



Flood Risk Assessment & Drainage Strategy at

**Grey Mare Lane
Manchester
M11 3DQ**

Client: Great Places

Reference: 34338-SUT-ZZ-00-RP-S-0001

Date: 04th March 2025

Liverpool Head Office
18-20 Harrington Street
Liverpool
L2 9QA

T: 0151 227 3155
E: enquiries@sutcliffe.co.uk
www.sutcliffe.co.uk

Manchester Office
T: 0161 817 5180

North Wales Office
T: 01978 664 071

London Office
T: 020 8016 4320

 [@Sutcliffe_1985](https://twitter.com/Sutcliffe_1985)

 [Sutcliffe1985](https://www.facebook.com/Sutcliffe1985)

 [Sutcliffe](https://www.linkedin.com/company/Sutcliffe)

Sutcliffe is the trading name of Sutcliffe Projects Limited a limited company registered in England and Wales No. 04287238.

SUTCLIFFE

Flood Risk Assessment & Drainage Strategy

DOCUMENT VERIFICATION

Report Reference: 34338-SUT-ZZ-00-RP-S-0001

Issue: C

Date: March 2025

Prepared by:

Name:	Matt Bowden
Title:	Graduate Civil Engineer
Qualifications:	BEng (Hons)

Checked / Approved by:

Name:	Toby Crayden
Title:	Associate
Qualifications:	FIOD

Revision History:

Rev	Date	Description	Prepared	Checked	Approved
A	November 2024	Initial Issue	MB	SB	TC
B	December 2024	Layout updated	MB	SB	TC
C	March 2025	Layout updated	MB	SB	TC

This document has been prepared by Sutcliffe within the terms of the Contract with the Client to whom this document is addressed. Sutcliffe disclaims any responsibility to the Client and others in respect of matters outside the scope of the said contract. No person other than the Client shall rely on it in any respect and Sutcliffe shall owe no duty of care to any such third party.

Table of Contents

FLOOD RISK ASSESSMENT.....	1
1 INTRODUCTION	1
2 PLANNING CONTEXT.....	2
3 CATCHMENT/SITE DESCRIPTION.....	3
4 CLIMATE CHANGE.....	9
5 EMERGENCY ACCESS/ESCAPE	9
6 FLOOD RISK SUMMARY AND CONCLUSION	9
SURFACE WATER DRAINAGE STRATEGY.....	10
7 POLICY CONTEXT	10
8 EXISTING DRAINAGE.....	11
9 PROPOSED SITE LAYOUT.....	11
10 URBAN CREEP.....	12
11 PROPOSED SURFACE WATER DRAINAGE	12
12 WATER QUALITY.....	13
13 PROPOSED FOUL WATER NETWORK.....	13
14 MAINTENANCE AND MANAGEMENT.....	13
15 SURFACE WATER MANAGEMENT SUMMARY AND CONCLUSION	13
16 APPENDIX A – PROPOSED SITE PLAN/TOPOGRAPHIC SURVEY	15
17 APPENDIX B – BROWNFIELD RUNOFF RATES	16
18 APPENDIX C – ENVIRONMENTAL AGENCY DATA.....	17
19 APPENDIX D – INFODRAINAGE CALCULATIONS	19

Flood Risk Assessment

1 Introduction

- 1.1 As part of the planning requirements for the development at Grey Mare Lane, Manchester a site-specific flood risk assessment has been prepared to ensure the flood risk is appropriately considered to protect people and the property from flooding.
- 1.2 The development boundary, Figure 1, is 0.30 hectares and situated within Flood Zone 1 as defined by the Environment Agency.
- 1.3 The National Planning Policy Framework (NPPF) Paragraph 168 seeks to promote development in areas at low risk of flooding and to reduce the flood risk resulting from development. This assessment will demonstrate that all sources of flooding have been considered and that development of the site is appropriate.
- 1.4 The existing site was previously occupied by a pub; this has now been demolished. The site also includes an existing highway which will be stopped up. The site is therefore considered a brownfield site.
- 1.5 The proposed site is to be developed with a 5-storey block of flats with associated resident parking. The proposed site plan is provided in Appendix A for reference.
- 1.6 The development site is located along Grey Mare Lane in Manchester. The location data for the site is:

Post Code:	M11 3DQ		
Grid Reference:	SJ 86967 98269		
Coordinates:	X: 386967	Y: 398269	
Latitude:	53°28'52"N	Longitude:	002°11'52"W
What3Words:	bench.single.float		

Table 1 – Location details



Figure 1: Site Boundary

- 1.7 Flood risk information for planning has been obtained from the Environment Agency (EA) website and is provided in Appendix C. The EA data confirms the site falls within Flood Zone 1.

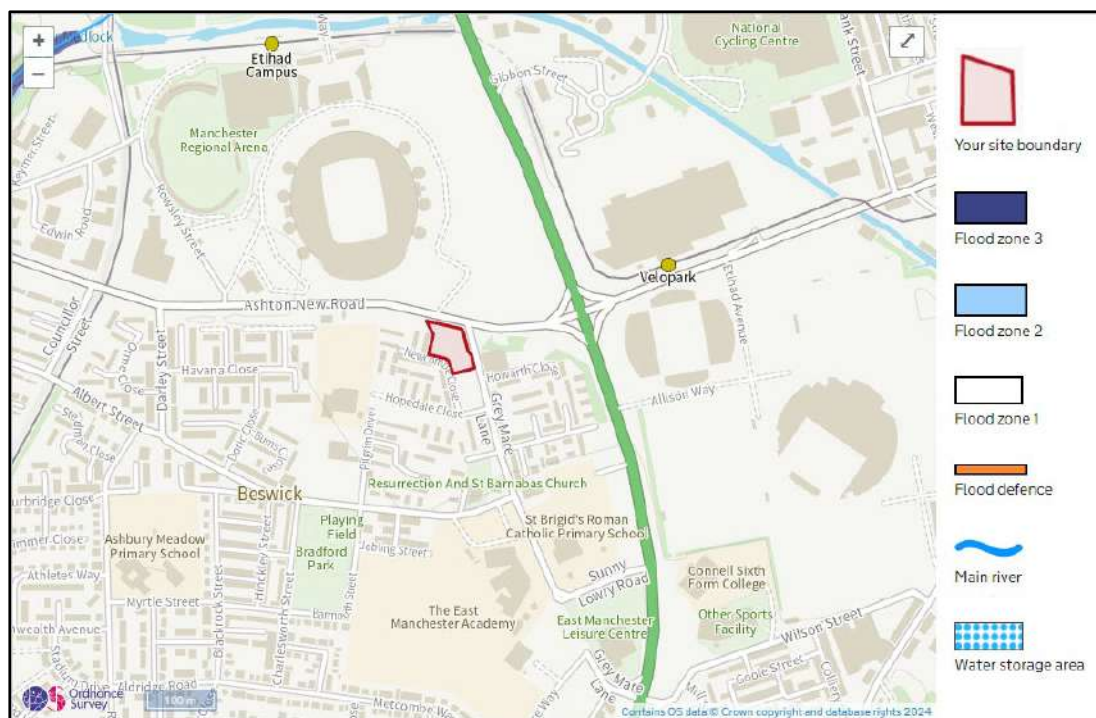


Figure 2: Environment Agency Flood Map for Planning

2 Planning Context

- 2.1. The National Planning Policy Framework expects local planning authorities to protect people and property from flooding. In fulfilling their duty local planning authorities are to ensure the following steps are assessed prior to granting planning permission:

- Assess flood risk
 - o The LPA must undertake a Strategic Flood Risk Assessment to inform the local plan and identify development sites that are in areas of low flood risk.
 - o Sites greater than 1 hectare or in areas of flood risk must have a Site-Specific Flood Risk Assessment prepared.
- Avoid flood risk
 - o The LPA should apply the sequential test to, as far as practicable, locate development sites in area at the least risk of flooding, and if required carry out the exception test.
- Manage and mitigate flood risk
 - o Where alternative sites are not available the LPA should ensure that development is flood resilient and resistant, safe for the users over the development's lifetime and will not increase overall flood risk.
 - o LPAs and developers should manage flood risk through the inclusion of sustainable drainage techniques.

- 2.2. There is no general statutory duty on the Government to protect land or property against flooding. However, the Government recognises the need for action to be taken to safeguard the wider social and economic wellbeing of the country.

- 2.3. Landowners have the primary responsibility for safeguarding their land and others property against natural hazards such as flooding. Individual property owners and users are also responsible for managing the drainage of their land in such a way as to prevent, as far as is reasonably practicable, adverse impacts on neighbouring land.
- 2.4. Those proposing development are responsible for:
- Demonstrating that it is consistent with the NPPF.
 - Providing an assessment of:
 - Whether any proposed development is likely to be affected by flooding from any source.
 - Whether it will increase flood risk elsewhere.
 - The measures to deal with these effects and risks.
 - Satisfying the local planning authority that any flood risk to the development or additional risk arising from the proposal will be successfully managed with the minimum environmental effect.
 - Designs which reduce flood risk to the development and elsewhere, by incorporating sustainable drainage systems and where necessary flood resilience measures.
 - Identifying opportunities to reduce flood risk, enhance biodiversity and amenity and seek collective solutions to managing flood risk.

3 Catchment/Site Description

- 3.1 The topography of the site generally slopes from east to west. The maximum elevation is 62.75m AOD, the minimum elevation is 61.32m AOD. The topographic survey is included within the appendix A for reference.
- 3.2 A review of grid reference finder confirms there is the Ashton Canal approximately 0.5km east from the development site, an extract of the Map is in Figure 3.

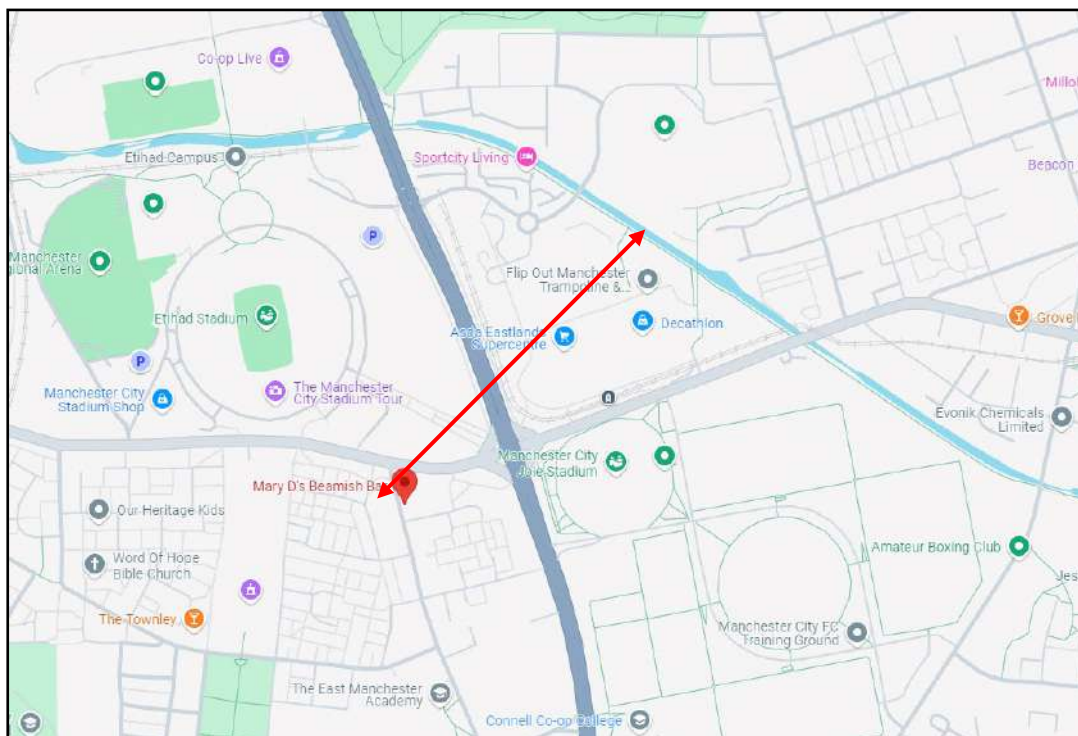


Figure 3: Existing Watercourse. (Source: Google Maps)

- 3.3 The British Geological Survey (BGS) Geology of Britain viewer defines the bedrock geology as Pennine Upper Coal Measures Formation - Mudstone, siltstone and sandstone. Superficial deposits are noted as Till, Devensian – Diamicton.
- 3.4 The National Soils Resources Institute, through the Soilscape web viewer, identify the soil type as Soilscape 17, Slowly permeable seasonally wet acid loamy and clayey soils with impeded drainage.
- 3.5 Flood Risk Assessment
- 3.5.1 The National Planning Policy Framework (NPPF) seeks to promote development in areas at low risk of flooding and to reduce the flood risk resulting from development. The purpose of this site-specific flood risk assessment is to demonstrate that the site can be considered to fall within an area of low annual probability and assess the risk to the site from all sources of flooding.
- 3.5.2 The planning flood maps from the Environment Agency confirm that the site is in Flood Zone 1 due to the low risk posed by sea or river or surface water flooding.
- 3.5.3 According to the NPPF Annex 3 : Flood risk vulnerability classification building residential use is classed as 'more vulnerable'.
- 3.5.4 A review of Table 3 of the NPPF Technical guide indicates that an exception test is not required for areas classed as more vulnerable that fall within Flood Zone 1.

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.						

Figure 4: Table 3 from the NPPF Technical Guide illustrating site classification.

- 3.6 Sources of Flooding
- 3.6.1 Flooding is a natural hazard and can happen at any time in a wide variety of locations. There are several forms of flooding, which present a range of different risks. The speed of inundation and the duration of different forms of flooding vary greatly. With climate change, the frequency, patterns, and severity of flooding are forecast to change and become more damaging.

- 3.6.2 The limits of flood risk areas cannot be defined precisely because floods with similar probability can arise from different combinations of weather, sources, rainfall patterns, local topography, and patterns of development.
- 3.6.3 Every flood will have different consequences on people, property and the environment and depends on the land use.
- 3.7 Flooding from the River and the Sea
- 3.7.1 Flooding from rivers or the sea is classed as a very low/no risk for the development site as seen in Figure 5 as it is not situated near a sea or river.

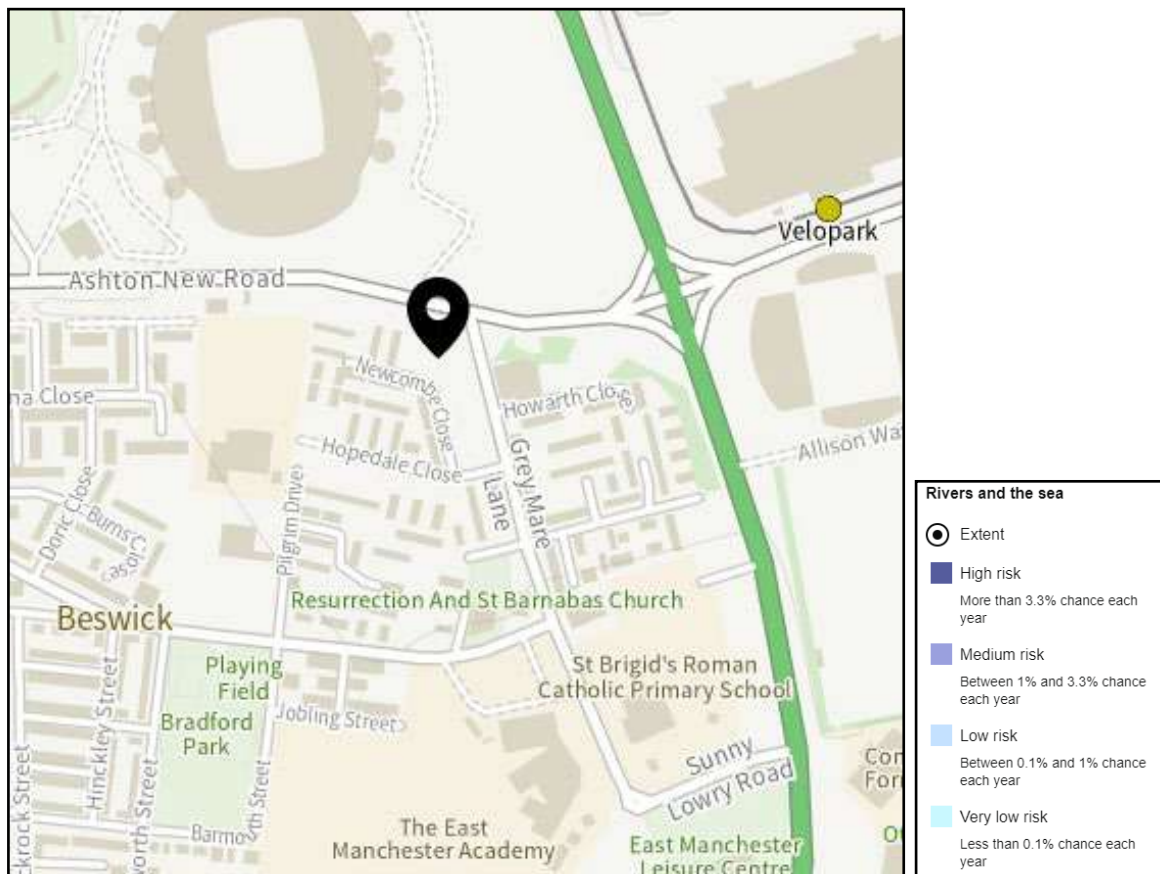


Figure 5: Environment Agency Flood Map - Extents of Flooding from Rivers or the Sea

- 3.8 Flooding from Surface Water
- 3.8.1 Flooding from surface water may occur in times of intense rainfall at a local site level as any drainage system may not be able to disperse the rainfall quickly enough. Surface flooding occurs when both the natural interception capacity of the ground is exceeded and the capacity of inlets to the drainage system are exceeded.
- 3.8.2 The Environment Agency provides surface water flood maps for the high (greater than 3.3% AEP), medium (1% AEP) and low (0.1% AEP) risk scenarios. All the surface water flood maps from the Environment Agency website are provided in Appendix C for reference, although the low-risk scenario is generally considered above the design return period.

