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Hanson Springs Project, Gorrels Way, Rochdale

Drainage Strategy Report

Date: October 2024

9475-SWF-XX-XX-TR-S-0201

S2: Suitable for Information

Version: P02

Classification: PM_40_20



Report Details

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Report Reference	9475-SWF-XX-XX-TR-S-0201
Client	Hanson Springs
Author	Phil S Sarbutts
Approval by	Phil S Sarbutts

Revision History

Version	Date	Suitability	Revision
P01	28/10/2024	S2: Suitable for Information	Issued For Information
P02	29/10/2024	S2: Suitable for Information	Red line boundary updated. Areas of soft landscaping adjusted accordingly

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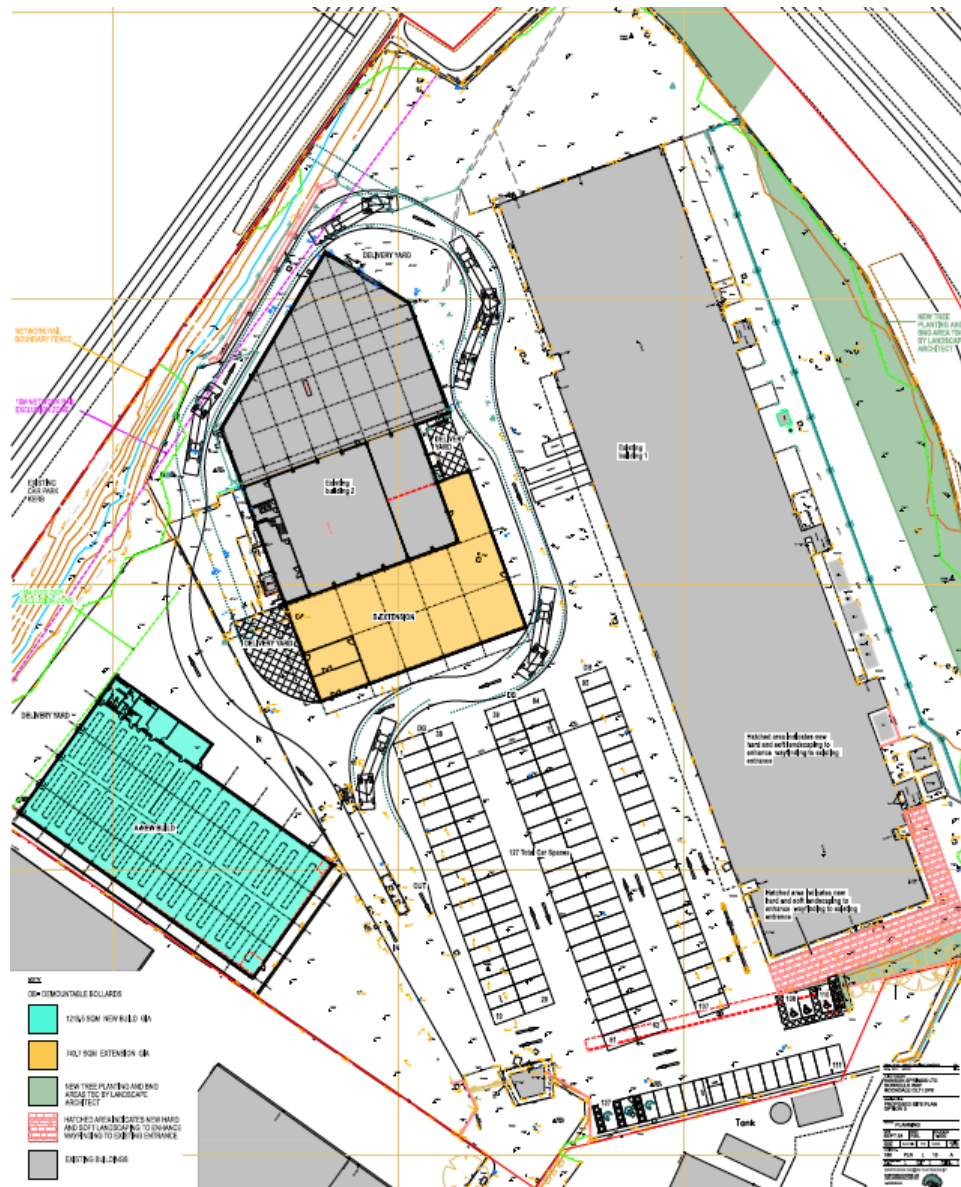
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1. Development Details

