



SWF CONSULTING
CONSULTING CIVIL & STRUCTURAL ENGINEERS

**New Brick Workshop,
Wythenshawe Campus,
Manchester College**

Drainage Strategy Report

Date: August 2025

9530-SWF-XX-XX-TR-S-0201

S1: Issued for Information

Version: P01

Classification: PM_40_20



Report Details

Report Title	Drainage Strategy Report
Report Reference	9530-SWF-XX-XX-TR-S-0201
Client	The Manchester College
Author	Phil S Sarbutts
Approval by	Phil S Sarbutts

Revision History

Version	Date	Suitability	Revision
P01	01/09/2025	S1: Issued for Information	Issued For Information

This document has been prepared for the titled project (or named part thereof) and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and prior written authorisation being obtained from SWF Consulting. SWF Consulting accepts no responsibility or liability for the consequences of the use of this document, wholly or in part, for any other purpose than that for which it was commissioned. Any persons so using or relying upon this document for such other purpose do so at their own risk.

This document has been prepared for the sole use of the Client and shall not be relied upon or transferred to any other party without express written authorisation of SWF Consulting. It may contain material subject to copyright or subject to licence; unauthorised copying of this report will be in breach of copyright/licence.



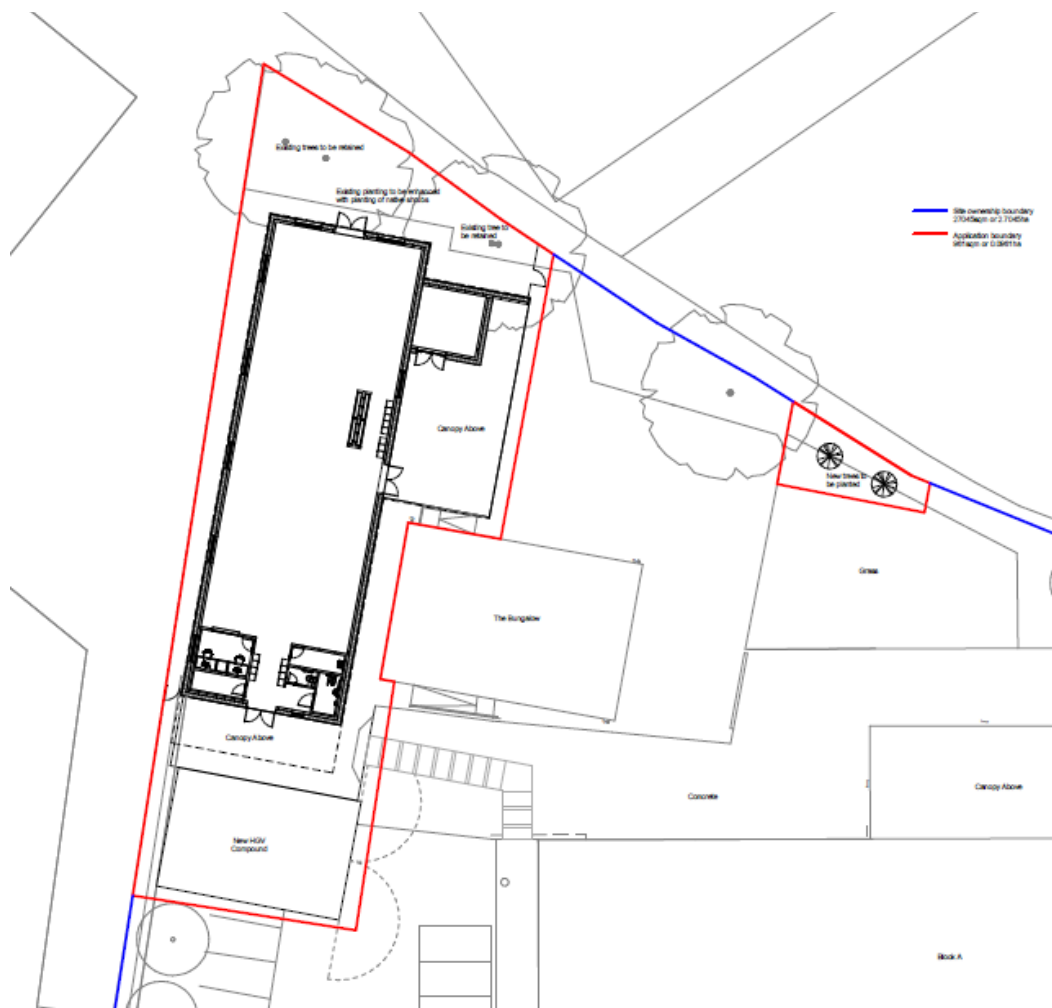
Contents

1.	Development Details.....	1
2.	Flood Zone Classification	2
3.	Climate Change Allowance	3
4.	Existing Drainage Details.....	4
4.1.	Surface Water Drainage	4
4.2.	Foul Water Drainage.....	5
5.	Proposed Drainage Details.....	6
5.1.	Surface Water Drainage	6
5.2.	SuDS Measures	7
5.3.	Foul Water Drainage.....	7
6.	Exceedance	8
7.	Future Maintenance	9
7.1.	Surface Water	9
7.2.	Foul Water	9
7.3.	Responsible Person	9
Appendix A	Existing Site Plan	10
Appendix B	Proposed Site Plan	12
Appendix C	Sewer Records	14
Appendix D	Existing Drainage & GPR Survey.....	16
Appendix E	Greenfield Run Off Calculation	19
Appendix F	Rainfall Intensity Calculations.....	21
Appendix G	Storage Estimates	23
Appendix H	Ground Investigation Findings	26
Appendix I	Proposed Schematic Drainage Layout	36
Appendix J	Maintenance Recommendations.....	38



1. Development Details

- 1.1. The development site is the Wythenshawe campus of the Manchester College, Brownley Road, Wythenshawe.
- 1.2. The postcode for the site is M22 9UH with the approximate National Grid Reference being 382796E, 387758N.
- 1.3. The northern boundary of the site is formed with the SS John Fisher & Thomas More Catholic Primary School with the western boundary against derelict flats. The southern boundary is formed by part of the car parking arrangements off Walney Road with the eastern side against the existing buildings.
- 1.4. The proposal for the development will see the demolition of the existing polytunnel building and brick workshop to build a more suitable single storey building in their place.
- 1.5. The building is likely to be a small portal framed structure with a metal clad envelope.
- 1.6. Details of the existing site layout can be found in Appendix A at the rear of this report.
- 1.7. Details of the proposed development can be found in Appendix B with an extract reproduced below.

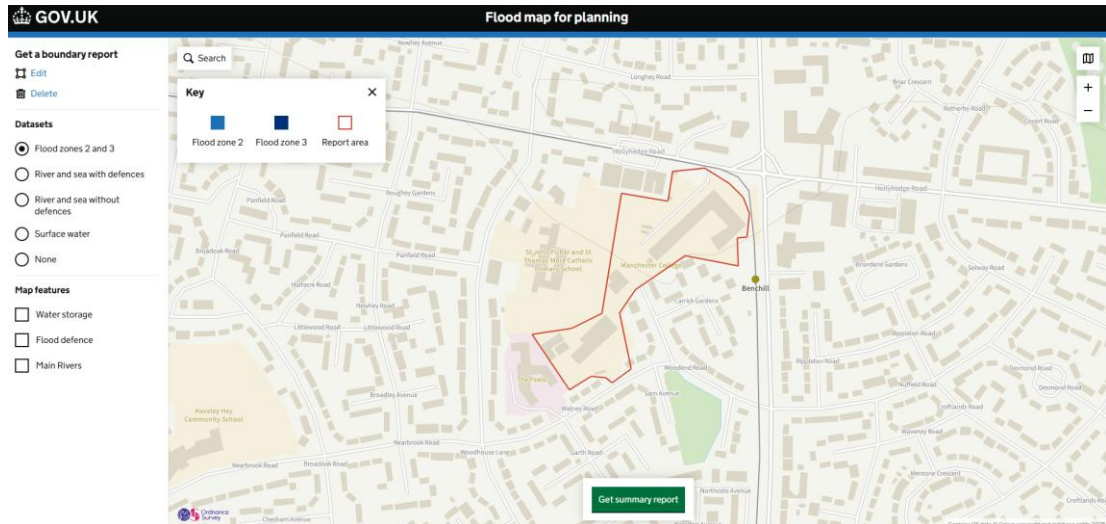


- 1.8. The blue line on the drawing indicates the site ownership boundary with the red line being the planning application boundary.



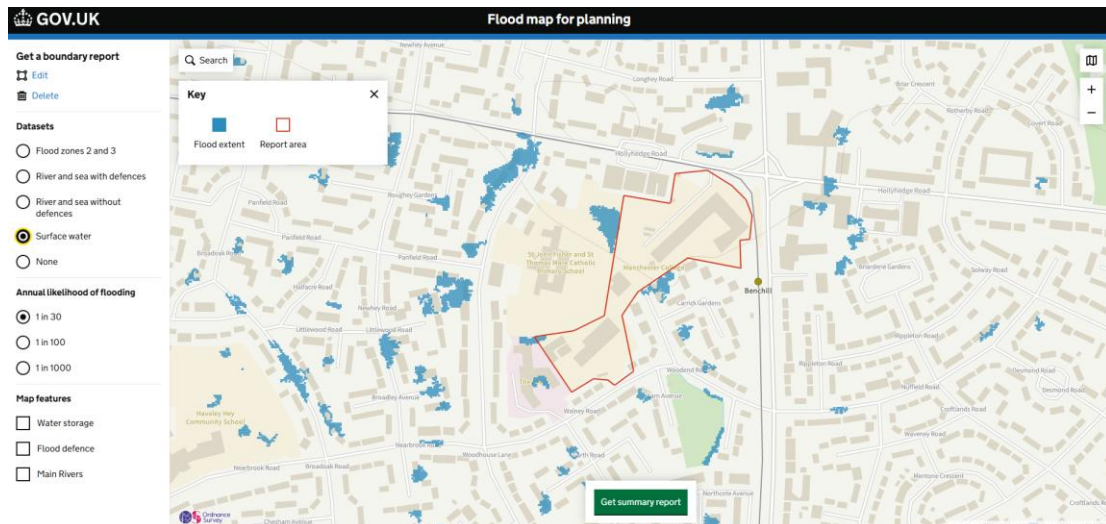
2. Flood Zone Classification

- 2.1. Environment Agency maps have been consulted online and these show the site to be in Flood Zone 1.



