown in the SFRA is provided by the Environment Agency; the centreline data may deviate from that shown on basemapping due to inherent differences in data resolution. Further information on Main Rivers is provided on the Environment Agency's website. The mapping of culverted sections of watercourse is a strategic screening only based upon Ordnance Survey 1:10,000 mapping and should be confirmed for more detailed studies such as site specific Flood Risk Assessment. The canals layer does not necessarily cover all the canal arms, but the modelled overtopping/breaching and hydraulic interactions with rivers and other waterbodies is complete and accurate as appropriate for a Strategic Flood Risk Assessment.

The River Irwell between Victoria Station and Pomona Island is not shown as a Main River on the Environment Agency's Flood Map although Flood Zones related to the river are. The same approach has been taken in this SFRA.

This map should be used to facilitate the undertaking of the Sequential Test by planners and developers. The SFRA has produced a further suite of flood maps following its assessment of other sources of flooding and the implications of climate change and these should be used in conjunction with this map.

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for

Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA

PPS25 Flood Zones

Drawn by:	J Cheetham	Date:	16/11/2010
Checked by:	J Dimelow	Date:	22/11/2010
Approved by:	H O'Callaghan	Date:	22/11/2010
File Name:	_ArcView\Mapping\Level1\MST_FloodZones_V1.3.mxd		
Drawing Number:	FL_1.2 F	Status:	FINAL
Scale:	1:10,000		

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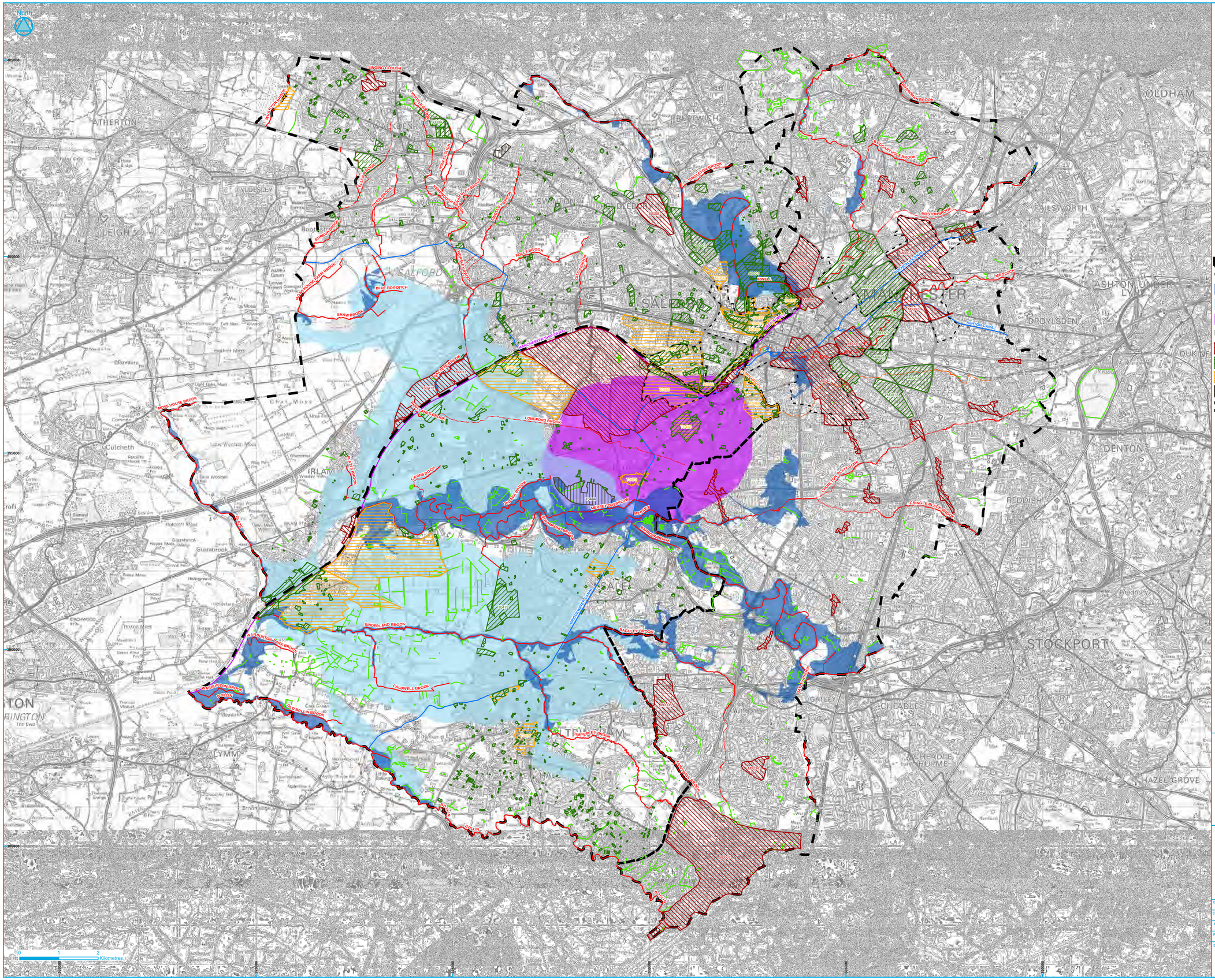
Original @ A1



Council Boundary

Groundwater Issue

- Areas at risk of GW Flooding
- Areas of shallow GW
- Areas at risk of GW rebound

Potential Development Sites / Locations

- Employment
- Housing
- Mixed Use
- Other
- Regional Centre Boundary

- Ashton, Bridgewater and Rochdale Canals
- Manchester Ship Canal / Grey Irwell
- Other Waterbodies

Main Rivers (V8.0)

- Culverted
- Open

Digitised River Lines

- Culverted
- Open

The map has been produced in accordance with PPS25: Development and Flood Risk and its Practice Guide. This map shows areas that are potentially at risk from groundwater flooding and should be used to scope suitable mitigation measures in a site specific Flood Risk Assessment.

The Main River information shown in the SFRA is provided by the Environment Agency; the centreline data may deviate from that shown on basemapping due to inherent differences in data resolution. Further information on Main Rivers is provided on the Environment Agency's website. The mapping of culverted sections of watercourse is a strategic screening only based upon Ordnance Survey 1:10,000 mapping and should be confirmed for more detailed studies such as site specific Flood Risk Assessment. The canals layer does not necessarily cover all the canal arms, but the modelled overtopping/breaching and hydraulic interactions with rivers and other waterbodies is complete and accurate as appropriate for a Strategic Flood Risk Assessment.

The information on the map is based on Environment Agency potential groundwater rebound areas, data from the Coal Authority, BGS drift geology mapping and Defra Groundwater Emergence Maps.

The River Irwell between Victoria Station and Pomona Island is not shown as a Main River on the Environment Agency's Flood Map although Flood Zones related to the river are. The same approach has been taken in this SFRA.

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for

Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA

Groundwater Flooding

Drawn by:	J Cheetham	Date:	08/03/2011
Checked by:	J Dimelow	Date:	01/02/2011
Approved by:	J Cooper	Date:	01/02/2011
File Name:	...ArcView\Mapping\Level1\MST_GroundwaterFlooding_V1.3.mxd		

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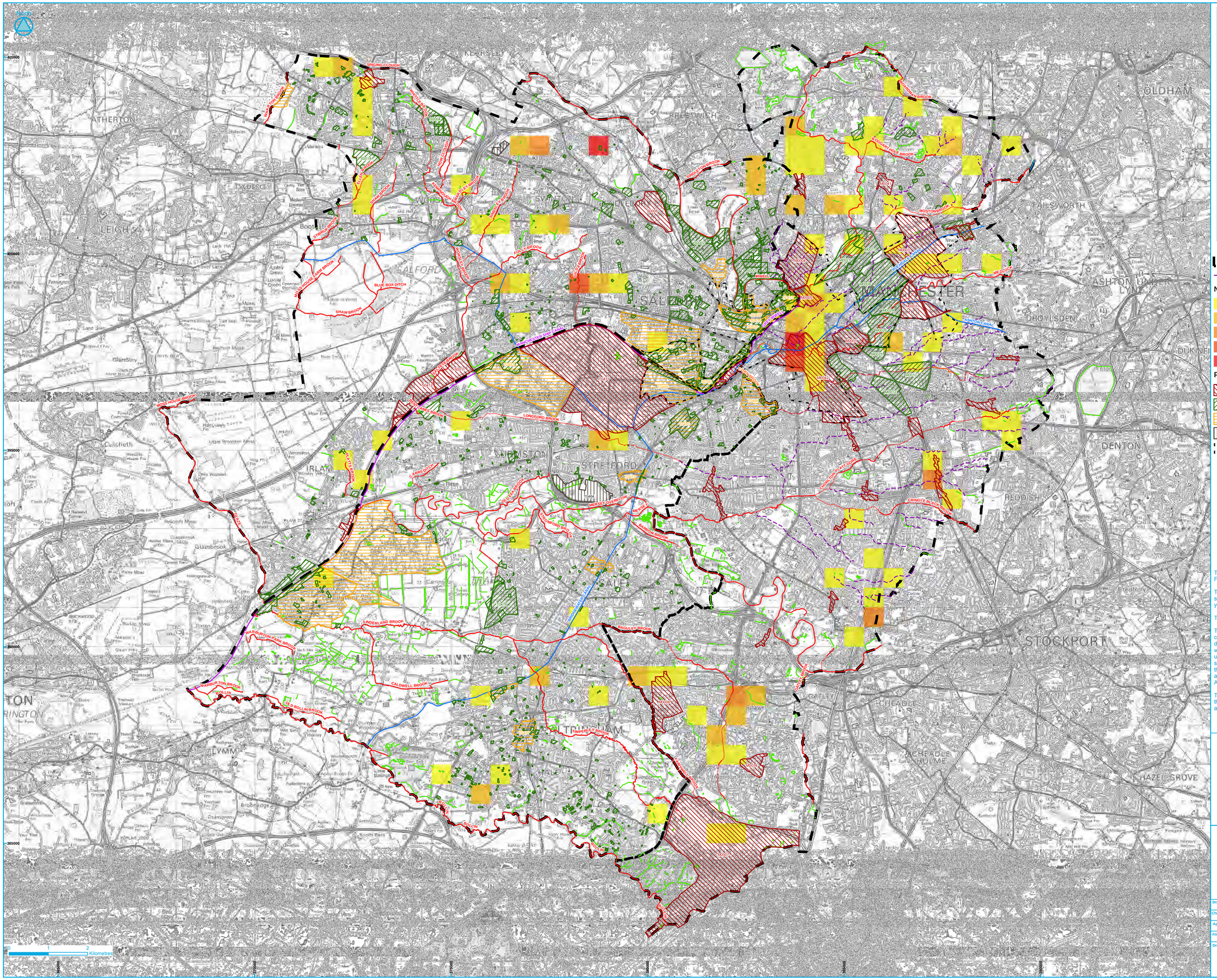
Drawing Number:	Status:	Scale:
GW_2.1	FINAL	1:45,000

Original @ A1



Council Boundary

Lost Watercourses

Number Of Properties At Risk

- 1 - 5
- 5 - 20
- 20 - 50
- 50 - 100
- 100 - 154

Potential Development Sites / Locations

- Employment
- Housing
- Mixed Use
- Other
- Regional Centre Boundary

Ashton, Bridgewater and Rochdale Canals

Manchester Ship Canal / Grey Irwell

Other Waterbodies

Main Rivers (V8.0)

- Culverted
- Open

Digitised River Lines

- Culverted
- Open

This map has been produced in addition to the requirements of PPS25: Development and Flood Risk.

This map shows the results of an assessment of surface water flood risk to properties. This shows the number of properties that could potentially be affected by such flooding if a 1 in 200 year rainfall event were to occur.

The data shown in this map has been used to scope the coverage of Critical Drainage Areas.

The Main River information shown in the SFRA is provided by the Environment Agency; the centreline data may deviate from that shown on basemapping due to inherent differences in data resolution. Further information on Main Rivers is provided on the Environment Agency's website. The mapping of culverted sections of watercourse is a strategic screening only based upon Ordnance Survey 1:10,000 mapping and should be confirmed for more detailed studies such as site specific Flood Risk Assessment. The canals layer does not necessarily cover all the canal arms, but the modelled overtopping/breaching and hydraulic interactions with rivers and other waterbodies is complete and accurate as appropriate for a Strategic Flood Risk Assessment.

The River Irwell between Victoria Station and Pomona Island is not shown as a Main River on the Environment Agency's Flood Map although Flood Zones related to the river are. The same approach has been taken in this SFRA.

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for

Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA

Surface Water Flooding Risk Assessment - Current Scenario

Drawn by:	J Cheetham	Date:	08/03/2011
Checked by:	J Dimelow	Date:	01/02/2011
Approved by:	J Cooper	Date:	01/02/2011
File Name:	...ArcView\Mapping\Level2\MST_SurfaceWaterFloodingRiskAssessment_Current_V1.2.mxd		

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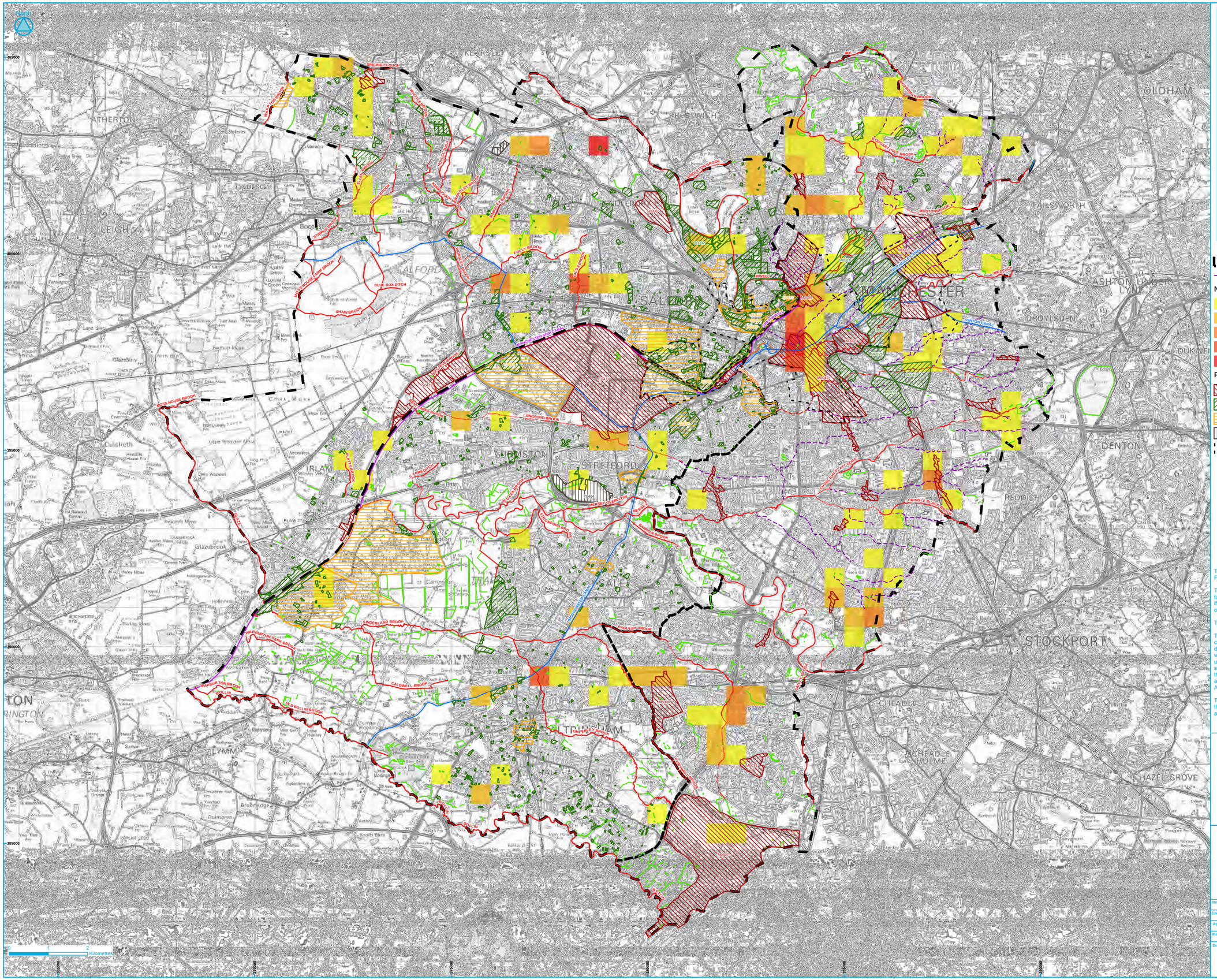

Council Boundary

Lost Watercourses

Number Of Properties At Risk

- 1 - 5
- 5 - 20
- 20 - 50
- 50 - 100
- 100 - 154

Potential Development Sites / Locations

- Employment
- Housing
- Mixed Use
- Other
- Regional Centre Boundary

Ashton, Bridgewater and Rochdale Canals

Manchester Ship Canal / Grey Irwell

Other Waterbodies

Main Rivers (V8.0)

- Culverted
- Open

Digitised River Lines

- Culverted
- Open

This map has been produced in addition to the requirements of PPS25: Development and Flood Risk.

This map shows the results of an assessment of surface water flood risk to properties in the future. This shows the number of properties that could potentially be affected by such flooding if a 1 in 200 year rainfall event were to occur. This map can be used to assess the sensitivity of surface water flood risk to climate change and urban development.

The data shown in this map has been used to scope the coverage of Critical Drainage Areas.

The Main River information shown in the SFRA is provided by the Environment Agency; the centreline data may deviate from that shown on basemapping due to inherent differences in data resolution. Further information on Main Rivers is provided on the Environment Agency's website. The mapping of culverted sections of watercourse is a strategic screening only based upon Ordnance Survey 1:10,000 mapping and should be confirmed for more detailed studies such as site specific Flood Risk Assessment. The canals layer does not necessarily cover all the canal arms, but the modelled overtopping/breaching and hydraulic interactions with rivers and other waterbodies is complete and accurate as appropriate for a Strategic Flood Risk Assessment.

The River Irwell between Victoria Station and Pomona Island is not shown as a Main River on the Environment Agency's Flood Map although Flood Zones related to the river are. The same approach has been taken in this SFRA.