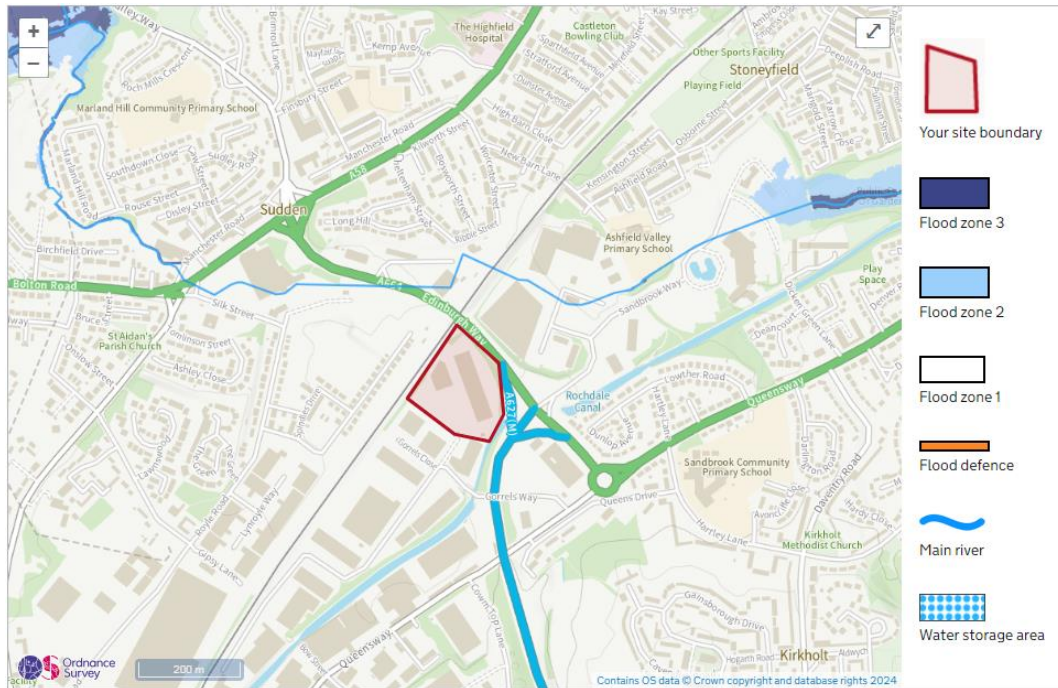
- 1.1. The development site is the Hanson Springs industrial site off Gorrels Way, Rochdale.
- 1.2. The southern end of the site is bounded by the Rochdale Canal whilst the northern end is bounded by a railway line. The eastern boundary has the Rochdale bypass whilst the western boundary is adjacent to another property.
- 1.3. The proposal will see the extension of an existing building, erection of a new building and works to enhance the front entrance area of the main building.
- 1.4. The proposed development will see the construction of a new industrial unit with associated goods yard and staff and visitor parking areas.
- 1.5. The development will not increase the hard standings or drained area as the proposed works are within existing macadam or concrete areas.
- 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.



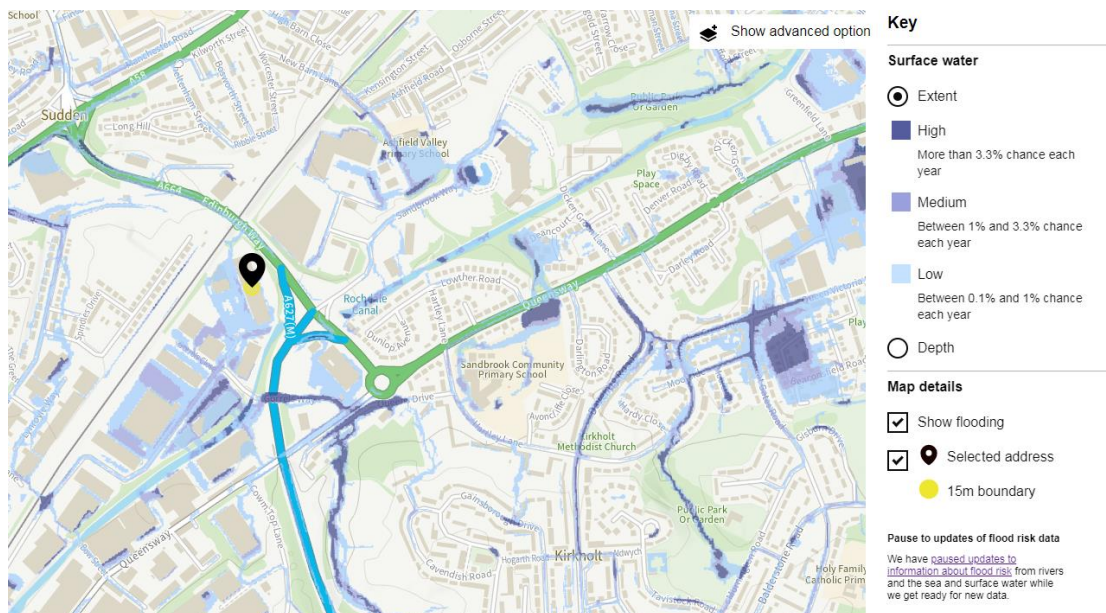


2. Flood Zone Classification

- 2.1. A flood risk assessment has been carried out by Betts Hydro Consulting Engineers and specific reference should be made to that report.
- 2.2. The information in this section replicates the FRA but does not supersede the advice given.
- 2.3. The Environment Agency maps have been consulted and the site is shown to be in Flood Zone 1.