- 2.2. Therefore, the site has a low probability of flooding having a less than 1 in 1000 annual probability of river or sea flooding.

- 2.3. The online mapping also indicates that the site is within an area at very low risk of surface water flooding up to the 2060's.



- 2.4. Flooding from groundwater is unlikely in the area according to the long-term flood risk data available online.

- 2.5. Reservoir flooding is also unlikely according to this same dataset.

Other flood risks [More about groundwater and reservoirs](#)

Groundwater

Flooding from groundwater is unlikely in this area.

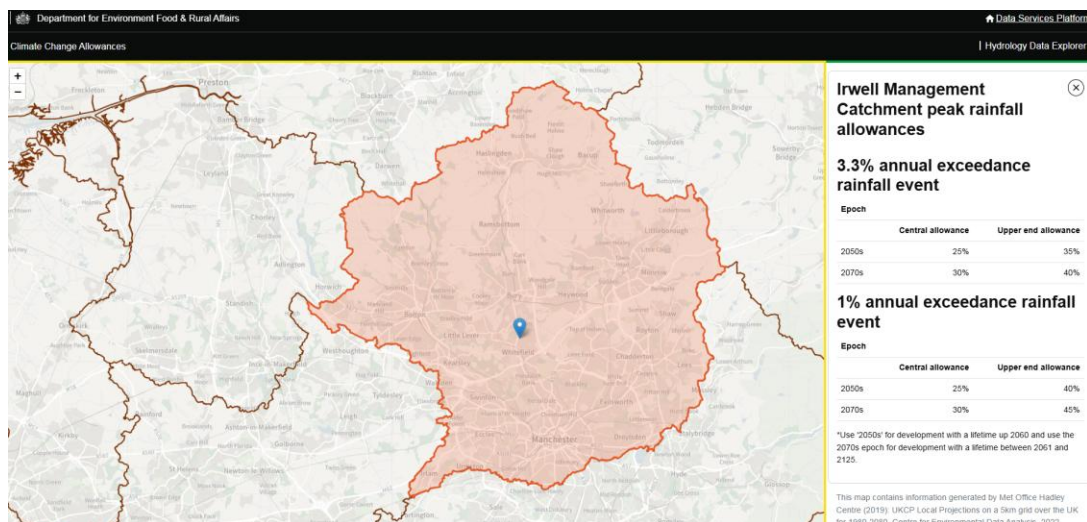
Reservoirs

Flooding from reservoirs is unlikely in this area.



3. Climate Change Allowance

- 3.1. The current guidance indicates that the change in the UK climate could result in significant changes to storm profiles and intensities and therefore an allowance should be made for this within the designs.
- 3.2. The current EA advice can be obtained from the government website. Climate change allowances for peak rainfall intensity are therefore considered on the basis of the river basin catchment area and the design life of the proposed development.
- 3.3. Given the lifetime of the development is expected to be 50 years the peak rainfall intensities can be obtained using the upper end allowances within the EA guidance.
- 3.4. Mapping shows the site to be in the Irwell Management catchment with the information indicated below.



- 3.5. Given the information on the EA website, a climate change allowance of 45% will be taken within the design, representing the upper end allowance for the 1% annual exceedance rainfall event (100YR event). A 35% allowance shall be considered for the 3.3% event (30YR event).
- 3.6. In addition, the requirements of the Building Regulations will be met in that no surface flooding will be accepted for the 1 in 30-year storm event and no surface water shall escape the site boundary for the 100-year event.



4. Existing Drainage Details

4.1. Surface Water Drainage

- 4.1.1. Details of the existing site drainage can be found in Appendix D with a detailed extract within the same appendix.
- 4.1.2. Details of drainage survey suggest a separate foul and surface water network serves the site.
- 4.1.3. Surface water is taken either straight to the ground, in an uncontrolled manner, from some rainwater pipes to the rear of the existing brick workshop or entering the network from rainwater pipes and channel drainage.
- 4.1.4. Surface water entering the network is controlled by a Hydrobrake within manhole S10 before entering the apparent watercourse under Woodend Road, via manhole S12.
- 4.1.5. Upstream of manhole S10 is an attenuation tank although the CCTV has not recorded the type of attenuation, i.e. geo-cellular tank or oversized pipe.
- 4.1.6. Surface water drainage to the existing yard area, between the bungalow building and the demolished brick workshop and polytunnel buildings have been directed into the combined drainage network.
- 4.1.7. The red line boundary to the development covers 923m² of which, in the existing situation, 310m² is soft landscaping.
- 4.1.8. Given some drainage is taken directly to the soft landscaping (233m²), the actual drained area for the site is 380m² with most of this area being taken into the foul/ combined drainage.
- 4.1.9. QBAR for the site has been determined as 0.5l/s, as shown within Appendix E, using InfoDrainage design software.
- 4.1.10. Researching on the Manchester City Council planning portal shows the original college discharge from the site was to be limited to 11.2l/s as described in the Flood Risk Assessment that accompanied the application for the site with an extract shown below.

5.2.3 Proposed Drainage Strategy

Calculations indicate that greenfield runoff from this site during a 50% annual probability rainfall event would be 11.2l/s (Appendix 2). The 1% annual probability post development site runoff not exceed this (including the 20% allowance for climate change)

The current site has approximately 11% impermeable area, whereas the new development is proposed to have approximately 85%. If the proposed development makes no use of infiltration systems, the attenuation volume required would be 1826m³. However, with the use of permeable paving, as is currently proposed, the impermeable area would be reduced to only approximately 20% of the site. This would require a much reduced attenuation volume of 337m³. This is based on storm water runoff estimates being modelled using the rational method for a range of different storm durations (Appendix 3).

It is recommended that attenuated runoff water from the site is discharged to the culverted Baguley Brook tributary in preference to the sewers located around the site, in line with EA guidance. Permission will need to be sought from the EA for this discharge. There may be scope for negotiation of the runoff rates with the EA, although this has not been undertaken as part of this assessment.

- 4.1.11. Discharge from the site, based on calculated rainfall intensities for a 15-minute storm have been calculated within Appendix F, using MicroDrainage software and reproduce in the table below:

Storm (15-minute duration)	rainfall intensity (mm/hr)	drained area (m ²)	discharge (l/s)
----------------------------	----------------------------	--------------------------------	-----------------



2 year	34.969	380	3.69
30 year	66.113	380	6.98
100 year	85.378	380	9.01
100 year + 30%CC	110.991	380	11.72

- 4.1.12. This discharge is currently taken to the combined water network and will be removed from this network as part of the development.

4.2. Foul Water Drainage

- 4.2.1. The drainage survey work has proven a 150mm foul water drain served the demolished brick workshop building with a separate 100mm foul drain serving the bungalow building.
- 4.2.2. Both pipes combine within manhole F2 before continuing as a 150mm pipe to manhole F4 where the pipe diameter changes to 225mm and would appear to be adopted.
- 4.2.3. Sewer records show this 225mm pipe is a combined sewer passing through the site and entering the wider network within Walney Road.



5. Proposed Drainage Details

5.1. Surface Water Drainage

5.1.1. Under the hierarchical approach from within the National Planning Practice Guidance, discharge of surface water should be considered in the following order:

- i. Infiltration
- ii. Surface water body (river/ watercourse etc)
- iii. surface water sewer or highway drain
- iv. combined sewer

5.1.2. The existing surface water drainage network discharges to a watercourse and this is expected to be the main point of connection for the new drainage.

5.1.3. Given the proximity of trees to the proposed building it will be difficult to install any soakaways to the northern gable end despite this area currently serving the rainwater goods.

5.1.4. The new building location is closer to the trees making the use of any form of SuDS in this area difficult to construct.

5.1.5. As part of the geo-environmental investigations some trial holes were tested to determine an infiltration rate on the site. Whilst these were not located directly in the proposed tank location, they showed the ground was unsuitable for infiltration techniques.

5.1.6. However, window sample locations, more in line with the proposed building location, show dense sands may be present around 2.0m below ground. Therefore, infiltration may be viable and should be explored further once the demolition works have been completed on the site.

5.1.7. Preliminary ground investigation logs, together with the soakaway testing data, can be found within Appendix H.

5.1.8. A geo-cellular tank is expected to be required to assist with any attenuation measures although consideration is to be given to the location given the possibility of sand measures.

5.1.9. The proposed development area is 923m² and considering this for a storage volume would give the following volumes presuming no infiltration and a 2l/s discharge rate:

2 YR	30 YR	30 YR + 35% CC	100 YR	100 YR + 45% CC
5 to 10 m ³	14 to 23 m ³	22 to 35 m ³	21 to 33 m ³	36 to 54 m ³

5.1.10. The full results are available within Appendix G.

5.1.11. The 2l/s discharge is to be controlled by a flow control device, such as a Hydrobrake, and then discharge into the existing surface water network, removing the flow from the foul/ combined system.

5.1.12. Should infiltration techniques be possible, suggested by the sand-based measures in some of the window samples, then this method will be used.

5.1.13. Using a modest infiltration rate of 3×10^{-5} m/s, based on a well graded sand, soakaway volumes have been estimated using InfoDrainage software.

5.1.14. This software has returned the following storage volumes for the community centre roof run off with the full results available within Appendix G:

2 YR	30 YR	30 YR + 35% CC	100 YR	100 YR + 45% CC
5 to 14 m ³	10 to 26 m ³	14 to 36 m ³	14 to 34 m ³	20 to 50 m ³

5.1.15. Indicative details of the proposed drainage can be found within Appendix I although this will be subject to final designs.