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for

Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA

Surface Water Flooding Risk Assessment - Future Scenario

Drawn by:	J Cheetham	Date:	08/03/2011
Checked by:	J Dimelow	Date:	01/02/2011
Approved by:	J Cooper	Date:	01/02/2011

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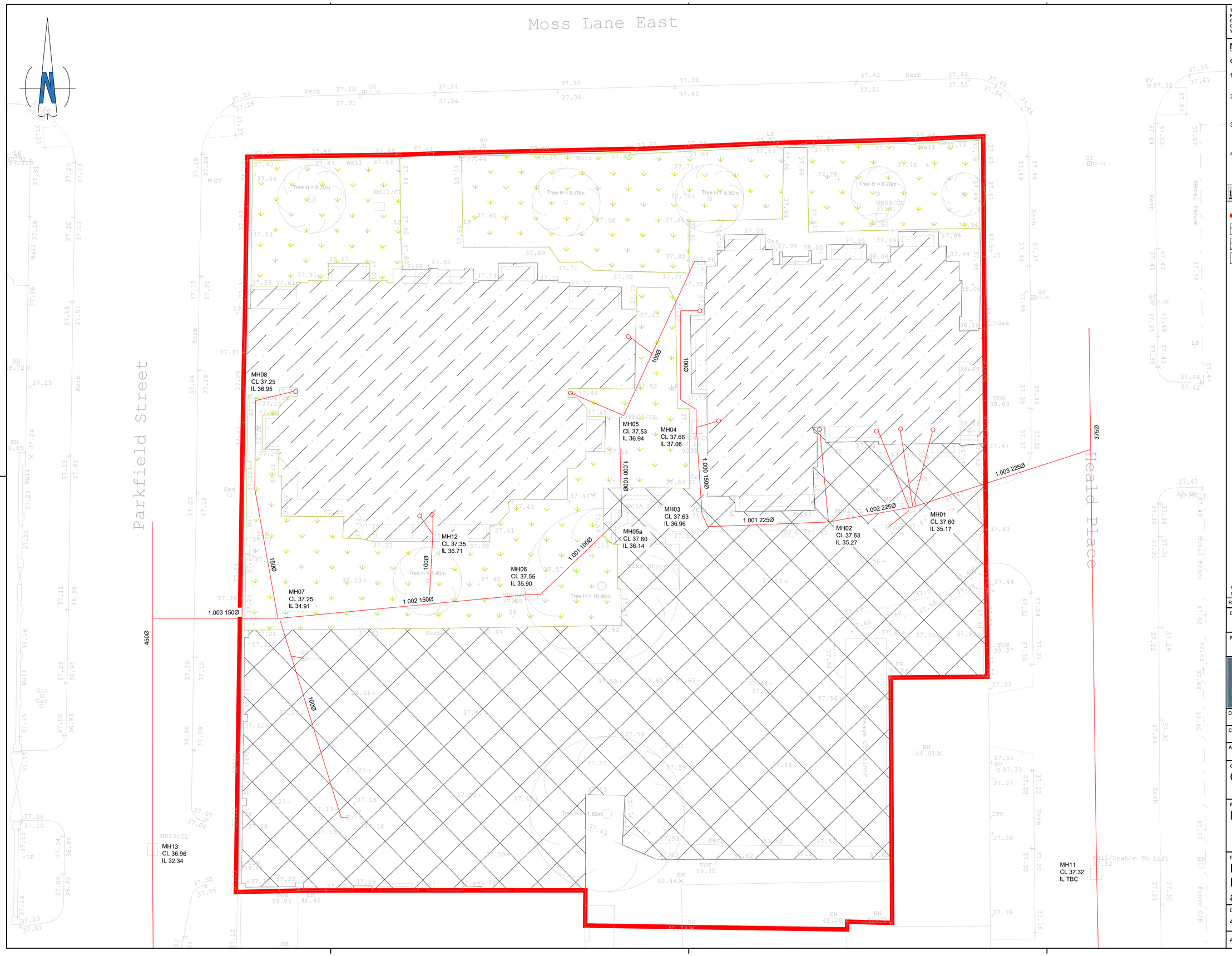
File Name: ...ArcView\Mapping\Level2\MST_SurfaceWaterFloodingRiskAssessment_Future_V1.2.mxd

Drawing Number:	Status:	Scale:
SS_4.4	FINAL	1:45,000

Original @ A1

APPENDIX G – EXISTING DRAINAGE AREAS



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NOTES

General Notes

1. All dimensions are in metres unless stated otherwise.
2. This drawing shall be read in conjunction with all other relevant engineering details, drawings and specifications.
3. Any discrepancies should be reported to the engineer immediately so that clarification can be sought prior to the commencement of work.
4. Underground services may be present in the area. Contractor is to confirm the precise line and depth of any services prior to the commencement of any excavation works

LEGEND

	Site Boundary	(0.187ha)
	Existing Building	(0.050ha)
	Existing Hardstanding	(0.075ha)
	Existing Landscaping	(0.044ha)

REV.	DATE	DETAILS	DRN.	CHK.
P2	16.09.22	ISSUED WITH FRA	ARJ	MN
P1	24.05.22	ISSUED WITH FRA	ARJ	MN

DRAWING STATUS
PRELIMINARY

RIBA STAGE
STAGE 2

RoC CONSULTING
Commercial Wharf
6 Commercial Street
Manchester M15 4PZ
T 0161 214 5390
W rocconsulting.com

DRAWN	DATE	SCALES
ARJ	24.05.22	SCALE
CHECKED MN	DATE 24.05.22	THE ABOVE SCALES APPLY WHEN PLOTTED AT A1 SIZE --DO NOT SCALE--
APPRVD. ROC	DATE 24.05.22	EMAIL FOR DRAWINGS info@rocconsulting.com

CLIENT
CITYSIDE

PROJECT TITLE
Moss Lane East

DRAWING TITLE
Flood Risk Assessment
Existing Drainage
and Catchment Areas

DRAWING No. 4453/ROC/XX/XX/DR/FRA01
REV. P2

4453

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APPENDIX H – EXISTING DRAINAGE CALCULATIONS

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm 1

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.360	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
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 1

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.060	4-8	0.003

Total Area Contributing (ha) = 0.063

Total Pipe Volume (m^3) = 1.021

Network Design Table for Storm 1

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
S1.000	5.104	0.025	204.2	0.021	4.00	0.0	0.600	o	150	Pipe/Conduit	
S1.001	7.410	1.690	4.4	0.042	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.002	5.067	0.100	50.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.003	10.942	0.216	50.7	0.000	0.00	0.0	0.600	o	225	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)
S1.000	50.00	4.12	37.060	0.021	0.0	0.0	0.0	0.70	12.4	2.9
S1.001	50.00	4.14	36.960	0.063	0.0	0.0	0.0	6.29	250.2	8.6
S1.002	50.00	4.19	35.270	0.063	0.0	0.0	0.0	1.84	73.2	8.6
S1.003	49.82	4.29	35.170	0.063	0.0	0.0	0.0	1.84	73.2	8.6

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Area Summary for Storm 1

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.021	0.021	0.021
1.001	User	-	100	0.042	0.042	0.042
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.063	0.063	0.063

Free Flowing Outfall Details for Storm 1

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.003	S	37.320	34.954	0.000	0	0

Simulation Criteria for Storm 1

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.360		

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

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 Coeffiecient 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 0
Number of Online Controls 0 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 0.357
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 OFF
Inertia Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160
Return Period(s) (years) 1
Climate Change (%) 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S04	15 Summer	1	+0%					37.113
S1.001	S03	15 Winter	1	+0%					36.988
S1.002	S02	15 Winter	1	+0%					35.330
S1.003	S01	15 Winter	1	+0%					35.221

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S04	-0.097	0.000	0.27			2.7	OK	
S1.001	S03	-0.197	0.000	0.04			7.0	OK	
S1.002	S02	-0.165	0.000	0.16			7.0	OK	
S1.003	S01	-0.174	0.000	0.11			7.0	OK	

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm 2

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.357	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
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 2

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.061	4-8	0.001

Total Area Contributing (ha) = 0.062

Total Pipe Volume (m^3) = 0.494

Network Design Table for Storm 2

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
S1.000	5.936	0.452	13.1	0.014	4.00	0.0	0.600	o	100	Pipe/Conduit	
S1.001	7.040	0.538	13.1	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
S1.002	14.890	0.990	15.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.003	7.284	2.270	3.2	0.048	0.00	0.0	0.600	o	150	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)
S1.000	50.00	4.05	36.940	0.014	0.0	0.0	0.0	2.14	16.8	1.9
S1.001	50.00	4.10	36.488	0.014	0.0	0.0	0.0	2.15	16.9	1.9
S1.002	50.00	4.20	35.900	0.014	0.0	0.0	0.0	2.61	46.1	1.9
S1.003	49.91	4.22	34.910	0.062	0.0	0.0	0.0	5.67	100.2	8.4

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Area Summary for Storm 2

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.014	0.014	0.014
1.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.000	0.000	0.000
1.003	User	-	100	0.015	0.015	0.015
	User	-	100	0.033	0.033	0.048
				Total	Total	Total
				0.062	0.062	0.062

Free Flowing Outfall Details for Storm 2

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.003	S	36.980	32.640	0.000	0	0

Simulation Criteria for Storm 2

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.360		

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1 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm 2

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 Coeffiecient 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 0
Number of Online Controls 0 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 0.357
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 OFF
Inertia Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160
Return Period(s) (years) 1
Climate Change (%) 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S05	15 Winter	1	+0%					36.963
S1.001	S05a	15 Summer	1	+0%					36.511
S1.002	S06	15 Summer	1	+0%					35.920
S1.003	S07	15 Winter	1	+0%					34.938

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S05	-0.077	0.000	0.12			1.8	OK	
S1.001	S05a	-0.077	0.000	0.12			1.8	OK	
S1.002	S06	-0.130	0.000	0.04			1.8	OK	
S1.003	S07	-0.122	0.000	0.08			6.7	OK	

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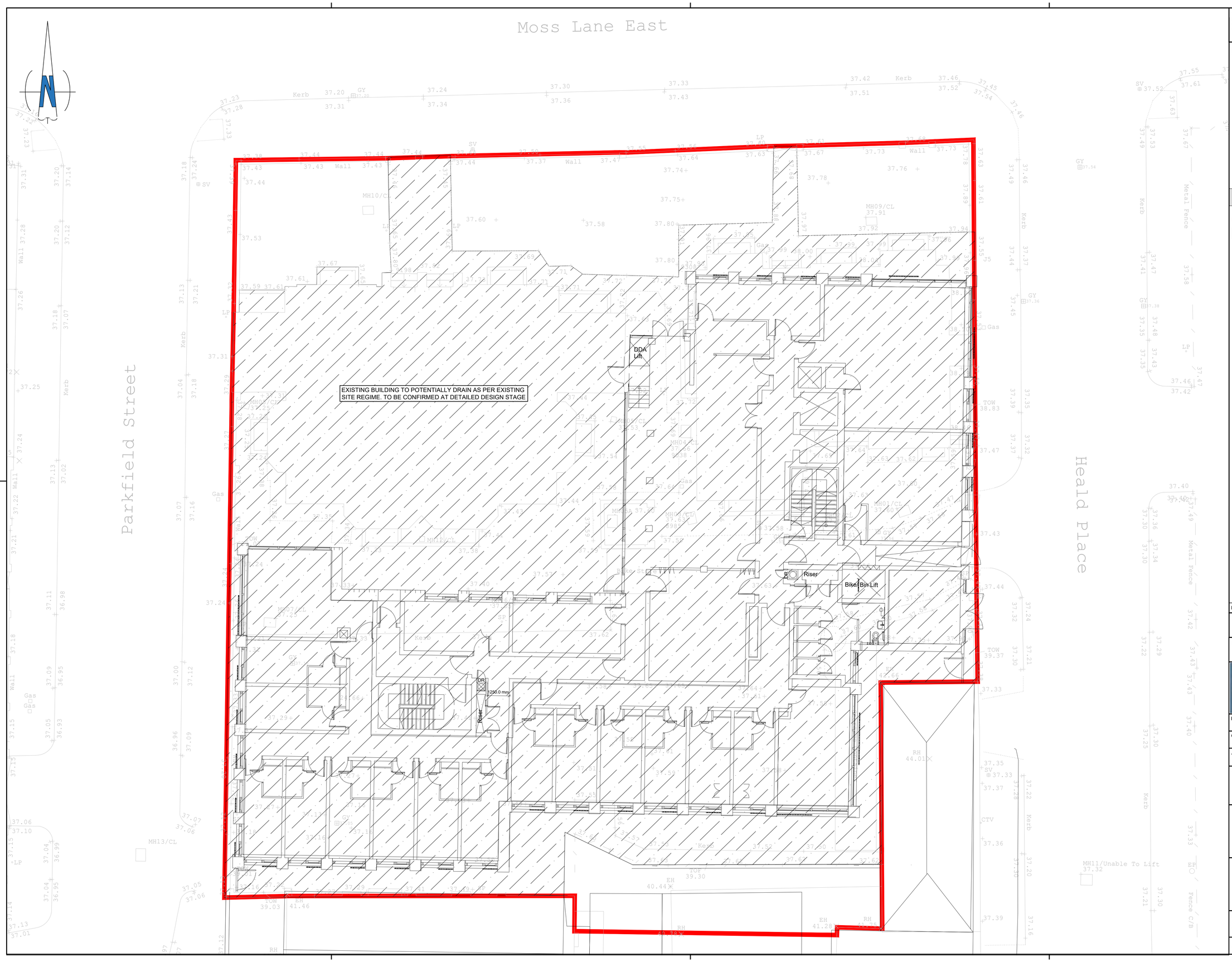
APPENDIX I – PROPOSED DRAINAGE AREAS



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NOTES

General Notes

1. All dimensions are in metres unless stated otherwise.
2. This drawing shall be read in conjunction with all other relevant engineering details, drawings and specifications.
3. Any discrepancies should be reported to the engineer immediately so that clarification can be sought prior to the commencement of work.
4. Underground services may be present in the area. Contractor is to confirm the precise line and depth of any services prior to the commencement of any excavation works

LEGEND

	Site Boundary	(0.187ha)
	Drained Area	(0.156ha)

REV.	DATE	DETAILS	DRN.	CHK.
P2	16.09.22	TOPO & SITE LAYOUT UPDATED	ARJ	MN
P1	24.05.22	ISSUED WITH FRA	ARJ	MN

DRAWING STATUS
PRELIMINARY

RIBA STAGE
STAGE 2

RoC CONSULTING
Commercial Wharf
6 Commercial Street
Manchester M15 4PZ
T 0161 214 5390
W rocconsulting.com

DRAWN ARJ	DATE 24.05.22	SCALES SCALE
CHECKED MN	DATE 24.05.22	THE ABOVE SCALES APPLY WHEN PLOTTED AT A1 SIZE –DO NOT SCALE–
APPRVD. ROC	DATE 24.05.22	EMAIL FOR DRAWINGS info@rocconsulting.com

CLIENT
CITYSIDE

PROJECT TITLE
Moss Lane East

DRAWING TITLE
Flood Risk Assessment
Proposed Drainage Areas

DRAWING No.	REV.
4453/ROC/XX/XX/DR/FRA02	P02

4453

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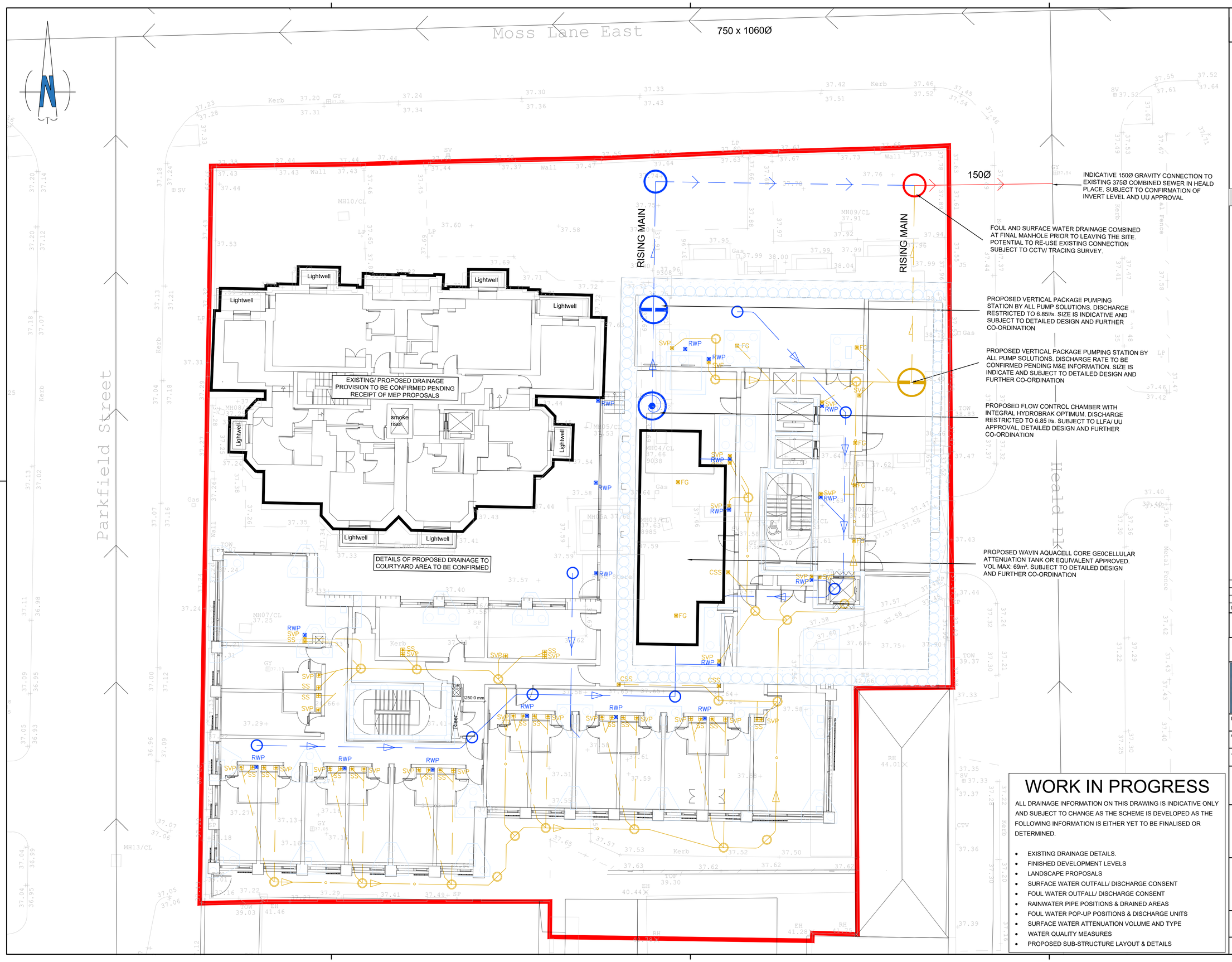
APPENDIX J – DRAINAGE STRATEGY



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NOTES

General Notes

1. All dimensions are in metres unless stated otherwise.
2. This drawing shall be read in conjunction with all other relevant engineering details, drawings and specifications.
3. Any discrepancies should be reported to the engineer immediately so that clarification can be sought prior to the commencement of work.
4. Underground services may be present in the area. Contractor is to confirm the precise line and depth of any services prior to the commencement of any excavation works

LEGEND

- Site Boundary
- SW Drain & Manhole/ Inspection Chamber
- FW Drain & Manhole/ Inspection Chamber
- SW Attenuation Tank

WORK IN PROGRESS

ALL DRAINAGE INFORMATION ON THIS DRAWING IS INDICATIVE ONLY AND SUBJECT TO CHANGE AS THE SCHEME IS DEVELOPED AS THE FOLLOWING INFORMATION IS EITHER YET TO BE FINALISED OR DETERMINED.