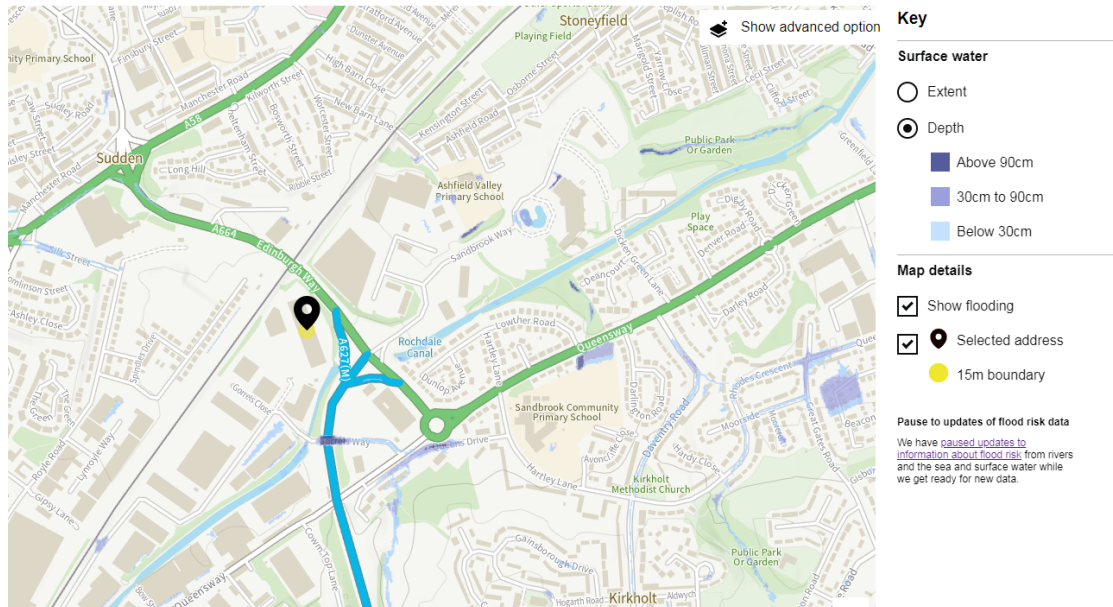


- 2.4. This means the site has a low probability of flooding having a less than 1 in 1000 annual probability of river or sea flooding.
- 2.5. The online mapping also indicates that the site is within an area of low risk of surface water flooding.





- 2.6. Further interrogation of the surface water flood maps suggest that the depth of water encountered would be below 300mm.

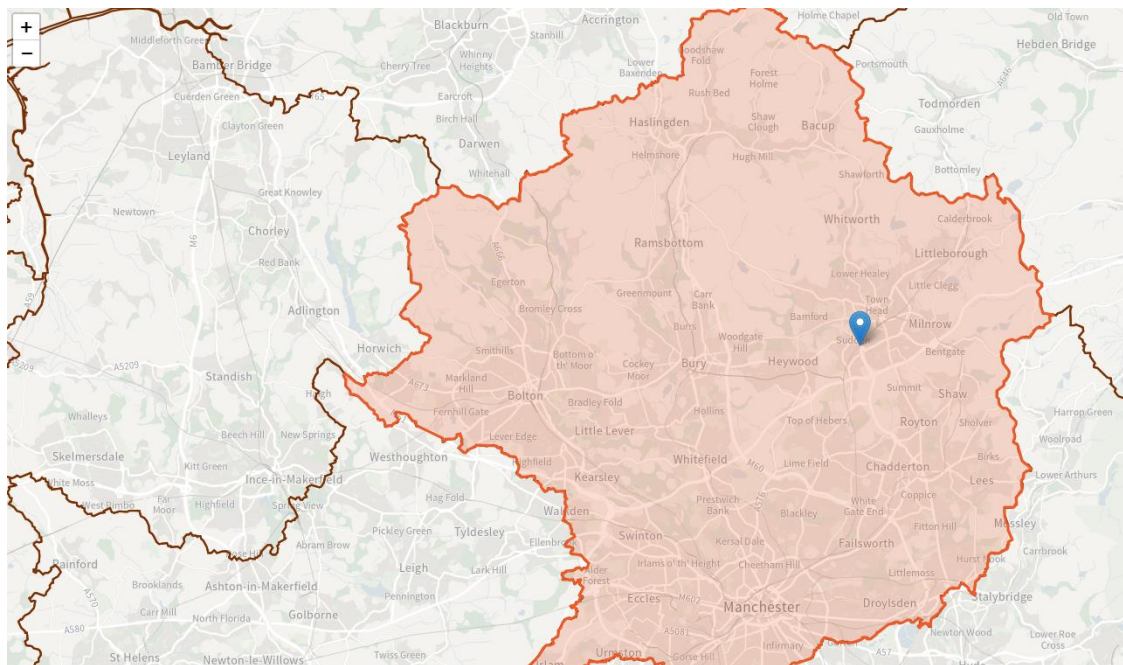


- 2.7. Flooding from groundwater is unlikely in the area according to the online mapping.
- 2.8. Reservoir flooding is also unlikely according to the online maps.