5.2. SuDS Measures

- 5.2.1. There will be a requirement to introduce sustainable urban drainage where appropriate on the scheme as part of the planning requirements.
- 5.2.2. As discussed in the previous section there is limited space around the building to introduce surface features such as ditches and swales.
- 5.2.3. It is hoped that infiltration techniques can be utilised in the form of soakway via geo-cellular storage.
- 5.2.4. Above ground rainwater gardens, such as the SuDSPod (<https://greenblue.com/>) by GreenBlue may be achievable to some areas but there is insufficient space between the bungalow and proposed building to allow safe egress.
- 5.2.5. Consideration should be given to use of these rainwater gardens to the gable end close to the existing trees and possibly to the front entrance.
- 5.2.6. Permeable paving is unlikely to be appropriate within the external areas given the space is used for brickwork and there would be a high risk of mortar spillage blocking drainage routes. A concrete yard area is therefore envisaged.

5.3. Foul Water Drainage

- 5.3.1. The proposed workshop building is to house a toilet, disabled toilet and wash troughs for the students to use during lessons.
- 5.3.2. It is therefore expected that foul water drainage will be able to connect to the existing foul drainage network on the site.
- 5.3.3. Discharge is to be domestic in nature and will not require trade effluent consents.



6. Exceedance

- 6.1. The surface water network is to be designed such that all storm events, up to and including the 100 Yr event, shall be stored below ground within the attenuation system.
- 6.2. Exceedance events will therefore see surface water for greater storms appear on the surface and this must be considered to ensure no increased risk from the development proposals to neighbouring properties.
- 6.3. Reviewing the topographic survey shows that the site generally rises towards the northern and western boundaries and therefore exceedance flooding is unlikely to escape site via this route.
- 6.4. Surface flooding to the south of the site is likely to be held within the car park and access road given the apparent ground levels in the area.
- 6.5. Any exceedance route to the east is expected to have to travel a significant distance to leave the site and would be constrained by the existing kerbing to the access road to prevent flood water leaving the site.



7. Future Maintenance

7.1. Surface Water

- 7.1.1. The surface water drainage network should be treated like any other gravity-based drainage system.
- 7.1.2. As part of the maintenance, it is recommended that gullies or channel drains are cleared of silt build up on an annual basis to prevent the build-up of silts within the below ground drainage network.
- 7.1.3. As with any drainage system it is recommended that jet clearing of the system is undertaken on a 5 yearly basis. This should check for defects in the pipework and allow for the removal of any debris.
- 7.1.4. The soakaway systems should be installed in line with manufacturers detailed recommendations with allowances made for cleaning/ inspection points.
- 7.1.5. Other recommendations are contained within Appendix J.

7.2. Foul Water

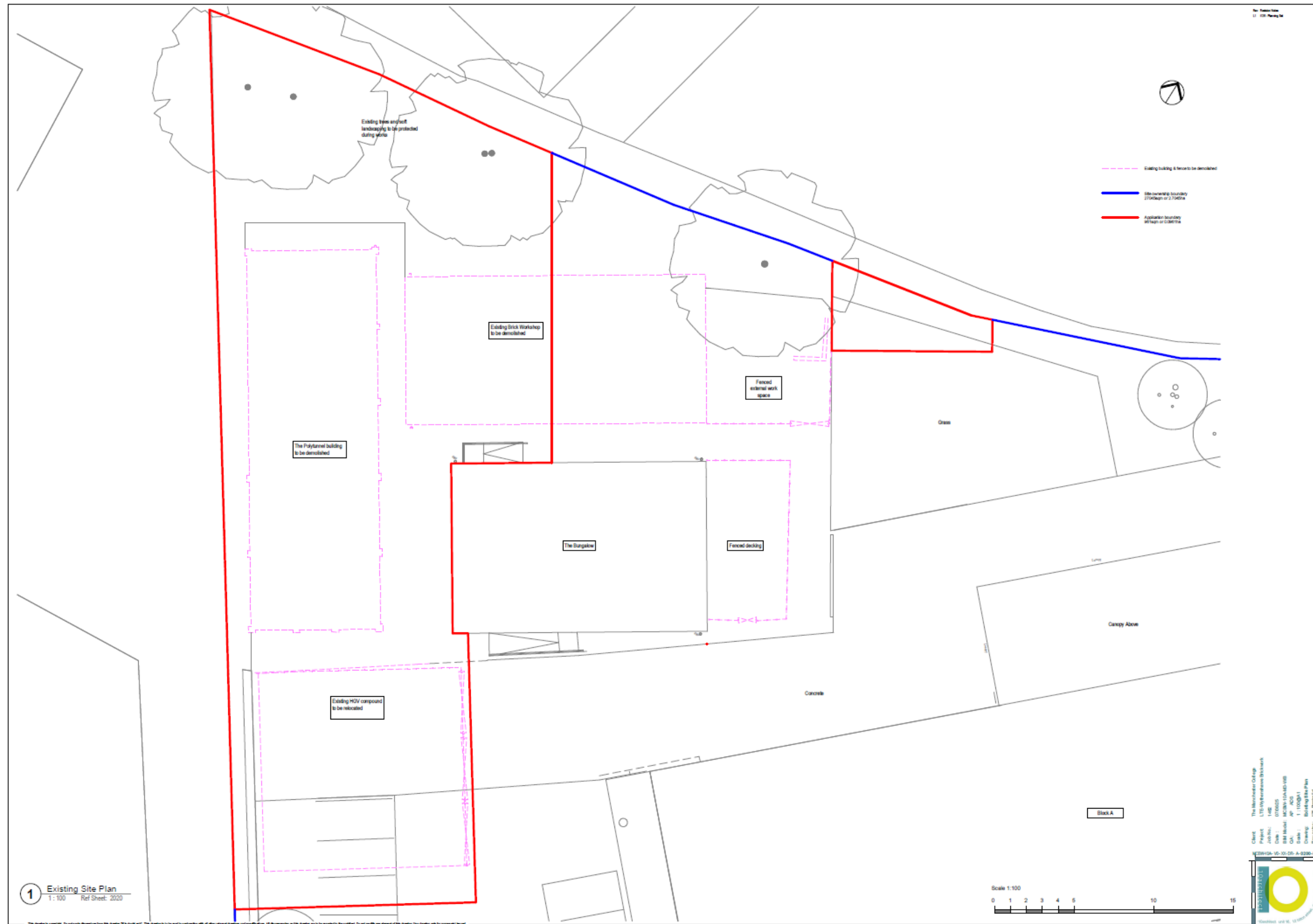
- 7.2.1. The foul water installation is also a gravity-based system and therefore is subject to a similar inspection regime.
- 7.2.2. It is recommended that the system is cleaned on a 5-yearly basis which checks for pipe defects and allows for removal of any blockages.

7.3. Responsible Person

- 7.3.1. At the time of writing this report it is not known who will be responsible for the maintenance of the drainage system although it is likely to be a member of staff of the estates team based on site.