- EXISTING DRAINAGE DETAILS.
- FINISHED DEVELOPMENT LEVELS
- LANDSCAPE PROPOSALS
- SURFACE WATER OUTFALL/ DISCHARGE CONSENT
- FOUL WATER OUTFALL/ DISCHARGE CONSENT
- RAINWATER PIPE POSITIONS & DRAINED AREAS
- FOUL WATER POP-UP POSITIONS & DISCHARGE UNITS
- SURFACE WATER ATTENUATION VOLUME AND TYPE
- WATER QUALITY MEASURES
- PROPOSED SUB-STRUCTURE LAYOUT & DETAILS

REV.	DATE	DETAILS	DRN.	CHK.
P3	16.09.22	UPDATED TO SUIT CCTV SURVEY	ARJ	MN
P2	24.08.22	ARCHITECT LAYOUTS UPDATED	JBN	MN
P1	21.06.22	FIRST ISSUE	ARJ	MN

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DRAWN	DATE	SCALES
ARJ	24.05.22	1:100
CHECKED MN	DATE 24.05.22	THE ABOVE SCALES APPLY WHEN PLOTTED AT A1 SIZE –DO NOT SCALE–
APPRVD. ROC	DATE 24.05.22	EMAIL FOR DRAWINGS info@rocconsulting.com

CLIENT
CITYSIDE

PROJECT TITLE
Moss Lane East

DRAWING TITLE
Outline Drainage Strategy

DRAWING No. 4453/ROC/XX/XX/DR/C/DS01
REV. P03

4453

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Appendix D – PDE Response from United Utilities

Craig Azhar

From: seweradoptions@uuplc.co.uk
Sent: 27 August 2024 14:33
To: Craig Azhar
Subject: UU REF 06217055 - WW PDE – Moss Lane East, Manchester

Follow Up Flag: Follow up
Flag Status: Flagged

Good Afternoon,

Thank you for your WW PDE response, please see our reply below:

UU REF 06217055 - WW PDE – Moss Lane East, Manchester

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

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

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

Foul Water

Foul flow from this site will be allowed to drain into the public combined sewer at a point most convenient to yourself

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.
Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.
This is outlined as follows, in order of priority:

1. **into the ground (infiltration);**
2. **to a surface waterbody;**
3. **to a surface water sewer or highway drain;**
4. **to a combined sewer.**

For guidance, The North West SuDS Pro-Forma provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.
The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your

proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).
The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Should the above be exhausted and a connection to the public sewer is required we would have no objections to a maximum pass forward flow rate of 5 l/s to any of the combined sewers nearby the site

Regards

Anthony

Anthony Laithwaite
Ww Engineer
Developer Services & Metering
Customer Services

M: 07880 298897
unitedutilities.com

---------- Original Message ----------
From: seweradoptions@uuplc.co.uk [seweradoptions@uuplc.co.uk]
Sent: 27/08/2024 11:26
To: craig.azhar@ruddconsult.com
Subject: REF - Wastewater Pre-Development Enquiry - 06217055

Dear Craig

PRE DEVELOPMENT APPLICATION AT: Moss Lane East – UU Ref 06217055

Please accept this email as receipt of your application received on 25 August 2024 for the above development. This has now been logged on our system and the job reference is 06217055 we would ask that you quote this reference in all future correspondence.

I have reviewed your application (and attachments) and can confirm this is suitable to be passed to Anthony Laithwaite for technical assessment. You will receive their response within 8 working days.

Kind regards

Jayne Guest
Customer Advisor Advanced
Developer Services & Metering
Customer Services
T: 0345 026 8989 option 4
unitedutilities.com

If you feel you have received a good service from myself, please can you take two minutes to fill in the survey below. This will be much appreciated

Visit: https://unitedutilities.thewowawards.co.uk/nominate

---------- Original Message ----------
From: [donotreply@uu-web.co.uk]
Sent: 25/08/2024 21:22
To: seweradoptions@uuplc.co.uk; webmaster@uuplc.co.uk
Subject: Wastewater Pre-Development Enquiry Submission

Question	Answer
Section 1 - Your Details	
Developer/Consultant/Land owner/Other	Consultant
Name	Craig Azhar
Company Name	Will Rudd
Address	100 Brunswick Street | Glasgow | G1 1TF
Contact Number	07917835604
Email Address	craig.azhar@ruddconsult.com
Section 2 - Development Details	
Do you intend to offer any of the sewers for adoption by United Utilities under S104?	No
Site Address	468 Moss Ln E, Manchester M14 4PJ
Site Postcode	#Development postcode#
Site Name	Moss Lane East
Grid Reference Number	SJ 84868 95667
Development Type	Commercial
Approx. Number Units	261
Total Site Area (hectares)	0.18
Does this site have planning permission?	Yes
Planning Reference Number	135544/FO/2022
Council Area	Manchester City Council
Have you approached us about this site previously?	No
If yes, please provide reference number	
Is the development part of a larger site that will be developed in phases?	No
Location Plan	L047-SBA-ZZ-ZZ.00-D-A-000001.pdf
Section 3: Previous Land Use	

Question	Answer
Please confirm what the land was previously used for:	Brownfield
Brownfield evidence of positive drainage to the public sewer	2022_07_22ROC Consulting(32770)Moss Lane East.pdf, CCTV Survey JN32770.pdf, Manhole Records.pdf, Q4176.pdf, Web_Report.pdf

Section 4 - Drainage Strategy

Foul connection: How are you proposing to drain foul flows from the site?	Via a new connection to the public sewer
Via an existing connection to the public sewer?	No
Surface water connection: How are you proposing to drain your site, following the surface water hierarchy, as outlined in National Planning Policy Guidance?	Combined sewer
SuDS: Have SuDS features been considered in the surface water drainage strategy?	Yes

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Appendix E - Drainage Calculations

Catchment Area Type : Catchment Area

Area (ha)	0.028

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Catchment Area (1) Type : Catchment Area

Area (ha)	0.013

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Catchment Area (2) Type : Catchment Area

Area (ha)	0.008

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Catchment Area (3) Type : Catchment Area

Area (ha)	0.044

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Catchment Area (4)

Type : Catchment Area

Area (ha)	0.01

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Catchment Area (5)

Type : Catchment Area

Area (ha)	0.005

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Catchment Area (6)

Type : Catchment Area

Area (ha)	0.006

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

G9448: Moss Lane East, Manchester	Date: 03/10/2024		
	Designed by: EB	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: SURFACE WATER NETWORK	Will Rudd: Rev C		

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
CSMH02	Manhole	384878.034	395673.461	37.654	2.302	35.352	Circular	1.200
Ex. MH01	Manhole	384878.034	395658.177	37.450	2.280	35.170	Circular	1.200
SWIC01	Manhole	384848.116	395654.323	37.374	0.802	36.572	Circular	0.450
SWIC03	Manhole	384877.247	395672.929	37.659	1.157	36.502	Circular	0.450
SWIC04	Manhole	384876.279	395638.509	37.514	1.434	36.080	Circular	0.450
SWIC05	Manhole	384857.752	395638.496	37.520	1.455	36.065	Circular	0.450
SWIC02	Manhole	384856.016	395654.329	37.455	1.669	35.786	Circular	0.450
SWMH01	Manhole	384866.872	395638.470	37.519	1.539	35.980	Circular	1.200
SWMH02	Manhole	384866.875	395674.437	37.733	2.118	35.614	Circular	1.200
Simple Junction	Simple Junction	384848.130	395636.469					

Name	Lock
CSMH02	None
Ex. MH01	None
SWIC01	None
SWIC03	None
SWIC04	None
SWIC05	None
SWIC02	None
SWMH01	None
SWMH02	None
Simple Junction	

Inlets

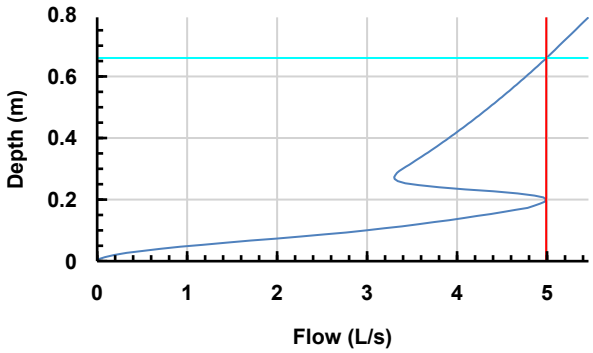
Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
CSMH02	Inlet	S1-1.004	(None)	No Restriction
Ex. MH01	Inlet	S1-1.005	(None)	No Restriction
SWIC01	Inlet	S1-1.000	(None)	No Restriction
	Inlet (1)	Catchment Area (4)	(None)	No Restriction
SWIC03	Inlet	Catchment Area (3)	(None)	No Restriction
SWIC04	Inlet	S1-3.000	(None)	No Restriction
	Inlet (1)	Catchment Area (2)	(None)	No Restriction
	Inlet (2)	Catchment Area (5)	(None)	No Restriction
SWIC05	Inlet	Catchment Area (1)	(None)	No Restriction
	Inlet (1)	Catchment Area (6)	(None)	No Restriction
SWIC02	Inlet	Pipe (1)	(None)	No Restriction
SWMH01	Inlet	Pipe (3) Pipe (5)	(None)	No Restriction
SWMH02	Inlet (3)	S1-1.003	(None)	No Restriction
Simple Junction	Inlet	Catchment Area	(None)	No Restriction

G9448: Moss Lane East, Manchester	Date: 03/10/2024		
	Designed by: EB	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: SURFACE WATER NETWORK	Will Rudd: Rev C		

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
CSMH02	Outlet	S1-1.005	Free Discharge
SWIC01	Outlet	Pipe	Free Discharge
SWIC03	Outlet	S1-3.000	Free Discharge
SWIC04	Outlet	Pipe (2)	Free Discharge
SWIC05	Outlet	Pipe (4)	Free Discharge
SWIC02	Outlet	S1-1.002	Free Discharge
SWMH01	Outlet	S1-2.001	Free Discharge
SWMH02	Outlet	S1-1.004	Hydro-Brake®
Simple Junction	Outlet	S1-1.000	Free Discharge

Invert Level (m)	35.614
Design Depth (m)	0.660
Design Flow (L/s)	5.0
Objective	Minimise Upstream Storage Requirements
Application	Surface Water Only
Sump Available	☐
Unit Reference	CHE-0106-5000-0660-5000



Infiltration Trench 1

Type : Infiltration Trench

Dimensions

Exceedance Level (m)	37.370
Depth (m)	1.569
Base Level (m)	35.801
Freeboard (mm)	569
Porosity (%)	30
Length (m)	6.002
Long. Slope (1:X)	100.00
Width (m)	1.000
Total Volume (m³)	1.875

Under Drain

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

Inlets

Inlet

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

Outlets

Outlet

Outgoing Connection	Pipe (1)
Outlet Type	Free Discharge

Advanced

Conductivity (m/hr)	250.0

Infiltration Trench 3

Type : Infiltration Trench

Dimensions

Exceedance Level (m)	37.508
Depth (m)	1.528
Base Level (m)	35.980
Freeboard (mm)	778
Porosity (%)	30
Length (m)	8.236
Long. Slope (1:X)	100.00
Width (m)	1.000
Total Volume (m³)	1.931

Under Drain

Height Above Base (m)	0.600
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (2)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	Pipe (3)
Outlet Type	Orifice

Diameter (m)	0.150
Coefficient of Discharge	0.600
Invert Level (m)	35.989

Advanced

Conductivity (m/hr)	250.0

Infiltration Trench 2

Type : Infiltration Trench

Dimensions

Exceedance Level (m)	37.508
Depth (m)	1.528
Base Level (m)	35.980
Freeboard (mm)	778
Porosity (%)	30
Length (m)	6.508
Long. Slope (1:X)	100.00
Width (m)	1.000
Total Volume (m³)	1.545

Under Drain

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

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (4)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (5)
Outlet Type	Free Discharge

Advanced

Conductivity (m/hr)	250.0

Cellular Storage

Type : Cellular Storage

Dimensions

Exceedance Level (m)	37.733
Depth (m)	0.660
Base Level (m)	35.700
Number of Crates Long	22
Number of Crates Wide	3
Number of Crates High	1
Porosity (%)	96
Crate Length (m)	0.8
Crate Width (m)	0.8
Crate Height (m)	0.66
Total Volume (m³)	28.136

NB: Crate volume
= 22x3x1x0.8x0.8x0.66x0.96x= 26.8 m^3

Total Volume

The Total Volume value shown in the bottom-right corner of the data form shows the volume available in the system up to the Freeboard elevation.

Note: The analysis will assume a $1m^2$ plan area shaft up from the crown of the crates up to the exceedance elevation. As such the Total Volume value will include this additional volume up to the freeboard elevation if present

Total Volume =
26.8 + (37.733-35.7-0.66)x1 = 28.136 m^3

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	S1-2.001
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	S1-1.002
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	S1-1.003
Outlet Type	Free Discharge

G9448: Moss Lane East, Manchester	Date: 03/10/2024		
	Designed by: EB	Checked by:	Approved By:
Report Details: Type: Manhole Schedule Storm Phase: SURFACE WATER NETWORK	Will Rudd: Rev C		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
CSMH02	37.654 35.352	Diameter / Length: 1.200	{1} S1-1.004	Pipe	35.427	Diam/Width:150	Manhole
E:384878.034 N:395673.461	2.302						
			{a} S1-1.005	Pipe	35.352	Diam/Width:225	Not Applicable
Ex. MH01	37.450 35.170	Diameter / Length: 1.200	{1} S1-1.005	Pipe	35.170	Diam/Width:225	Manhole
E:384878.034 N:395658.177	2.280						
							Not Applicable
SWIC01	37.374 36.572	Diameter / Length: 0.450	{1} S1-1.000	Pipe	36.572	Diam/Width:150	Manhole
E:384848.116 N:395654.323	0.802						
			{a} Pipe	Pipe	36.572	Diam/Width:150	Not Applicable
SWIC03	37.659 36.502	Diameter / Length: 0.450					Manhole
E:384877.247 N:395672.929	1.157						
			{a} S1-3.000	Pipe	36.502	Diam/Width:150	Not Applicable
SWIC04	37.514 36.080	Diameter / Length: 0.450	{1} S1-3.000	Pipe	36.080	Diam/Width:150	Manhole
E:384876.279 N:395638.509	1.434						
			{a} Pipe (2)	Pipe	36.080	Diam/Width:150	Not Applicable

G9448: Moss Lane East, Manchester	Date: 03/10/2024		
	Designed by: EB	Checked by:	Approved By:
Report Details: Type: Manhole Schedule Storm Phase: SURFACE WATER NETWORK	Will Rudd: Rev C		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
SWIC05	37.520 36.065	Diameter / Length: 0.450					Manhole
E:384857.752 N:395638.496	1.455						
			{a} Pipe (4)	Pipe	36.065	Diam/Width:100	Not Applicable
SWIC02	37.455 35.786	Diameter / Length: 0.450	{1} Pipe (1)	Pipe	35.786	Diam/Width:150	Manhole
E:384856.016 N:395654.329	1.669						
			{a} S1-1.002	Pipe	35.786	Diam/Width:150	Not Applicable
SWMH01	37.519 35.980	Diameter / Length: 1.200	{1} Pipe (3) {2} Pipe (5)	Pipe Pipe	35.980 35.980	Diam/Width:150 Diam/Width:100	Manhole
E:384866.872 N:395638.470	1.539						
			{a} S1-2.001	Pipe	35.980	Diam/Width:150	Not Applicable
SWMH02	37.733 35.614	Diameter / Length: 1.200	{1} S1-1.003	Pipe	35.614	Diam/Width:150	Manhole
E:384866.875 N:395674.437	2.118						
			{a} S1-1.004	Pipe	35.614	Diam/Width:150	Not Applicable
Simple Junction		Diameter / Length: 1.200					Simple Junction
E:384848.130 N:395636.469							
			{a} S1-1.000	Pipe	36.750	Diam/Width:150	Not Applicable

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	☐

Pipe Size Library

Default

Add. Increment (mm)	75
Max. Diameter (mm)	0

Diameter (mm)	Min. Slope (1:X)	Max. Slope (1:X)
100	0.00	0.00
150	0.00	0.00

Manhole Options

Apply Offset	☐

Manhole Size Library

Default

Diameter / Width

Connection (mm)	Diameter / Length (m)	Width (m)
0	1.200	0.000
375	1.350	0.000
500	1.500	0.000
750	1.800	0.000

Additional Sizing

Connection (mm)	900
Diameter / Length (m)	0.900
Width (m)	0.000

Depth

Depth (m)	Diameter / Length (m)	Width (m)
0.000	1.050	0.000
1.500	1.200	0.000

Access

Depth (m)	Ladder Protrusion (mm)
0.000	130
3.000	230

Benching Requirements

Landing Width (mm)	500
Benching Width (mm)	225

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	☐

CSMH02 Type : Manhole

Critical by Return Period: FEH - Full Test: 2 years: Increase Rainfall (%): +45: 60 mins: Summer