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 storm).



Irwell Management Catchment peak rainfall allowances



3.3% annual exceedance rainfall event

Epoch

	Central allowance	Upper end allowance
2050s	25%	35%
2070s	30%	40%

1% annual exceedance rainfall event

Epoch

	Central allowance	Upper end allowance
2050s	25%	40%
2070s	30%	45%

*Use '2050s' for development with a lifetime up to 2060 and use the 2070s epoch for development with a lifetime between 2061 and 2125.

This map contains information generated by Met Office Hadley Centre (2019): UKCP Local Projections on a 5km grid over the UK for 1980-2080. Centre for Environmental Data Analysis. 2022

- 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. Proposed Drainage Details

4.1. Surface Water Drainage

- 4.1.1. The existing surface water on the site is controlled by a series of gullies with below ground pipework, working as a gravity system.
- 4.1.2. Drainage survey works have been undertaken with the findings contained within Appendix C.
- 4.1.3. United Utilities sewer records can be viewed within Appendix D.
- 4.1.4. United Utilities have been approached using a pre-planning application using their online application system but, at the time of writing this report, a response has not been received.
- 4.1.5. 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
- 4.1.6. The existing site ownership covers an area of 25,425m² although only 22,360m² is included in the planning boundary. The largest building on the site, which will be unaffected by the proposals, has a footprint of 4,635m². The second existing building, which will be extended, has an area of 1,630m². Soft landscaping, within the site ownership, covers around 3,920m².
- 4.1.7. The survey work shows three discharges to the public sewers which surround the site:
 - i. The unaffected building, the building to be extended and part of the service yard, discharges via a 225mm pipe into the surface water sewer system at manhole 0501. Approx area = 14,530m²
 - ii. The area of the new building discharges into a dished channel that connects directly to the foul water sewer system at manhole 9501. Approx area = 2,475m².
 - iii. The remaining area of the service yard passes through a separator and also discharges to the foul water sewer system but at manhole 9608. Approx area = 6,970m².
- 4.1.8. The proposed development would see no increase in impermeable area as the new construction will be over existing concrete or macadam areas.
- 4.1.9. A drawing indicating the drained and landscaped areas, pre-development, can be found in Appendix E.
- 4.1.10. An intrusive ground investigation has not been undertaken in relation to this particular project but an investigation was undertaken in June and July 2017.
- 4.1.11. The investigation suggests sand/ gravel measures are to be found at suitable levels for infiltration techniques to be used on the scheme. However, no specific testing has yet been carried out to determine infiltration rates.
- 4.1.12. Window sample logs, together with the logs from the cable percussive investigation, are included in Appendix F to indicate the potential use of infiltration. These are taken from the Rogers Geotechnical Services Report J3936/17E.
- 4.1.13. Infiltration testing should be undertaken in the form of soakaway tests in accordance with BRE 365.
- 4.1.14. Testing will also be required to determine if there are any ground contamination issues that may prevent use of soakaways due to potential leaching of contaminants.



- 4.1.15. For the purposes of conceptual designs, the infiltration rate will be $1 \times 10^{-5} \text{m/s}$ representing a well graded sand using figure 20.17 from the CIRIA SuDS Manual 2015.
- 4.1.16. It should also be noted that the northern boundary adjoins Network Rail land and infiltration techniques will not be allowed within 30m of railway boundary.
- 4.1.17. If infiltration methods are not suitable for use, then consideration needs to be given to discharge to a surface water body.
- 4.1.18. There is no watercourse in the immediate vicinity of the site although there is the Rochdale Canal.
- 4.1.19. Canals are generally closed systems and struggle to facilitate the addition of additional flows without upsetting the balance of the system.
- 4.1.20. It is therefore presumed that discharge to the canal would only be considered by the Canal & River Trust if there is no alternative option.
- 4.1.21. The original drainage network is presumed to have been designed for a rainfall intensity of 50mm/hr which gives rise to the following discharges for the site:

	Area (m ²)	Discharge (l/s) (50mm/hr)	Discharge (l/s) (33.4mm/hr)
Original Building	14,530	201.8	134.8
New Build Area	2,475	34.4	23.0
Service Yard	6,970	96.8	64.7
Total	23,975	333.0	222.5

- 4.1.22. The final column in the table above is for the calculated average rainfall intensity on the site for a 15-minute 2-year storm using InfoDrainage software.
- 4.1.23. Given the intention to remove surface water from the existing network we would suggest that the following areas can be removed from each discharge:

	Area (m ²)	Removed Area (m ²)
Original Building	14,530	440
New Build Area	2,475	2,475
Service Yard	6,970	690
Total		3,605

- 4.1.24. This would reduce the discharge from site by 50l/s which represents a 15% reduction in flow being removed from the sewers, based on the 50mm/hr designs.
- 4.1.25. Further surface water removal from the discharge should be considered to give a minimum 30% reduction in off-site flow.
- 4.1.26. This would require a further 3,600m² of service yard to be drained via the new soakaways.
- 4.1.27. It is therefore suggested that some of the parking areas are drained to the proposed soakaway alongside the extended building.
- 4.1.28. The potential soakaway volumes, based on the presumed infiltration rate from paragraph 4.1.17 are as follows with calculations to be found in Appendix G:



	Soakaway volume (m ³)	Soakaway Size
Original Building	55	5.5 x 10.0 x 1.0m deep
New Build Area	311	18.0 x 17.5 x 1.0m deep
Service Yard	87	9.0 x 10.0 x 1.0m deep
Additional Yard	452	20.0 x 21.5 x 1.0m deep

- 4.1.29. Should discharge via infiltration be unfeasible, the proposed soakaway tanks would need to become attenuation tanks, most likely with a pump to control the rate of discharge.
- 4.1.30. The proposed drainage schematic can be found within Appendix H showing the approximate location of the attenuation measures.
- 4.1.31. Given the site is at risk of oil spillage it is suggested that any drainage entering the attenuation measures should pass through a separator.
- 4.1.32. A SPEL ESR Stormceptor is recommended as is a bypass style separator with enhanced silt retention which has been tested and approved by the WRc for total suspended solid and metal retention requirements.

4.2. Foul Water Drainage

- 4.2.1. There are two potential points of connection for any new foul drainage using existing pipework to reach the adopted sewers.
- 4.2.2. Only the new building is expected to require new foul drainage as the extension is not thought to include additional drainage.
- 4.2.3. The most suitable point of connection would appear to be the existing private foul manhole behind the building to be extended. This would then drain via the private network before ultimately discharging to UU manhole reference 9608.
- 4.2.4. The discharge will be from approximately 4 WC's, 6 wash hand basins, 3 urinals and a domestic kitchen.



5. Future Maintenance

5.1. Surface Water

- 5.1.1. Given the drainage installation is a gravity fed system the requirements for maintenance are similar to any typical installation.
- 5.1.2. As part of the maintenance it is recommend that road gullys 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.
- 5.1.3. The separator will require annual maintenance and the client will be encouraged to enter a service agreement with the supplier.
- 5.1.4. It is expected that an alarm shall be fitted to the separator which will be wired back to the building. This will alert the client that the system needs attention and the specialist should be approached for repair.
- 5.1.5. The separator should be maintained in accordance with BS EN 858-2 which gives advice on the frequency and type of inspection to be carried out. At the very least this should be every six months or in accordance with the manufacturers' specification. The inspection shall determine the depth of oil in the system and the depth of sediment/ sludge present together with details of any repairs.
- 5.1.6. As with any drainage system is it 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.
- 5.1.7. Other recommendations are contained within Appendix I.

5.2. Foul Water

- 5.2.1. Given the drainage installation is a gravity fed system the requirements for maintenance are similar to any typical installation.
- 5.2.2. As with any drainage system is it 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.