- 3.8.3 The Environment Agency cautions that due to the limitations within the model (single drainage rate, national level modelling, LiDAR data etc.) the surface water flood maps do not provide a definitive risk of surface water flooding at the plot level. This assessment reflects the current scenario and provides an indication of the potential surface water flood risk in the absence of drainage network designed to facilitate the proposed development through the management of surface water.
- 3.8.4 The extent of surface water flooding, Figure 6, indicates that there is a very low risk of surface water flooding occurring within the site boundary. The surface water flood risk is shown occurring to the south of the site within Newcombe Close, outside the site area. The flooding along the road is constrained to the roadway and only occurs for the 0.1% AEP event.
- 3.8.5 The surface water flooding for the 0.1% AEP event is noted being less than 300mm on the Environment Agency Low Risk Surface Water Flood Map, Appendix C.

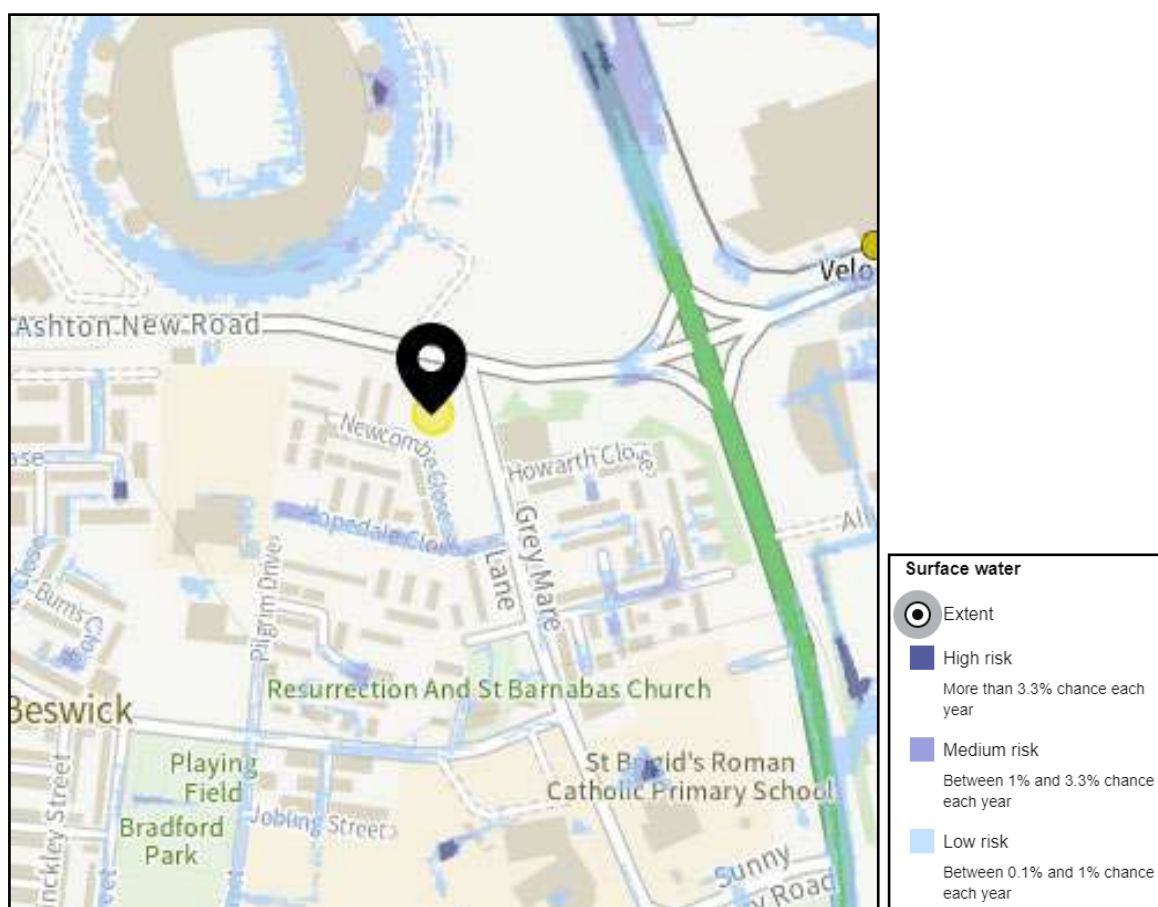


Figure 6: Environment Agency Extent of Surface Water Flooding Map

- 3.8.6 The risk of surface water flooding to the development can be mitigated by ensuring the surface water management network safely manages rainfall events to the required standard. Also, a careful consideration of finished floor levels is made during the design of proposed site levels.
- 3.8.7 Following implementation of the mitigation measures the risk of surface water flooding to the site can be considered to be low.

3.9 Flooding from Sewers

- 3.9.1 Flooding from the sewers occurs when surcharging during periods of excess flow breaks ground, typically at manholes or road gullies. The proposed development is not likely to increase the risk posed by sewer flooding as the surface water runoff, a primary cause of sewer surcharging, from the site is to be managed in accordance with the requirements of the NPPF and LLFA.
- 3.9.2 The development area is served by a surface water within the development site that connects to the combined sewer in Newcombe Close. This connection is to be re used. The foul drainage will also connect into this combined sewer at the same point as the surface drainage. An extract from the public sewer record is shown in Figure 7.
- 3.9.3 Drainage for the proposed development will be designed to current best practice for the foul sewers using Approved Document H. Where new surface water drainage for the site is proposed it shall be designed to cater for the 100-year plus climate change event in accordance with current guidance and will incorporate long-term storage and SuDS as appropriate.
- 3.9.4 As the public sewers are operated and maintained by United Utilities and the proposed drainage within the site will be designed to the current requirements of the LLFA the site can be considered at low risk of sewer flooding.

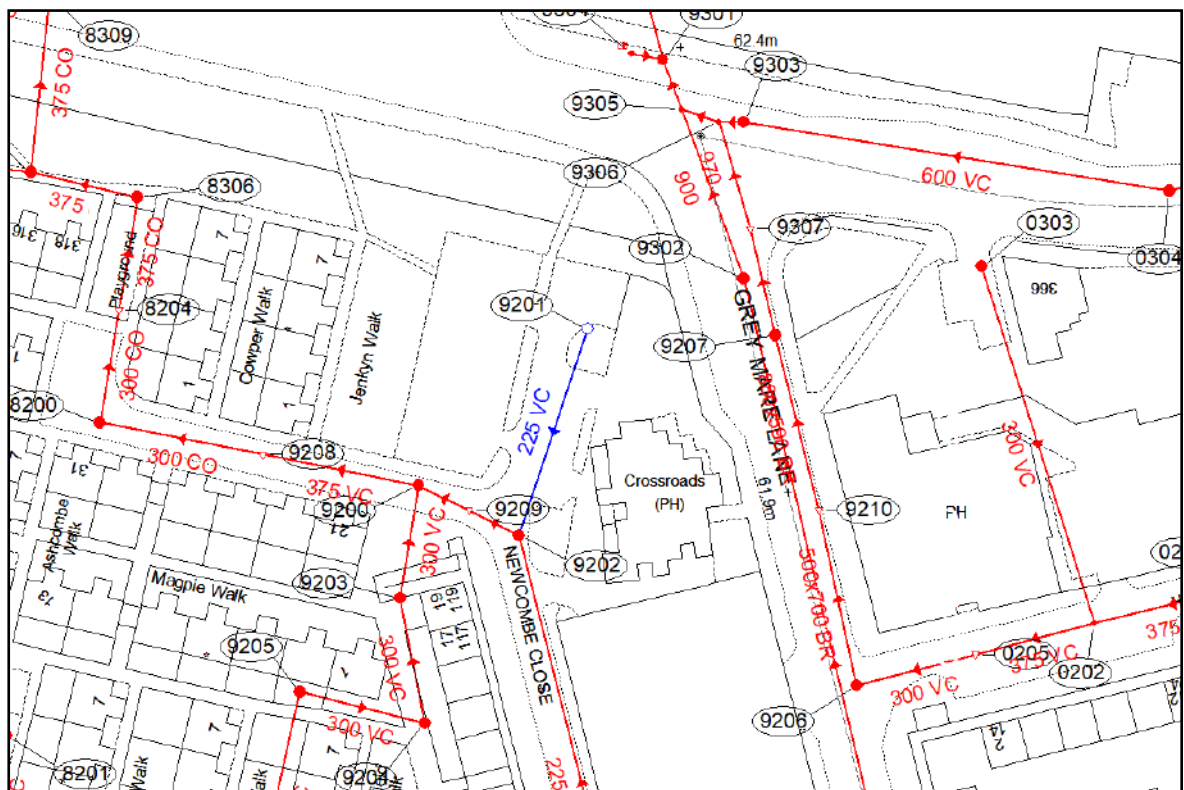


Figure 7: United Utilities Sewer Record Extract.

3.10 Flooding from Infrastructure

- 3.10.1 Flooding from infrastructure occurs when canals, dams or other manmade structures capacity is exceeded, or fail. The Environment Agency Flood Map for Planning confirms the site is not within a flood risk area for a reservoir and the site is not located near canals.
- 3.10.2 There is no risk of flooding associated with infrastructure failure.

3.11 Flooding from Groundwater

- 3.11.1 The Manchester City Council Flood risk management strategy document, groundwater flood risk map, Figure 8, confirms the site falls within an area denoted as being at risk of groundwater emergence, however, it states 'The likelihood of groundwater flooding occurring in Manchester is considered to be generally low'.
- 3.11.2 The site has sufficient topographic relief for groundwater emergence not to cause a significant risk.
- 3.11.3 There are no other sources of flooding that affect the site. Overall flood risk to the proposed development can be considered low.

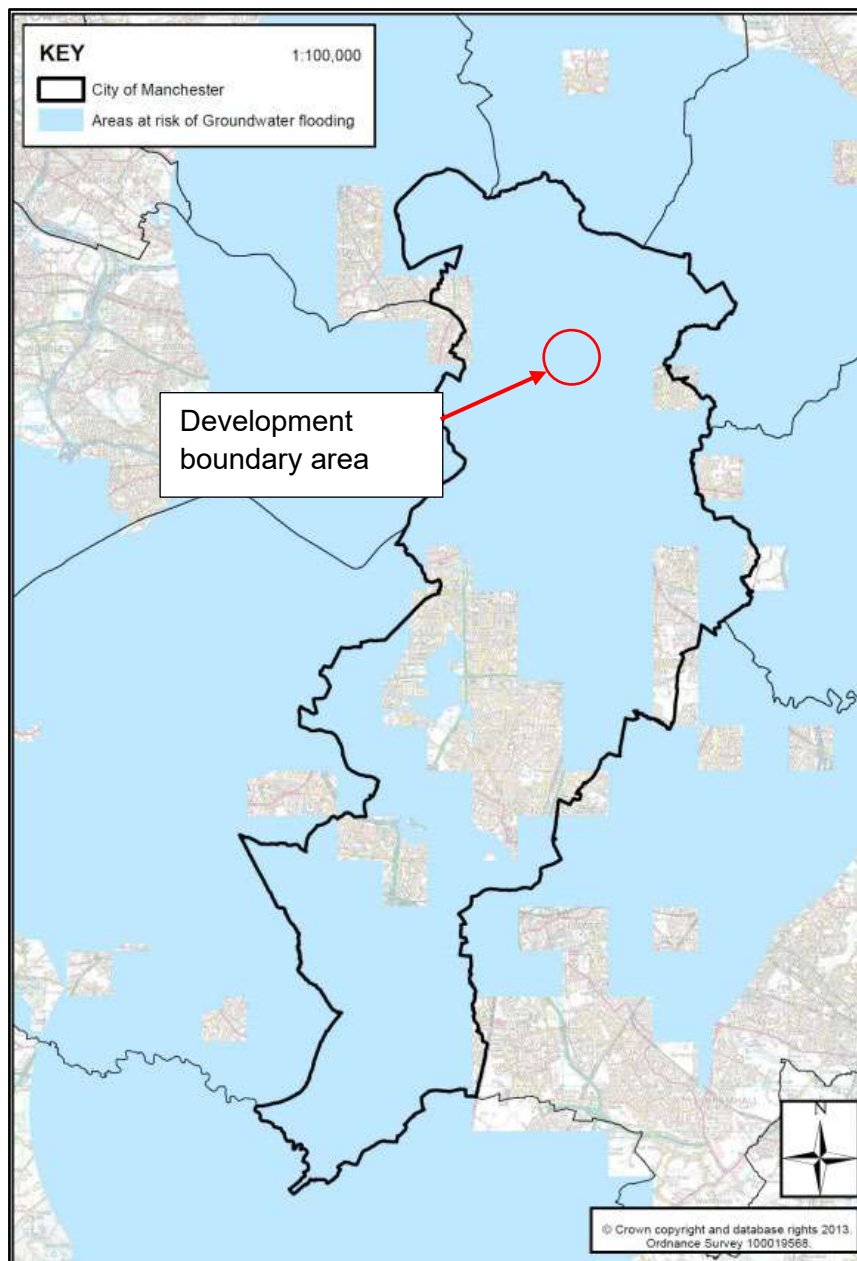


Figure 8: Groundwater Flood Risk (Local flood risk management strategy 2014)

4 Climate Change

- 4.1 Paragraph 158 of the National Planning Policy Framework (NPPF) requires that plans should take a proactive approach to mitigating and adapting to climate change.
- 4.2 Paragraph 167 of the NPPF requires all plans to adopt a sequential risk-based approach taking into account all sources of flood risk and future impacts of climate change.
- 4.3 To appropriately mitigate the increased flood risk caused by climate change the Government has published guidance (<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>) related to the appropriate climate change allowances.

3.3% Annual Exceedance Rainfall Event		
Irwell	Central Allowance	Upper End Allowance
2050s	25%	35%
2070s	30%	40%
1% Annual Exceedance Rainfall Event		
Irwell	Central Allowance	Upper End Allowance
2050s	25%	40%
2070s	30%	45%

Table 1: Climate Change Allowances.

- 4.4 For development with a lifetime between 2061 and 2125 the 2070s epoch data should be used.
- 4.5 To mitigate the impact of climate change on the development the upper end allowances should be considered for both the 1% and 3.3% annual exceedance probability events and the development should be design for the 1% annual exceedance probability event so that there is:
- 4.5.1 No increased flooding elsewhere.
- 4.5.2 And the development is safe from surface water flooding.
- 4.6 Where new surface water drainage is proposed an allowance for climate change shall be included to mitigate the risk.