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.0	0.000	0.000	0.000	0.0
10	0.0	0.000	0.000	0.000	0.0
15	0.0	0.001	0.001	0.000	0.0
20	0.3	0.012	0.013	0.000	0.3
25	1.0	0.021	0.023	0.000	1.0
30	2.8	0.034	0.039	0.000	2.7
35	4.4	0.043	0.049	0.000	4.3
40	5.0	0.046	0.052	0.000	5.0
45	5.0	0.046	0.052	0.000	5.0
50	4.9	0.046	0.052	0.000	4.9
55	4.7	0.045	0.051	0.000	4.7
60	4.4	0.043	0.049	0.000	4.4
65	4.0	0.042	0.047	0.000	4.0
70	3.5	0.039	0.044	0.000	3.6
75	3.0	0.036	0.041	0.000	3.0
80	2.5	0.033	0.037	0.000	2.5
85	1.9	0.029	0.033	0.000	1.9
90	1.1	0.022	0.025	0.000	1.1
95	0.7	0.018	0.021	0.000	0.8
100	0.5	0.016	0.018	0.000	0.6
105	0.4	0.014	0.016	0.000	0.4
110	0.4	0.013	0.015	0.000	0.4
115	0.3	0.012	0.014	0.000	0.3
120	0.3	0.011	0.013	0.000	0.3

Ex. MH01 Type : Manhole

Critical by Return Period: FEH - Full Test: 2 years: Increase Rainfall (%): +45: 60 mins: Summer

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.0	0.000	0.000	0.000	0.0
10	0.0	0.000	0.000	0.000	0.0
15	0.0	0.001	0.000	0.000	0.0
20	0.3	0.011	0.000	0.000	0.3
25	1.0	0.020	0.000	0.000	1.0
30	2.7	0.033	0.000	0.000	2.7
35	4.3	0.042	0.000	0.000	4.3
40	5.0	0.045	0.000	0.000	5.0
45	5.0	0.045	0.000	0.000	5.0
50	4.9	0.045	0.000	0.000	4.9
55	4.7	0.044	0.000	0.000	4.7
60	4.4	0.042	0.000	0.000	4.4
65	4.0	0.040	0.000	0.000	4.0
70	3.6	0.038	0.000	0.000	3.6
75	3.0	0.035	0.000	0.000	3.0
80	2.5	0.032	0.000	0.000	2.5
85	1.9	0.028	0.000	0.000	1.9
90	1.1	0.022	0.000	0.000	1.1
95	0.8	0.018	0.000	0.000	0.8
100	0.6	0.016	0.000	0.000	0.6
105	0.4	0.014	0.000	0.000	0.4
110	0.4	0.013	0.000	0.000	0.4
115	0.3	0.012	0.000	0.000	0.3
120	0.3	0.011	0.000	0.000	0.3

SWIC01

Type : Manhole

Critical by Return Period: FEH - Full Test: 2 years: Increase Rainfall (%): +45: 15 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	2.2	0.039	0.006	0.000	2.1
10	8.3	0.083	0.013	0.000	8.1
15	2.4	0.045	0.007	0.000	2.7
20	0.2	0.015	0.002	0.000	0.3
25	0.0	0.003	0.000	0.000	0.0
30	0.0	0.002	0.000	0.000	0.0

SWIC03

Type : Manhole

Critical by Return Period: FEH - Full Test: 2 years: Increase Rainfall (%): +45: 15 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	2.6	0.035	0.006	0.000	2.5
10	9.8	0.363	0.058	0.000	8.7
15	2.7	0.225	0.036	0.000	3.2
20	0.0	0.171	0.027	0.000	0.3
25	0.0	0.129	0.020	0.000	0.2
30	0.0	0.093	0.015	0.000	0.2

SWIC04

Type : Manhole

Critical by Return Period: FEH - Full Test: 2 years: Increase Rainfall (%): +45: 15 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	3.2	0.114	0.018	0.000	1.1
10	11.5	0.692	0.110	0.000	11.0
15	4.0	0.639	0.102	0.000	4.3
20	0.3	0.595	0.095	0.000	0.5
25	0.2	0.551	0.088	0.000	0.3
30	0.2	0.515	0.082	0.000	0.3

SWIC05

Type : Manhole

Critical by Return Period: FEH - Full Test: 2 years: Increase Rainfall (%): +45: 15 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	1.1	0.032	0.005	0.000	1.1
10	4.2	0.069	0.011	0.000	4.0
15	1.1	0.035	0.006	0.000	1.3
20	0.0	0.011	0.002	0.000	0.1
25	0.0	0.002	0.000	0.000	0.0
30	0.0	0.002	0.000	0.000	0.0

SWIC02

Type : Manhole

Critical by Return Period: FEH - Full Test: 2 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.3	0.005	0.001	0.000	0.0
10	0.7	0.024	0.004	0.000	0.7
15	0.9	0.025	0.004	0.000	0.9
20	1.4	0.031	0.005	0.000	1.4
25	2.6	0.042	0.007	0.000	2.6
30	3.9	0.049	0.008	0.000	3.9
35	4.0	0.057	0.009	0.000	3.8
40	2.8	0.093	0.015	0.000	2.7
45	1.6	0.109	0.017	0.000	1.6
50	1.0	0.107	0.017	0.000	1.1
55	0.9	0.094	0.015	0.000	0.9
60	0.6	0.074	0.012	0.000	0.7
65	0.2	0.050	0.008	0.000	0.3
70	0.1	0.024	0.004	0.000	0.2
75	0.0	0.005	0.001	0.000	0.0
80	0.0	0.003	0.001	0.000	0.0
85	0.0	0.003	0.000	0.000	0.0
90	0.0	0.003	0.000	0.000	0.0
95	0.0	0.002	0.000	0.000	0.0
100	0.0	0.002	0.000	0.000	0.0
105	0.0	0.002	0.000	0.000	0.0
110	0.0	0.002	0.000	0.000	0.0
115	0.0	0.002	0.000	0.000	0.0
120	0.0	0.002	0.000	0.000	0.0

SWMH01

Type : Manhole

Critical by Return Period: FEH - Full Test: 2 years: Increase Rainfall (%): +45: 30 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.1	0.001	0.001	0.000	0.0
10	0.9	0.018	0.020	0.000	0.8
15	5.1	0.041	0.046	0.000	4.3
20	10.9	0.064	0.072	0.000	10.9
25	5.6	0.043	0.049	0.000	5.8
30	2.6	0.029	0.032	0.000	2.7
35	0.9	0.018	0.020	0.000	1.0
40	0.5	0.013	0.015	0.000	0.5
45	0.4	0.012	0.014	0.000	0.4
50	0.4	0.011	0.013	0.000	0.4
55	0.3	0.011	0.012	0.000	0.3
60	0.3	0.010	0.012	0.000	0.3

SWMH02

Type : Manhole

Critical by Return Period: FEH - Full Test: 2 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.0	0.000	0.000	0.000	0.0
10	0.0	0.001	0.001	0.000	0.0
15	0.2	0.017	0.019	0.000	0.1
20	0.8	0.053	0.059	0.000	0.6
25	2.2	0.099	0.112	0.000	1.8
30	3.7	0.155	0.175	0.000	3.4
35	4.8	0.211	0.239	0.000	4.6
40	5.1	0.253	0.286	0.000	5.0
45	4.5	0.272	0.308	0.000	4.4
50	4.4	0.272	0.307	0.000	4.5
55	4.9	0.257	0.290	0.000	5.0
60	4.8	0.238	0.269	0.000	4.9
65	4.6	0.214	0.242	0.000	4.7
70	4.1	0.189	0.214	0.000	4.2
75	3.6	0.166	0.188	0.000	3.7
80	3.0	0.144	0.163	0.000	3.1
85	2.5	0.124	0.141	0.000	2.6
90	1.9	0.107	0.121	0.000	2.1
95	1.0	0.076	0.087	0.000	1.2
100	0.7	0.061	0.068	0.000	0.7
105	0.5	0.051	0.057	0.000	0.5
110	0.4	0.044	0.050	0.000	0.4
115	0.3	0.040	0.046	0.000	0.3
120	0.3	0.037	0.042	0.000	0.3

Simple Junction Type : Simple Junction

Critical by Return Period: FEH - Full Test: 2 years: Increase Rainfall (%): +45: 15 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Total Outflow (L/s)
0	0.0	0.000	0.0
5	1.7	0.031	1.6
10	6.2	0.061	6.1
15	1.7	0.033	1.8
20	0.0	0.010	0.2
25	0.0	0.002	0.0
30	0.0	0.001	0.0

Cellular Storage Type : Cellular Storage

Critical by Return Period: FEH - Full Test: 2 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth(m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.0	0.000	0.000	0.000	0.0
10	1.0	0.004	0.172	0.000	0.0
15	1.3	0.012	0.497	0.000	0.2
20	2.2	0.021	0.862	0.000	0.8
25	4.5	0.034	1.397	0.000	2.2
30	11.4	0.076	3.094	0.000	3.7
35	11.9	0.134	5.419	0.000	4.8
40	9.0	0.176	7.133	0.000	5.1
45	5.5	0.194	7.850	0.000	4.5
50	3.3	0.193	7.816	0.000	4.4
55	2.6	0.179	7.265	0.000	4.9
60	1.9	0.160	6.481	0.000	4.8
65	1.0	0.136	5.505	0.000	4.6
70	0.7	0.110	4.453	0.000	4.1
75	0.4	0.086	3.473	0.000	3.6
80	0.4	0.064	2.605	0.000	3.0
85	0.3	0.046	1.881	0.000	2.5
90	0.3	0.032	1.298	0.000	1.9
95	0.3	0.024	0.965	0.000	1.0
100	0.2	0.019	0.789	0.000	0.7
105	0.2	0.017	0.681	0.000	0.5
110	0.2	0.015	0.607	0.000	0.4
115	0.2	0.014	0.553	0.000	0.3
120	0.1	0.013	0.511	0.000	0.3

Infiltration Trench 1 Type : Infiltration Trench

Critical by Return Period: FEH - Full Test: 2 years: Increase Rainfall (%): +45: 15 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.000	0.0
5	2.1	0.040	0.040	0.071	0.000	1.9
10	8.1	0.085	0.085	0.152	0.000	7.9
15	2.7	0.047	0.058	0.095	0.000	2.9
20	0.3	0.018	0.053	0.064	0.000	0.5
25	0.0	0.005	0.027	0.029	0.000	0.1
30	0.0	0.003	0.004	0.006	0.000	0.0

Infiltration Trench 3 Type : Infiltration Trench

Critical by Return Period: FEH - Full Test: 2 years: Increase Rainfall (%): +45: 15 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.000	0.0
5	1.1	0.132	0.002	0.165	0.000	0.0
10	11.0	0.697	0.148	1.044	0.000	9.3
15	4.3	0.656	0.107	0.943	0.000	5.0
20	0.5	0.613	0.046	0.814	0.000	0.9
25	0.3	0.569	0.032	0.743	0.000	0.5
30	0.3	0.533	0.031	0.696	0.000	0.4

Infiltration Trench 2 Type : Infiltration Trench

Critical by Return Period: FEH - Full Test: 2 years: Increase Rainfall (%): +45: 15 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.000	0.0
5	1.1	0.028	0.048	0.074	0.000	0.9
10	4.0	0.056	0.086	0.138	0.000	3.6
15	1.3	0.033	0.062	0.093	0.000	1.6
20	0.1	0.013	0.035	0.048	0.000	0.3
25	0.0	0.004	0.024	0.028	0.000	0.0
30	0.0	0.002	0.023	0.024	0.000	0.0

CSMH02 Type : Manhole

Critical by Return Period: FEH - Full Test: 30 years: Increase Rainfall (%): +45: 480 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.0	0.000	0.000	0.000	0.0
10	0.0	0.000	0.000	0.000	0.0
15	0.0	0.000	0.000	0.000	0.0
20	0.0	0.000	0.000	0.000	0.0
25	0.0	0.000	0.000	0.000	0.0
30	0.0	0.001	0.001	0.000	0.0
35	0.1	0.004	0.005	0.000	0.0
40	0.2	0.009	0.010	0.000	0.2
45	0.3	0.012	0.013	0.000	0.3
50	0.4	0.014	0.015	0.000	0.4
55	0.5	0.015	0.017	0.000	0.5
60	0.6	0.016	0.018	0.000	0.6
65	0.7	0.017	0.020	0.000	0.7
70	0.7	0.018	0.021	0.000	0.7
75	0.8	0.019	0.021	0.000	0.8
80	0.8	0.019	0.022	0.000	0.8
85	0.9	0.020	0.022	0.000	0.9
90	0.9	0.020	0.023	0.000	0.9
95	0.9	0.020	0.023	0.000	0.9
100	1.0	0.021	0.023	0.000	1.0
105	1.0	0.021	0.024	0.000	1.0
110	1.0	0.021	0.024	0.000	1.0
115	1.1	0.022	0.025	0.000	1.1
120	1.1	0.022	0.025	0.000	1.1
125	1.2	0.023	0.026	0.000	1.2
130	1.4	0.025	0.028	0.000	1.4
135	1.6	0.026	0.030	0.000	1.6
140	1.7	0.027	0.031	0.000	1.7
145	1.9	0.029	0.032	0.000	1.9
150	2.1	0.030	0.034	0.000	2.1
155	2.3	0.031	0.035	0.000	2.3
160	2.3	0.032	0.036	0.000	2.3
165	2.4	0.032	0.037	0.000	2.4
170	2.6	0.033	0.037	0.000	2.6
175	2.7	0.034	0.039	0.000	2.7
180	2.9	0.035	0.040	0.000	2.9
185	3.1	0.036	0.041	0.000	3.0
190	3.2	0.037	0.042	0.000	3.2
195	3.4	0.038	0.043	0.000	3.4
200	3.6	0.039	0.044	0.000	3.6
205	3.8	0.040	0.046	0.000	3.8
210	4.0	0.041	0.047	0.000	4.0
215	4.1	0.042	0.048	0.000	4.1
220	4.3	0.043	0.049	0.000	4.3
225	4.5	0.044	0.050	0.000	4.5
230	4.7	0.045	0.051	0.000	4.7
235	4.8	0.045	0.051	0.000	4.8

G9448: Moss Lane East, Manchester	Date: 03/10/2024		
	Designed by: EB	Checked by:	Approved By:
Report Details: Type: Junction Results Storm Phase: SURFACE WATER NETWORK	Will Rudd: Rev C		

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
240	4.9	0.046	0.052	0.000	4.9
245	5.0	0.046	0.052	0.000	5.0
250	5.0	0.046	0.052	0.000	5.0
255	4.9	0.046	0.052	0.000	4.9
260	4.7	0.045	0.051	0.000	4.7
265	4.1	0.042	0.048	0.000	4.1
270	3.5	0.039	0.044	0.000	3.5
275	3.3	0.038	0.043	0.000	3.3
280	3.3	0.038	0.043	0.000	3.3
285	3.3	0.038	0.043	0.000	3.3
290	3.4	0.038	0.043	0.000	3.4
295	3.4	0.038	0.043	0.000	3.4
300	3.5	0.038	0.043	0.000	3.5
305	3.5	0.039	0.044	0.000	3.5
310	3.5	0.039	0.044	0.000	3.5
315	3.5	0.039	0.044	0.000	3.5
320	3.5	0.039	0.044	0.000	3.5
325	3.5	0.038	0.044	0.000	3.5
330	3.4	0.038	0.043	0.000	3.4
335	3.4	0.038	0.043	0.000	3.4
340	3.4	0.038	0.043	0.000	3.4
345	3.3	0.038	0.043	0.000	3.3
350	3.3	0.038	0.043	0.000	3.3
355	3.3	0.038	0.043	0.000	3.3
360	3.3	0.038	0.043	0.000	3.3
365	3.7	0.039	0.045	0.000	3.6
370	4.7	0.045	0.051	0.000	4.7
375	5.0	0.046	0.052	0.000	5.0
380	4.7	0.045	0.051	0.000	4.7
385	4.3	0.043	0.049	0.000	4.3
390	3.9	0.041	0.046	0.000	3.9
395	3.5	0.039	0.044	0.000	3.5
400	3.1	0.036	0.041	0.000	3.1
405	2.7	0.034	0.039	0.000	2.7
410	2.4	0.032	0.036	0.000	2.4
415	2.0	0.030	0.033	0.000	2.0
420	1.5	0.026	0.029	0.000	1.5
425	1.3	0.024	0.027	0.000	1.3
430	1.2	0.023	0.026	0.000	1.2
435	1.1	0.022	0.025	0.000	1.1
440	1.1	0.022	0.025	0.000	1.1
445	1.1	0.022	0.025	0.000	1.1
450	1.1	0.022	0.025	0.000	1.1
455	1.0	0.021	0.024	0.000	1.0
460	1.0	0.021	0.024	0.000	1.0
465	1.0	0.021	0.023	0.000	1.0
470	0.9	0.020	0.023	0.000	0.9
475	0.8	0.019	0.022	0.000	0.8
480	0.8	0.018	0.021	0.000	0.8
485	0.7	0.017	0.020	0.000	0.7
490	0.6	0.016	0.018	0.000	0.6
495	0.5	0.015	0.017	0.000	0.5
500	0.4	0.014	0.016	0.000	0.4
505	0.4	0.013	0.015	0.000	0.4
510	0.3	0.013	0.014	0.000	0.3

G9448: Moss Lane East, Manchester	Date: 03/10/2024		
	Designed by: EB	Checked by:	Approved By:
Report Details: Type: Junction Results Storm Phase: SURFACE WATER NETWORK	Will Rudd: Rev C		

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
515	0.3	0.012	0.013	0.000	0.3
520	0.3	0.011	0.013	0.000	0.3
525	0.2	0.011	0.012	0.000	0.2
530	0.2	0.010	0.012	0.000	0.2
535	0.2	0.010	0.011	0.000	0.2
540	0.2	0.009	0.011	0.000	0.2
545	0.2	0.009	0.010	0.000	0.2
550	0.1	0.009	0.010	0.000	0.2
555	0.1	0.008	0.010	0.000	0.1
560	0.1	0.008	0.009	0.000	0.1
565	0.1	0.008	0.009	0.000	0.1
570	0.1	0.008	0.009	0.000	0.1
575	0.1	0.007	0.008	0.000	0.1
580	0.1	0.007	0.008	0.000	0.1
585	0.1	0.007	0.008	0.000	0.1
590	0.1	0.007	0.008	0.000	0.1
595	0.1	0.007	0.008	0.000	0.1
600	0.1	0.007	0.008	0.000	0.1
605	0.1	0.007	0.007	0.000	0.1
610	0.1	0.006	0.007	0.000	0.1
615	0.1	0.006	0.007	0.000	0.1
620	0.1	0.006	0.007	0.000	0.1
625	0.1	0.006	0.007	0.000	0.1
630	0.1	0.006	0.006	0.000	0.1
635	0.1	0.005	0.006	0.000	0.1
640	0.1	0.005	0.006	0.000	0.1
645	0.1	0.005	0.006	0.000	0.1
650	0.1	0.005	0.006	0.000	0.1
655	0.1	0.005	0.006	0.000	0.1
660	0.1	0.005	0.006	0.000	0.1
665	0.0	0.005	0.005	0.000	0.0
670	0.0	0.005	0.005	0.000	0.0
675	0.0	0.005	0.005	0.000	0.0
680	0.0	0.004	0.005	0.000	0.0
685	0.0	0.004	0.005	0.000	0.0
690	0.0	0.004	0.005	0.000	0.0
695	0.0	0.004	0.005	0.000	0.0
700	0.0	0.004	0.005	0.000	0.0
705	0.0	0.004	0.004	0.000	0.0
710	0.0	0.004	0.004	0.000	0.0
715	0.0	0.004	0.004	0.000	0.0
720	0.0	0.003	0.004	0.000	0.0
725	0.0	0.003	0.004	0.000	0.0
730	0.0	0.003	0.004	0.000	0.0
735	0.0	0.003	0.004	0.000	0.0
740	0.0	0.003	0.004	0.000	0.0
745	0.0	0.003	0.004	0.000	0.0
750	0.0	0.003	0.003	0.000	0.0
755	0.0	0.003	0.003	0.000	0.0
760	0.0	0.003	0.003	0.000	0.0
765	0.0	0.003	0.003	0.000	0.0
770	0.0	0.003	0.003	0.000	0.0
775	0.0	0.003	0.003	0.000	0.0
780	0.0	0.003	0.003	0.000	0.0
785	0.0	0.003	0.003	0.000	0.0