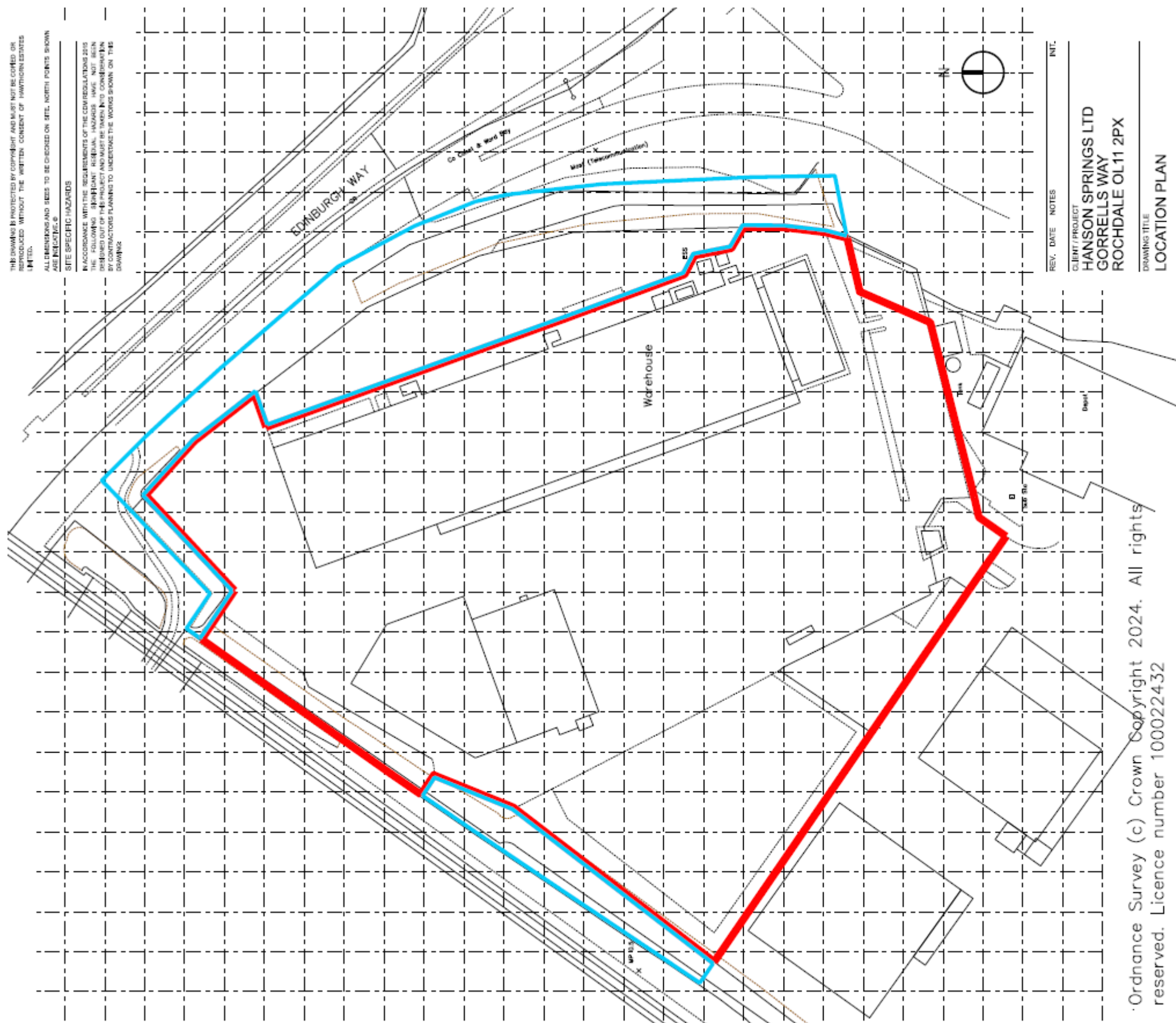
5.3. Responsible Person

- 5.3.1. Hanson Springs will undertake the maintenance of the private drainage network on completion of the works. The responsible person is:

Amanda Hanson - Purchasing Coordinator
Hanson Springs
Hanson Place
Gorrels Way
Rochdale
OL11 2PX
Tel: 01706 510600



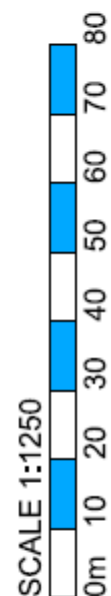
Appendix A Existing Site Plan



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- SITE BOUNDARY 22360 SQM
- OTHER LAND IN THE CLIENTS OWNERSHIP

STATUS		PLANNING	
DATE	SEPT 24	DRAWN	RSL
PROJECT NUMBER	188	PLAN/BUILD	L 16
DRAWING NO.	188	TYPE	NUMBER
REVISION LETTER		REVISION	LETTER
SCALE @ A4	1:1250		
SCALE @ A3	1:1250		
SCALE @ A2	1:1250		
SCALE @ A1	1:1250		
SCALE @ A0	1:1250		