5 Emergency Access/Escape

- 5.1 With flood risk to the site considered low and the area being within a flood zone 1 for sea and rivers, there is no requirement for an emergency access or escape routes.

6 Flood Risk Summary and Conclusion

- 6.1 From the above assessment of flood risk, it has been established that the development site is entirely within Flood Zone 1 for river and sea flooding.
- 6.2 Surface water flood risk can be mitigated through careful consideration of finished floor levels and implementation of a SuDS drainage scheme that helps to manage runoff from the development.
- 6.3 Proposed surface water and foul water drainage will connect into existing public combined sewers to the south of the site.
- 6.4 The surface water drainage network will be designed taking climate change into consideration and to help ensure the development is safe for its lifetime.
- 6.5 The development will not increase the risk of flooding off site.

Surface Water Drainage Strategy

7 Policy Context

- 7.1 The LLFA expect the surface water management strategy to comply with:
- 7.2 Paragraph 80 of the Planning Practice Guidance (PPG);
- 7.3 Paragraph 175 of the National Planning Policy Framework; and
- 7.4 Standards 2, 3, 4, 5, 6, 7, 8 and 9 of the Non-Statutory Technical Standards for Sustainable Drainage (March 2015).
- 7.5 Paragraph 56 of the Planning Practice Guide requires that surface water from development be discharged in line discharge hierarchy:
 - 7.5.1 Infiltrate into the ground close to source.
 - 7.5.2 Discharge runoff to a surface water body.
 - 7.5.3 Discharge runoff to a surface water sewer, highway drain or other surface water drainage system.
 - 7.5.4 Discharge to a combined sewer.
- 7.6 The implementation of the hierarchy will be discussed in greater detail in Section 11.
- 7.7 Paragraph 175 of the National Planning Policy requires major developments to incorporate sustainable drainage systems unless there is clear evidence that their inclusion would be inappropriate. Sustainable drainage systems should:
 - 7.7.1 Take account of advice from the LLFA.
 - 7.7.2 Have appropriate proposed minimum operational standards.
 - 7.7.3 Have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and
 - 7.7.4 Where possible, provide multifunctional benefits.
- 7.8 Standards 2, 3, 4, 5, 6, 7, 8 and 9 of the Non-Statutory Technical Standards for Sustainable Drainage System (2015) are:
 - 7.8.1 S2 requires, for greenfield developments, the peak runoff rate from the development to any highway drain, sewer, or surface water body for the 1 in 1-year rainfall event and the 1 in 100-year rainfall event should never exceed the peak greenfield runoff rate for the same event.
 - 7.8.2 S3 requires for sites that 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.

- 7.8.3 S4 requires, where reasonably practicable, for greenfield development, 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 should never exceed the greenfield runoff volume for the same event.
- 7.8.4 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.
- 7.8.5 S6 where it is not reasonably practicable to constrain the volume of runoff to any drain, sewer or surface water body in accordance with S4 or S5 above, the runoff volume must be discharged at a rate that does not adversely affect flood risk.
- 7.8.6 S7 requires the drainage system be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30-year rainfall event.
- 7.8.7 S8 requires the drainage system to be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur during a 1 in 100-year rainfall event in any part of: a building (including a basement); or in any utility plant susceptible to water (e.g. pumping station or electricity substation) within the development.
- 7.8.8 S9 requires the design of the site must ensure that, so far as is reasonably practicable, flows resulting from rainfall exceeding a 1 in 100-year rainfall event are managed in exceedance routes that minimise the risks to people and property.
- 7.9 The requirements of the local and national policy will be addressed by the proposed site layout and proposed drainage system, discussed in detail in Sections 9 and 11.

8 Existing Drainage

- 8.1 Compliance with policy begins with a review of the existing site and its drainage characteristics.
- 8.2 As discussed within the flood risk assessment, the development site is considered to have a brownfield land classification as it falls within an area with an existing road and buildings which have been demolished but have remaining drainage networks.
- 8.3 The nearest watercourse to the development is the Ashton Canal approximately 0.5km east of the development site.
- 8.4 The site topography directs runoff to the south.
- 8.5 The standard S3 of the Non-Statutory Technical Standards for Sustainable Drainage requires that surface water runoff from development sites be as close as reasonably practicable to brownfield rates but should never exceed the previously developed rates.

9 Proposed Site Layout

- 9.1 The proposed site layout is influenced by retained infrastructure and residential accommodation surrounding the development site.
- 9.2 Proposed site levels reflect the existing topography with the site falling gently towards the south.
- 9.3 The proposed FFL is 150mm above the proposed ground levels.

10 Urban Creep

- 10.1 Urban creep is not applied to this type of development.

11 Proposed Surface Water Drainage

- 11.1 Planning policy requires that the proposed network manage surface water runoff in line with the discharge hierarchy noted in Section 7.
- 11.2 The first level of the hierarchy requires that infiltration solutions be considered for the management of surface water runoff.
- 11.2.1 Infiltration systems can take the form of soakaways, detention ponds, permeable pavements, bio-retention areas etc.
- 11.2.2 The Soilscales viewer identified the general area as Soilscale 17, Slowly permeable seasonally wet acid loamy and clayey soils.
- 11.2.3 Infiltration testing has not been carried out on the proposed development site but the soilscale classification confirms that the use of soakaways is not likely a viable solution for the management of surface water from the development. Infiltration testing to BRE365 shall be carried out to confirm viability.
- 11.3 The second tier of the hierarchy requires surface water to be discharged to a surface water body.
- 11.3.1 A review of the area surrounding the site has confirmed that there are no watercourses around the development site.
- 11.4 The third tier of the hierarchy requires surface water to runoff to a surface water sewer, highway drain or other surface water drainage system.
- 11.4.1 The existing records and CCTV survey have confirmed that there is an existing surface water sewer within the proposed development that discharges into a combined sewer to the south.
- 11.5 The fourth tier requires surface water to be discharged to a combined sewer.
- 11.6 The existing surface water sewer connection into the combined sewer network will be re-used for the proposed development.
- 11.6.1 With the surface water sewer discharging to the combined sewer the development adjacent to it is considered that the surface water is managed at level four of the discharge hierarchy.
- 11.7 Details of the proposed drainage strategy are presented on the proposed drainage plans in Appendix A.
- 11.8 United Utilities have confirmed through consultation with Planning, that should an infiltration solution not be viable then the development can connect to the public sewer at a maximum pass forward rate of 5 l/s for the site.
- 11.9 It is recommended that '50% reduction of surface water runoff is achieved, or flows are limited to greenfield run-off discharge rates'. United Utilities have confirmed that they will accept a 5l/s surface water discharge into their combined sewer network.
- 11.10 The existing brownfield surface water run off rate was calculated (in Infodrainage) at 15.4l/s.

- 11.11 With the full site being brownfield, reducing the surface water outfall rate to 5l/s gives a greater than 50% reduction on the existing water flows while still complying with the United Utilities requirements.
- 11.12 The proposed drainage networks require flow controls and attenuation, to achieve the required discharge rates and manage surface water to mitigate the flood risk stemming from the development, prior to discharging to the combined sewer from the existing surface water sewer within the site.
- 11.13 Attenuation is provided in the form of a cellular tank and permeable paving prior to controlling discharge to the existing surface water sewer via a vortex control.
- 11.14 The calculations for the proposed drainage strategy network are provided in the Appendix, for reference, these confirm the attenuation volume and discharge rates. The calculations confirm the resultant discharges can be managed to satisfy the limiting discharge rate.
- 11.15 The simulation results confirm that the proposed surface water network satisfies the required design standards for all events up to and including the 100 year plus 45% climate change event.
- 11.16 The proposed surface water drainage network can be considered to fulfil the policy requirements as far as practicable.

12 Water Quality

- 12.1 Water quality guidance is set out in Chapter 26 of the SuDS Manual (CIRIA C753). For the anticipated hazards the simple index approach is suitable.
- 12.2 Pollution hazard indices for the simple index approach are provided in Table 26.2 of the SuDS Manual. The development site primarily consists of roofs and residential parking areas. The pollution hazard from these land use classifications can be considered very low.
- 12.3 Suspended solids from the surface runoff will be managed through the use of trapped gullies and a sump, prior to the outfall, which will allow suspended solids to settle out. Permeable paving is to be used as a method to improve water quality. Permeable paving helps to remove hydrocarbons and solids to improve the overall water quality during its storage time within the paving.

13 Proposed Foul Water Network

- 13.1 The proposed foul water network will be designed in accordance with the requirement of Approved Document H.
- 13.2 The anticipated peak foul flow connection point and discharge rate will be agreed with the water authority.

14 Maintenance and Management

- 14.1 The proposed drainage network will be managed by the building management company.
The piped network, attenuation and flow control will be maintained in accordance with the building management company processes.

15 Surface Water Management summary and Conclusion

-
- 15.1 The proposed drainage network manages surface water runoff up to the 100-year plus 45% climate event.
 - 15.2 Long-term storage is provided within permeable paving and cellular storage systems and the runoff rates are controlled to comply with standards S3 and S5 of the Non-Statutory Technical Standards for Sustainable Drainage Systems, as far as practicable, through the inclusion of flow controls in accordance with CIRIA C753.
 - 15.3 The surface water discharge rate is controlled in line with the requirements of the Statutory Undertaker and the LLFA.
 - 15.4 The proposed drainage network includes SuDS as far as practicable given the layout of the site and constraints set by the existing infrastructure.
 - 15.5 Through the implementation of the proposed drainage strategy the site does not increase flooding within or downstream of the catchment including an allowance for climate change.
 - 15.6 The proposed drainage network is considered to satisfy the requirement of local and national planning policy.

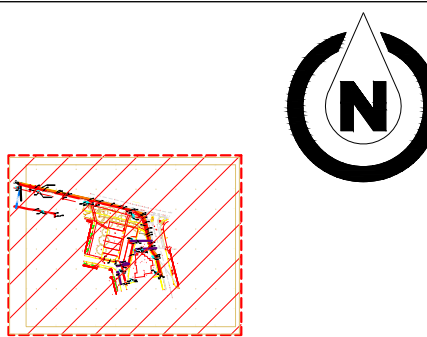
16 Appendix A – Proposed site plan/Topographic Survey

[illegible]

GENERAL NOTES

PLEASE STATE WHERE THE SURVEY CONTROL CAME FROM

SITE MAP



LEGEND

ELECTRIC	ELEC
ELECTRIC FROM RECORDS	ELEC (R)
WATER	WTR
WATER FROM RECORDS	WTR (R)
GAS	GAS
GAS FROM RECORDS	GAS (R)
BT	BT
BT FROM RECORDS	BT (R)
COMMS	COMMS
COMMS FROM RECORDS	COMMS (R)
STREET LIGHTING	SL
STREET LIGHTING FROM RECORDS	SL (R)
CCTV	CCTV
CCTV FROM RECORDS	CCTV (R)
TRAFFIC MANAGEMENT	TM
TRAFFIC MANAGEMENT FROM RECORDS	TM (R)
OIL PIPELINE	OL
OIL PIPELINE FROM RECORDS	OL (R)
UNKNOWN	UNK
MISCELLANEOUS	MISC
DRAINAGE	DRA
DRAINAGE FROM RECORDS	DRA (R)
OVERHEAD BT	BT (O)
OVERHEAD ELECTRIC	ELEC (O)
EXTRA HIGH VOLTAGE ELECTRIC	ELEC (EHV)
HIGH VOLTAGE ELECTRIC	ELEC (HV)
LOW VOLTAGE ELECTRIC	ELEC (LV)
HIGH PRESSURE GAS	GAS (HP)
LOW PRESSURE GAS	GAS (LP)
INTERMEDIATE PRESSURE GAS	GAS (IP)
ASSUMED DRAINAGE	ADR
SURVEY AREA	
TEXT BOX	
END OF TRACE	— BOXEND
ND	NO DEPTH RECORDS
EOT	DEPTH OF UTILITY
Ø	DIAMETER OF PIPE
GPR	GROUND PENETRATING RADAR

Always Exercise Caution When Excavating

A range of detection methods are used to obtain the underground information produced in this drawing. Variations in ground conditions can affect the quality of the data and therefore an absolute affirmation cannot be guaranteed.

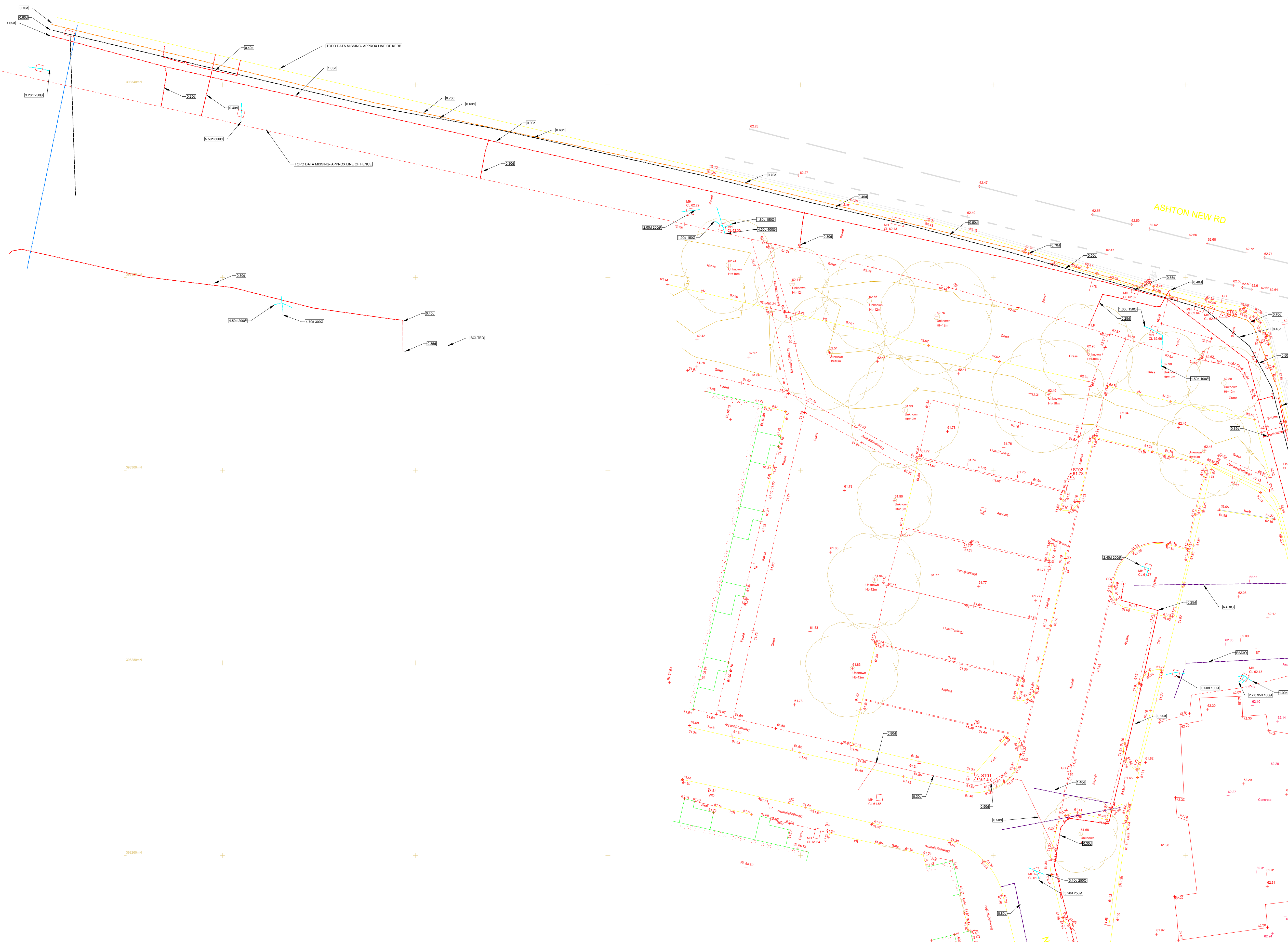
F IN ANY DOUBT ASK

-	00/00/00	Add Description	XXX
-	00/00/00	Add Description	XXX
-	00/00/00	Add Description	XXX
-	00/00/00	Add Description	XXX
-	00/00/00	Add Description	XXX
REV	DATE	DESCRIPTION	INITIALS