G9448: Moss Lane East, Manchester	Date: 03/10/2024		
	Designed by: EB	Checked by:	Approved By:
Report Details: Type: Junction Results Storm Phase: SURFACE WATER NETWORK	Will Rudd: Rev C		

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
790	0.0	0.003	0.003	0.000	0.0
795	0.0	0.003	0.003	0.000	0.0
800	0.0	0.003	0.003	0.000	0.0
805	0.0	0.003	0.003	0.000	0.0
810	0.0	0.003	0.003	0.000	0.0
815	0.0	0.003	0.003	0.000	0.0
820	0.0	0.003	0.003	0.000	0.0
825	0.0	0.003	0.003	0.000	0.0
830	0.0	0.003	0.003	0.000	0.0
835	0.0	0.003	0.003	0.000	0.0
840	0.0	0.003	0.003	0.000	0.0
845	0.0	0.003	0.003	0.000	0.0
850	0.0	0.003	0.003	0.000	0.0
855	0.0	0.003	0.003	0.000	0.0
860	0.0	0.003	0.003	0.000	0.0
865	0.0	0.003	0.003	0.000	0.0
870	0.0	0.002	0.003	0.000	0.0
875	0.0	0.002	0.003	0.000	0.0
880	0.0	0.002	0.003	0.000	0.0
885	0.0	0.002	0.003	0.000	0.0
890	0.0	0.002	0.003	0.000	0.0
895	0.0	0.002	0.003	0.000	0.0
900	0.0	0.002	0.003	0.000	0.0
905	0.0	0.002	0.003	0.000	0.0
910	0.0	0.002	0.003	0.000	0.0
915	0.0	0.002	0.003	0.000	0.0
920	0.0	0.002	0.003	0.000	0.0
925	0.0	0.002	0.003	0.000	0.0
930	0.0	0.002	0.003	0.000	0.0
935	0.0	0.002	0.003	0.000	0.0
940	0.0	0.002	0.003	0.000	0.0
945	0.0	0.002	0.003	0.000	0.0
950	0.0	0.002	0.003	0.000	0.0
955	0.0	0.002	0.002	0.000	0.0
960	0.0	0.002	0.002	0.000	0.0

Ex. MH01 Type : Manhole

Critical by Return Period: FEH - Full Test: 30 years: Increase Rainfall (%): +45: 480 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.0	0.000	0.000	0.000	0.0
10	0.0	0.000	0.000	0.000	0.0
15	0.0	0.000	0.000	0.000	0.0
20	0.0	0.000	0.000	0.000	0.0
25	0.0	0.000	0.000	0.000	0.0
30	0.0	0.000	0.000	0.000	0.0
35	0.0	0.005	0.000	0.000	0.0
40	0.2	0.009	0.000	0.000	0.2
45	0.3	0.011	0.000	0.000	0.3
50	0.4	0.013	0.000	0.000	0.4
55	0.5	0.015	0.000	0.000	0.5
60	0.6	0.016	0.000	0.000	0.6
65	0.7	0.017	0.000	0.000	0.7
70	0.7	0.018	0.000	0.000	0.7
75	0.8	0.018	0.000	0.000	0.8
80	0.8	0.019	0.000	0.000	0.8
85	0.9	0.019	0.000	0.000	0.9
90	0.9	0.020	0.000	0.000	0.9
95	0.9	0.020	0.000	0.000	0.9
100	1.0	0.020	0.000	0.000	1.0
105	1.0	0.020	0.000	0.000	1.0
110	1.0	0.021	0.000	0.000	1.0
115	1.1	0.021	0.000	0.000	1.1
120	1.1	0.022	0.000	0.000	1.1
125	1.2	0.023	0.000	0.000	1.2
130	1.4	0.024	0.000	0.000	1.4
135	1.6	0.026	0.000	0.000	1.6
140	1.7	0.027	0.000	0.000	1.7
145	1.9	0.028	0.000	0.000	1.9
150	2.1	0.029	0.000	0.000	2.1
155	2.3	0.031	0.000	0.000	2.3
160	2.3	0.031	0.000	0.000	2.3
165	2.4	0.032	0.000	0.000	2.4
170	2.6	0.032	0.000	0.000	2.6
175	2.7	0.033	0.000	0.000	2.7
180	2.9	0.034	0.000	0.000	2.9
185	3.0	0.035	0.000	0.000	3.0
190	3.2	0.036	0.000	0.000	3.2
195	3.4	0.037	0.000	0.000	3.4
200	3.6	0.038	0.000	0.000	3.6
205	3.8	0.039	0.000	0.000	3.8
210	4.0	0.040	0.000	0.000	4.0
215	4.1	0.041	0.000	0.000	4.1
220	4.3	0.042	0.000	0.000	4.3
225	4.5	0.043	0.000	0.000	4.5
230	4.7	0.043	0.000	0.000	4.7
235	4.8	0.044	0.000	0.000	4.8

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
240	4.9	0.044	0.000	0.000	4.9
245	5.0	0.045	0.000	0.000	5.0
250	5.0	0.045	0.000	0.000	5.0
255	4.9	0.045	0.000	0.000	4.9
260	4.7	0.044	0.000	0.000	4.7
265	4.1	0.041	0.000	0.000	4.1
270	3.5	0.038	0.000	0.000	3.5
275	3.3	0.037	0.000	0.000	3.3
280	3.3	0.037	0.000	0.000	3.3
285	3.3	0.037	0.000	0.000	3.3
290	3.4	0.037	0.000	0.000	3.4
295	3.4	0.037	0.000	0.000	3.4
300	3.5	0.037	0.000	0.000	3.5
305	3.5	0.038	0.000	0.000	3.5
310	3.5	0.038	0.000	0.000	3.5
315	3.5	0.038	0.000	0.000	3.5
320	3.5	0.038	0.000	0.000	3.5
325	3.5	0.037	0.000	0.000	3.5
330	3.4	0.037	0.000	0.000	3.4
335	3.4	0.037	0.000	0.000	3.4
340	3.4	0.037	0.000	0.000	3.4
345	3.3	0.037	0.000	0.000	3.3
350	3.3	0.037	0.000	0.000	3.3
355	3.3	0.037	0.000	0.000	3.3
360	3.3	0.037	0.000	0.000	3.3
365	3.6	0.038	0.000	0.000	3.6
370	4.7	0.044	0.000	0.000	4.7
375	5.0	0.045	0.000	0.000	5.0
380	4.7	0.044	0.000	0.000	4.7
385	4.3	0.042	0.000	0.000	4.3
390	3.9	0.040	0.000	0.000	3.9
395	3.5	0.038	0.000	0.000	3.5
400	3.1	0.036	0.000	0.000	3.1
405	2.7	0.033	0.000	0.000	2.7
410	2.4	0.031	0.000	0.000	2.4
415	2.0	0.029	0.000	0.000	2.0
420	1.5	0.025	0.000	0.000	1.5
425	1.3	0.023	0.000	0.000	1.3
430	1.2	0.022	0.000	0.000	1.2
435	1.1	0.022	0.000	0.000	1.1
440	1.1	0.022	0.000	0.000	1.1
445	1.1	0.021	0.000	0.000	1.1
450	1.1	0.021	0.000	0.000	1.1
455	1.0	0.021	0.000	0.000	1.0
460	1.0	0.021	0.000	0.000	1.0
465	1.0	0.020	0.000	0.000	1.0
470	0.9	0.020	0.000	0.000	0.9
475	0.8	0.019	0.000	0.000	0.8
480	0.8	0.018	0.000	0.000	0.8
485	0.7	0.017	0.000	0.000	0.7
490	0.6	0.016	0.000	0.000	0.6
495	0.5	0.015	0.000	0.000	0.5
500	0.4	0.014	0.000	0.000	0.4
505	0.4	0.013	0.000	0.000	0.4
510	0.3	0.012	0.000	0.000	0.3

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
515	0.3	0.012	0.000	0.000	0.3
520	0.3	0.011	0.000	0.000	0.3
525	0.2	0.011	0.000	0.000	0.2
530	0.2	0.010	0.000	0.000	0.2
535	0.2	0.010	0.000	0.000	0.2
540	0.2	0.009	0.000	0.000	0.2
545	0.2	0.009	0.000	0.000	0.2
550	0.2	0.008	0.000	0.000	0.2
555	0.1	0.008	0.000	0.000	0.1
560	0.1	0.008	0.000	0.000	0.1
565	0.1	0.008	0.000	0.000	0.1
570	0.1	0.007	0.000	0.000	0.1
575	0.1	0.007	0.000	0.000	0.1
580	0.1	0.007	0.000	0.000	0.1
585	0.1	0.007	0.000	0.000	0.1
590	0.1	0.007	0.000	0.000	0.1
595	0.1	0.007	0.000	0.000	0.1
600	0.1	0.006	0.000	0.000	0.1
605	0.1	0.006	0.000	0.000	0.1
610	0.1	0.006	0.000	0.000	0.1
615	0.1	0.006	0.000	0.000	0.1
620	0.1	0.006	0.000	0.000	0.1
625	0.1	0.006	0.000	0.000	0.1
630	0.1	0.006	0.000	0.000	0.1
635	0.1	0.006	0.000	0.000	0.1
640	0.1	0.005	0.000	0.000	0.1
645	0.1	0.005	0.000	0.000	0.1
650	0.1	0.005	0.000	0.000	0.1
655	0.1	0.005	0.000	0.000	0.1
660	0.1	0.005	0.000	0.000	0.1
665	0.0	0.005	0.000	0.000	0.0
670	0.0	0.005	0.000	0.000	0.0
675	0.0	0.005	0.000	0.000	0.0
680	0.0	0.005	0.000	0.000	0.0
685	0.0	0.005	0.000	0.000	0.0
690	0.0	0.005	0.000	0.000	0.0
695	0.0	0.005	0.000	0.000	0.0
700	0.0	0.005	0.000	0.000	0.0
705	0.0	0.004	0.000	0.000	0.0
710	0.0	0.004	0.000	0.000	0.0
715	0.0	0.004	0.000	0.000	0.0
720	0.0	0.004	0.000	0.000	0.0
725	0.0	0.004	0.000	0.000	0.0
730	0.0	0.004	0.000	0.000	0.0
735	0.0	0.004	0.000	0.000	0.0
740	0.0	0.004	0.000	0.000	0.0
745	0.0	0.004	0.000	0.000	0.0
750	0.0	0.004	0.000	0.000	0.0
755	0.0	0.004	0.000	0.000	0.0
760	0.0	0.004	0.000	0.000	0.0
765	0.0	0.004	0.000	0.000	0.0
770	0.0	0.004	0.000	0.000	0.0
775	0.0	0.003	0.000	0.000	0.0
780	0.0	0.003	0.000	0.000	0.0
785	0.0	0.003	0.000	0.000	0.0

G9448: Moss Lane East, Manchester	Date: 03/10/2024		
	Designed by: EB	Checked by:	Approved By:
Report Details: Type: Junction Results Storm Phase: SURFACE WATER NETWORK	Will Rudd: Rev C		

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
790	0.0	0.003	0.000	0.000	0.0
795	0.0	0.003	0.000	0.000	0.0
800	0.0	0.003	0.000	0.000	0.0
805	0.0	0.003	0.000	0.000	0.0
810	0.0	0.003	0.000	0.000	0.0
815	0.0	0.003	0.000	0.000	0.0
820	0.0	0.003	0.000	0.000	0.0
825	0.0	0.003	0.000	0.000	0.0
830	0.0	0.003	0.000	0.000	0.0
835	0.0	0.003	0.000	0.000	0.0
840	0.0	0.003	0.000	0.000	0.0
845	0.0	0.003	0.000	0.000	0.0
850	0.0	0.003	0.000	0.000	0.0
855	0.0	0.003	0.000	0.000	0.0
860	0.0	0.003	0.000	0.000	0.0
865	0.0	0.003	0.000	0.000	0.0
870	0.0	0.003	0.000	0.000	0.0
875	0.0	0.003	0.000	0.000	0.0
880	0.0	0.003	0.000	0.000	0.0
885	0.0	0.003	0.000	0.000	0.0
890	0.0	0.003	0.000	0.000	0.0
895	0.0	0.003	0.000	0.000	0.0
900	0.0	0.003	0.000	0.000	0.0
905	0.0	0.003	0.000	0.000	0.0
910	0.0	0.003	0.000	0.000	0.0
915	0.0	0.003	0.000	0.000	0.0
920	0.0	0.003	0.000	0.000	0.0
925	0.0	0.003	0.000	0.000	0.0
930	0.0	0.003	0.000	0.000	0.0
935	0.0	0.003	0.000	0.000	0.0
940	0.0	0.003	0.000	0.000	0.0
945	0.0	0.003	0.000	0.000	0.0
950	0.0	0.003	0.000	0.000	0.0
955	0.0	0.002	0.000	0.000	0.0
960	0.0	0.002	0.000	0.000	0.0

SWIC01

Type : Manhole

Critical by Return Period: FEH - Full Test: 30 years: Increase Rainfall (%): +45: 15 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	4.9	0.061	0.010	0.000	4.7
10	18.4	0.155	0.025	0.000	17.8
15	5.3	0.068	0.011	0.000	5.8
20	0.3	0.019	0.003	0.000	0.5
25	0.0	0.003	0.001	0.000	0.0
30	0.0	0.002	0.000	0.000	0.0

SWIC03

Type : Manhole

Critical by Return Period: FEH - Full Test: 30 years: Increase Rainfall (%): +45: 15 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	5.8	0.055	0.009	0.000	5.7
10	21.7	0.822	0.131	0.000	18.2
15	5.9	0.363	0.058	0.000	8.9
20	0.0	0.178	0.028	0.000	0.4
25	0.0	0.134	0.021	0.000	0.2
30	0.0	0.099	0.016	0.000	0.2

SWIC04

Type : Manhole

Critical by Return Period: FEH - Full Test: 30 years: Increase Rainfall (%): +45: 15 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	7.3	0.325	0.052	0.000	3.8
10	24.4	0.886	0.141	0.000	22.8
15	10.6	0.708	0.113	0.000	11.9
20	0.4	0.604	0.096	0.000	0.8
25	0.2	0.556	0.088	0.000	0.3
30	0.2	0.520	0.083	0.000	0.3

SWIC05

Type : Manhole

Critical by Return Period: FEH - Full Test: 30 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.5	0.021	0.003	0.000	0.5
10	0.9	0.028	0.004	0.000	0.8
15	1.0	0.031	0.005	0.000	1.0
20	1.7	0.041	0.006	0.000	1.7
25	3.1	0.058	0.009	0.000	3.0
30	4.5	0.074	0.012	0.000	4.4
35	4.5	0.129	0.021	0.000	4.0
40	3.1	0.210	0.033	0.000	2.9
45	1.7	0.231	0.037	0.000	1.7
50	1.0	0.239	0.038	0.000	1.0
55	0.9	0.242	0.039	0.000	0.9
60	0.5	0.237	0.038	0.000	0.6
65	0.0	0.218	0.035	0.000	0.1
70	0.0	0.193	0.031	0.000	0.1
75	0.0	0.169	0.027	0.000	0.1
80	0.0	0.145	0.023	0.000	0.0
85	0.0	0.121	0.019	0.000	0.1
90	0.0	0.097	0.015	0.000	0.1
95	0.0	0.074	0.012	0.000	0.1
100	0.0	0.052	0.008	0.000	0.1
105	0.0	0.031	0.005	0.000	0.1
110	0.0	0.011	0.002	0.000	0.1
115	0.0	0.002	0.000	0.000	0.0
120	0.0	0.002	0.000	0.000	0.0

SWIC02

Type : Manhole

Critical by Return Period: FEH - Full Test: 30 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.8	0.026	0.004	0.000	0.7
10	1.6	0.035	0.006	0.000	1.6
15	2.0	0.036	0.006	0.000	2.0
20	3.3	0.047	0.007	0.000	3.3
25	6.0	0.061	0.010	0.000	5.9
30	7.9	0.170	0.027	0.000	7.3
35	8.4	0.318	0.051	0.000	7.8
40	6.0	0.428	0.068	0.000	5.6
45	3.5	0.489	0.078	0.000	3.3
50	2.1	0.511	0.081	0.000	2.0
55	1.8	0.516	0.082	0.000	1.7
60	1.2	0.513	0.082	0.000	1.2
65	0.3	0.497	0.079	0.000	0.4
70	0.2	0.472	0.075	0.000	0.3
75	0.1	0.448	0.071	0.000	0.2
80	0.1	0.423	0.067	0.000	0.2
85	0.2	0.400	0.064	0.000	0.2
90	0.2	0.376	0.060	0.000	0.2
95	0.1	0.353	0.056	0.000	0.2
100	0.1	0.330	0.053	0.000	0.2
105	0.1	0.309	0.049	0.000	0.2
110	0.1	0.289	0.046	0.000	0.2
115	0.1	0.268	0.043	0.000	0.2
120	0.1	0.248	0.039	0.000	0.2