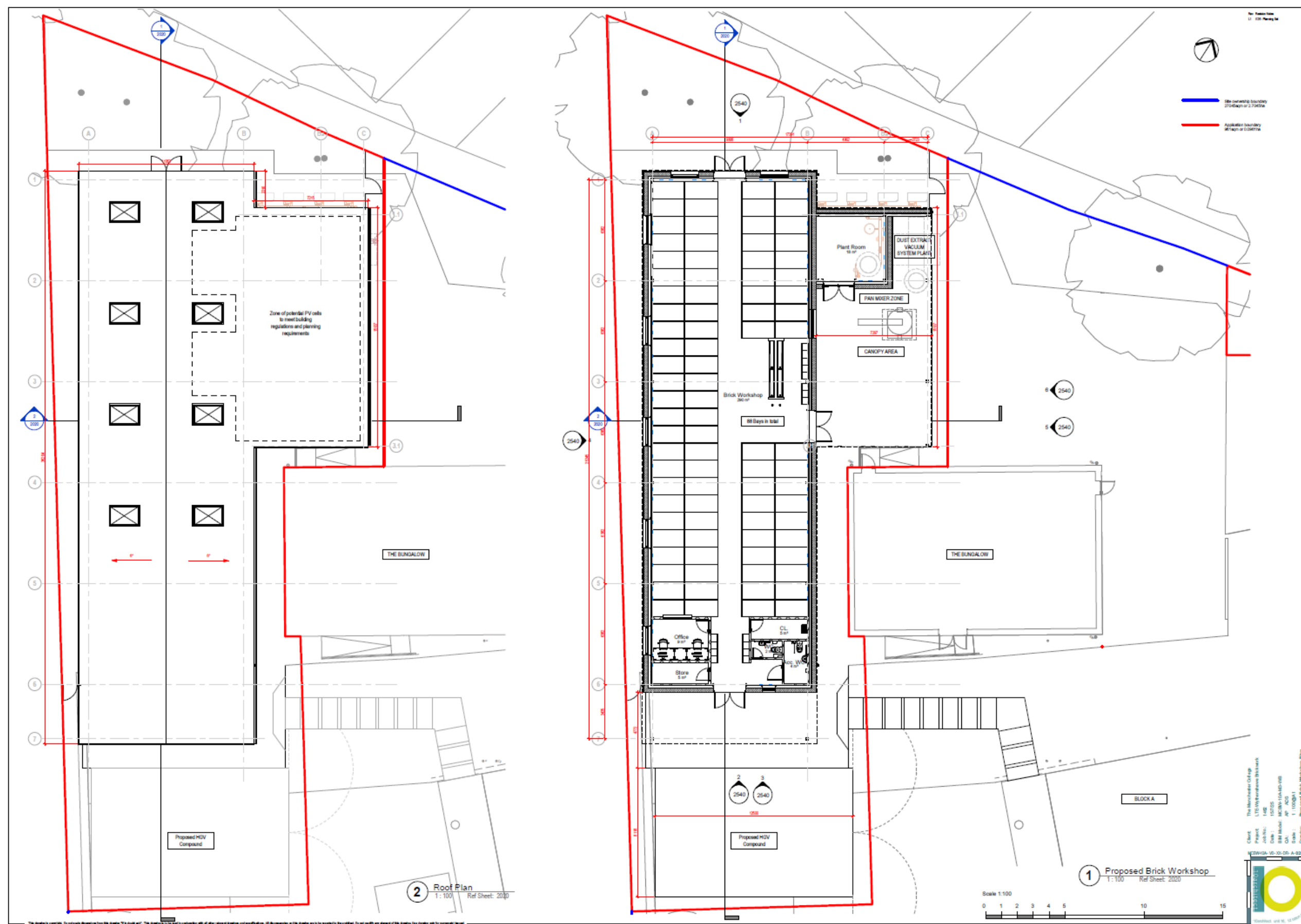


Appendix A Existing Site Plan



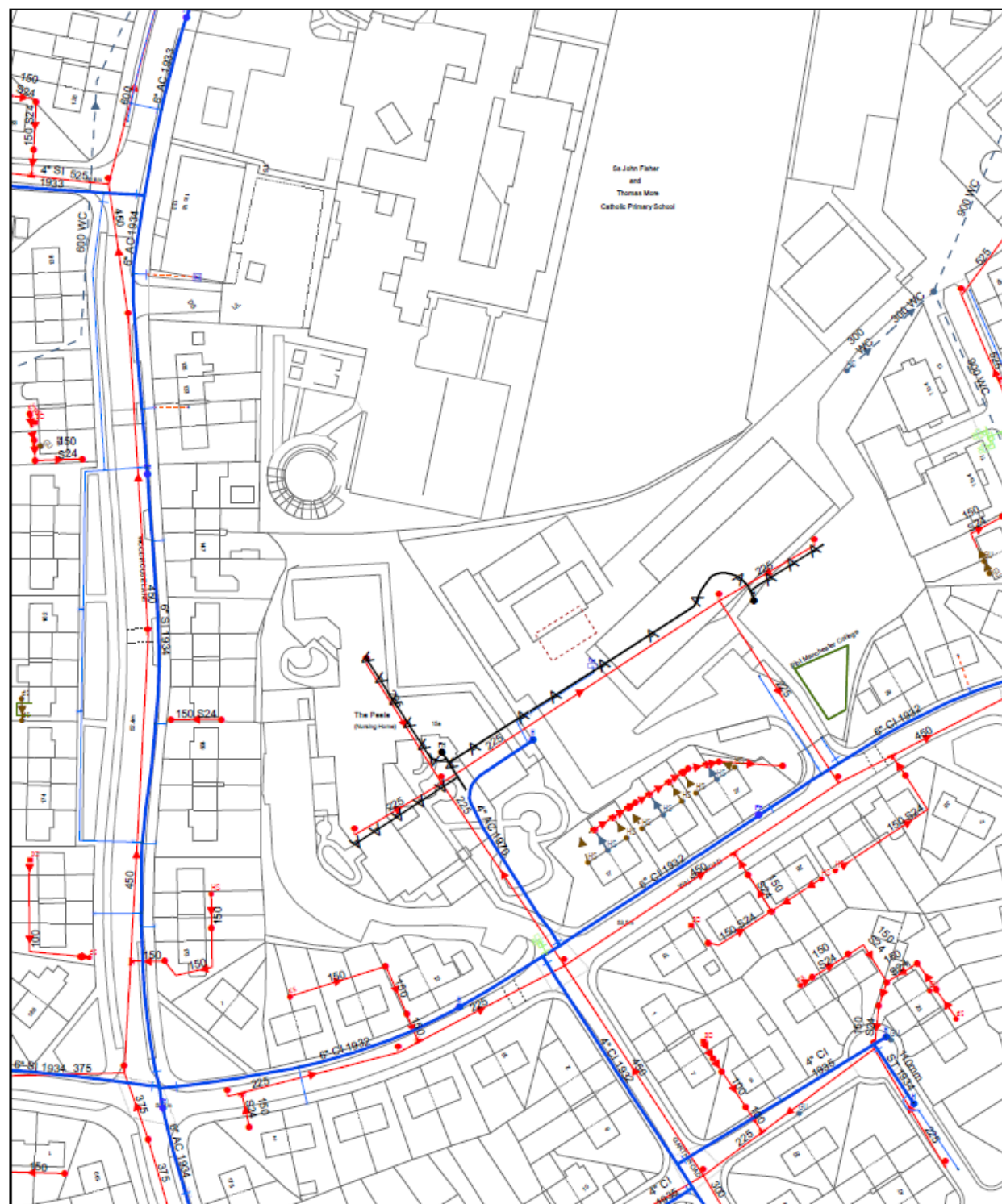


Appendix B Proposed Site Plan





Appendix C Sewer Records



Wastewater Symbolology

Abandoned	Foul	Surface Water	Combined	
---	---	---	---	Public Sewer
---	---	---	---	Private Sewer
---	---	---	---	Section 104
---	---	---	---	Rising Main
---	---	---	---	Sludge Main
---	---	---	---	Overflow
---	---	---	---	Water Course
---	---	---	---	Highway Drain

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

• Manhole	• Side Entry Manhole
• Head of System	• Outfall
• Extent of Survey	• Screen Chamber
• Rodding Eye	• Inspection Chamber
• Inlet	• Bifurcation Chamber
• Discharge Point	• Lamp Hole
• Vortex	• T Junction / Saddle
• Penstock	• Catchpit
• Washout Chamber	• Valve Chamber
• Valve	• Vent Column
• Air Valve	• Vortex Chamber
• Non Return Valve	• Penstock Chamber
• Soakaway	• Network Storage Tank
• Gully	• Sewer Overflow
• Cascade	• Ww Treatment Works
• Flow Meter	• Ww Pumping Station
• Hatch Box	• Septic Tank
• Oil Interceptor	• Control Kiosk
• Summit	• DNM Network Monitoring Point
• Drop Shaft	• Change of Characteristic
• Orifice Plate	