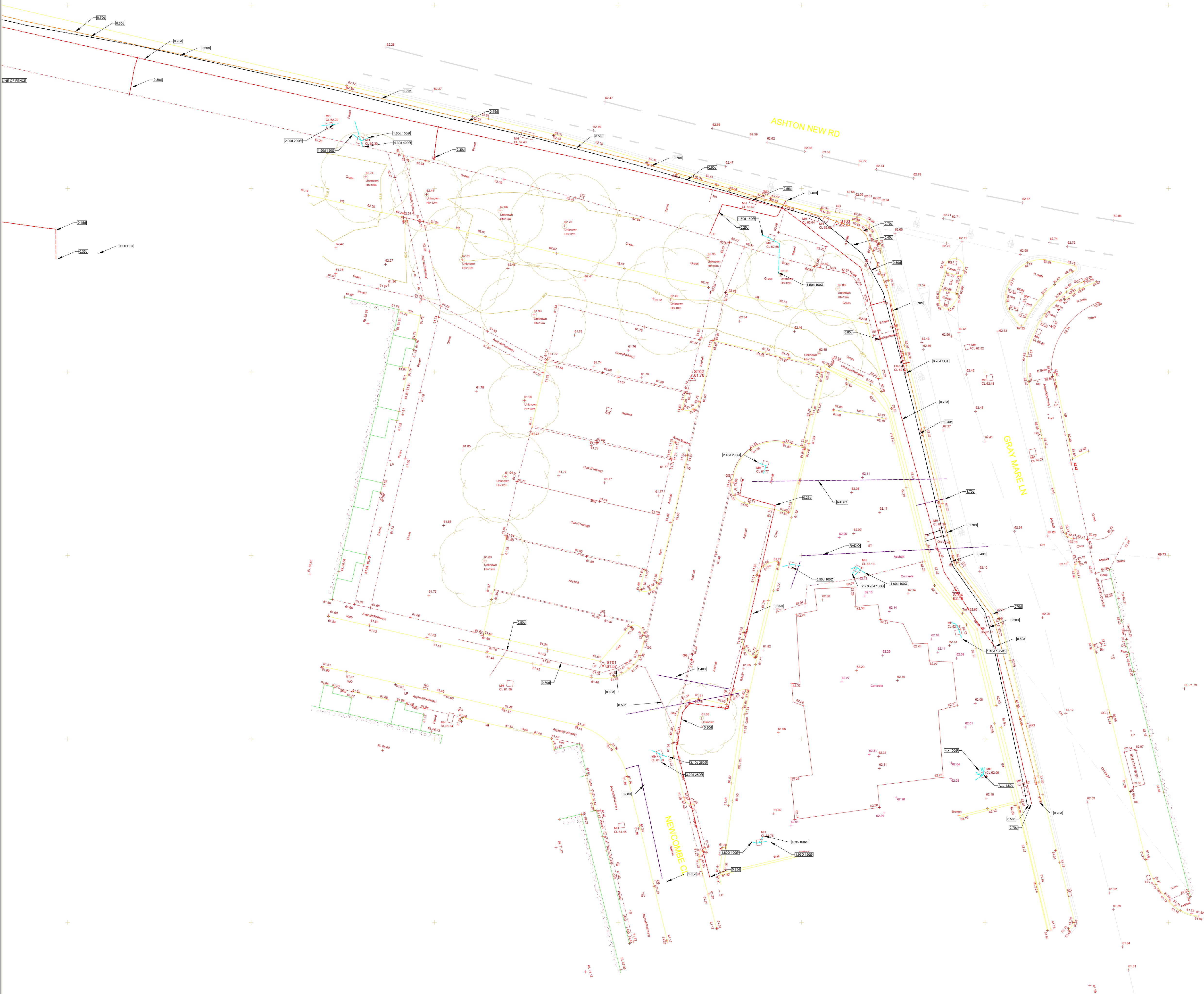
TITLE: Utility Survey
PAS 128 B
GREY MARE LANE

CLIENT:	SHAPE CONSULTING
ADDRESS:	Shape Consulting Engineers Ltd Amber House Green Lane Liverpool L13 7GD

PROJECT NAME:	Utility Survey
DRAWING NAME:	Grey Mare Lane
SURVEYED BY:	DT 24/04/24
DRAWN BY:	NS 24/04/24
APPROVED BY:	DT 24/04/24
DRAWING NUMBER:	CUB-SC-001A
SHEET NUMBER:	1 OF 2
SCALE @ A1:	1:200 DRAWING IN METRE



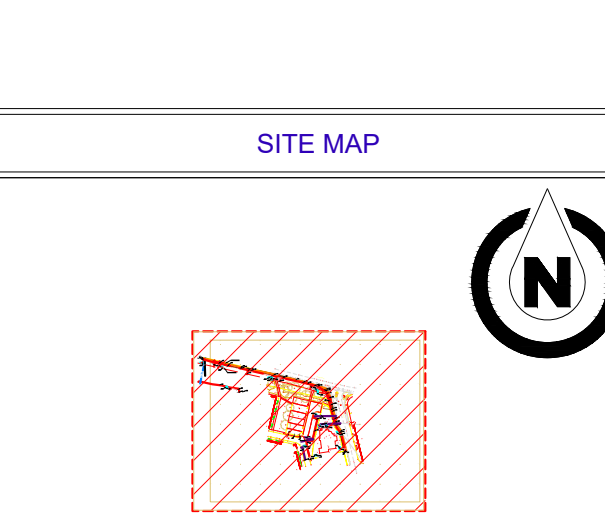
MISSING APPROX. LINE OF K108



TEL. 0870 7550093
EMAIL. SALES@CUBESURVEYS.CO.UK

CONTROL SCHEDULE			
STATION	EASTING	NORTHING	LEVEL

GENERAL NOTES
PLEASE STATE WHERE THE SURVEY CONTROL CAME FROM



LEGEND	
ELECTRIC	ELEC
ELECTRIC FROM RECORDS	ELEC (R)
WATER	WTR
WATER FROM RECORDS	WTR (R)
GAS	GAS
GAS FROM RECORDS	GAS (R)
BT	BT
BT FROM RECORDS	BT (R)
COMMS	COMMS
COMMS FROM RECORDS	COMMS (R)
STREET LIGHTING	SL
STREET LIGHTING FROM RECORDS	SL (R)
CCTV	CCTV
CCTV FROM RECORDS	CCTV (R)
TRAFFIC MANAGEMENT	TM
TRAFFIC MANAGEMENT FROM RECORDS	TM (R)
OIL PIPELINE	OIL
OIL PIPELINE FROM RECORDS	OIL (R)
MISCELLANEOUS	MISC
MISCELLANEOUS FROM RECORDS	MISC (R)
DRAINAGE	DRA
DRAINAGE FROM RECORDS	DRA (R)
OVERHEAD BT	BT (O)
OVERHEAD ELECTRIC	ELEC (O)
EXTRA HIGH VOLTAGE ELECTRIC	ELEC (EHV)
HIGH VOLTAGE ELECTRIC	ELEC (HV)
LOW VOLTAGE ELECTRIC	ELEC (LV)
HIGH PRESSURE GAS	GAS (HP)
LOW PRESSURE GAS	GAS (LP)
INTERMEDIATE PRESSURE GAS	GAS (IP)
ASSUMED DRAINAGE	ADRA
SURVEY AREA	AS
TEXT BOX	
EOT	
ND	
d	
Ø	
GPR	

Always Exercise Caution When Excavating
A range of detection methods are used to obtain the underground information produced in this drawing. Variations in ground conditions can affect the quality of the data and therefore an absolute affirmation cannot be guaranteed.

IF IN ANY DOUBT ASK

REV	DATE	DESCRIPTION	INITIALS

TITLE: Utility Survey
PAS 128 B
GREY MARE LANE

CLIENT: SHAPE CONSULTING
ADDRESS: Shape Consulting Engineers Ltd
Amber House | Green Lane |
Liverpool | L13 7GD

PROJECT NAME:	Utility Survey
DRAWING NAME:	Grey Mare Lane
SURVEYED BY:	DT 24/04/24
DRAWN BY:	NS 24/04/24
APPROVED BY:	DT 24/04/24
DRAWING NUMBER:	CUB-SC-001A
SHEET NUMBER:	2 OF 2
SCALE @ A1:	1:200 DRAWING IN METRES



GENERAL NOTES

THIS DRAWING TO READ IN CONJUNCTION WITH ALL RELEVANT STRUCTURAL AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR / FABRICATOR PRIOR TO COMMENCEMENT OF WORKS.

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.

ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE ENGINEER'S SPECIFICATIONS, RELEVANT BRITISH STANDARDS, STATUTORY HEALTH AND SAFETY/C.D.M. REGULATIONS, RELEVANT CODES OF PRACTICE AND THE CURRENT EDITION OF THE BUILDING REGULATIONS.

KEY:

- EXISTING FOUL WATER DRAINAGE
- EXISTING SURFACE WATER DRAINAGE
- EXISTING COMBINED WATER DRAINAGE

P01	PRELIMINARY ISSUE	23.09.24	MB	TC
Rev	Description	Date	By	Chkd
Drawing Status				
PRELIMINARY DRAWING				
				
Client GREAT PLACES				
Project GREY MARE LANE MANCHESTER M11 3DQ				
Drawing Title EXISTING DRAINAGE LAYOUT				
Date SEP 24	Drawn By MB	Checked By TC		
Scale at A1 1:100		Project Number 34338		
Sheet Number 34338-SUT-ZZ-XX-DR-C-6000				Revision P01



GENERAL NOTES

THIS DRAWING TO READ IN CONJUNCTION WITH ALL RELEVANT STRUCTURAL AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR / FABRICATOR PRIOR TO COMMENCEMENT OF WORKS.

ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.

ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE ENGINEER'S SPECIFICATIONS, RELEVANT BRITISH STANDARDS, STATUTORY HEALTH AND SAFETY/C.D.M. REGULATIONS, RELEVANT CODES OF PRACTICE AND THE CURRENT EDITION OF THE BUILDING REGULATIONS.

FOR FINAL SETTING OUT INFORMATION RELATING TO GRID LINES AND WALL POSITIONS REFER TO THE ARCHITECT'S DRAWINGS.

CATCHMENT KEY:

SITE BOUNDARY

IMPERMEABLE AREA - 2182.71m²

P01	PRELIMINARY ISSUE	26.11.24	KW	TC
Rev	Description	Date	By	Chkd

Drawing Status
PRELIMINARY DRAWING

Sutcliffe
Structural & Civil Engineering
Geotechnical & Environmental Investigations
Building Surveying
Preliminary Services

Client
GREAT PLACES

Project
**GREY MARE LANE
MANCHESTER
M11 3DQ**

Drawing Title
**EXISTING CATCHMENT
AREA PLAN**

Date NOV 24	Drawn By KW	Checked By TC
Scale at A1 1:200		Project Number 34338
Sheet Number 34338-SUT-ZZ-XX-DR-C-6010		Revision P01



GENERAL NOTES

THIS DRAWING TO READ IN CONJUNCTION WITH ALL RELEVANT STRUCTURAL AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR / FABRICATOR PRIOR TO COMMENCEMENT OF WORKS.

ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.

ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE ENGINEER'S SPECIFICATIONS, RELEVANT BRITISH STANDARDS, STATUTORY HEALTH AND SAFETY/C.D.M. REGULATIONS, RELEVANT CODES OF PRACTICE AND THE CURRENT EDITION OF THE BUILDING REGULATIONS.

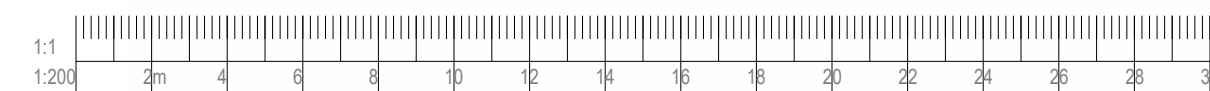
FOR FINAL SETTING OUT INFORMATION RELATING TO GRID LINES AND WALL POSITIONS REFER TO THE ARCHITECT'S DRAWINGS.

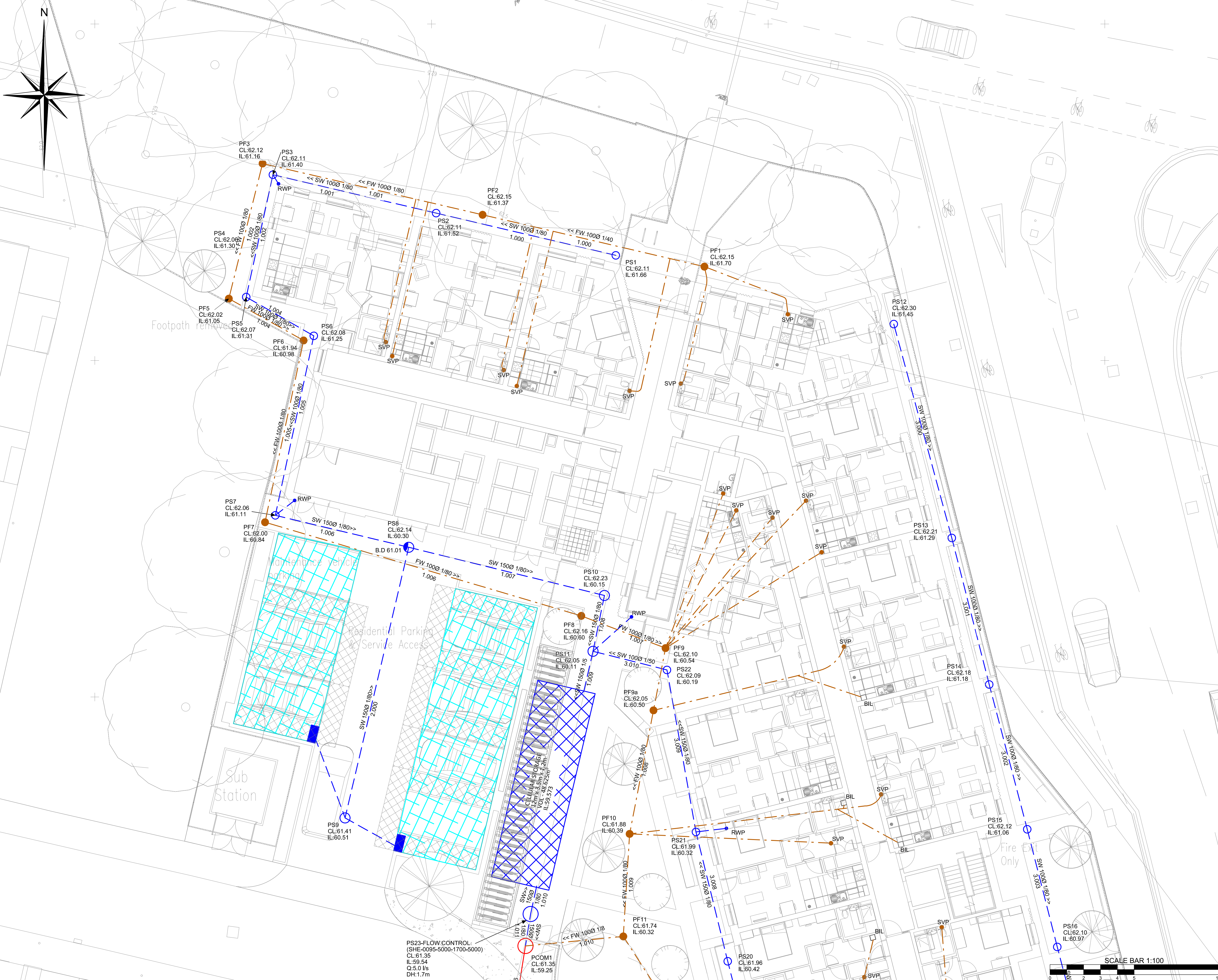
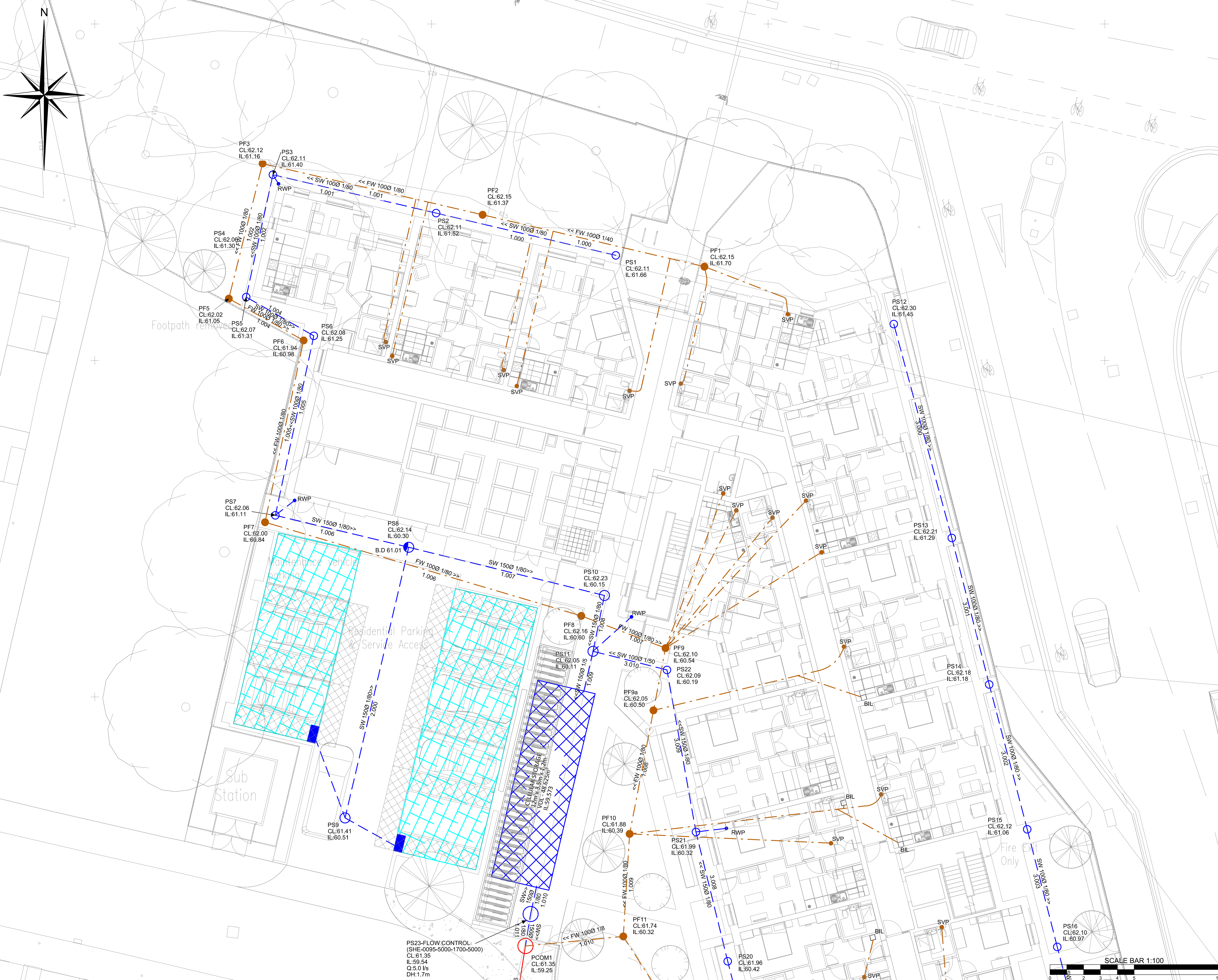
CATCHMENT KEY:

SITE BOUNDARY

FLOOD FLOW ROUTE

P01	PRELIMINARY ISSUE	26.11.24	KW	TC
Rev	Description	Date	By	Chkd
Drawing Status				
PRELIMINARY DRAWING				
				
Client GREAT PLACES				
Project GREY MARE LANE MANCHESTER M11 3DQ				
Drawing Title EXISTING FLOOD FLOW ROUTE PLAN				
Date NOV 24	Drawn By KW	Checked By TC		
Scale at A1 1:200		Project Number 34338		
Sheet Number 34338-SUT-ZZ-XX-DR-C-6011				Revision P01





GENERAL NOTES

THIS DRAWING TO READ IN CONJUNCTION WITH ALL RELEVANT STRUCTURAL AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR / FABRICATOR PRIOR TO COMMENCEMENT OF WORKS.

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.

ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE ENGINEER'S SPECIFICATIONS, RELEVANT BRITISH STANDARDS, STATUTORY HEALTH AND SAFETY/C.D.M. REGULATIONS, RELEVANT CODES OF PRACTICE AND THE CURRENT EDITION OF THE BUILDING REGULATIONS.

DRAINAGE KEY:

- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED FOUL WATER DRAINAGE
- PROPOSED COMBINED SEWER
- SURFACE WATER ATTENUATION STORAGE CELLS
- PERMEABLE PAVING
- RWP
- SVP
- BIG
- PERMAVOID DIFFUSER BOX

P03	UPDATED TO SUIT NEW SITE LAYOUT	08.03.25	MJB	TC
P02	LAYOUT UPDATED	18.12.24	MB	TC
P01	PRELIMINARY ISSUE	26.11.24	MB	TC
Rev	Description	Date	By	Chkd

Drawing Status

FOR INFORMATION ONLY

Sutcliffe

Structural & Civil Engineering
Geotechnical & Environmental Investigation
Building Surveying
Pre Planning Services

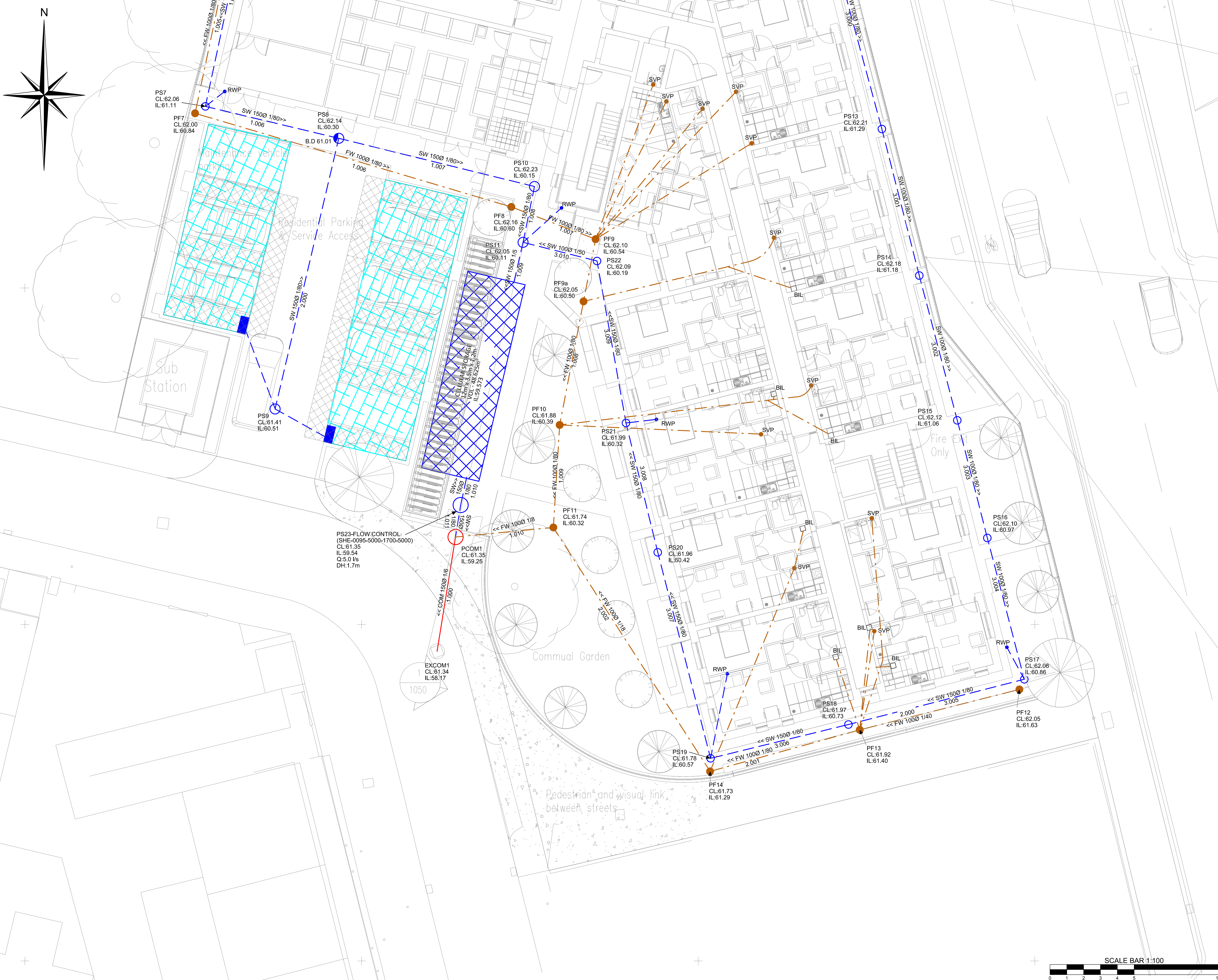
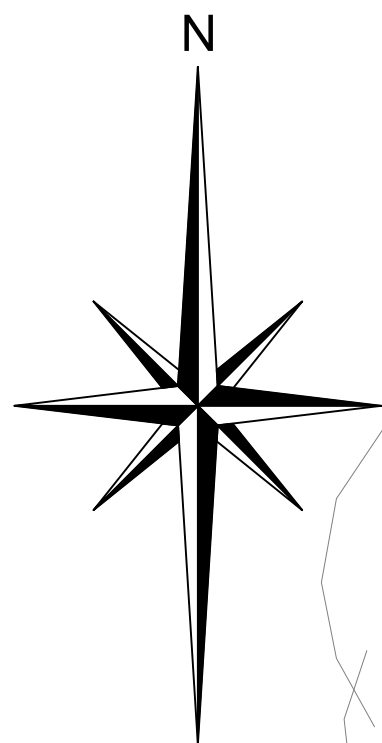
London Road Office: 0151 227 3155
Manchester Office: 0161 871 5180
South Wales Office: 01495 644 019
Leeds Office: 0113 254 4205
www.sutcliffe.co.uk

Client
GREAT PLACES

Project
**GREY MARE LANE
MANCHESTER
M11 3DQ**

Drawing Title
**INDICATIVE DRAINAGE
STRATEGY
SHEET 1 OF 2**

Date NOV 24	Drawn By KW	Checked By TC
Scale at A1 1:100	Project Number 34338	Revision
Sheet Number 34338-SUT-ZZ-XX-DR-C-6200		P03



GENERAL NOTES

THIS DRAWING TO READ IN CONJUNCTION WITH ALL RELEVANT STRUCTURAL AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR / FABRICATOR PRIOR TO COMMENCEMENT OF WORKS.

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.

ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE ENGINEER'S SPECIFICATIONS, RELEVANT BRITISH STANDARDS, STATUTORY HEALTH AND SAFETY/C.D.M. REGULATIONS, RELEVANT CODES OF PRACTICE AND THE CURRENT EDITION OF THE BUILDING REGULATIONS.

DRAINAGE KEY:

PROPOSED SURFACE WATER DRAINAGE

PROPOSED FOUL WATER DRAINAGE

PROPOSED COMBINED SEWER

SURFACE WATER ATTENUATION STORAGE CELLS

PERMEABLE PAVING

RWP

SVP

BIG

PERMAVOID DIFFUSER BOX

Rev				Description				Date				By				Chkd			
P03				UPDATED TO SUIT NEW SITE LAYOUT				08.03.25				MJB				TC			
P02				LAYOUT UPDATED				18.12.24				MB				TC			
P01				PRELIMINARY ISSUE				26.11.24				MB				TC			

FOR INFORMATION ONLY

Structural & Civil Engineering

Geotechnical & Environmental Investigations

Building Surveying

Pre Planning Services

London Head Office

01753 227 3100

www.sutcliffe.co.uk

Manchester Office

0161 871 5180

South Wales Office

01495 644 017

London Office

020 8014 4200

Client

GREAT PLACES

Project

GREY MARE LANE
MANCHESTER
M11 3DQ

Drawing Title

INDICATIVE DRAINAGE
STRATEGY
SHEET 2 OF 2

Date

SEPT 24

Drawn By

KW

Checked By

TC

Scale at A1

1:100

Project Number

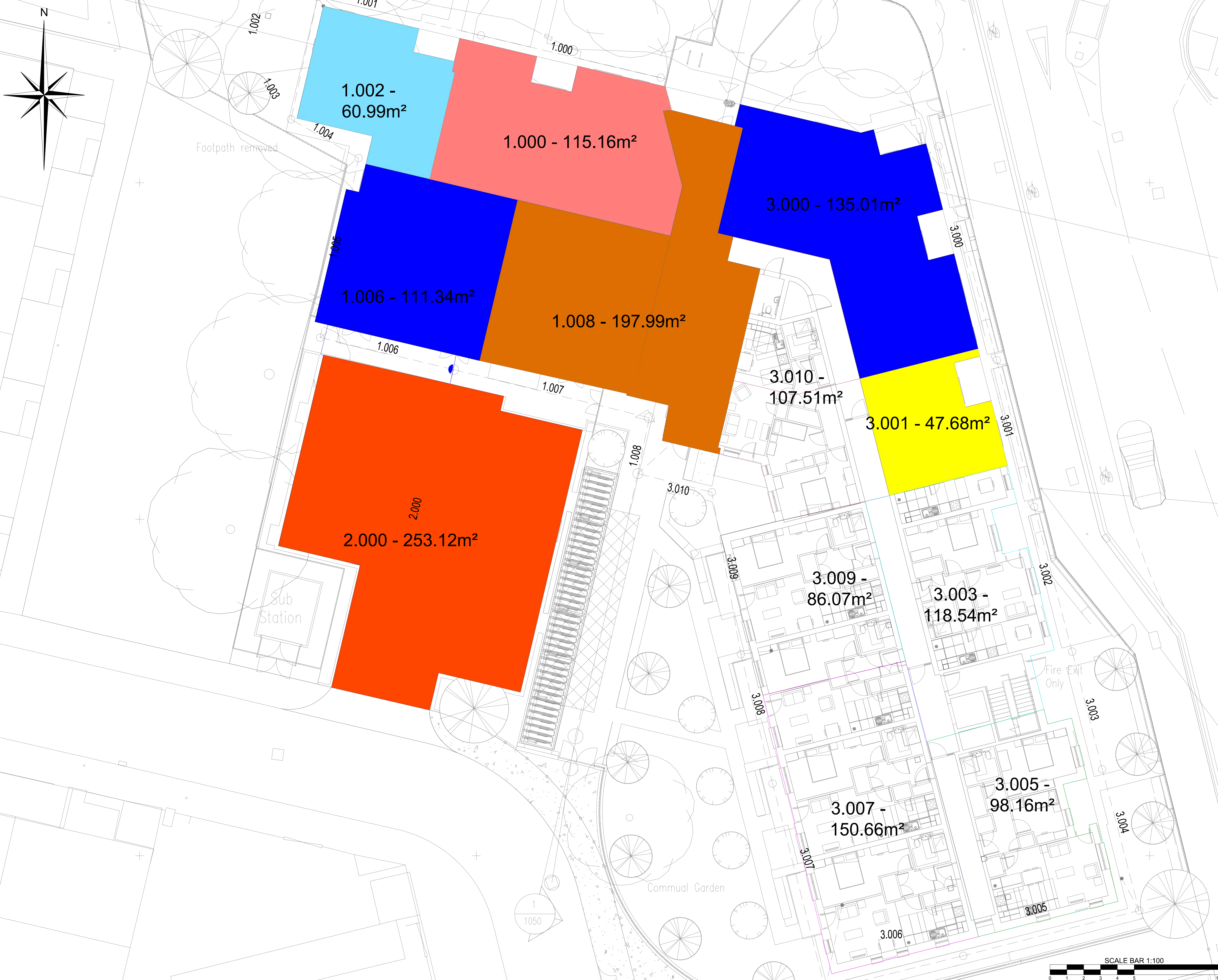
34338

Sheet Number

34338-SUT-ZZ-XX-DR-C-6201

Revision

P03



GENERAL NOTES

THIS DRAWING TO READ IN CONJUNCTION WITH ALL RELEVANT STRUCTURAL AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR / FABRICATOR PRIOR TO COMMENCEMENT OF WORKS.

ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.

ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE ENGINEER'S SPECIFICATIONS, RELEVANT BRITISH STANDARDS, STATUTORY HEALTH AND SAFETY/C.D.M. REGULATIONS, RELEVANT CODES OF PRACTICE AND THE CURRENT EDITION OF THE BUILDING REGULATIONS.

FOR FINAL SETTING OUT INFORMATION RELATING TO GRID LINES AND WALL POSITIONS REFER TO THE ARCHITECT'S DRAWINGS.

CATCHMENT KEY:	
	1.000 - 115.16m ²
	1.002 - 60.99m ²
	1.006 - 111.34m ²
	1.008 - 197.99m ²
	2.000 - 253.12m ²
	3.000 - 135.01m ²
	3.001 - 47.68m ²
	3.003 - 118.54m ²
	3.005 - 98.16m ²
	3.007 - 150.66m ²
	3.009 - 86.07m ²
	3.010 - 107.51m ²
TOTAL: 1437.97m ² (0.14 Ha)	

P03	UPDATED TO NEW SITE LAYOUT	05.03.25	MJB	TC
P02	LAYOUT UPDATED	19.12.24	MB	TC
P01	PRELIMINARY ISSUE	26.11.24	MB	TC
Rev	Description	Date	By	Chkd

Drawing Status
PRELIMINARY DRAWING



Structural & Civil Engineering
Geotechnical & Environmental Investigations
Building Surveying
Preliminary Services

Unleashed Road Office: 0151 227 3115
Manchester Office: 0161 871 5180
North Wales Office: 01753 644 411
London Office: 020 8164 4205

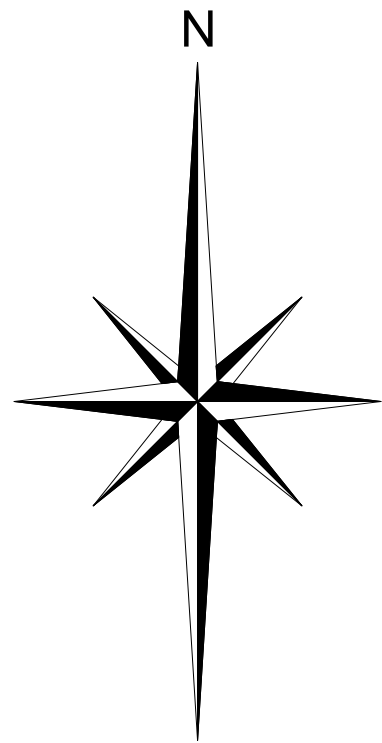
www.sutcliffe.co.uk

Client
GREAT PLACES

Project
**GREY MARE LANE
MANCHESTER
M11 3DQ**

Drawing Title
**PROPOSED CATCHMENT
AREA PLAN**

Date NOV 24	Drawn By MB	Checked By TC
Scale at A1 1:100	Project Number 34338	Revision
Sheet Number 34338-SUT-ZZ-XX-DR-C-6020	P03	



GENERAL NOTES

THIS DRAWING TO READ IN CONJUNCTION WITH ALL RELEVANT STRUCTURAL AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR / FABRICATOR PRIOR TO COMMENCEMENT OF WORKS.

ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.

ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE ENGINEER'S SPECIFICATIONS, RELEVANT BRITISH STANDARDS, STATUTORY HEALTH AND SAFETY/C.D.M. REGULATIONS, RELEVANT CODES OF PRACTICE AND THE CURRENT EDITION OF THE BUILDING REGULATIONS.

FOR FINAL SETTING OUT INFORMATION RELATING TO GRID LINES AND WALL POSITIONS REFER TO THE ARCHITECT'S DRAWINGS.

CATCHMENT KEY:

— SITE BOUNDARY

↙ FLOOD FLOW ROUTE

P03	UPDATED TO SUIT NEW LAYOUT	04.03.25	MJB	TC
P02	LAYOUT UPDATED	18.12.24	KW	TC
P01	PRELIMINARY ISSUE	26.11.24	KW	TC
Rev	Description	Date	By	Chkd

Drawing Status
PRELIMINARY DRAWING



Structural & Civil Engineering
Geotechnical & Environmental Investigations
Building Surveying
Preliminary Services

Unlabeled Head Office: 0151 227 3115
www.sutcliffe.co.uk

Manchester Office: 0161 871 5180

North Wales Office: 01753 644 011

London Office: 020 8114 4205



Client
GREAT PLACES

Project
**GREY MARE LANE
MANCHESTER
M11 3DQ**

Drawing Title
**PROPOSED FLOOD FLOW
ROUTE PLAN**

Date NOV 24	Drawn By KW	Checked By TC
Scale at A1 1:200	Project Number 34338	Revision
Sheet Number 34338-SUT-ZZ-XX-DR-C-6021		P03

17 Appendix B – Brownfield runoff rates

Grey Mare Lane: Manchester M11 3DQ	Date: 26/11/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Junctions Storm Phase: Phase	18-20 Harrington Street: Liverpool L2 9QA		



Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
9202	Manhole	386944.500	398258.383	61.390	3.070	58.320	Circular	1.200
9201	Manhole	386956.125	398289.799	61.770	2.390	59.380	Circular	1.200

Name	Lock
9202	None
9201	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
9202	Inlet	Pipe Catchment Area (1)	(None)	No Restriction
9201	Inlet	Catchment Area	(None)	No Restriction

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
9201	Outlet	Pipe	Free Discharge

Grey Mare Lane: Manchester M11 3DQ	Date: 26/11/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Connections Storm Phase: Phase	18-20 Harrington Street: Liverpool L2 9QA		



Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
Pipe	33.498	Pipe	31.602		0.6	225	61.770	59.380

Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Part Family	Lock	Culvert Type	Culvert Entrance
Pipe	61.390	58.320		None	(None)	(None)

Grey Mare Lane: Manchester M11 3DQ	Date: 26/11/2024			
	Designed by: MB	Checked by: TC	Approved By: TC	
Report Details: Type: Outfall Details Storm Phase: Phase	18-20 Harrington Street: Liverpool L2 9QA			

Outfalls

Outfall	Outfall Type	Gated	Fixed Surcharged Level (m)	Level Curve
9202	Free Discharge			

Grey Mare Lane: Manchester M11 3DQ	Date: 26/11/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Rainfall Analysis Criteria	18-20 Harrington Street: Liverpool L2 9QA		



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	☐

Grey Mare Lane: Manchester M11 3DQ	Date: 26/11/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Inflows Summary Storm Phase: Phase	18-20 Harrington Street: Liverpool L2 9QA		



FSR: 2 years: Increase Rainfall (%): +0: 15 mins: Summer

Inflow	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	0.04	6.3	2.830
Catchment Area (1)	0.06	9.0	4.011

Grey Mare Lane: Manchester M11 3DQ	Date: 26/11/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Junctions Summary Storm Phase: Phase	18-20 Harrington Street: Liverpool L2 9QA		

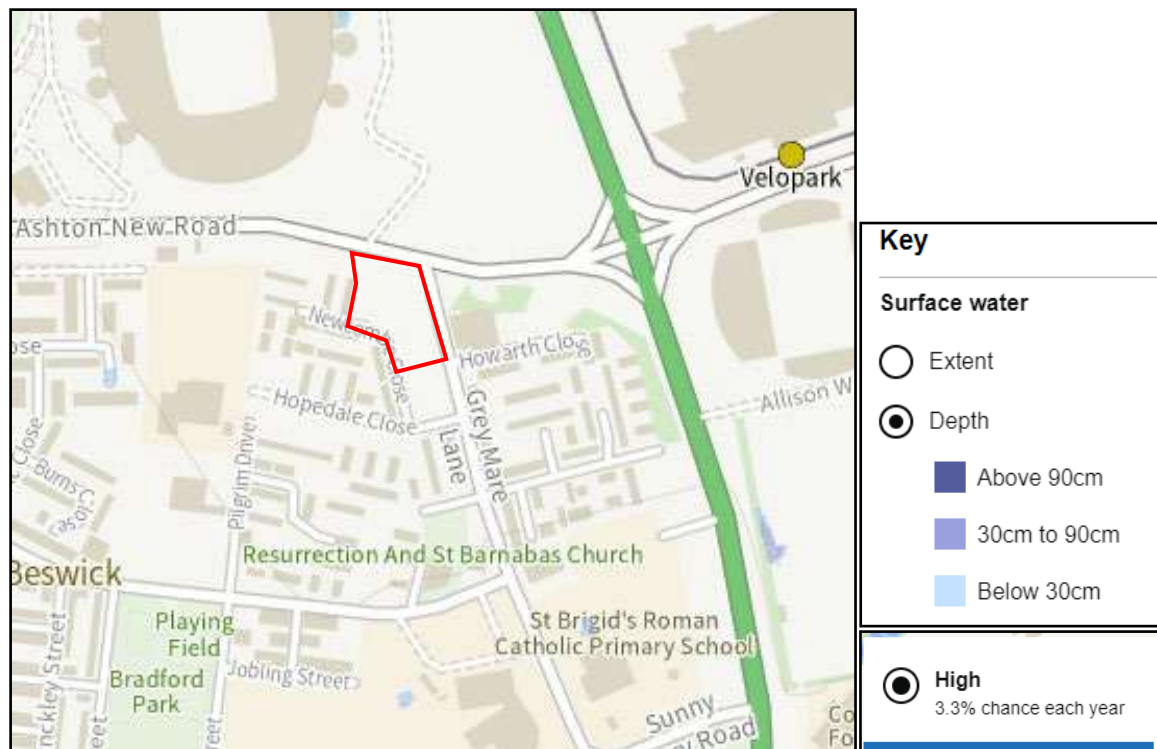
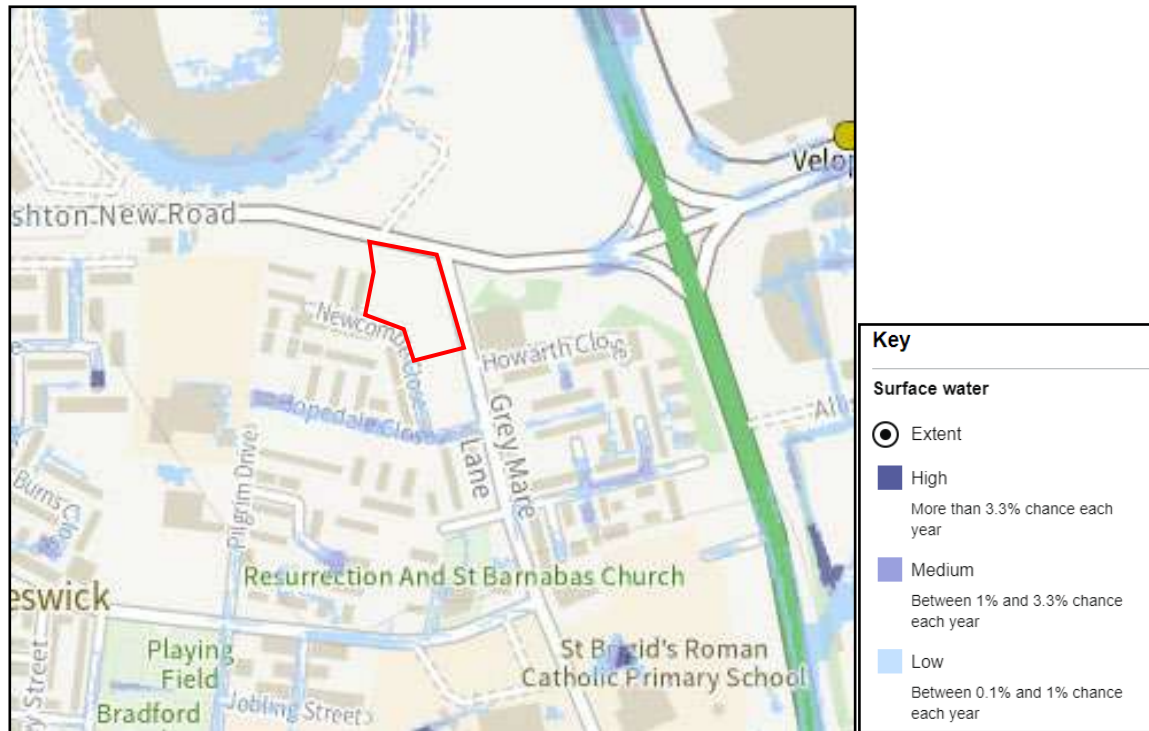


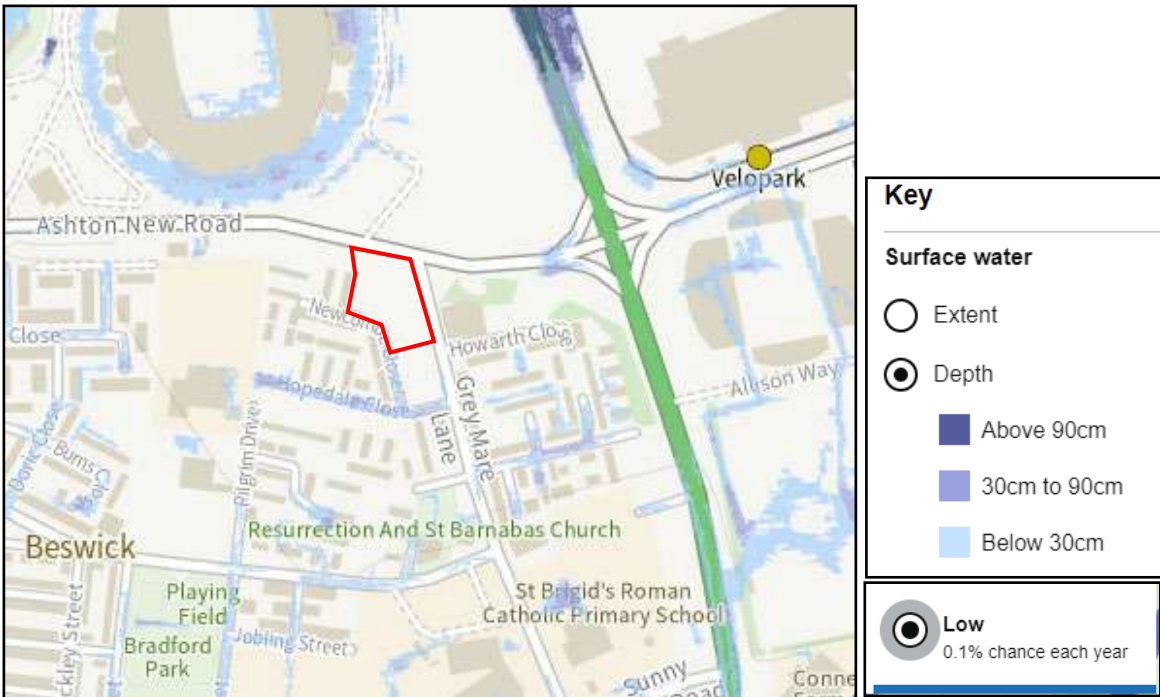
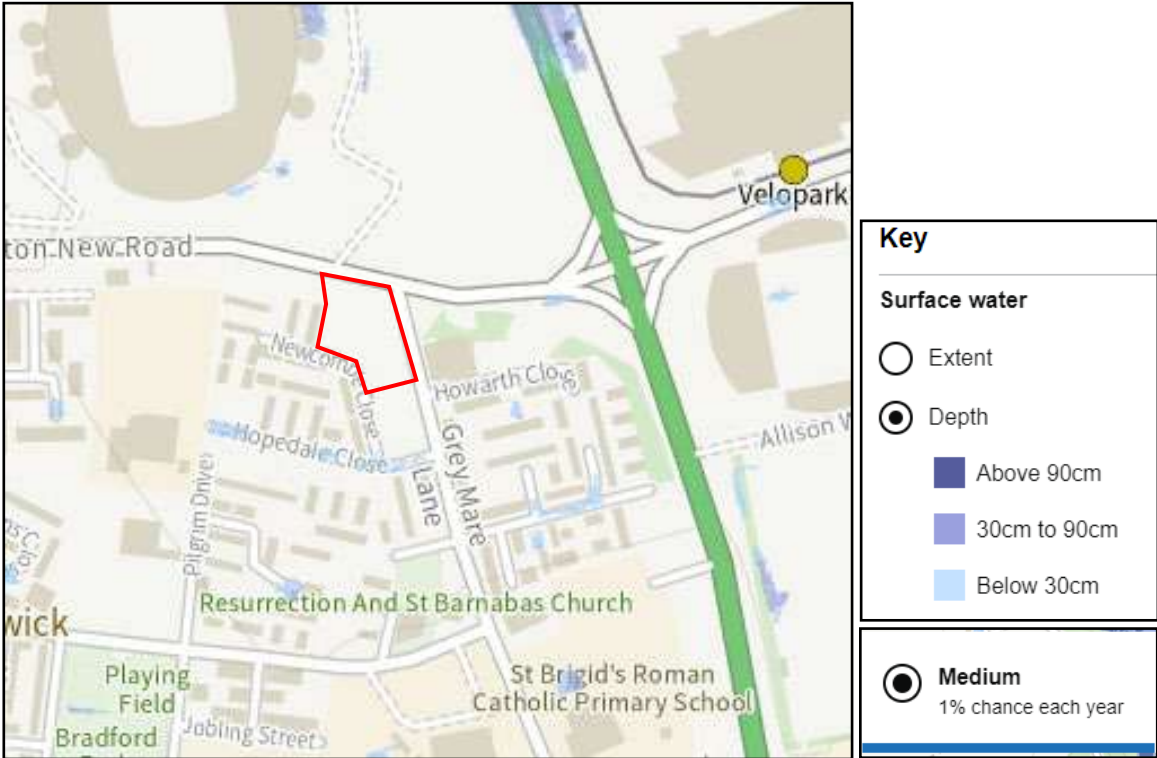
FSR: 2 years: Increase Rainfall (%): +0: 15 mins: Summer