SWMH01 Type : Manhole

Critical by Return Period: FEH - Full Test: 30 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.2	0.002	0.002	0.000	0.0
10	0.8	0.017	0.019	0.000	0.7
15	1.3	0.021	0.024	0.000	1.2
20	6.0	0.047	0.053	0.000	5.9
25	11.3	0.065	0.074	0.000	11.2
30	17.0	0.081	0.092	0.000	16.9
35	15.7	0.190	0.215	0.000	15.1
40	12.5	0.280	0.317	0.000	12.4
45	7.4	0.311	0.352	0.000	7.3
50	4.3	0.323	0.365	0.000	4.3
55	3.5	0.326	0.369	0.000	3.5
60	2.5	0.321	0.363	0.000	2.5
65	1.0	0.303	0.343	0.000	1.1
70	0.9	0.278	0.315	0.000	1.0
75	1.1	0.254	0.287	0.000	1.0
80	1.1	0.229	0.259	0.000	1.0
85	0.9	0.206	0.233	0.000	0.8
90	0.6	0.182	0.206	0.000	0.9
95	0.7	0.159	0.180	0.000	0.8
100	0.8	0.137	0.155	0.000	0.9
105	0.8	0.116	0.131	0.000	0.9
110	0.8	0.095	0.108	0.000	0.9
115	0.7	0.074	0.084	0.000	0.8
120	0.6	0.054	0.061	0.000	0.7

SWMH02 Type : Manhole

Critical by Return Period: FEH - Full Test: 30 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.0	0.000	0.000	0.000	0.0
10	0.3	0.012	0.013	0.000	0.1
15	1.5	0.074	0.084	0.000	1.1
20	3.0	0.128	0.145	0.000	2.7
25	4.7	0.195	0.221	0.000	4.3
30	3.9	0.317	0.358	0.000	3.3
35	4.5	0.459	0.519	0.000	4.0
40	4.9	0.579	0.655	0.000	4.5
45	4.9	0.649	0.734	0.000	4.8
50	4.9	0.673	0.761	0.000	4.9
55	4.9	0.679	0.768	0.000	4.9
60	4.8	0.677	0.765	0.000	4.9
65	4.7	0.661	0.748	0.000	4.8
70	4.6	0.637	0.720	0.000	4.7
75	4.5	0.612	0.693	0.000	4.6
80	4.4	0.588	0.665	0.000	4.5
85	4.3	0.565	0.639	0.000	4.4
90	4.3	0.541	0.612	0.000	4.3
95	4.2	0.519	0.586	0.000	4.2
100	4.1	0.497	0.562	0.000	4.1
105	4.0	0.476	0.538	0.000	4.1
110	3.9	0.455	0.515	0.000	4.0
115	3.8	0.435	0.492	0.000	3.9
120	3.7	0.415	0.469	0.000	3.8

Simple Junction Type : Simple Junction

Critical by Return Period: FEH - Full Test: 30 years: Increase Rainfall (%): +45: 15 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Total Outflow (L/s)
0	0.0	0.000	0.0
5	3.7	0.046	3.6
10	13.6	0.099	13.4
15	3.7	0.048	4.0
20	0.0	0.013	0.3
25	0.0	0.002	0.0
30	0.0	0.001	0.0

Cellular Storage Type : Cellular Storage

Critical by Return Period: FEH - Full Test: 30 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth(m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.7	0.001	0.026	0.000	0.0
10	2.4	0.013	0.531	0.000	0.3
15	3.2	0.028	1.144	0.000	1.5
20	9.1	0.050	2.041	0.000	3.0
25	17.1	0.118	4.770	0.000	4.7
30	24.1	0.236	9.563	0.000	3.9
35	23.0	0.381	15.425	0.000	4.5
40	18.0	0.502	20.336	0.000	4.9
45	10.6	0.571	23.155	0.000	4.9
50	6.3	0.596	24.149	0.000	4.9
55	5.3	0.601	24.369	0.000	4.9
60	3.8	0.599	24.283	0.000	4.8
65	1.5	0.583	23.641	0.000	4.7
70	1.2	0.558	22.632	0.000	4.6
75	1.2	0.534	21.645	0.000	4.5
80	1.2	0.509	20.659	0.000	4.4
85	1.1	0.485	19.697	0.000	4.3
90	1.1	0.462	18.729	0.000	4.3
95	1.0	0.439	17.792	0.000	4.2
100	1.1	0.416	16.891	0.000	4.1
105	1.2	0.395	16.030	0.000	4.0
110	1.1	0.375	15.194	0.000	3.9
115	1.0	0.354	14.363	0.000	3.8
120	0.9	0.334	13.529	0.000	3.7

Infiltration Trench 1 Type : Infiltration Trench

Critical by Return Period: FEH - Full Test: 30 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.000	0.0
5	1.0	0.027	0.025	0.047	0.000	0.8
10	1.7	0.036	0.036	0.064	0.000	1.6
15	2.0	0.039	0.039	0.070	0.000	2.0
20	3.4	0.051	0.051	0.092	0.000	3.3
25	6.1	0.071	0.070	0.127	0.000	6.0
30	9.0	0.119	0.163	0.254	0.000	7.9
35	9.2	0.278	0.312	0.531	0.000	8.4
40	6.4	0.369	0.417	0.708	0.000	6.0
45	3.7	0.419	0.476	0.806	0.000	3.5
50	2.1	0.438	0.497	0.841	0.000	2.1
55	1.8	0.443	0.502	0.850	0.000	1.8
60	1.1	0.439	0.499	0.844	0.000	1.2
65	0.2	0.422	0.482	0.814	0.000	0.3
70	0.0	0.397	0.457	0.769	0.000	0.2
75	0.0	0.373	0.432	0.725	0.000	0.1
80	0.0	0.348	0.408	0.681	0.000	0.1
85	0.0	0.324	0.384	0.639	0.000	0.2
90	0.0	0.301	0.361	0.596	0.000	0.2
95	0.0	0.278	0.338	0.554	0.000	0.1
100	0.0	0.255	0.315	0.514	0.000	0.1
105	0.0	0.234	0.294	0.476	0.000	0.1
110	0.0	0.214	0.274	0.439	0.000	0.1
115	0.0	0.193	0.253	0.402	0.000	0.1
120	0.0	0.173	0.233	0.365	0.000	0.1

Infiltration Trench 3 Type : Infiltration Trench

Critical by Return Period: FEH - Full Test: 30 years: Increase Rainfall (%): +45: 15 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.000	0.0
5	4.0	0.341	0.012	0.437	0.000	-0.1
10	22.8	0.851	0.351	1.484	0.000	19.5
15	11.9	0.711	0.402	1.376	0.000	15.5
20	0.8	0.622	0.161	0.968	0.000	1.3
25	0.3	0.574	0.141	0.884	0.000	0.5
30	0.3	0.538	0.121	0.814	0.000	0.5

Infiltration Trench 2 Type : Infiltration Trench

Critical by Return Period: FEH - Full Test: 30 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.000	0.0
5	0.5	0.019	0.034	0.051	0.000	0.2
10	0.8	0.025	0.046	0.070	0.000	0.8
15	1.0	0.028	0.049	0.074	0.000	1.0
20	1.7	0.036	0.062	0.095	0.000	1.6
25	3.0	0.048	0.082	0.127	0.000	2.9
30	4.4	0.060	0.102	0.158	0.000	4.3
35	4.0	0.138	0.199	0.329	0.000	3.1
40	2.9	0.224	0.286	0.498	0.000	2.7
45	1.7	0.249	0.314	0.550	0.000	1.6
50	1.0	0.259	0.323	0.568	0.000	1.0
55	0.9	0.262	0.327	0.575	0.000	0.9
60	0.6	0.257	0.322	0.565	0.000	0.6
65	0.1	0.238	0.303	0.529	0.000	0.3
70	0.1	0.213	0.278	0.481	0.000	0.3
75	0.1	0.189	0.254	0.433	0.000	0.3
80	0.0	0.165	0.230	0.386	0.000	0.2
85	0.1	0.141	0.206	0.339	0.000	0.4
90	0.1	0.117	0.183	0.293	0.000	0.2
95	0.1	0.094	0.159	0.247	0.000	0.2
100	0.1	0.072	0.137	0.204	0.000	0.2
105	0.1	0.051	0.116	0.163	0.000	0.2
110	0.1	0.030	0.095	0.122	0.000	0.2
115	0.0	0.010	0.075	0.082	0.000	0.1
120	0.0	0.003	0.054	0.055	0.000	0.1

CSMH02

Type : Manhole

Critical by Return Period: FEH - Full Test: 100 years: Increase Rainfall (%): +45: 30 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.0	0.000	0.000	0.000	0.0
10	1.7	0.025	0.028	0.000	1.4
15	4.9	0.046	0.052	0.000	5.0
20	4.2	0.042	0.048	0.000	4.1
25	5.0	0.046	0.052	0.000	5.0
30	5.5	0.048	0.055	0.000	5.5
35	5.5	0.048	0.055	0.000	5.5
40	5.3	0.048	0.054	0.000	5.3
45	5.0	0.047	0.053	0.000	5.1
50	4.9	0.046	0.052	0.000	5.0
55	4.9	0.046	0.052	0.000	4.9
60	4.8	0.045	0.051	0.000	4.8

Ex. MH01

Type : Manhole

Critical by Return Period: FEH - Full Test: 100 years: Increase Rainfall (%): +45: 30 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.0	0.000	0.000	0.000	0.0
10	1.4	0.024	0.000	0.000	1.4
15	5.0	0.045	0.000	0.000	5.0
20	4.1	0.041	0.000	0.000	4.1
25	5.0	0.045	0.000	0.000	5.0
30	5.5	0.047	0.000	0.000	5.5
35	5.5	0.047	0.000	0.000	5.5
40	5.3	0.046	0.000	0.000	5.3
45	5.1	0.045	0.000	0.000	5.1
50	5.0	0.045	0.000	0.000	5.0
55	4.9	0.044	0.000	0.000	4.9
60	4.8	0.044	0.000	0.000	4.8

SWIC01 Type : Manhole

Critical by Return Period: FEH - Full Test: 100 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	1.3	0.030	0.005	0.000	1.3
10	2.2	0.040	0.006	0.000	2.2
15	2.6	0.044	0.007	0.000	2.6
20	4.4	0.058	0.009	0.000	4.3
25	8.0	0.082	0.013	0.000	7.9
30	11.7	0.104	0.017	0.000	11.6
35	11.8	0.105	0.017	0.000	11.8
40	8.1	0.084	0.013	0.000	8.3
45	4.6	0.196	0.031	0.000	4.0
50	2.3	0.287	0.046	0.000	3.1
55	2.2	0.320	0.051	0.000	0.3
60	1.5	0.322	0.051	0.000	1.3
65	0.4	0.265	0.042	0.000	0.7
70	0.0	0.170	0.027	0.000	0.3
75	0.0	0.067	0.011	0.000	0.6
80	0.0	0.004	0.001	0.000	0.0
85	0.0	0.002	0.000	0.000	0.0
90	0.0	0.001	0.000	0.000	0.0
95	0.0	0.001	0.000	0.000	0.0
100	0.0	0.001	0.000	0.000	0.0
105	0.0	0.001	0.000	0.000	0.0
110	0.0	0.001	0.000	0.000	0.0
115	0.0	0.001	0.000	0.000	0.0
120	0.0	0.001	0.000	0.000	0.0

SWIC03

Type : Manhole

Critical by Return Period: FEH - Full Test: 100 years: Increase Rainfall (%): +45: 15 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	7.4	0.063	0.010	0.000	7.0
10	27.2	1.106	0.176	0.000	22.3
15	7.4	0.567	0.090	0.000	12.3
20	0.0	0.181	0.029	0.000	0.5
25	0.0	0.140	0.022	0.000	0.2
30	0.0	0.106	0.017	0.000	0.1

SWIC04

Type : Manhole

Critical by Return Period: FEH - Full Test: 100 years: Increase Rainfall (%): +45: 15 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	9.1	0.441	0.070	0.000	4.9
10	30.1	1.011	0.161	0.000	27.8
15	14.4	0.836	0.133	0.000	17.2
20	0.5	0.607	0.097	0.000	0.9
25	0.2	0.562	0.089	0.000	0.3
30	0.1	0.528	0.084	0.000	0.3

SWIC05 Type : Manhole

Critical by Return Period: FEH - Full Test: 100 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.7	0.024	0.004	0.000	0.6
10	1.1	0.032	0.005	0.000	1.1
15	1.3	0.035	0.006	0.000	1.3
20	2.2	0.047	0.007	0.000	2.2
25	4.0	0.068	0.011	0.000	3.9
30	5.8	0.104	0.017	0.000	5.1
35	5.8	0.308	0.049	0.000	5.1
40	4.0	0.420	0.067	0.000	3.8
45	2.2	0.702	0.112	0.000	1.6
50	1.3	0.795	0.126	0.000	1.1
55	1.1	0.829	0.132	0.000	1.0
60	0.7	0.831	0.132	0.000	0.8
65	0.0	0.775	0.123	0.000	0.4
70	0.0	0.682	0.108	0.000	0.4
75	0.0	0.577	0.092	0.000	0.5
80	0.0	0.450	0.072	0.000	0.5
85	0.0	0.320	0.051	0.000	0.5
90	0.0	0.273	0.043	0.000	0.1
95	0.0	0.246	0.039	0.000	0.2
100	0.0	0.220	0.035	0.000	0.1
105	0.0	0.194	0.031	0.000	0.1
110	0.0	0.169	0.027	0.000	0.1
115	0.0	0.143	0.023	0.000	0.1
120	0.0	0.118	0.019	0.000	0.1

SWIC02

Type : Manhole

Critical by Return Period: FEH - Full Test: 100 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	1.1	0.030	0.005	0.000	1.0
10	2.1	0.039	0.006	0.000	2.1
15	2.5	0.041	0.007	0.000	2.5
20	4.3	0.052	0.008	0.000	4.3
25	7.5	0.093	0.015	0.000	6.9
30	10.3	0.270	0.043	0.000	9.6
35	10.8	0.447	0.071	0.000	10.1
40	7.6	0.589	0.094	0.000	7.2
45	3.1	0.975	0.155	0.000	2.4
50	2.3	1.069	0.170	0.000	1.8
55	1.9	1.102	0.175	0.000	2.0
60	1.7	1.105	0.176	0.000	1.7
65	1.2	1.050	0.167	0.000	1.6
70	1.0	0.956	0.152	0.000	1.4
75	1.3	0.852	0.135	0.000	1.8
80	0.8	0.724	0.115	0.000	1.3
85	0.7	0.594	0.094	0.000	1.2
90	0.3	0.552	0.088	0.000	0.5
95	0.0	0.525	0.083	0.000	0.2
100	0.2	0.498	0.079	0.000	0.3
105	0.2	0.472	0.075	0.000	0.2
110	0.0	0.447	0.071	0.000	0.3
115	0.1	0.422	0.067	0.000	0.2
120	0.1	0.398	0.063	0.000	0.2

SWMH01 Type : Manhole

Critical by Return Period: FEH - Full Test: 100 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.5	0.008	0.010	0.000	0.1
10	1.0	0.019	0.022	0.000	1.0
15	2.0	0.025	0.029	0.000	1.8
20	8.0	0.054	0.061	0.000	7.9
25	14.8	0.074	0.084	0.000	14.7
30	18.2	0.151	0.171	0.000	17.1
35	19.8	0.353	0.400	0.000	19.1
40	16.9	0.480	0.543	0.000	16.7
45	4.8	0.785	0.888	0.000	4.2
50	4.1	0.878	0.994	0.000	4.0
55	3.8	0.912	1.032	0.000	3.7
60	3.5	0.915	1.035	0.000	3.5
65	2.8	0.859	0.972	0.000	3.2
70	2.9	0.765	0.866	0.000	3.3
75	2.4	0.660	0.747	0.000	2.9
80	2.7	0.533	0.603	0.000	3.2
85	2.6	0.403	0.456	0.000	3.1
90	1.3	0.357	0.404	0.000	1.0
95	1.3	0.331	0.374	0.000	0.9
100	0.8	0.304	0.344	0.000	0.9
105	0.6	0.279	0.315	0.000	0.9
110	0.4	0.253	0.286	0.000	0.9
115	0.7	0.229	0.259	0.000	0.9
120	0.3	0.204	0.230	0.000	0.7

SWMH02 Type : Manhole

Critical by Return Period: FEH - Full Test: 100 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Volume (m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	0.0	0.000	0.000	0.000	0.0
10	0.5	0.023	0.026	0.000	0.2
15	2.3	0.101	0.114	0.000	1.9
20	3.8	0.155	0.176	0.000	3.4
25	5.4	0.242	0.274	0.000	5.0
30	4.3	0.398	0.451	0.000	3.7
35	5.1	0.571	0.646	0.000	4.5
40	5.6	0.732	0.828	0.000	5.1
45	6.1	1.133	1.282	0.000	5.5
50	5.6	1.229	1.390	0.000	5.5
55	5.6	1.264	1.429	0.000	5.5
60	5.4	1.267	1.433	0.000	5.5
65	5.2	1.213	1.372	0.000	5.5
70	5.1	1.119	1.265	0.000	5.5
75	5.0	1.015	1.148	0.000	5.5
80	4.9	0.887	1.003	0.000	5.5
85	4.7	0.758	0.857	0.000	5.2
90	4.9	0.715	0.809	0.000	5.0
95	4.8	0.689	0.779	0.000	4.9
100	4.7	0.662	0.749	0.000	4.8
105	4.6	0.637	0.720	0.000	4.7
110	4.5	0.612	0.692	0.000	4.6
115	4.4	0.587	0.664	0.000	4.5
120	4.3	0.563	0.637	0.000	4.4

Simple Junction Type : Simple Junction

Critical by Return Period: FEH - Full Test: 100 years: Increase Rainfall (%): +45: 15 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth (m)	Total Outflow (L/s)
0	0.0	0.000	0.0
5	4.6	0.052	4.5
10	17.1	0.164	15.6
15	4.7	0.054	5.0
20	0.0	0.014	0.3
25	0.0	0.002	0.0
30	0.0	0.001	0.0