Date: 25/07/2025 Extract from maps of public sewers and water mains

Printed By:
Property Searches

Site Off Brownley Road Manchester

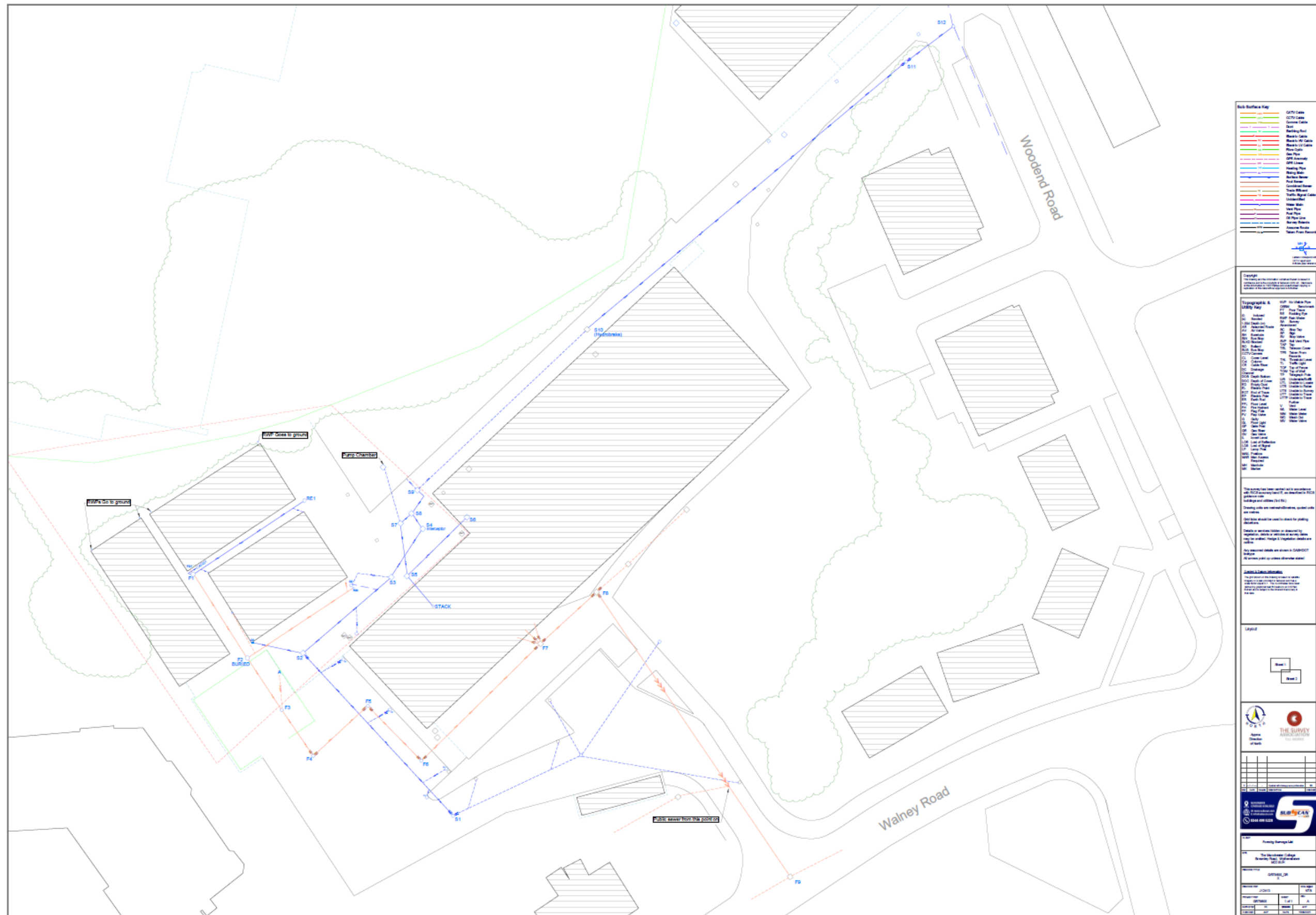


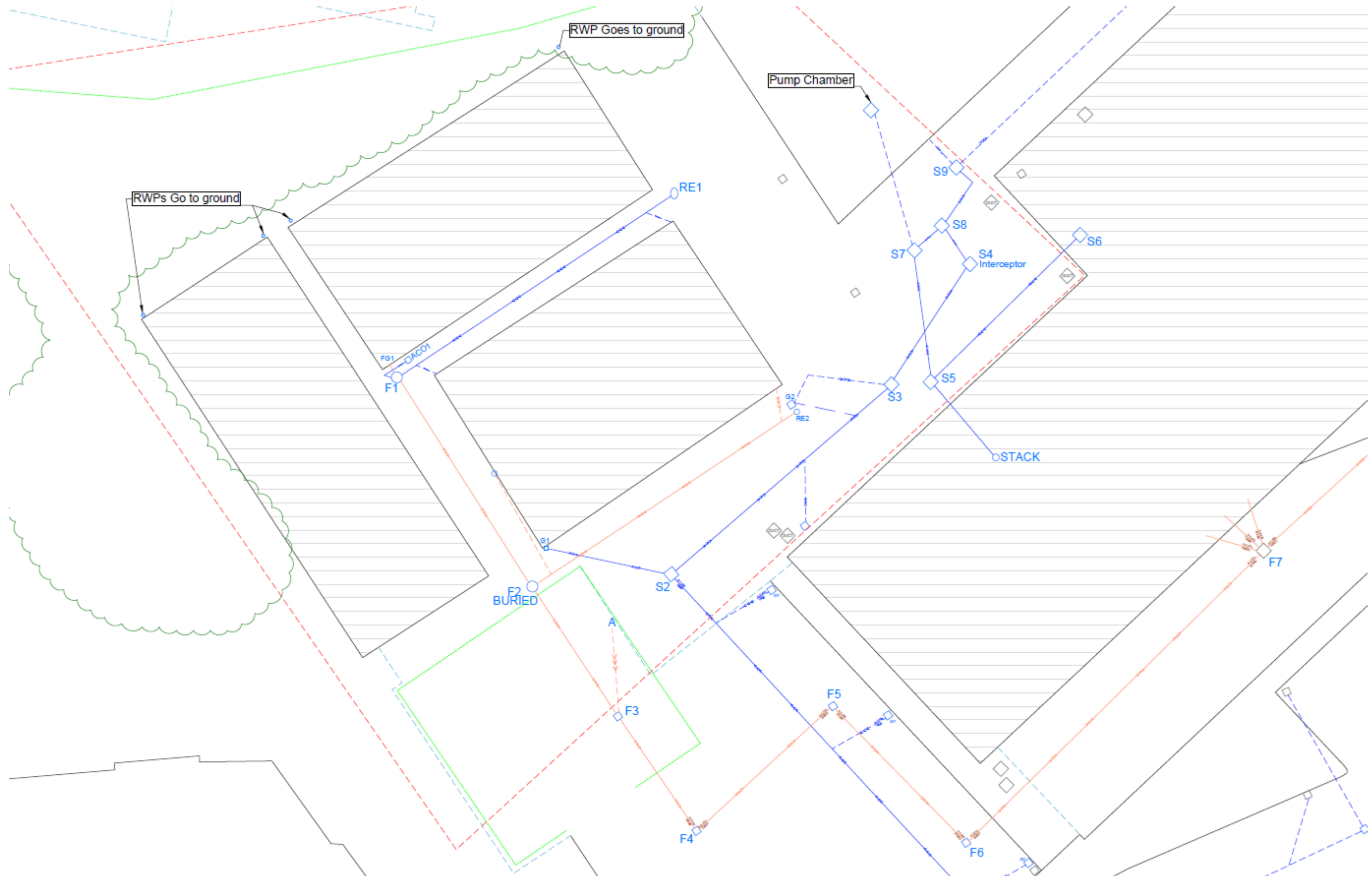
The position of underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private pipes, sewers or drains may not be recorded. United Utilities Water PLC will not accept any liability for any damage caused by the actual positions being different from those shown.

© United Utilities Water PLC 2025. The plan is based upon the Ordnance Survey Map with the sanction of the Controller of H.M. Stationery Office, Crown copyright 0000813445 and United Utilities Water PLC copyrights are reserved. Unauthorised reproduction will infringe these copyrights.



Appendix D Existing Drainage & GPR Survey







Appendix E Greenfield Run Off Calculation



UK and Ireland Rural Runoff Calculator

ICP SUDS / IH 124

ADAS 345

FEH

ReFH2

Greenfield Volume

Method

☒ ICP SUDS ☐ IH 124

Area (ha)

0.093

SAAR (mm)

800.0

Map

Soil

0.470

Region

Region 10

...

Additional Options

Urban

0.000

Return Period (years)

0

Growth Curve

(None)



Calculate

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 10	0.5	0.5	0.5	0.9	1.1

OK

Cancel

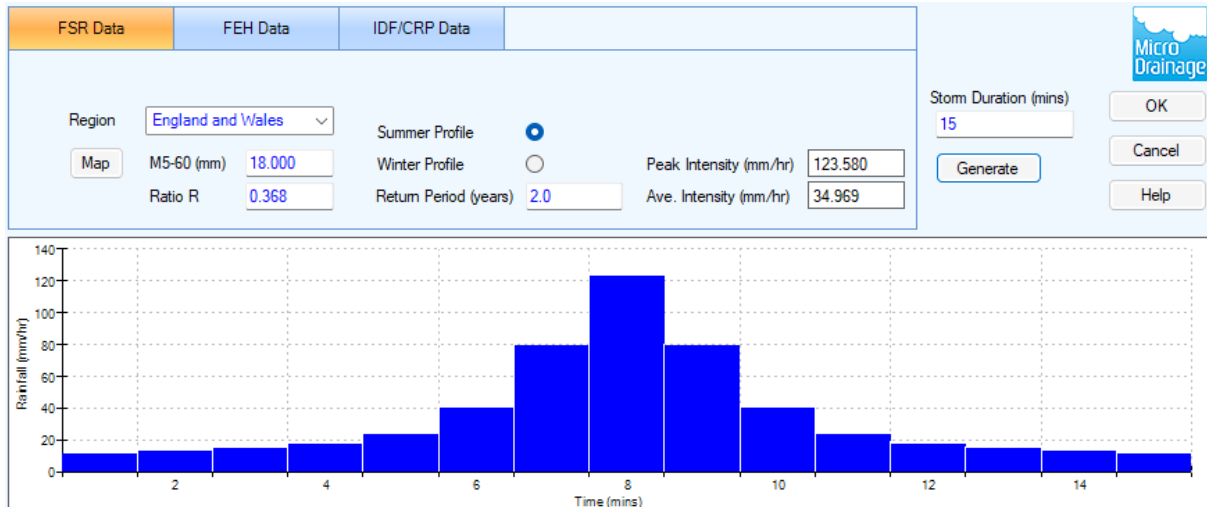
 Help



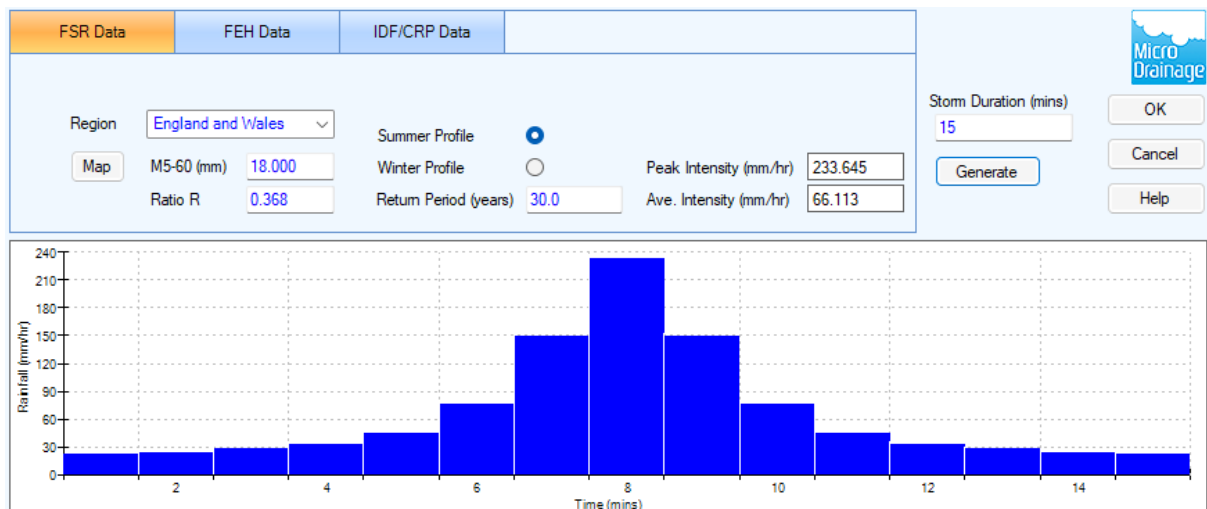
Appendix F Rainfall Intensity Calculations



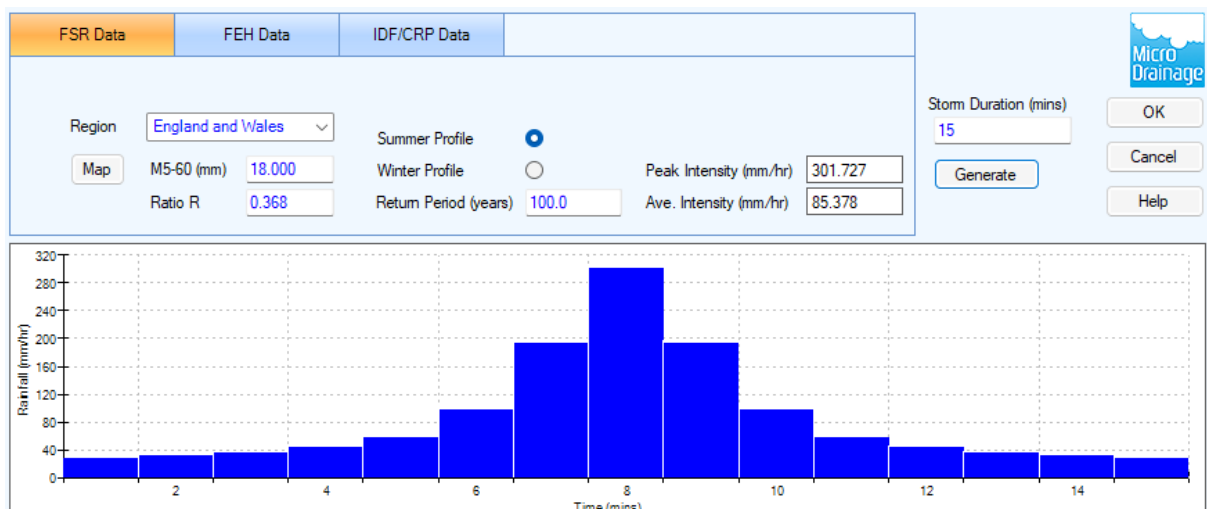
2 Year storm



30 Year storm



100 Year storm





Appendix G Storage Estimates



Input: NO INFILTRATION

Quick Storage Estimate

Input

Input Type

User Input

Area (ha)

0.092

Volumetric Runoff Coefficient

0.750

Discharge Rate (L/s)

2.0

Infiltration Rate (m/hr)

0.0

Safety Factor

2.0

Quick

Calculate

☐ Create New

☒ From Library

☒ All

☒ FSR

...