Junction	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
9202	61.390	58.320	58.336	0.016	15.1	0.000	0.000	15.4	6.840	OK
9201	61.770	59.380	59.425	0.045	6.3	0.051	0.000	6.1	2.829	OK

18 Appendix C – Environmental Agency Data

EA Flood Maps





19 **Appendix D – InfoDrainage Calculations**

Grey Mare Lane: Manchester M11 3DQ	Date: 18/12/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Junctions Storm Phase: Phase	Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA		



Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
EXCOM1	Manhole	386944.488	398258.399	61.294	3.124	58.170	Circular	0.900
PS3	Manhole	386927.663	398311.800	62.115	0.753	61.362	Circular	0.450
PS4	Manhole	386926.470	398306.802	62.045	0.746	61.299	Circular	0.450
PS7	Manhole	386930.724	398290.795	62.062	1.142	60.919	Circular	0.450
PS10	Manhole	386950.276	398286.032	62.234	2.080	60.153	Circular	0.600
PS11	Manhole	386949.408	398281.964	62.016	1.915	60.101	Circular	0.600
PS17	Manhole	386979.052	398257.923	62.079	1.199	60.880	Circular	0.450
PS18	Manhole	386968.640	398255.274	62.011	1.265	60.746	Circular	0.450
PS19	Manhole	386961.010	398254.717	61.896	1.246	60.651	Circular	0.450
PS20	Manhole	386957.599	398264.289	61.960	1.436	60.524	Circular	0.450
PS21	Manhole	386955.712	398271.978	61.987	1.562	60.425	Circular	0.450
PS22	Manhole	386954.276	398280.911	62.090	1.778	60.312	Circular	0.450
PS23	Manhole	386945.889	398267.099	61.547	1.999	59.548	Circular	0.900
PCOM1	Manhole	386945.583	398265.198	61.500	2.102	59.398	Circular	0.900
PS9	Manhole	386934.865	398272.810	61.409	0.900	60.509	Circular	0.600
PS8	Manhole	386938.648	398288.897	62.140	1.837	60.303	Circular	0.600
PS5	Manhole	386928.495	398304.057	62.055	0.798	61.257	Circular	0.450
PS6	Manhole	386933.009	398301.464	62.079	0.887	61.192	Circular	0.450
PS12	Manhole	386967.463	398302.164	62.303	0.850	61.453	Circular	0.450
PS13	Manhole	386970.912	398289.451	62.213	0.925	61.288	Circular	0.450
PS14	Manhole	386973.135	398280.740	62.183	1.008	61.176	Circular	0.450
PS15	Manhole	386975.393	398272.135	62.120	1.056	61.064	Circular	0.450
PS16	Manhole	386977.178	398265.142	62.096	1.122	60.974	Circular	0.450
PS2	Manhole	386940.275	398308.759	62.110	0.586	61.524	Circular	0.450
PS1	Manhole	386951.169	398306.196	62.114	0.450	61.664	Circular	0.450

Name	Lock
EXCOM1	None
PS3	None
PS4	None
PS7	None
PS10	None
PS11	None
PS17	None
PS18	None
PS19	None
PS20	None
PS21	None
PS22	None
PS23	None
PCOM1	None
PS9	None
PS8	None
PS5	None
PS6	None
PS12	None
PS13	None
PS14	None
PS15	None
PS16	None
PS2	None
PS1	None

Grey Mare Lane: Manchester M11 3DQ	Date: 18/12/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Stormwater Controls Storm Phase: Phase	Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA		



Porous Paving (1)

Type : Porous Paving

Dimensions

Exceedance Level (m)	61.359
Depth (m)	0.430
Base Level (m)	60.929
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	360.0
Porosity (%)	30
Length (m)	12.711
Long. Slope (1:X)	100.00
Width (m)	4.588
Total Volume (m³)	5.249

Advanced

Conductivity (m/hr)	50.0
---------------------	------



Porous Paving

Type : Porous Paving

Dimensions

Exceedance Level (m)	61.356
Depth (m)	0.430
Base Level (m)	60.926
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	360.0
Porosity (%)	30
Length (m)	15.997
Long. Slope (1:X)	100.00
Width (m)	5.000
Total Volume (m³)	7.199

Advanced

Conductivity (m/hr)	50.0
---------------------	------

Grey Mare Lane: Manchester M11 3DQ	Date: 18/12/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Stormwater Controls Storm Phase: Phase	Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA		



Cellular Storage

Type : Cellular Storage

Dimensions	
Exceedance Level (m)	61.518
Depth (m)	1.200
Base Level (m)	59.573
Number of Crates Long	1
Number of Crates Wide	1
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	12
Crate Width (m)	3.5
Crate Height (m)	1.2
Total Volume (m³)	48.625

Grey Mare Lane: Manchester M11 3DQ	Date: 18/12/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Connections Storm Phase: Phase	Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA		



Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
1.002	5.139	Pipe	81.573		0.6	100	62.115	61.362
1.008	4.159	Pipe	80.000		0.6	150	62.234	60.153
3.005	10.744	Pipe	80.187		0.6	100	62.079	60.880
3.006	7.650	Pipe	80.312		0.6	100	62.011	60.746
3.007	10.162	Pipe	80.000		0.6	100	61.896	60.651
3.008	7.917	Pipe	80.000		0.6	100	61.960	60.524
3.009	9.048	Pipe	80.000		0.6	150	61.987	60.425
3.010	4.981	Pipe	23.657		0.6	150	62.090	60.312
1.011	1.926	Pipe	12.829		0.6	150	61.547	59.548
1.000 COM	6.887	Pipe	5.608		0.6	150	61.500	59.398
1.006	8.148	Pipe	13.218		0.6	100	62.062	60.919
1.007	11.976	Pipe	80.000		0.6	150	62.140	60.303
2.000	16.525	Pipe	80.000		0.6	150	61.409	60.509
1.003	3.411	Pipe	81.219		0.6	100	62.045	61.299
1.004	5.205	Pipe	80.075		0.6	100	62.055	61.257
1.005	10.911	Pipe	40.000		0.6	100	62.079	61.192
3.000	13.173	Pipe	79.924		0.6	100	62.303	61.453
3.001	8.990	Pipe	80.000		0.6	100	62.213	61.288
3.002	8.897	Pipe	79.703		0.6	100	62.183	61.176
3.003	7.217	Pipe	80.000		0.6	100	62.120	61.064
3.004	7.458	Pipe	79.515		0.6	100	62.096	60.974
1.000	11.192	Pipe	80.000		0.6	100	62.114	61.664
1.001	12.973	Pipe	80.104		0.6	100	62.110	61.524
1.009	1.753	Pipe	3.319		0.6	150	62.016	60.101
1.010	1.697	Pipe	67.866		0.6	150	61.590	59.573
PP CON	3.396	Pipe	8.152		0.6	100	61.399	60.926
PP CON1	4.989	Pipe	11.878		0.6	100	61.368	60.929

Grey Mare Lane: Manchester M11 3DQ	Date: 18/12/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Connections Storm Phase: Phase	Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA		



Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Part Family	Lock	Flow Restriction (L/s)	Culvert Type	Culvert Entrance
1.002	62.045	61.299		None		(None)	(None)
1.008	62.016	60.101		None		(None)	(None)
3.005	62.011	60.746		None		(None)	(None)
3.006	61.896	60.651		None		(None)	(None)
3.007	61.960	60.524		None		(None)	(None)
3.008	61.987	60.425		None		(None)	(None)
3.009	62.090	60.312		None		(None)	(None)
3.010	62.016	60.101		None		(None)	(None)
1.011	61.500	59.398		None	5.4	(None)	(None)
1.000 COM	61.294	58.170		None		(None)	(None)
1.006	62.140	60.303		None		(None)	(None)
1.007	62.234	60.153		None		(None)	(None)
2.000	62.140	60.303		None		(None)	(None)
1.003	62.055	61.257		None		(None)	(None)
1.004	62.079	61.192		None		(None)	(None)
1.005	62.062	60.919		None		(None)	(None)
3.000	62.213	61.288		None		(None)	(None)
3.001	62.183	61.176		None		(None)	(None)
3.002	62.120	61.064		None		(None)	(None)
3.003	62.096	60.974		None		(None)	(None)
3.004	62.079	60.880		None		(None)	(None)
1.000	62.110	61.524		None		(None)	(None)
1.001	62.115	61.362		None		(None)	(None)
1.009	61.940	59.573		None		(None)	(None)
1.010	61.547	59.548		None		(None)	(None)
PP CON	61.409	60.509		None	10.4	(None)	(None)
PP CON1	61.409	60.509		None	10.4	(None)	(None)

Grey Mare Lane: Manchester M11 3DQ	Date: 18/12/2024			
	Designed by: MB	Checked by: TC	Approved By: TC	
Report Details: Type: Outfall Details Storm Phase: Phase	Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA			

Outfalls

Outfall	Outfall Type	Gated	Fixed Surcharged Level (m)	Level Curve
EXCOM1	Free Discharge			

Grey Mare Lane: Manchester M11 3DQ	Date: 18/12/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Title: Rainfall Analysis Criteria	Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA		



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	☐

Grey Mare Lane: Manchester M11 3DQ	Date: 18/12/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Junctions Summary Storm Phase: Phase	Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA		



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

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
EXCOM1	FEH: 2 years: +0 %: 30 mins: Summer	61.29 4	58.17 0	58.194	0.024	6.6	0.000	0.000	6.6	12.890	OK
PS3	FEH: 2 years: +0 %: 15 mins: Summer	62.11 5	61.36 2	61.417	0.055	3.5	0.009	0.000	3.4	1.579	OK
PS4	FEH: 2 years: +0 %: 15 mins: Summer	62.04 5	61.29 9	61.354	0.055	3.4	0.009	0.000	3.3	1.575	OK
PS7	FEH: 2 years: +0 %: 15 mins: Summer	62.06 2	60.91 9	60.957	0.038	5.1	0.006	0.000	5.0	2.441	OK
PS10	FEH: 2 years: +0 %: 15 mins: Summer	62.23 4	60.15 3	60.237	0.084	10.8	0.024	0.000	10.6	5.343	OK
PS11	FEH: 2 years: +0 %: 15 mins: Summer	62.01 6	60.10 1	60.157	0.056	20.8	0.016	0.000	20.7	10.967	OK
PS17	FEH: 2 years: +0 %: 15 mins: Summer	62.07 9	60.88 0	60.968	0.088	6.9	0.014	0.000	6.5	3.238	OK
PS18	FEH: 2 years: +0 %: 15 mins: Winter	62.01 1	60.74 6	60.831	0.085	6.2	0.014	0.000	5.4	3.230	OK
PS19	FEH: 2 years: +0 %: 15 mins: Summer	61.89 6	60.65 1	60.774	0.123	7.5	0.020	0.000	7.0	4.144	Surcharged
PS20	FEH: 2 years: +0 %: 15 mins: Summer	61.96 0	60.52 4	60.615	0.091	7.0	0.015	0.000	6.8	4.136	OK
PS21	FEH: 2 years: +0 %: 15 mins: Summer	61.98 7	60.42 5	60.497	0.072	8.2	0.011	0.000	8.2	4.737	OK
PS22	FEH: 2 years: +0 %: 15 mins: Summer	62.09 0	60.31 2	60.371	0.060	10.3	0.009	0.000	10.2	5.630	OK
PS23	FEH: 2 years: +0 %: 120 mins: Summer	61.54 7	59.54 8	59.829	0.281	4.4	0.179	0.000	4.3	24.133	Surcharged
PCOM1	FEH: 2 years: +0 %: 120 mins: Summer	61.50 0	59.39 8	59.424	0.026	4.3	0.017	0.000	4.3	24.125	OK
PS9	FEH: 2 years: +0 %: 15 mins: Summer	61.40 9	60.50 9	60.544	0.035	2.4	0.010	0.000	2.3	1.272	OK
PS8	FEH: 2 years: +0 %: 15 mins: Summer	62.14 0	60.30 3	60.368	0.065	7.4	0.018	0.000	7.0	3.700	OK
PS5	FEH: 2 years: +0 %: 15 mins: Summer	62.05 5	61.25 7	61.309	0.052	3.3	0.008	0.000	3.2	1.571	OK
PS6	FEH: 2 years: +0 %: 15 mins: Summer	62.07 9	61.19 2	61.233	0.041	3.2	0.006	0.000	3.1	1.566	OK
PS12	FEH: 2 years: +0 %: 15 mins: Summer	62.30 3	61.45 3	61.496	0.043	2.6	0.007	0.000	2.5	1.128	OK
PS13	FEH: 2 years: +0 %: 15 mins: Summer	62.21 3	61.28 8	61.341	0.053	3.4	0.008	0.000	3.3	1.521	OK
PS14	FEH: 2 years: +0 %: 15 mins: Summer	62.18 3	61.17 6	61.225	0.049	3.3	0.008	0.000	3.2	1.519	OK
PS15	FEH: 2 years: +0 %: 15 mins: Summer	62.12 0	61.06 4	61.138	0.074	5.5	0.012	0.000	5.3	2.507	OK
PS16	FEH: 2 years: +0 %: 15 mins: Summer	62.09 6	60.97 4	61.046	0.072	5.3	0.011	0.000	5.1	2.503	OK
PS2	FEH: 2 years: +0 %: 15 mins: Summer	62.11 0	61.52 4	61.562	0.038	2.1	0.006	0.000	2.1	0.955	OK
PS1	FEH: 2 years: +0 %: 15 mins: Summer	62.11 4	61.66 4	61.704	0.040	2.2	0.006	0.000	2.1	0.957	OK

Grey Mare Lane: Manchester M11 3DQ	Date: 18/12/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Junctions Summary Storm Phase: Phase	Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA		