Cellular Storage Type : Cellular Storage

Critical by Return Period: FEH - Full Test: 100 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	Depth(m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.0
5	1.2	0.001	0.052	0.000	0.0
10	3.1	0.018	0.713	0.000	0.5
15	4.4	0.035	1.432	0.000	2.3
20	12.2	0.077	3.119	0.000	3.8
25	21.7	0.167	6.749	0.000	5.4
30	26.6	0.319	12.949	0.000	4.3
35	29.2	0.494	20.035	0.000	5.1
40	23.9	0.657	26.617	0.000	5.6
45	6.6	1.059	27.161	0.000	6.1
50	5.8	1.153	27.251	0.000	5.6
55	5.6	1.187	27.284	0.000	5.6
60	5.3	1.190	27.287	0.000	5.4
65	4.8	1.135	27.235	0.000	5.2
70	4.8	1.041	27.144	0.000	5.1
75	4.6	0.937	27.044	0.000	5.0
80	4.5	0.809	26.922	0.000	4.9
85	4.3	0.680	26.797	0.000	4.7
90	1.5	0.637	25.852	0.000	4.9
95	1.1	0.611	24.762	0.000	4.8
100	1.2	0.584	23.697	0.000	4.7
105	1.1	0.558	22.658	0.000	4.6
110	1.2	0.533	21.629	0.000	4.5
115	1.1	0.508	20.622	0.000	4.4
120	0.9	0.484	19.615	0.000	4.3

Infiltration Trench 1 Type : Infiltration Trench

Critical by Return Period: FEH - Full Test: 100 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.000	0.0
5	1.3	0.031	0.030	0.054	0.000	1.1
10	2.2	0.041	0.041	0.074	0.000	2.1
15	2.6	0.045	0.044	0.080	0.000	2.5
20	4.3	0.059	0.058	0.105	0.000	4.3
25	7.9	0.084	0.094	0.160	0.000	7.5
30	11.6	0.249	0.269	0.466	0.000	10.3
35	11.8	0.427	0.446	0.786	0.000	10.8
40	8.3	0.541	0.581	1.011	0.000	7.6
45	4.0	0.905	0.962	1.681	0.000	3.1
50	3.1	0.994	1.055	1.844	0.000	2.3
55	0.3	1.030	1.089	1.908	0.000	1.9
60	1.3	1.027	1.089	1.906	0.000	1.7
65	0.7	0.976	1.035	1.810	0.000	1.2
70	0.3	0.881	0.941	1.640	0.000	1.0
75	0.6	0.777	0.837	1.455	0.000	1.3
80	0.0	0.649	0.709	1.224	0.000	0.8
85	0.0	0.519	0.579	0.989	0.000	0.7
90	0.0	0.477	0.537	0.913	0.000	0.3
95	0.0	0.450	0.510	0.864	0.000	0.0
100	0.0	0.423	0.483	0.816	0.000	0.2
105	0.0	0.398	0.457	0.770	0.000	0.2
110	0.0	0.372	0.432	0.725	0.000	0.0
115	0.0	0.347	0.407	0.680	0.000	0.1
120	0.0	0.323	0.383	0.636	0.000	0.1

Infiltration Trench 3 Type : Infiltration Trench

Critical by Return Period: FEH - Full Test: 100 years: Increase Rainfall (%): +45: 60 mins: Winter

Tables

Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.000	0.0
5	0.6	0.087	0.001	0.109	0.000	0.0
10	1.8	0.357	0.020	0.464	0.000	0.1
15	3.0	0.641	0.057	0.861	0.000	1.9
20	6.4	0.669	0.119	0.973	0.000	6.2
25	11.4	0.701	0.161	1.065	0.000	11.1
30	16.5	0.747	0.281	1.269	0.000	15.2
35	17.4	0.783	0.505	1.591	0.000	16.5
40	13.1	0.717	0.583	1.607	0.000	13.5
45	6.0	0.727	0.798	1.884	0.000	4.8
50	3.7	0.809	0.885	2.092	0.000	3.4
55	3.2	0.840	0.917	2.171	0.000	3.0
60	2.2	0.839	0.918	2.171	0.000	2.5
65	0.8	0.779	0.861	2.027	0.000	1.5
70	0.7	0.686	0.767	1.795	0.000	1.5
75	0.1	0.612	0.660	1.573	0.000	0.7
80	0.1	0.597	0.533	1.398	0.000	0.8
85	0.2	0.575	0.404	1.210	0.000	0.8
90	0.2	0.548	0.360	1.122	0.000	0.6
95	0.2	0.525	0.331	1.058	0.000	0.6
100	0.2	0.502	0.304	0.997	0.000	0.4
105	0.1	0.480	0.279	0.938	0.000	0.0
110	0.2	0.458	0.255	0.881	0.000	0.0
115	0.1	0.434	0.230	0.820	0.000	0.2
120	0.1	0.406	0.205	0.755	0.000	1.5

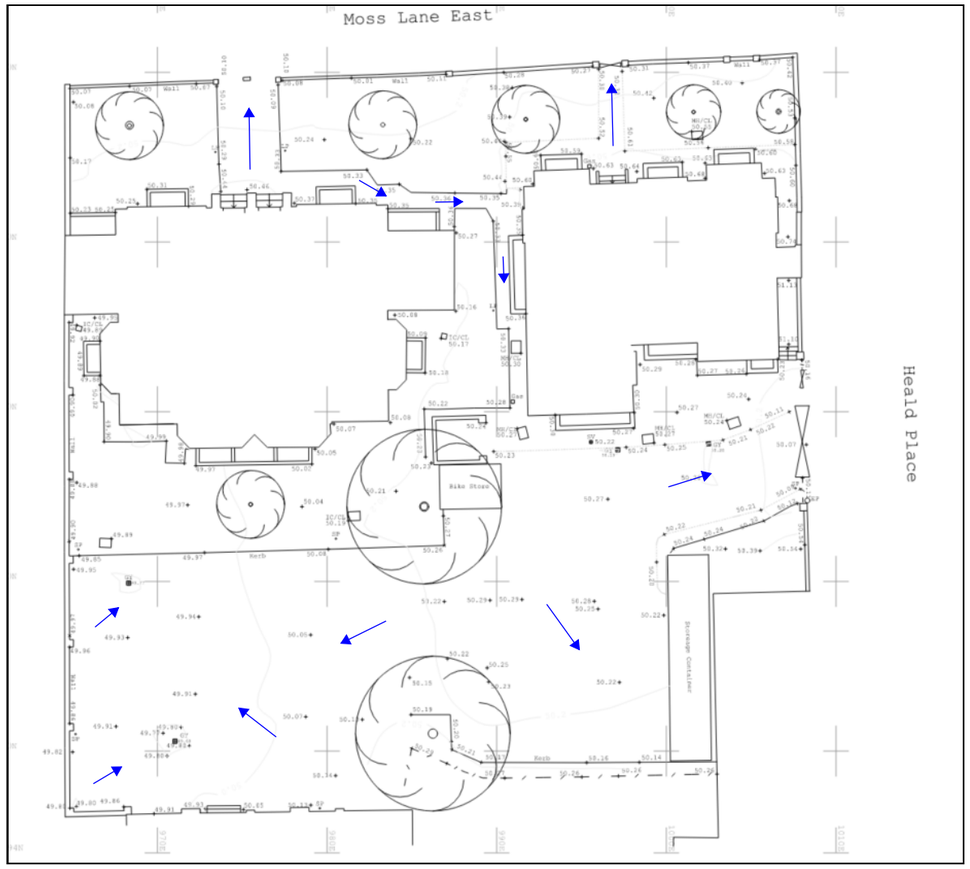
Infiltration Trench 2 Type : Infiltration Trench

Critical by Return Period: FEH - Full Test: 100 years: Increase Rainfall (%): +45: 60 mins: Winter

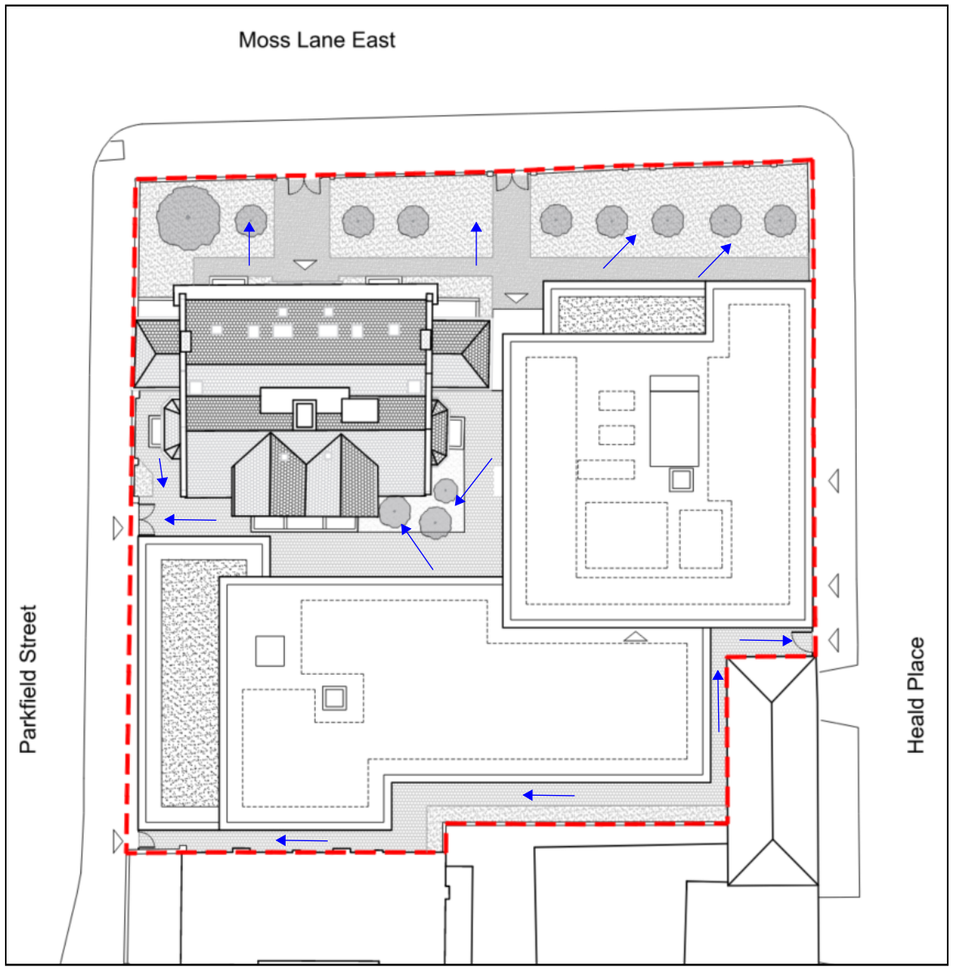
Tables

Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.000	0.0
5	0.6	0.022	0.040	0.060	0.000	0.5
10	1.1	0.029	0.049	0.076	0.000	1.0
15	1.3	0.031	0.053	0.082	0.000	1.2
20	2.2	0.041	0.069	0.107	0.000	2.1
25	3.9	0.055	0.094	0.146	0.000	3.8
30	5.1	0.105	0.164	0.262	0.000	3.7
35	5.1	0.310	0.368	0.662	0.000	4.0
40	3.8	0.431	0.491	0.899	0.000	3.5
45	1.6	0.721	0.785	1.471	0.000	0.6
50	1.1	0.814	0.879	1.653	0.000	0.8
55	1.0	0.848	0.913	1.719	0.000	0.8
60	0.8	0.851	0.916	1.725	0.000	0.9
65	0.4	0.795	0.860	1.617	0.000	0.9
70	0.4	0.702	0.766	1.433	0.000	1.0
75	0.5	0.597	0.661	1.229	0.000	1.2
80	0.5	0.470	0.535	0.982	0.000	1.4
85	0.5	0.340	0.405	0.727	0.000	1.3
90	0.1	0.293	0.358	0.636	0.000	0.4
95	0.2	0.266	0.331	0.583	0.000	0.5
100	0.1	0.240	0.304	0.532	0.000	0.3
105	0.1	0.214	0.279	0.481	0.000	0.3
110	0.1	0.189	0.253	0.433	0.000	0.2
115	0.1	0.163	0.229	0.383	0.000	0.2
120	0.1	0.138	0.204	0.335	0.000	0.3

Appendix F – Overland Flow



EXISTING OVERLAND FLOW ROUTES
NTS



PROPOSED OVERLAND FLOW AND EXCEEDANCE PLAN
NTS

GENERAL NOTES

1. DO NOT SCALE FROM THIS DRAWING - IF IN DOUBT CONTACT PROJECT ENGINEER.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
3. ALL LEVELS ARE IN METRES.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL, STRUCTURAL AND SERVICES DRAWINGS.
5. THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS ON SITE AND IS RESPONSIBLE FOR ACCURATE SETTING OUT.
6. THE CONTRACTOR IS TO CONFIRM THE EXISTING BOUNDARY AND SITE STRUCTURES ETC. PRIOR TO COMMENCING THE WORKS AND IMMEDIATELY INFORM THE SUPERVISING OFFICER SHOULD THESE BE AT VARIANCE WITH THE ASSUMPTIONS SHOWN ON THE DRAWING.

ALL DIMENSIONS SHOWN ON THIS DRAWING ARE TO BE VERIFIED BY THE ARCHITECT PRIOR TO FABRICATION / MANUFACTURE / CONSTRUCTION

CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 2015

THE DESIGNS ON THIS DRAWING ARE PREPARED WITH CONSIDERATION OF THE NEED TO IDENTIFY HAZARDS AND GIVE REGARD TO THEIR ELIMINATION OR MINIMISATION. REFERENCE MUST BE MADE TO THE HEALTH AND SAFETY INFORMATION PREPARED BY THE PRINCIPAL DESIGNER.

ISSUE	DETAILS	BY	DATE	CHK	DATE
P01	INFORMATION	eb	30/08/24	CA	30/08/24

STATUS:
INFORMATION

Will Rudd
Realise what's possible
Consulting Structural & Civil Engineers
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Will Rudd Davidson Ltd
100 Brunswick St, Glasgow, G1 1TF

PROJECT: **MOSS LANE EAST, MANCHESTER**

CLIENT: **ALUMNO GROUP**

TITLE:
OVERLAND FLOW AND EXCEEDANCE

DRAWN BY:	**EB**	DATE:	**30/08/2024**
CHECKED BY:	**CA**	DATE:	**30/08/2024**
SCALE:	**NTS**	SHEET SIZE:	A3

PROJECT	ORIG.	VOL.	LEVEL	TYPE	ROLE	No.	REV
G9448	WRD	EX	ZZ	SK	C	50032	P01

Appendix G - Simple Index Approach Check

SIMPLE INDEX APPROACH: TOOL

HRW shall not be liable for any direct or indirect damage claim, loss, cost, expense or liability howsoever arising out of the use or impossibility to use the tools, even when HRW has been informed of the possibility of the same. The user hereby indemnifies HRW from and against any damage claim, loss, expense or liability resulting from any action taken against HRW that is related in any way to the use of the tool or any reliance made in respect of the output of such use by any person whatsoever. HRW does not guarantee that the tool's functions meet the requirements of any person, nor that the tool is free from errors.

1. The steps set out in the tool should be applied for each inflow or 'runoff area' (ie each impermeable surface area separately discharging to a SuDS component).

2. The supporting 'Design Conditions' stated by the tool must be fully considered and implemented in all cases.

3. Relevant design examples are included in the SuDS Manual Appendix C.

4. Each of the steps below are part of the process set out in the flowchart on Sheet 3.

5. Sheet 4 summarises the selections made below and indicates the acceptability of the proposed SuDS components.

DROP DOWN LIST	RELEVANT INPUTS NEED TO BE SELECTED FROM THESE LISTS, FOR EACH STEP
USER ENTRY	USER ENTRY CELLS ARE ONLY REQUIRED WHERE INDICATED BY THE TOOL

STEP 1: Determine the Pollution Hazard Index for the runoff area discharging to the proposed SuDS scheme

This step requires the user to select the appropriate land use type for the area from which the runoff is occurring

If the land use varies across the 'runoff area', either:

- use the land use type with the highest Pollution Hazard Index

- apply the approach for each of the land use types to determine whether the proposed SuDS design is sufficient for all. If it is not, consider collecting more hazardous runoff separately and providing additional treatment.

If the generic land use types suggested are not applicable, select 'Other' and enter a description of the land use of the runoff area and agreed user defined indices in the row below the drop down lists.

	Runoff Area Land Use Description	*Hazard Level*	*Pollution Hazard Indices* Total Suspended Solids	Metals	Hydrocarbons
Select land use type from the drop down list (or 'Other' if none applicable): →	Residential roofing	Very low	0.2	0.2	0.05
If the generic land use types in the drop down list above are not applicable, select 'Other' and enter a description of the land use of the runoff area and agreed user defined indices in this row:					
	Landuse Pollution Hazard Index	**Very low**	**0.2**	**0.2**	**0.05**

DESIGN CONDITIONS

1

2

STEP 2A: Determine the Pollution Mitigation Index for the proposed SuDS components

This step requires the user to select the proposed SuDS components that will be used to treat runoff - before it is discharged to a receiving surface waterbody or downstream infiltration component

If the runoff is discharged directly to an infiltration component, without upstream treatment, select 'None' for each of the 3 SuDS components and move to Step 2B

This step should be applied to evaluate the water quality protection provided by proposed SuDS components for discharges to receiving surface waters or downstream infiltration components (note: in England and Wales this will include components that allow any amount of infiltration, however small, even where infiltration is not specifically accounted for in the design).

If you have fewer than 3 components, select 'None' for the components that are not required

If the proposed component is bespoke and/or a proprietary treatment product and not generically described by the suggested components, then 'Proprietary treatment system' or 'User defined indices' should be selected and a description of the component and agreed user defined indices should be entered in the rows below the drop down lists

	SuDS Component Description	*Pollution Mitigation Indices* Total Suspended Solids	Metals	Hydrocarbons
Select SuDS Component 1 (i.e. the upstream SuDS component) from the drop down list: →	Filter drain (where the trench is not designed as an infiltration component)	0.4	0.4	0.4
Select SuDS Component 2 (i.e. the second SuDS component in a series) from the drop down list: →	None			
Select SuDS Component 3 (i.e. the third SuDS component in a series) from the drop down list: →	None			
If the proposed SuDS components are bespokeproprietary and/or the generic indices above are not considered appropriate, select 'Proprietary treatment system' or 'User defined indices' and enter component descriptions and agreed user defined indices in these rows:				
	Aggregated Surface Water Pollution Mitigation Index	**0.4**	**0.4**	**0.4**

DESIGN CONDITIONS

1	2	3
SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B	Filter drains should be preceded by upstream component(s) that trap(s) silt; or designed specifically to retain sediment in a separate zone, easily accessible for maintenance, such that the sediment will not be re-suspended in subsequent events	

Note: If the total aggregated mitigation index is > 1 (which is not a realistic outcome), then the outcome is fixed at "=0.95". In this scenario, the proposed components are likely to have a very high mitigation potential for reducing pollutant levels in the runoff and should be sufficient for any proposed land use (note: where risk assessment is required, this outcome would need more detailed verification).

Is the runoff now discharged to an infiltration component?