Method

FSR

Number of Storms

18

Max. Run Time (mins)

2880

2 Year storm:

Results

Quick Storage Estimate variables require approximate storage of between 5m³ - 10m³.

These values are estimates only and should not be used for final design purposes.

30 Year storm:

Results

Quick Storage Estimate variables require approximate storage between 14m³ - 23m³.

These values are estimates only and should not be used for design purposes.

100 Year storm:

Results

Quick Storage Estimate variables require approximate storage of between 21m³ - 33m³.

These values are estimates only and should not be used for final design purposes.

30 Year storm + 35% CC:

Results

Quick Storage Estimate variables require approximate storage between 22m³ - 35m³.

These values are estimates only and should not be used for design purposes.

100 Year storm + 45% CC:

Results

Quick Storage Estimate variables require approximate storage of between 36m³ - 54m³.

These values are estimates only and should not be used for final design purposes.



Input: Allowing Infiltration

Quick Storage Estimate

Input

Input Type

User Input

Area (ha)

0.092

Volumetric Runoff Coefficient

0.750

Discharge Rate (L/s)

0.0

Infiltration Rate (m/hr)

0.108

Safety Factor

2.0

Quick

Calculate

☐ Create New ☒ From Library

☒ All

☒ FSR

Method

FSR

Number of Storms

18

Max. Run Time (mins)

2880

2 Year storm:

Results
Quick Storage Estimate variables require approximate storage of between 28m ³ - 28m ³ .
With Infiltration storage is reduced to between 5m ³ - 14m ³ .
These values are estimates only and should not be used for final design purposes.

30 Year storm:

Results
Quick Storage Estimate variables require approximate storage of between 49m ³ - 49m ³ .
With Infiltration storage is reduced to between 10m ³ - 26m ³ .
These values are estimates only and should not be used for final design purposes.

100 Year storm:

Results
Quick Storage Estimate variables require approximate storage of between 62m ³ - 62m ³ .
With Infiltration storage is reduced to between 14m ³ - 34m ³ .
These values are estimates only and should not be used for final design purposes.

30 Year storm + 35% CC:

Results
Quick Storage Estimate variables require approximate storage of between 66m ³ - 66m ³ .
With Infiltration storage is reduced to between 14m ³ - 36m ³ .
These values are estimates only and should not be used for final design purposes.

100 Year storm + 45% CC:

Results
Quick Storage Estimate variables require approximate storage of between 90m ³ - 90m ³ .
With Infiltration storage is reduced to between 20m ³ - 50m ³ .
These values are estimates only and should not be used for final design purposes.



Appendix H Ground Investigation Findings



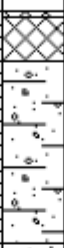


		Project Title: Wythenshawe Campus				WS01	
		Project Number: A8943		Client: SWF Consulting		Sheet 1 Of 1	
		GL (mAOD):		N Coord: 387784		E Coord: 382784	
Date: 01/08/2025		Method: Drilling Rig		Driller: PM Sampling		Logged By: AH	

Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe
0.30	ES	N=6 (1,1,2,2)			0.10	MADE GROUND: Dark brown slightly clayey slightly gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse of wood, brick and sandstone. (Topsoil) MADE GROUND: Grey sandy GRAVEL. Gravel subangular and fine to medium of limestone. Soft dark brown slightly sandy slightly gravelly CLAY. Gravel subangular to subrounded fine to medium of wood and mudstone.		
0.80	ES				0.65			
1.00	D				1.00			
		N=4 (1,1,1,1)			2.00			
2.80	D	N=15 (2,2,2,9)			2.80			
					3.00	Medium dense brown fine to coarse SAND.		
3.50	D	pp 50/40mm			3.70			
					3.80	Very dense silty gravelly fine to coarse SAND. Gravel angular to subangular fine to medium of sandstone.		
					4.00	End Of Borehole At 3.80 m		
					5.00			
					6.00			
					7.00			
					8.00			

KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa ▽ - Groundwater Strike ▼ - Groundwater Level		REMARKS No Groundwater Encountered 1. Borehole was scanned and an inspection dug to 1.2mbgl. 2. No offactory or visual evidence of contamination was encountered. 3. Groundwater was not encountered. 4. The borehole was backfilled with arisings.		Water Strikes <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Date</th> <th>Strike</th> <th>Level</th> <th>Minutes</th> <th>Casing</th> <th>Sealed</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>		Date	Strike	Level	Minutes	Casing	Sealed																		
Date	Strike	Level	Minutes	Casing	Sealed																								
		Scale: 1:50		Daily Log Of Depths <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Date</th> <th>Casing</th> <th>Water</th> <th>From</th> <th>To</th> <th>Hours</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>		Date	Casing	Water	From	To	Hours																		
Date	Casing	Water	From	To	Hours																								



		Project Title: Wythenshawe Campus				WS02																				
		Project Number: A6943		Client: SWF Consulting																						
		GL (mAOD):		N Coord: 0		E Coord: 382796																				
Date: 01/08/2025		Method: Drilling Rig		Driller: PM Sampling		Logged By: AH																				
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe																		
0.20	ES	N=12 (3,3,3,3)			0.40	MADE GROUND: Asphalt.																				
0.60	ES				MADE GROUND: Grey sandy GRAVEL. Gravel subangular and fine to medium of limestone.																					
0.60	D				Firm brown slightly silty slightly sandy slightly gravelly CLAY. Gravel subangular to subrounded fine to medium of mudstone and sandstone.																					
1.80	D	pp 50/265mm			1.80	Very dense brown very silty gravelly fine to coarse SAND. Gravel subangular and fine to medium of mudstone.																				
2.00	D				2.00				End Of Borehole At 2.00 m																	
					3.00																					
					4.00																					
					5.00																					
					6.00																					
					7.00																					
					8.00																					
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa ▽ - Groundwater Strike ▼ - Groundwater Level 			REMARKS No Groundwater Encountered 1. Borehole was scanned and an inspection dug to 1.2mbgl. 2. No olfactory or visual evidence of contamination was encountered. 3. Groundwater was not encountered. 4. The borehole was backfilled with arisings. Scale: 1:50			Water Strikes																				
						<table border="1"><thead><tr><th>Date</th><th>Strike</th><th>Level</th><th>Minutes</th><th>Casing</th><th>Sealed</th></tr></thead><tbody><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>			Date	Strike	Level	Minutes	Casing	Sealed												
Date	Strike	Level	Minutes	Casing	Sealed																					
						Daily Log Of Depths																				
						<table border="1"><thead><tr><th>Date</th><th>Casing</th><th>Water</th><th>From</th><th>To</th><th>Hours</th></tr></thead><tbody><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>			Date	Casing	Water	From	To	Hours												
Date	Casing	Water	From	To	Hours																					



		Project Title: Wythenshawe Campus				WS03																																																		
		Project Number: A6943		Client: SWF Consulting																																																				
		GL (mAOD):		N Coord: 387776		E Coord: 382825																																																		
Date: 01/08/2025		Method: Drilling Rig		Driller: PM Sampling		Logged By: AH																																																		
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe																																																
0.70	ES				0.10	MADE GROUND: Dark brown slightly clayey slightly gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse of wood, brick and sandstone. (Topsoil)																																																		
1.10	D	N=10 (2,2,3,3)			1.00	MADE GROUND: soft dark brown sandy gravelly CLAY. Gravel angular to subrounded fine to coarse of brick, sandstone and wood.																																																		
2.10	D	N=28 (4,6,8,10)			2.00	Soft dark brown slightly silty slightly sandy slightly gravelly CLAY. Gravel angular to subrounded fine to medium of mudstone.																																																		
		pp 50/250mm				End Of Borehole At 2.00 m																																																		
					3.00																																																			
					4.00																																																			
					5.00																																																			
					6.00																																																			
					7.00																																																			
					8.00																																																			
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa ▽ - Groundwater Strike ▼ - Groundwater Level			REMARKS No Groundwater Encountered 1. Borehole was scanned and an inspection dug to 1.2mbgl. 2. No olfactory or visual evidence of contamination was encountered. 3. Groundwater was not encountered. 4. The borehole was backfilled with arisings. Scale: 1:50			Water Strikes <table border="1"><thead><tr><th>Date</th><th>Strike</th><th>Level</th><th>Minutes</th><th>Casing</th><th>Sealed</th></tr></thead><tbody><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table> Daily Log Of Depths <table border="1"><thead><tr><th>Date</th><th>Casing</th><th>Water</th><th>From</th><th>To</th><th>Hours</th></tr></thead><tbody><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>			Date	Strike	Level	Minutes	Casing	Sealed																			Date	Casing	Water	From	To	Hours																		
Date	Strike	Level	Minutes	Casing	Sealed																																																			
Date	Casing	Water	From	To	Hours																																																			