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

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
EXCOM1	FEH: 30 years: +0 %: 15 mins: Summer	61.29 4	58.17 0	58.195	0.025	13.0	0.000	0.000	13.0	9.920	OK
PS3	FEH: 30 years: +0 %: 15 mins: Summer	62.11 5	61.36 2	61.485	0.123	7.7	0.020	0.000	6.9	3.470	Surcharged
PS4	FEH: 30 years: +0 %: 15 mins: Summer	62.04 5	61.29 9	61.398	0.099	6.9	0.016	0.000	6.5	3.466	OK
PS7	FEH: 30 years: +0 %: 15 mins: Summer	62.06 2	60.91 9	60.977	0.058	10.7	0.009	0.000	10.6	5.369	OK
PS10	FEH: 30 years: +0 %: 15 mins: Summer	62.23 4	60.15 3	60.312	0.159	23.9	0.045	0.000	23.0	11.834	Surcharged
PS11	FEH: 30 years: +0 %: 15 mins: Summer	62.01 6	60.10 1	60.190	0.089	38.7	0.025	0.000	38.3	24.230	OK
PS17	FEH: 30 years: +0 %: 15 mins: Summer	62.07 9	60.88 0	61.321	0.441	8.8	0.070	0.000	7.4	7.120	Surcharged
PS18	FEH: 30 years: +0 %: 15 mins: Summer	62.01 1	60.74 6	61.151	0.405	7.4	0.064	0.000	7.8	7.113	Surcharged
PS19	FEH: 30 years: +0 %: 30 mins: Summer	61.89 6	60.65 1	60.999	0.348	9.8	0.055	0.000	9.4	12.146	Surcharged
PS20	FEH: 30 years: +0 %: 15 mins: Summer	61.96 0	60.52 4	60.747	0.223	9.3	0.036	0.000	9.5	9.120	Surcharged
PS21	FEH: 30 years: +0 %: 15 mins: Summer	61.98 7	60.42 5	60.513	0.088	11.5	0.014	0.000	11.3	10.444	OK
PS22	FEH: 30 years: +0 %: 15 mins: Summer	62.09 0	60.31 2	60.390	0.078	15.9	0.012	0.000	15.7	12.404	OK
PS23	FEH: 30 years: +0 %: 15 mins: Summer	61.54 7	59.54 8	60.042	0.494	5.0	0.314	0.000	4.5	6.049	Surcharged
PCOM1	FEH: 30 years: +0 %: 15 mins: Summer	61.50 0	59.39 8	59.425	0.028	4.5	0.018	0.000	4.5	5.978	OK
PS9	FEH: 30 years: +0 %: 15 mins: Summer	61.40 9	60.50 9	60.562	0.053	5.6	0.015	0.000	5.4	2.863	OK
PS8	FEH: 30 years: +0 %: 15 mins: Summer	62.14 0	60.30 3	60.413	0.110	16.0	0.031	0.000	15.5	8.217	OK
PS5	FEH: 30 years: +0 %: 15 mins: Summer	62.05 5	61.25 7	61.340	0.083	6.5	0.013	0.000	6.3	3.462	OK
PS6	FEH: 30 years: +0 %: 15 mins: Summer	62.07 9	61.19 2	61.255	0.063	6.3	0.010	0.000	6.3	3.456	OK
PS12	FEH: 30 years: +0 %: 15 mins: Winter	62.30 3	61.45 3	61.546	0.093	5.3	0.015	0.000	4.8	2.466	OK
PS13	FEH: 30 years: +0 %: 15 mins: Summer	62.21 3	61.28 8	61.549	0.261	6.6	0.042	0.000	5.2	3.342	Surcharged

Grey Mare Lane: Manchester M11 3DQ	Date: 18/12/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Junctions Summary Storm Phase: Phase	Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA		



PS14	FEH: 30 years: +0 %: 60 mins: Summer	62.18 3	61.17 6	61.391	0.216	4.3	0.034	0.000	4.2	5.610	Surcharged
PS15	FEH: 30 years: +0 %: 15 mins: Summer	62.12 0	61.06 4	61.476	0.412	8.5	0.066	0.000	6.7	5.507	Surcharged
PS16	FEH: 30 years: +0 %: 15 mins: Summer	62.09 6	60.97 4	61.406	0.432	6.7	0.069	0.000	6.1	5.503	Surcharged
PS2	FEH: 30 years: +0 %: 15 mins: Summer	62.11 0	61.52 4	61.584	0.060	4.7	0.010	0.000	4.6	2.102	OK
PS1	FEH: 30 years: +0 %: 15 mins: Summer	62.11 4	61.66 4	61.729	0.066	4.9	0.010	0.000	4.7	2.106	OK

Grey Mare Lane: Manchester M11 3DQ	Date: 18/12/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Junctions Summary Storm Phase: Phase	Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA		



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

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
EXCOM1	FEH: 100 years: +0 %: 15 mins: Summer	61.29 4	58.17 0	58.195	0.025	15.6	0.000	0.000	15.6	11.051	OK
PS3	FEH: 100 years: +0 %: 15 mins: Summer	62.11 5	61.36 2	61.539	0.177	8.7	0.028	0.000	7.9	4.393	Surcharged
PS4	FEH: 100 years: +0 %: 15 mins: Summer	62.04 5	61.29 9	61.430	0.131	7.9	0.021	0.000	7.5	4.390	Surcharged
PS7	FEH: 100 years: +0 %: 15 mins: Summer	62.06 2	60.91 9	60.985	0.066	12.7	0.010	0.000	12.6	6.808	OK
PS10	FEH: 100 years: +0 %: 15 mins: Summer	62.23 4	60.15 3	60.346	0.193	28.4	0.055	0.000	27.9	15.007	Surcharged
PS11	FEH: 100 years: +0 %: 15 mins: Summer	62.01 6	60.10 1	60.184	0.083	46.3	0.024	0.000	47.5	30.602	OK
PS17	FEH: 100 years: +0 %: 15 mins: Summer	62.07 9	60.88 0	61.483	0.603	9.7	0.096	0.000	8.1	9.001	Surcharged
PS18	FEH: 100 years: +0 %: 30 mins: Summer	62.01 1	60.74 6	61.264	0.518	8.0	0.082	0.000	8.5	12.047	Surcharged
PS19	FEH: 100 years: +0 %: 30 mins: Summer	61.89 6	60.65 1	61.110	0.460	11.1	0.073	0.000	10.5	15.458	Surcharged
PS20	FEH: 100 years: +0 %: 15 mins: Summer	61.96 0	60.52 4	60.806	0.282	10.3	0.045	0.000	10.5	11.528	Surcharged
PS21	FEH: 100 years: +0 %: 15 mins: Summer	61.98 7	60.42 5	60.521	0.096	12.9	0.015	0.000	12.8	13.199	OK
PS22	FEH: 100 years: +0 %: 15 mins: Summer	62.09 0	60.31 2	60.398	0.087	18.5	0.014	0.000	18.4	15.675	OK
PS23	FEH: 100 years: +0 %: 15 mins: Winter	61.54 7	59.54 8	60.179	0.631	5.4	0.401	0.000	4.5	6.198	Surcharged
PCOM1	FEH: 100 years: +0 %: 15 mins: Summer	61.50 0	59.39 8	59.427	0.029	4.5	0.018	0.000	4.6	6.071	OK
PS9	FEH: 100 years: +0 %: 15 mins: Summer	61.40 9	60.50 9	60.569	0.060	7.1	0.017	0.000	6.9	3.637	OK
PS8	FEH: 100 years: +0 %: 15 mins: Summer	62.14 0	60.30 3	60.490	0.187	19.5	0.053	0.000	17.8	10.434	Surcharged
PS5	FEH: 100 years: +0 %: 15 mins: Summer	62.05 5	61.25 7	61.354	0.097	7.5	0.015	0.000	7.1	4.385	OK
PS6	FEH: 100 years: +0 %: 15 mins: Summer	62.07 9	61.19 2	61.260	0.068	7.1	0.011	0.000	7.1	4.380	OK
PS12	FEH: 100 years: +0 %: 15 mins: Summer	62.30 3	61.45 3	61.771	0.318	7.2	0.051	0.000	4.8	3.121	Surcharged
PS13	FEH: 100 years: +0 %: 15 mins: Summer	62.21 3	61.28 8	61.748	0.460	7.3	0.073	0.000	5.2	4.222	Surcharged

Grey Mare Lane: Manchester M11 3DQ	Date: 18/12/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Junctions Summary Storm Phase: Phase	Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA		



PS14	FEH: 100 years: +0 %: 15 mins: Summer	62.18 3	61.17 6	61.710	0.534	5.2	0.085	0.000	4.3	4.219	Surcharged
PS15	FEH: 100 years: +0 %: 15 mins: Summer	62.12 0	61.06 4	61.662	0.598	9.4	0.095	0.000	7.1	6.963	Surcharged
PS16	FEH: 100 years: +0 %: 15 mins: Summer	62.09 6	60.97 4	61.579	0.605	7.1	0.096	0.000	6.6	6.957	Surcharged
PS2	FEH: 100 years: +0 %: 15 mins: Summer	62.11 0	61.52 4	61.624	0.100	6.0	0.016	0.000	4.7	2.659	OK
PS1	FEH: 100 years: +0 %: 15 mins: Summer	62.11 4	61.66 4	61.742	0.078	6.1	0.012	0.000	6.0	2.664	OK

Grey Mare Lane: Manchester M11 3DQ	Date: 18/12/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Junctions Summary Storm Phase: Phase	Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA		



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

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
EXCOM1	FEH: 100 years: +45 %: 15 mins: Summer	61.294	58.170	58.193	0.023	21.0	0.000	0.000	21.1	13.008	OK
PS3	FEH: 100 years: +45 %: 15 mins: Summer	62.115	61.362	61.682	0.320	10.8	0.051	0.000	9.3	6.371	Surcharged
PS4	FEH: 100 years: +45 %: 30 mins: Summer	62.045	61.299	61.514	0.215	8.8	0.034	0.000	8.6	8.520	Surcharged
PS7	FEH: 100 years: +45 %: 15 mins: Summer	62.062	60.919	61.115	0.196	15.3	0.031	0.000	12.9	9.872	Surcharged
PS10	FEH: 100 years: +45 %: 15 mins: Summer	62.234	60.153	60.545	0.392	33.9	0.111	0.000	32.1	21.099	Surcharged
PS11	FEH: 100 years: +45 %: 15 mins: Summer	62.016	60.101	60.468	0.367	55.9	0.104	0.000	55.8	42.334	Surcharged
PS17	FEH: 100 years: +45 %: 15 mins: Summer	62.079	60.880	61.845	0.965	11.7	0.153	0.000	9.7	12.776	Flood Risk
PS18	FEH: 100 years: +45 %: 15 mins: Summer	62.011	60.746	61.587	0.841	9.7	0.134	0.000	10.0	12.560	Surcharged
PS19	FEH: 100 years: +45 %: 30 mins: Summer	61.896	60.651	61.431	0.780	13.7	0.124	0.000	12.6	22.467	Surcharged
PS20	FEH: 100 years: +45 %: 15 mins: Summer	61.960	60.524	60.933	0.410	12.5	0.065	0.000	12.8	15.896	Surcharged
PS21	FEH: 100 years: +45 %: 15 mins: Summer	61.987	60.425	60.538	0.113	15.9	0.018	0.000	15.7	18.257	OK
PS22	FEH: 100 years: +45 %: 15 mins: Summer	62.090	60.312	60.481	0.169	24.0	0.027	0.000	23.8	21.664	Surcharged
PS23	FEH: 100 years: +45 %: 120 mins: Winter	61.547	59.548	61.287	1.739	5.4	1.106	0.000	5.0	56.411	Flood Risk
PCOM1	FEH: 100 years: +45 %: 120 mins: Winter	61.500	59.398	59.426	0.028	5.0	0.018	0.000	5.0	56.347	OK
PS9	FEH: 100 years: +45 %: 15 mins: Summer	61.409	60.509	60.741	0.232	10.5	0.066	0.000	7.9	5.321	Surcharged
PS8	FEH: 100 years: +45 %: 15 mins: Summer	62.140	60.303	60.700	0.397	20.8	0.112	0.000	19.0	14.838	Surcharged
PS5	FEH: 100 years: +45 %: 15 mins: Summer	62.055	61.257	61.501	0.244	8.3	0.039	0.000	8.7	6.363	Surcharged
PS6	FEH: 100 years: +45 %: 15 mins: Summer	62.079	61.192	61.365	0.173	8.7	0.027	0.000	9.4	6.358	Surcharged
PS12	FEH: 100 years: +45 %: 15 mins: Summer	62.303	61.453	62.232	0.779	10.4	0.124	0.000	6.1	4.527	Flood Risk

Grey Mare Lane: Manchester M11 3DQ		Date: 18/12/2024			
		Designed by: MB	Checked by: TC	Approved By: TC	
Report Details: Type: Junctions Summary Storm Phase: Phase		Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA			

PS13	FEH: 100 years: +45 %: 15 mins: Summer	62.21 3	61.28 8	62.195	0.907	9.8	0.144	0.000	6.0	6.116	Flood Risk
PS14	FEH: 100 years: +45 %: 15 mins: Summer	62.18 3	61.17 6	62.141	0.965	6.0	0.153	0.000	5.1	6.105	Flood Risk
PS15	FEH: 100 years: +45 %: 30 mins: Summer	62.12 0	61.06 4	62.094	1.030	9.9	0.164	0.000	8.1	13.537	Flood Risk
PS16	FEH: 100 years: +45 %: 15 mins: Summer	62.09 6	60.97 4	61.967	0.993	8.1	0.158	0.000	7.8	9.968	Flood Risk
PS2	FEH: 100 years: +45 %: 30 mins: Summer	62.11 0	61.52 4	61.755	0.231	5.8	0.037	0.000	5.2	5.152	Surcharged
PS1	FEH: 100 years: +45 %: 15 mins: Summer	62.11 4	61.66 4	61.887	0.223	8.9	0.035	0.000	6.6	3.862	Flood Risk

Grey Mare Lane: Manchester M11 3DQ	Date: 18/12/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA		



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

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Total Lost Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH: 2 years: +0 %: 120 mins: Summer	59.831	59.831	0.258	0.258	11.4	10.312	0.000	0.000	4.4	24.148	78.794	OK
Porous Paving (1)	FEH: 2 years: +0 %: 1440 mins: Summer	61.127	60.935	0.070	0.006	0.1	0.954	0.000	0.000	0.0	2.198	81.824	OK
Porous Paving	FEH: 2 years: +0 %: 1440 mins: Summer	61.160	60.932	0.074	0.006	0.1	1.406	0.000	0.000	0.1	2.850	80.469	OK

Grey Mare Lane: Manchester M11 3DQ	Date: 18/12/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA		



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

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Total Lost Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH: 30 years: +0 %: 60 mins: Winter	60.270	60.270	0.697	0.697	24.5	27.792	0.000	0.000	5.1	27.546	42.844	OK
Porous Paving (1)	FEH: 30 years: +0 %: 960 mins: Summer	61.185	60.939	0.128	0.010	0.3	1.607	0.000	0.000	0.1	3.307	69.384	OK
Porous Paving	FEH: 30 years: +0 %: 1440 mins: Summer	61.224	60.936	0.138	0.010	0.3	2.411	0.000	0.000	0.1	5.276	66.512	OK

Grey Mare Lane: Manchester M11 3DQ	Date: 18/12/2024		
	Designed by: MB	Checked by: TC	Approved By: TC
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA		



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

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Total Lost Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH: 100 years: +0 %: 60 mins: Winter	60.523	60.523	0.950	0.950	30.1	37.905	0.000	0.000	5.2	25.875	22.047	OK
Porous Paving (1)	FEH: 100 years: +0 %: 960 mins: Summer	61.222	60.941	0.166	0.012	0.3	2.021	0.000	0.000	0.1	4.366	61.495	OK
Porous Paving	FEH: 100 years: +0 %: 1440 mins: Summer	61.265	60.938	0.179	0.012	0.3	3.038	0.000	0.000	0.2	6.922	57.793	OK

Grey Mare Lane: Manchester M11 3DQ		Date: 18/12/2024			
		Designed by: MB	Checked by: TC		Approved By: TC
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Sutcliffe: 18-20 Harrington Street Liverpool L2 9QA			



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

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Total Lost Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH: 100 years: +45 %: 120 mins: Winter	61.290	61.290	1.717	1.717	26.1	48.386	0.000	0.000	5.4	57.410	0.492	OK
Porous Paving (1)	FEH: 100 years: +45 %: 240 mins: Summer	61.270	61.040	0.214	0.111	1.2	3.142	0.000	0.000	0.4	3.043	40.141	OK
Porous Paving	FEH: 100 years: +45 %: 240 mins: Summer	61.309	61.029	0.223	0.103	1.7	4.401	0.000	0.000	0.6	3.730	38.870	OK