Yes ? Go to Step 2B
No ? Go to Step 2C

STEP 2B: Determine the Pollution Mitigation Index for the proposed Groundwater Protection

This step requires the user to select the type of groundwater protection that is either part of the SuDS component or that lies between the component and the groundwater

This step should be applied where a SuDS component is specifically designed to infiltrate runoff (note: in England and Wales this will include components that allow any amount of infiltration, however small, even where infiltration is not specifically accounted for in the design).

'Groundwater protection' describes the proposed depth of soil or other material through which runoff will flow between the runoff surface and the underlying groundwater.

Where the discharge is to surface waters and risks to groundwater need not be considered, select 'None'

If the proposed groundwater protection is bespoke and/or a proprietary product and not generically described by the suggested measures, then a description of the protection and agreed user defined indices should be entered in the row below the drop down list

	Pollution Mitigation Indices Total Suspended Solids	Metals	Hydrocarbons
Select type of groundwater protection from the drop down list: → None			
If the proposed groundwater protection is bespokeproprietary and/or the generic indices above are not considered appropriate, select 'Proprietary product' or 'User defined indices' and enter a description of the protection and agreed user defined indices in this row:			
Groundwater Protection Pollution Mitigation Index	**0**	**0**	**0**

DESIGN CONDITIONS

1	2	3	4

STEP 2C: Determine the Combined Pollution Mitigation Indices for the Runoff Area

This is an automatic step which combines the proposed SuDS Pollution Mitigation Indices with any Groundwater Protection Pollution Mitigation Indices

	Combined Pollution Mitigation Indices Total Suspended Solids	Metals	Hydrocarbons
Combined Pollution Mitigation Indices for the Runoff Area	**0.4**	**0.4**	**0.4**

Note: If the total aggregated mitigation index is > 1 (which is not a realistic outcome), then the outcome is fixed at "=0.95". In this scenario, the proposed components are likely to have a very high mitigation potential for reducing pollutant levels in the runoff and should be sufficient for any proposed land use (note: where risk assessment is required, this outcome would need more detailed verification).

STEP 2D: Determine Sufficiency of Pollution Mitigation Indices for Selected SuDS Components

This is an automatic step which compares the Combined Pollution Mitigation Indices with the Land Use Hazard Indices, to determine whether the proposed components are sufficient to manage each pollutant category type

When the combined mitigation index exceeds the land use pollution hazard index, then the proposed components are considered sufficient in providing pollution risk mitigation.

In England and Wales, where the discharge is to protected surface waters or groundwater, an additional treatment component (ie over and above that required for standard discharges), or other equivalent protection, is required that provides environmental protection in the event of an unexpected pollution event or poor system performance. Protected surface waters are those designated for drinking water abstraction. In England and Wales, protected groundwater resources are defined as Source Protection Zone 1. In Northern Ireland, a more precautionary approach may be required and this should be checked with the environmental regulator on a site by site basis.

Sufficiency of Pollution Mitigation Indices Total Suspended Solids	Metals	Hydrocarbons
Sufficient	**Sufficient**	**Sufficient**

DESIGN CONDITIONS

1
Reference to local planning documents should also be made to identify any additional protection required for sites due to habitat conservation (see *Chapter 7 The SuDS design process*). The implications of developments on or within close proximity to an area with an environmental designation, such as a Site of Special Scientific Interest (SSSI), should be considered via consultation with relevant conservation bodies such as Natural England

Appendix H – Maintenance Schedules

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PROJECT TITLE	Job Number	
Moss Lane East, Manchester	G9448	
	Page 1	
SECTION	Prepared by	Date
SuDS Maintenance Schedules	EB	30/08/24
	Checked by	Date
	CA	30/08/24

Reference | Output

Below ground Cellular Storage Crates

Operation and maintenance requirements for attenuation storage tanks

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	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
	Remove sediment from pre-treatment structures and/ or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

Note: Maintenance schedule for cellular storage taken from 'The SuDS Manual'

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Reference | Output

Foul Drainage System

Maintenance Schedule	Required Action	Frequency
Gullies	Visual inspection and removal of debris	3 months (more frequently in Autumn)
Inspection Chambers and Manholes	Visual inspection and removal of debris. Rod pipes if necessary	12 months

Surface Water Drainage System

Maintenance Schedule	Required Action	Frequency
Gullies, Channel Drains & Slot Drains	Visual inspection and removal of debris	6 months and after significant rainfall
Inspection Chambers & Manholes	Visual inspection and removal of debris. Rod pipes if necessary.	12 months
Catchpits	Visual inspection and removal of debris.	3 months for first year and 6 months thereafter
Orifice plates (in chambers)	Visually inspect and check for operation	6 months and after significant rainfall

Note: Maintenance schedules for Foul and Surface Water Drainage Systems were taken from relevant combined recommendations from Warwickshire County Council, East Sussex County Council and Spelthorne County Council.

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Reference | Output

Hydrobrake Manhole

Hydrobrake Manhole

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Remove sediment and debris from flow control chambers and upstream manholes	Monthly for first 12 months then 6 monthly
Remedial Actions	Replace or clean hydrobrake if performance deteriorates or failure occurs	As necessary
Monitoring	Check flow control to ensure emptying is occurring	Quarterly and post high intensity storm event

Note: Maintenance schedule for Hydrobrake manholes were taken from Topping Engineers.

Buried Filter Trench

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Inspect for sediment and debris in pre-treatment components and access chambers	Monthly (or as required)
	Inspect inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre-treatment devices	Six monthly, or as required
Occasional Maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (eg NJUG, 2007 or BS 3998:2010)	As required
	Clear perforated pipework of blockages	As required

Note: Maintenance schedule for Buried Filter Trench were adapted from from the recommendations for filter drains from "The SuDS Manual".

Appendix I – Percolation Test Results

Drilling Ltd

FALLING HEAD PERMEABILITY TEST IN BOREHOLE

Borehole No.

BH03

Project Name:	Moss Lane East	Depth of borehole	2.00 m
Project No:	GD 0730	Depth of casing	1.50 m
Client:	Mason Evans Partnership	Depth to groundwater prior to test	2.00 m
Carried out by:	GD	Depth to groundwater used in analysis	2.00 m
Date of Test:	26/02/2024	Diameter of borehole	0.12 m
Test No:	1	L/D Ratio	4.3
Easting:	384863.6		0.12
Nothing:	395661.1		
Level (m AOD):	37.53		

Test carried out in accordance with BS EN ISO 22282:2012 and permeability calculated using the Hvorslev method

Intake Factor F from BS EN ISO 22282-1:2012: 1.45 m

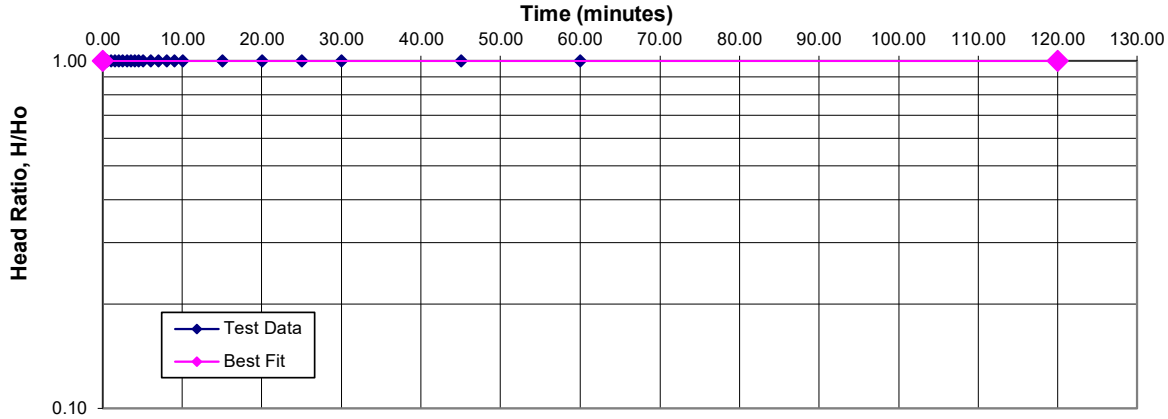
Notes:

Test Condition: Cylindrical cavity with: L/D > 10

$$\text{Permeability } k = \frac{S}{F(t_2-t_1)} (\log_e H_1/H_2)$$

k = ***0.0E+00*** m/s

Test Data				
Time mins	**Depth m**	**Head**	**Ho**	**Head Ratio H/H_0**
0.00	0.00	2.00	2.00	1.00
0.50	0.00	2.00	2.00	1.00
1.00	0.00	2.00	2.00	1.00
1.50	0.00	2.00	2.00	1.00
2.00	0.00	2.00	2.00	1.00
2.50	0.00	2.00	2.00	1.00
3.00	0.00	2.00	2.00	1.00
3.50	0.00	2.00	2.00	1.00
4.00	0.00	2.00	2.00	1.00
4.50	0.00	2.00	2.00	1.00
5.00	0.00	2.00	2.00	1.00
6.00	0.00	2.00	2.00	1.00
7.00	0.00	2.00	2.00	1.00
8.00	0.00	2.00	2.00	1.00
9.00	0.00	2.00	2.00	1.00
10.00	0.00	2.00	2.00	1.00
15.00	0.00	2.00	2.00	1.00
20.00	0.00	2.00	2.00	1.00
25.00	0.00	2.00	2.00	1.00
30.00	0.00	2.00	2.00	1.00
45.00	0.00	2.00	2.00	1.00
60.00	0.00	2.00	2.00	1.00
120.00	0.00	2.00	2.00	1.00



Plot of Head Ratio against Time

designed and created by omgeo.co.uk
www.gddrilling.co.uk
GD DRILLING
38 ASHER ROAD
CHAPELHALL
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Drilling Ltd
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gerry@gddrilling.co.uk
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PHOTOGRAPHIC INFORMATION
PROJECT NAME: MOSS LANE EAST
PROJECT NUMBER: GD 0730
LOCATION ID: BH03-
DEPTH: 0·00 mbgl to 2·00 mbgl
SAMPLE ID:
DATE: 26 / 02 / 2024

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PHOTOGRAPHIC INFORMATION
PROJECT NAME: MOSS LANE EAST
PROJECT NUMBER: GD 0730
LOCATION ID: BH03-
DEPTH: 0·00 mbgl to 2·00 mbgl
SAMPLE ID:
DATE: 26 / 02 / 2024

Drilling Ltd

FALLING HEAD PERMEABILITY TEST IN BOREHOLE

Borehole No.

BH05

Project Name:	Moss Lane East	Depth of borehole	1.70 m
Project No:	GD 0730	Depth of casing	1.30 m
Client:	Mason Evans Partnership	Depth to groundwater prior to test	1.70 m
Carried out by:	GD	Depth to groundwater used in analysis	1.70 m
Date of Test:	26/02/2024	Diameter of borehole	0.12 m
Test No:	1	L/D Ratio	3.5
Easting:	384880.4		0.12
Nothing:	395678		
Level (m AOD):	37.63		

Test carried out in accordance with BS EN ISO 22282:2012 and permeability calculated using the Hvorslev method

Intake Factor F from BS EN ISO 22282-1:2012: 1.30 m

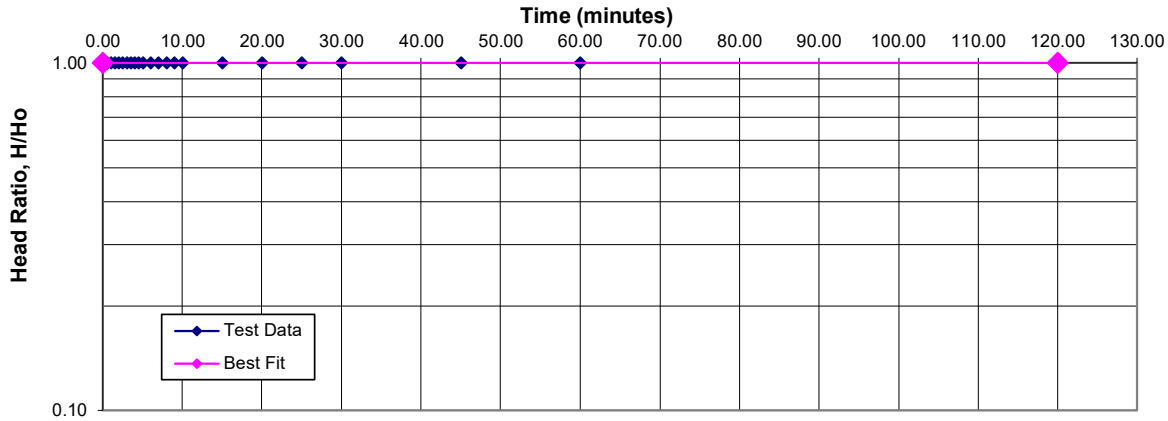
Notes:

Test Condition: Cylindrical cavity with: L/D > 10

$$\text{Permeability } k = \frac{S}{F(t_2-t_1)} (\log_e H_1/H_2)$$

k = ***0.0E+00*** m/s

Test Data				
Time mins	**Depth m**	**Head**	**Ho**	**Head Ratio H/H_0**
0.00	0.00	1.70	1.70	1.00
0.50	0.00	1.70	1.70	1.00
1.00	0.00	1.70	1.70	1.00
1.50	0.00	1.70	1.70	1.00
2.00	0.00	1.70	1.70	1.00
2.50	0.00	1.70	1.70	1.00
3.00	0.00	1.70	1.70	1.00
3.50	0.00	1.70	1.70	1.00
4.00	0.00	1.70	1.70	1.00
4.50	0.00	1.70	1.70	1.00
5.00	0.00	1.70	1.70	1.00
6.00	0.00	1.70	1.70	1.00
7.00	0.00	1.70	1.70	1.00
8.00	0.00	1.70	1.70	1.00
9.00	0.00	1.70	1.70	1.00
10.00	0.00	1.70	1.70	1.00
15.00	0.00	1.70	1.70	1.00
20.00	0.00	1.70	1.70	1.00
25.00	0.00	1.70	1.70	1.00
30.00	0.00	1.70	1.70	1.00
45.00	0.00	1.70	1.70	1.00
60.00	0.00	1.70	1.70	1.00
120.00	0.00	1.70	1.70	1.00



Plot of Head Ratio against Time

PHOTOGRAPHIC INFORMATION
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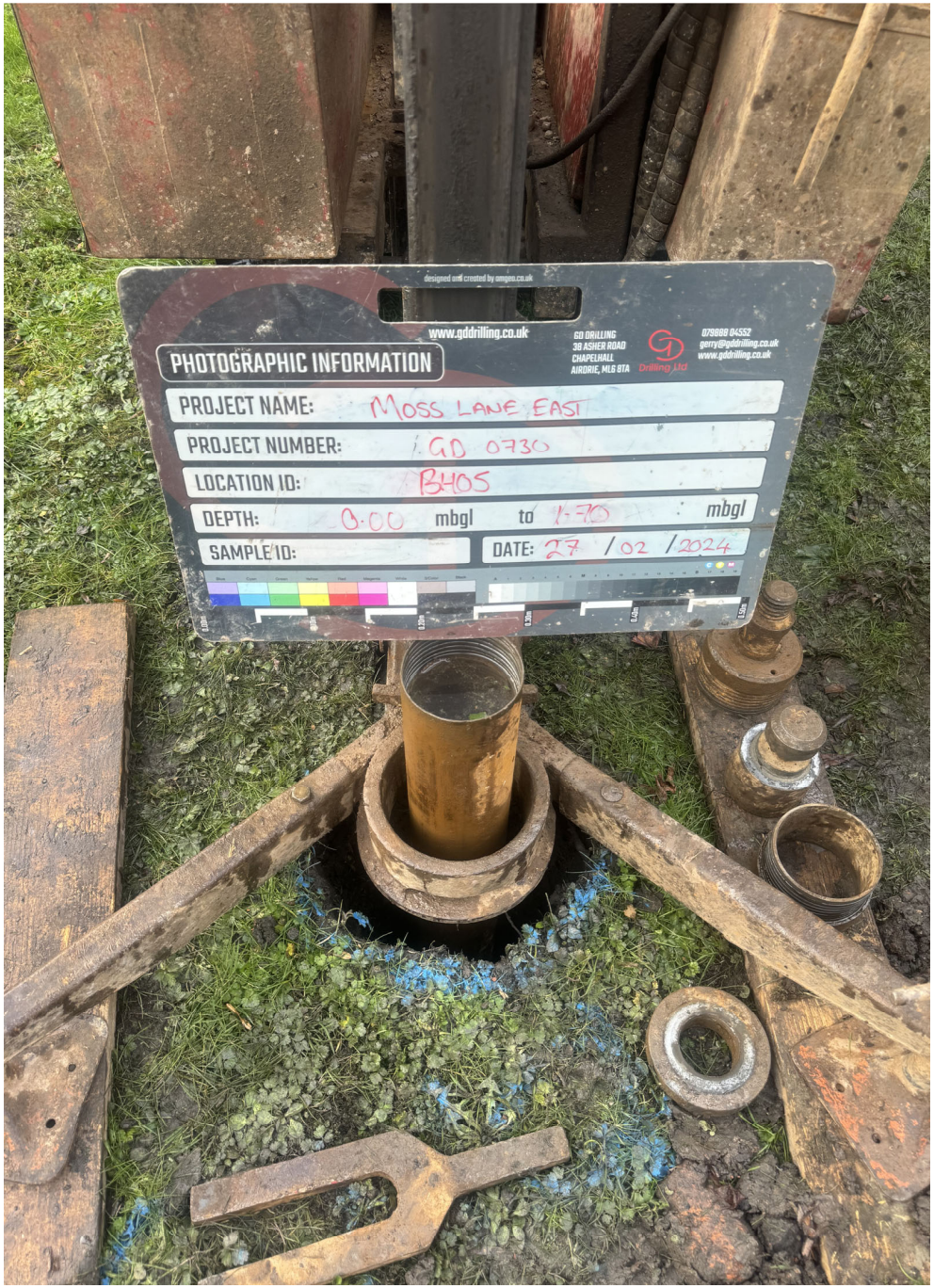
PROJECT NUMBER: GD 0730
LOCATION ID: BH05
DEPTH: 0.00 mbgl to 1.70 mbgl
SAMPLE ID:
DATE: 27 / 02 / 2024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PHOTOGRAPHIC INFORMATION
PROJECT NAME: MOSS LANE EAST
PROJECT NUMBER: GD 0730
LOCATION ID: BH05
DEPTH: 0.00 mbgl to 1.70 mbgl
SAMPLE ID:
DATE: 27 / 02 / 2024