		Project Title: Wythenshawe Campus				WS04																																																		
		Project Number: A6943		Client: SWF Consulting		Sheet 1 Of 1																																																		
		GL (mAOD):		N Coord: 387764		E Coord: 382784																																																		
Date: 01/08/2025		Method: Drilling Rig		Driller: PM Sampling		Logged By: AH																																																		
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe																																																
0.10	ES	N=9 (2,2,2,3) N=35 (8,8,9,10) pp 50/85mm			0.07	MADE GROUND: Concrete paving slab.																																																		
0.50	D				0.30	MADE GROUND: Grey sandy GRAVEL. Gravel subangular and fine to medium of limestone.																																																		
0.60	ES				1.00	Stiff brown slightly sandy slightly gravelly CLAY. Gravel subangular to subrounded fine to medium of sandstone and mudstone.																																																		
1.50	D				2.00																																																			
2.50	D				2.20																																																			
					2.80	Very dense brown very silty slightly gravelly fine to coarse SAND. Gravel angular to subangular and fine of mudstone																																																		
					3.00	Very dense brown gravelly fine to coarse SAND. Gravel angular to subangular fine to medium of mudstone.																																																		
						End Of Borehole At 3.00 m																																																		
					4.00																																																			
					5.00																																																			
					6.00																																																			
					7.00																																																			
					8.00																																																			
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa ▽ - Groundwater Strike ▼ - Groundwater Level			REMARKS No Groundwater Encountered 1. Borehole was scanned and an inspection dug to 1.2mbgl. 2. No olfactory or visual evidence of contamination was encountered. 3. Groundwater was not encountered. 4. The borehole was backfilled with arisings. Scale: 1:50			Water Strikes <table border="1"><thead><tr><th>Date</th><th>Strike</th><th>Level</th><th>Minutes</th><th>Casing</th><th>Sealed</th></tr></thead><tbody><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table> Daily Log Of Depths <table border="1"><thead><tr><th>Date</th><th>Casing</th><th>Water</th><th>From</th><th>To</th><th>Hours</th></tr></thead><tbody><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>			Date	Strike	Level	Minutes	Casing	Sealed																			Date	Casing	Water	From	To	Hours																		
Date	Strike	Level	Minutes	Casing	Sealed																																																			
Date	Casing	Water	From	To	Hours																																																			

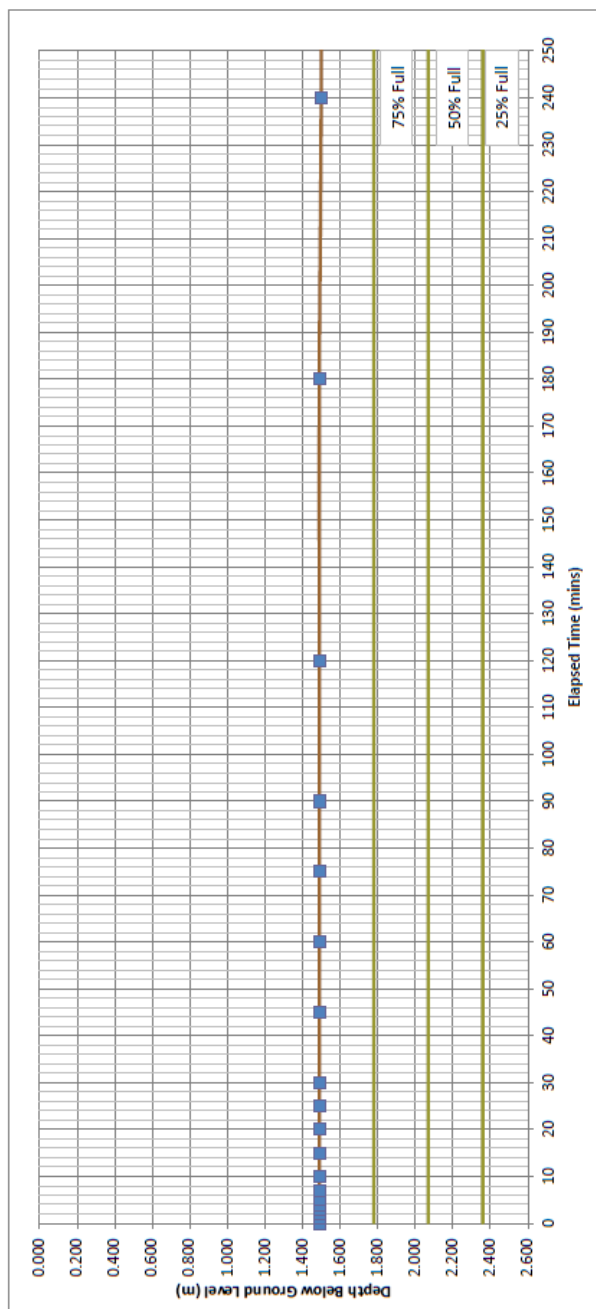


EARTH ENVIRONMENTAL & GEOTECHNICAL Houldsworth Mill Business & Arts Centre, Houldsworth Street, Stockport, SK5 6DA Tel: 0161 975 6088 Email: info@earthenvironmental.co.uk Web: www.earthenvironmental.co.uk	TRIAL PIT LOG															
Project Name: Wythenshawe Campus Date: 31/07/25 Project No.: A6493 Client: SWF Consulting	Hole Number: TP01 Logged By: AH Total Depth: 2.65m Remarks: -															
Schematic Profile: NOT TO SCALE	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Legend</th> <th style="width: 10%;">Depth (m)</th> <th style="width: 80%;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">0.00-0.90</td> <td>MADE GROUND: Light brown gravelly fine to coarse SAND. Gravel angular to subrounded fine to coarse of brick, limestone, concrete metal and plastic</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">0.90-1.50</td> <td>MADE GROUND: Firm dark brown slightly sandy gravelly CLAY. Gravel angular to subrounded fine to coarse of wood, brick, metal and plastic.</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">1.50-2.50</td> <td>Firm dark brown slightly sandy slightly gravelly CLAY. Gravel subangular to subrounded fine to medium of mudstone and wood.</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">2.50-2.65</td> <td>Stiff brown sandy gravelly CLAY. Gravel subangular and fine to medium of sandstone</td> </tr> </tbody> </table> Trial pit terminated at 2.65m. ES at 1.00m bgl. D at 1.60m bgl Pit stable and dry. ES=Environmental Sample, D=Disturbed Sample.	Legend	Depth (m)	Description		0.00-0.90	MADE GROUND: Light brown gravelly fine to coarse SAND. Gravel angular to subrounded fine to coarse of brick, limestone, concrete metal and plastic		0.90-1.50	MADE GROUND: Firm dark brown slightly sandy gravelly CLAY. Gravel angular to subrounded fine to coarse of wood, brick, metal and plastic.		1.50-2.50	Firm dark brown slightly sandy slightly gravelly CLAY. Gravel subangular to subrounded fine to medium of mudstone and wood.		2.50-2.65	Stiff brown sandy gravelly CLAY. Gravel subangular and fine to medium of sandstone
Legend	Depth (m)	Description														
	0.00-0.90	MADE GROUND: Light brown gravelly fine to coarse SAND. Gravel angular to subrounded fine to coarse of brick, limestone, concrete metal and plastic														
	0.90-1.50	MADE GROUND: Firm dark brown slightly sandy gravelly CLAY. Gravel angular to subrounded fine to coarse of wood, brick, metal and plastic.														
	1.50-2.50	Firm dark brown slightly sandy slightly gravelly CLAY. Gravel subangular to subrounded fine to medium of mudstone and wood.														
	2.50-2.65	Stiff brown sandy gravelly CLAY. Gravel subangular and fine to medium of sandstone														
Pictures:																
Trial Pit 01: Overview of excavation	Trial Pit 01: Internal view of excavation															



Location Reference:	\$401	
Date	01/08/2025	
Geology in test section	CLAY	
Depth to Base of Hole	2.65	m
Effective Depth	1.16	m
Hole width	0.53	m
Hole length	1.32	m
Depth to water at start of test below ground level	1.49	m
Depth to water at end of test below ground level	1.50	m
Effective storage depth to 75% full	0.57	m
(Depth below GL)	1.78	m
Effective storage depth to 50% full	0.58	m
(Depth below GL)	2.07	m
Effective storage depth to 25% full	0.29	m
(Depth below GL)	2.36	m
Height to 50% depth	0.580	m3
Effective Storage Volume V_{p75-25}	0.41	m3
Time t _{p25} at which water is 75% of effective depth (minutes)	15	mins
Time t _{p25} at which water is 25% of effective depth (minutes)		mins
Time for water level to fall between V_{p75-25}		secs
Time for water level to fall between V_{p75-25}		secs
Internal surface area of hole up to 50% depth including base		m ²
Internal infiltration Rate, I		m/s

Infiltration Rate to slow to calculate





EARTH ENVIRONMENTAL & GEOTECHNICAL Houldsworth Mill Business & Arts Centre, Houldsworth Street, Stockport, SK5 6DA Tel: 0161 975 6088 Email: info@earthenvironmental.co.uk Web: www.earthenvironmental.co.uk		TRIAL PIT LOG													
Project Name: Wythenshawe Campus		Hole Number: TP02													
Date: 31/07/25		Logged By: AH													
Project No.: A6493		Total Depth: 2.30m													
Client: SWF Consulting		Remarks: -													
Schematic Profile: 		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Legend</th> <th style="width: 10%;">Depth (m)</th> <th style="width: 80%;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">0.00-0.10</td> <td>MADE GROUND: Dark brown slightly clayey slightly gravelly fine to coarse SAND. Gravel subangular and fine to medium of mudstone. (Topsoil)</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">0.10-0.80</td> <td>MADE GROUND: Firm dark brown sandy gravelly CLAY. Gravel angular to subrounded fine to coarse of wood, brick, metal and concrete.</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">0.80-2.30</td> <td>Firm dark brown slightly silty slightly sandy CLAY.</td> </tr> </tbody> </table> Trial pit terminated at 2.30m. ES at 0.60m bgl. D at 1.00m bgl Pit stable and dry. ES=Environmental Sample, D=Disturbed Sample.		Legend	Depth (m)	Description		0.00-0.10	MADE GROUND: Dark brown slightly clayey slightly gravelly fine to coarse SAND. Gravel subangular and fine to medium of mudstone. (Topsoil)		0.10-0.80	MADE GROUND: Firm dark brown sandy gravelly CLAY. Gravel angular to subrounded fine to coarse of wood, brick, metal and concrete.		0.80-2.30	Firm dark brown slightly silty slightly sandy CLAY.
Legend	Depth (m)	Description													
	0.00-0.10	MADE GROUND: Dark brown slightly clayey slightly gravelly fine to coarse SAND. Gravel subangular and fine to medium of mudstone. (Topsoil)													
	0.10-0.80	MADE GROUND: Firm dark brown sandy gravelly CLAY. Gravel angular to subrounded fine to coarse of wood, brick, metal and concrete.													
	0.80-2.30	Firm dark brown slightly silty slightly sandy CLAY.													
Pictures:															
Trial Pit 02: Overview of excavation		Trial Pit 02: Internal view of excavation													

SOAKAWAY TEST

(To: BRE 365 1991)

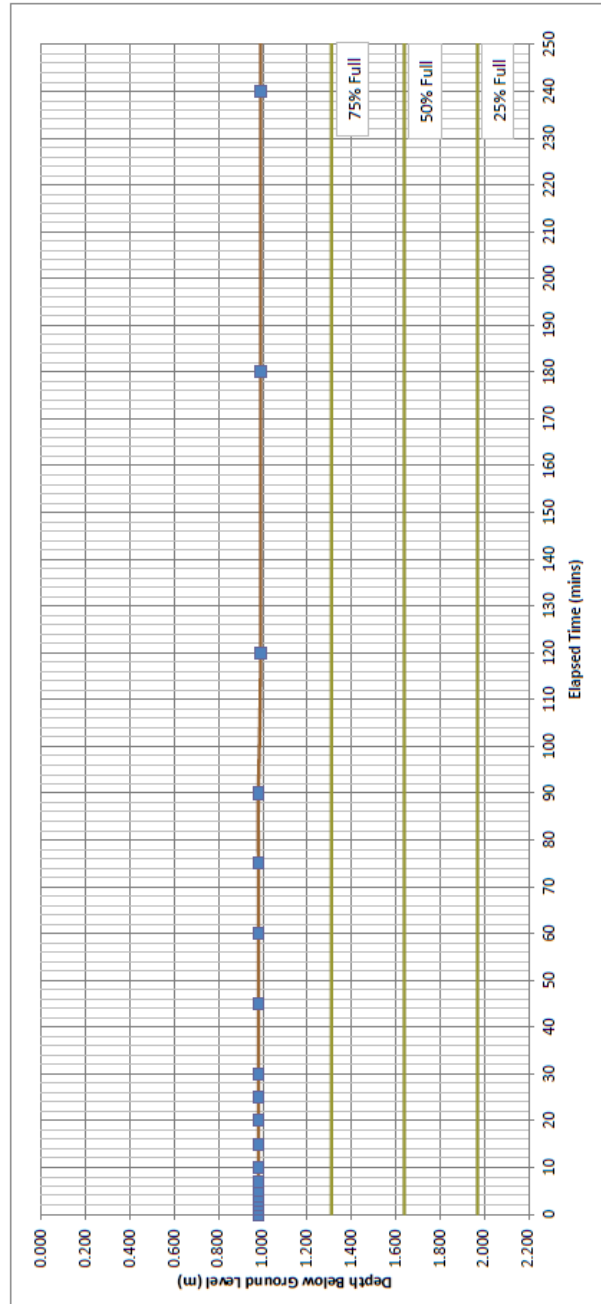
Job No: AB943
Site: Wythenshawe Campus
Client: SWF Consulting

Location Reference:	S402
Date	01/08/2025
Geology in test section	CLAY
Depth to Base of Hole	2.30 m
Effective Depth	1.32 m
Hole width	0.63 m
Hole length	1.32 m
Depth to water at start of test below ground level	1.49 m
Depth to water at end of test below ground level	1.50 m
Effective storage depth to 75% full	0.99 m
(Depth below GL)	1.31 m
Effective storage depth to 50% full	0.66 m
(Depth below GL)	1.64 m
Effective storage depth to 25% full	0.33 m
(Depth below GL)	1.97 m
Height to 50% depth	0.405 m3
Effective storage Volume Vp75-25	0.46 m3
Time tp25 at which water is 75% of effective depth (minutes)	15 mins
Time tp25 at which water is 25% of effective depth (minutes)	
Time for water level to fall between Vp75 -25	
Time for water level to fall between Vp75 -25	
Internal surface area of hole up to 50% depth including base	
Soil Infiltration Rate, I	

Assumes pit is not filled

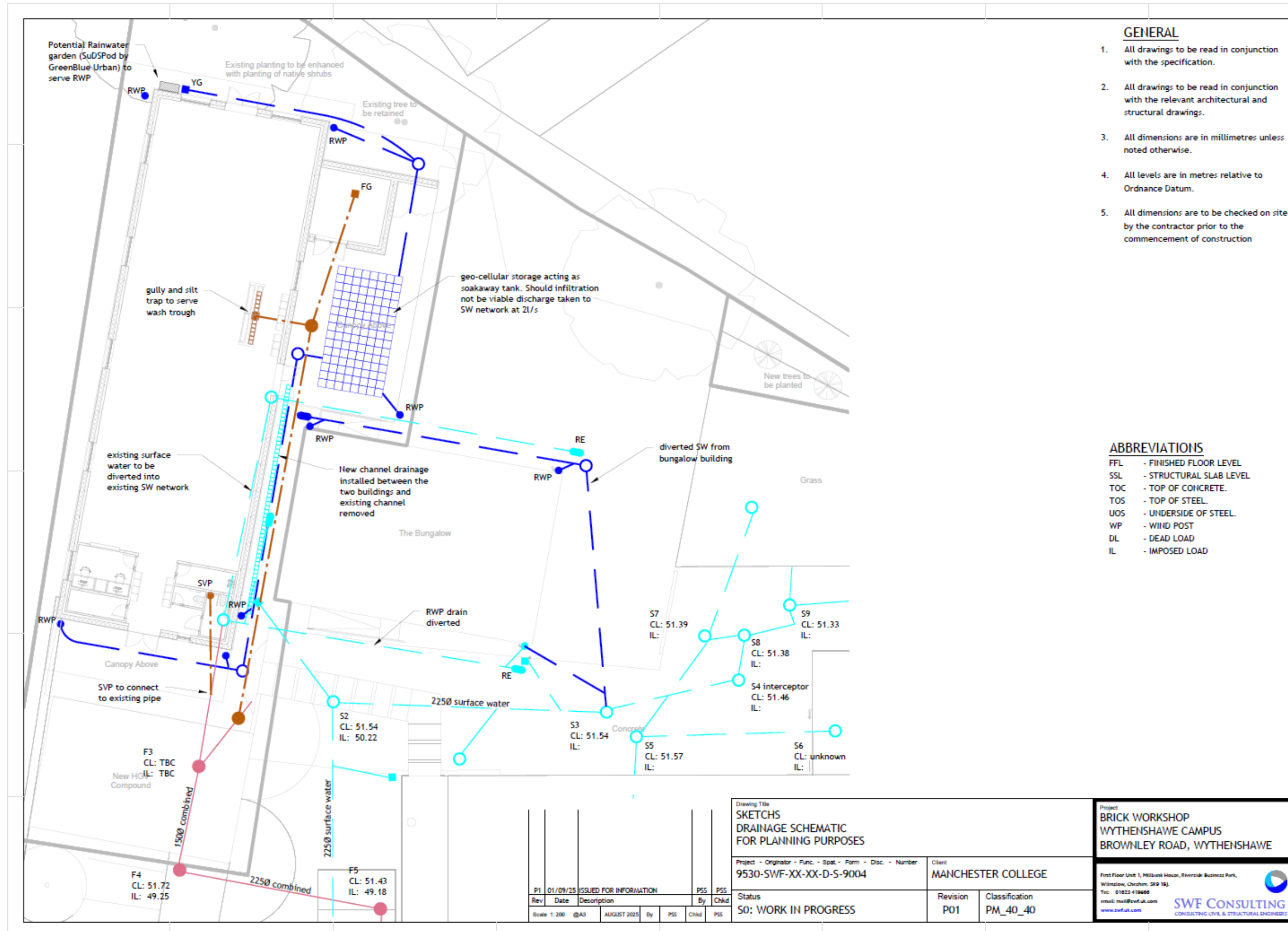
Infiltration Rate to slow to calculate

Time Elapsed (mins)	Depth of Water below GL (m)
0	0.990
1	0.990
2	0.990
3	0.990
4	0.990
5	0.990
6	0.990
7	0.990
10	0.990
15	0.990
20	0.990
25	0.990
30	0.990
45	0.990
60	0.990
75	0.990
90	0.990
120	0.990
180	0.990
240	0.990
300	0.990
360	1.000





Appendix I Proposed Schematic Drainage Layout





Appendix J Maintenance Recommendations



Soakaways

Extract from CIRIA SuDS Manual 2015

TABLE 13.1 Operation and maintenance requirements for soakaways		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
	Check soakaway to ensure emptying is occurring	Annually

Maintenance will usually be carried out manually, although a suction tanker can be used for sediment/debris removal for large systems. If maintenance is not undertaken for long periods, deposits can become hard-packed and require considerable effort to remove.

Replacement of the aggregate or geocellular units will be necessary if the system becomes blocked with silt. Effective monitoring will give information on changes in infiltration rate and provide a warning of potential failure in the long term.

Roads and/or parking areas draining to infiltration components should be regularly swept to prevent silt being washed off the surface. This will minimise the need for maintenance.