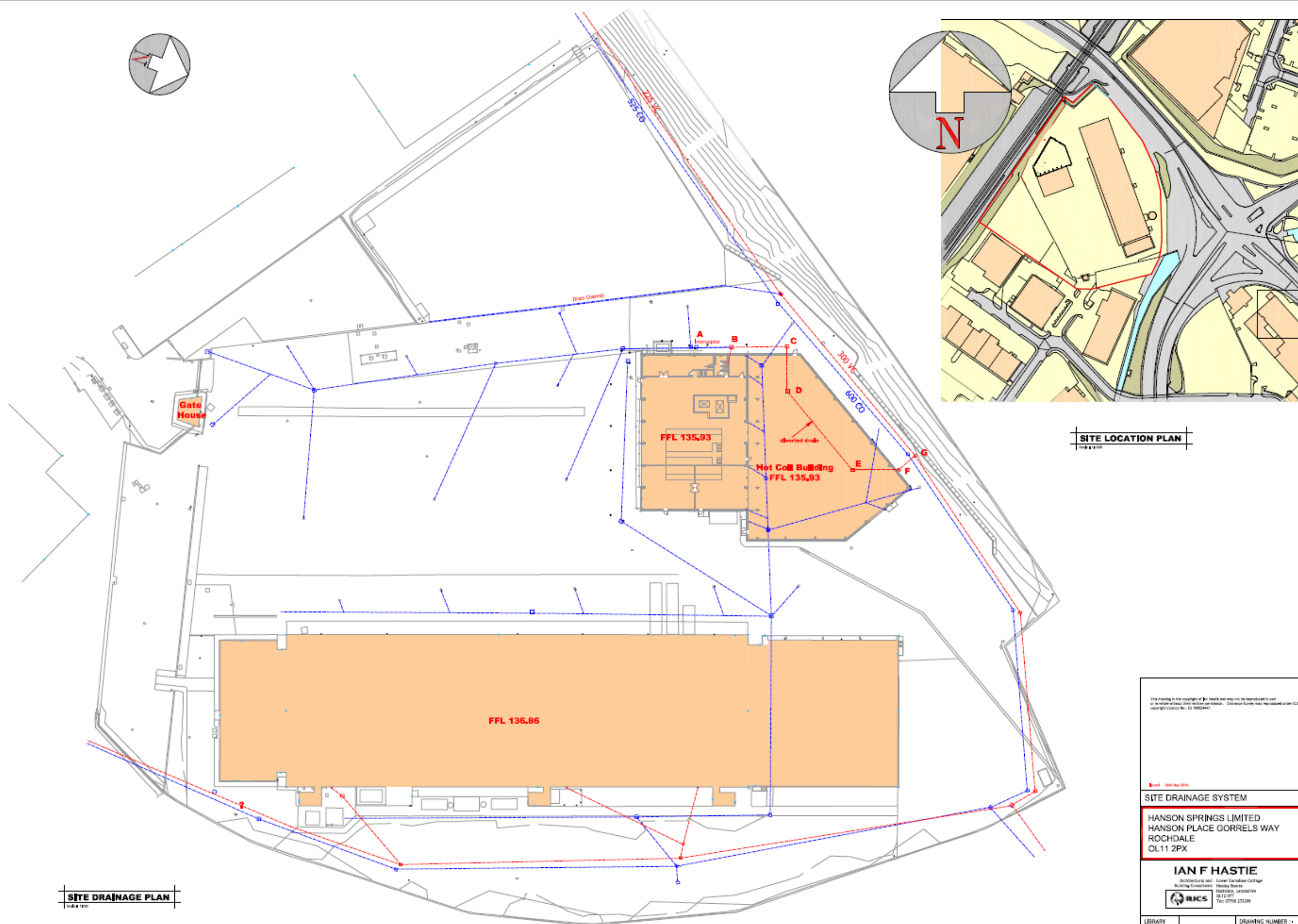


Appendix B Proposed Site Plan





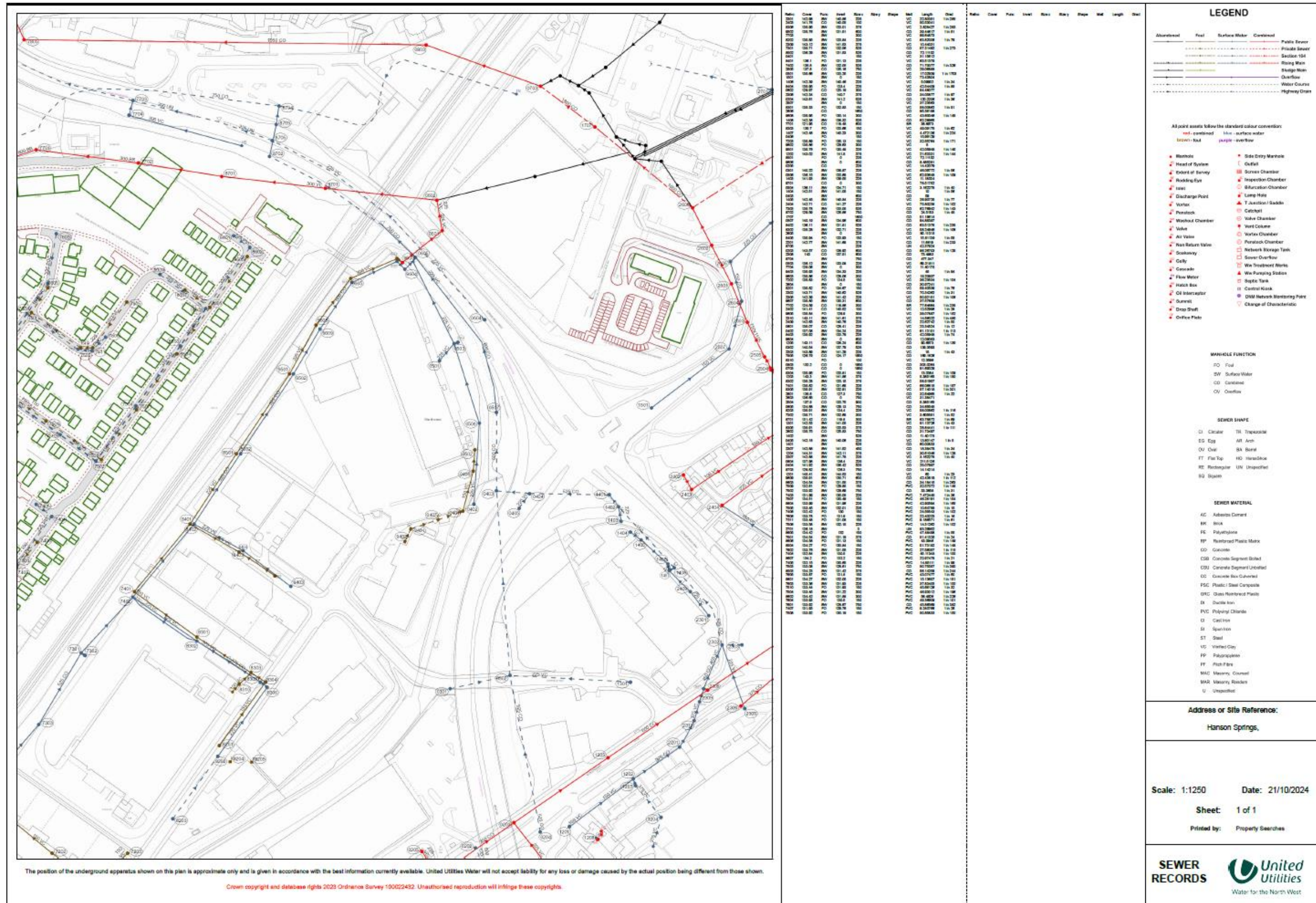
Appendix C Drainage Survey

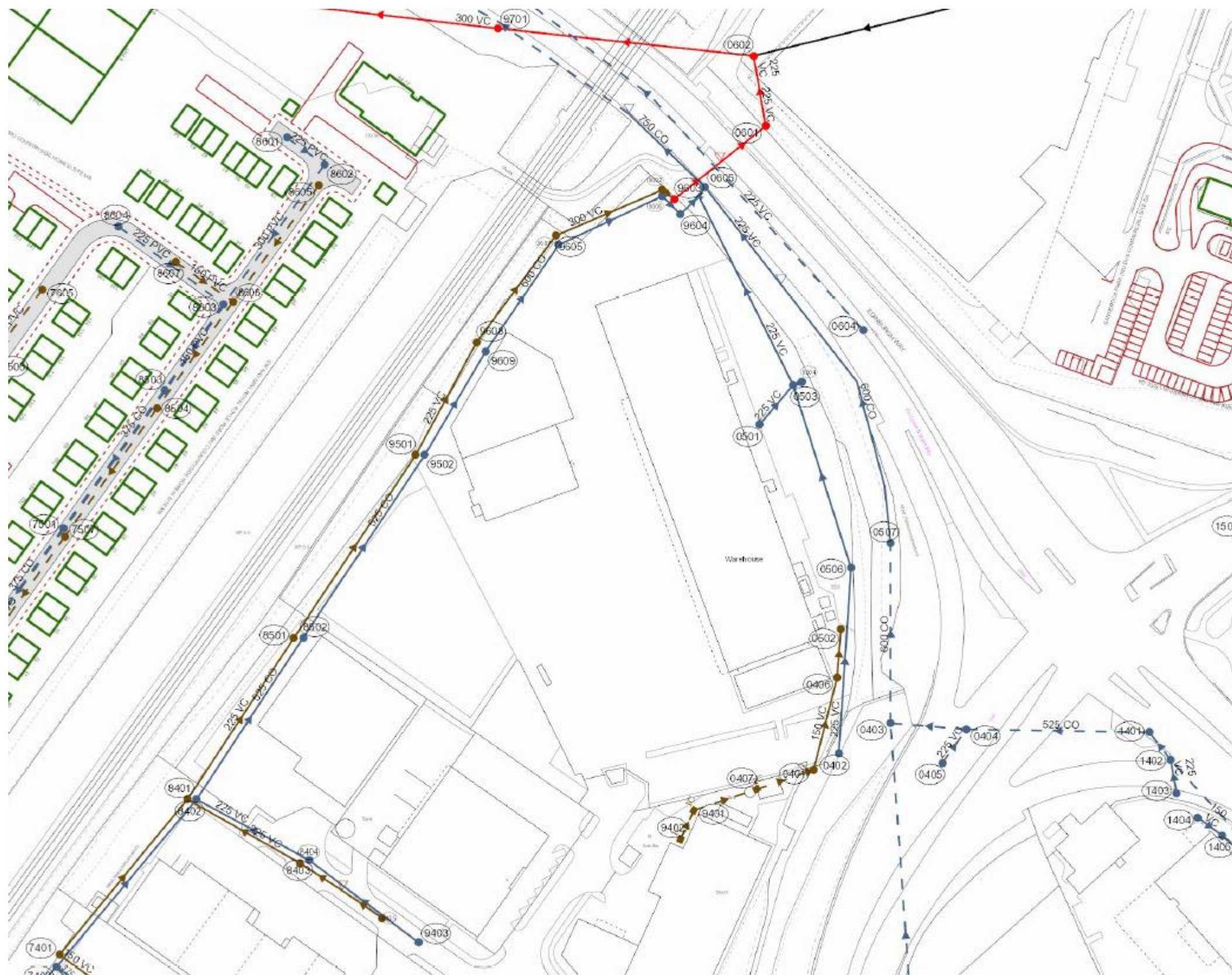


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Revised: 2004-05-20/04		
SITE DRAINAGE SYSTEM		
HANSON SPRINGS LIMITED HANSON PLACE GORRELS WAY ROCHDALE OL11 2PX		
IAN F HASTIE Architectural and Building Consultants Lower Sandbach Cottage Hedley Street Rochdale, Lancashire OL11 2PT Tel: 01706 273396		
LIBRARY	in P Hastie 20 May 2016	DRAWING NUMBER: 3351.100
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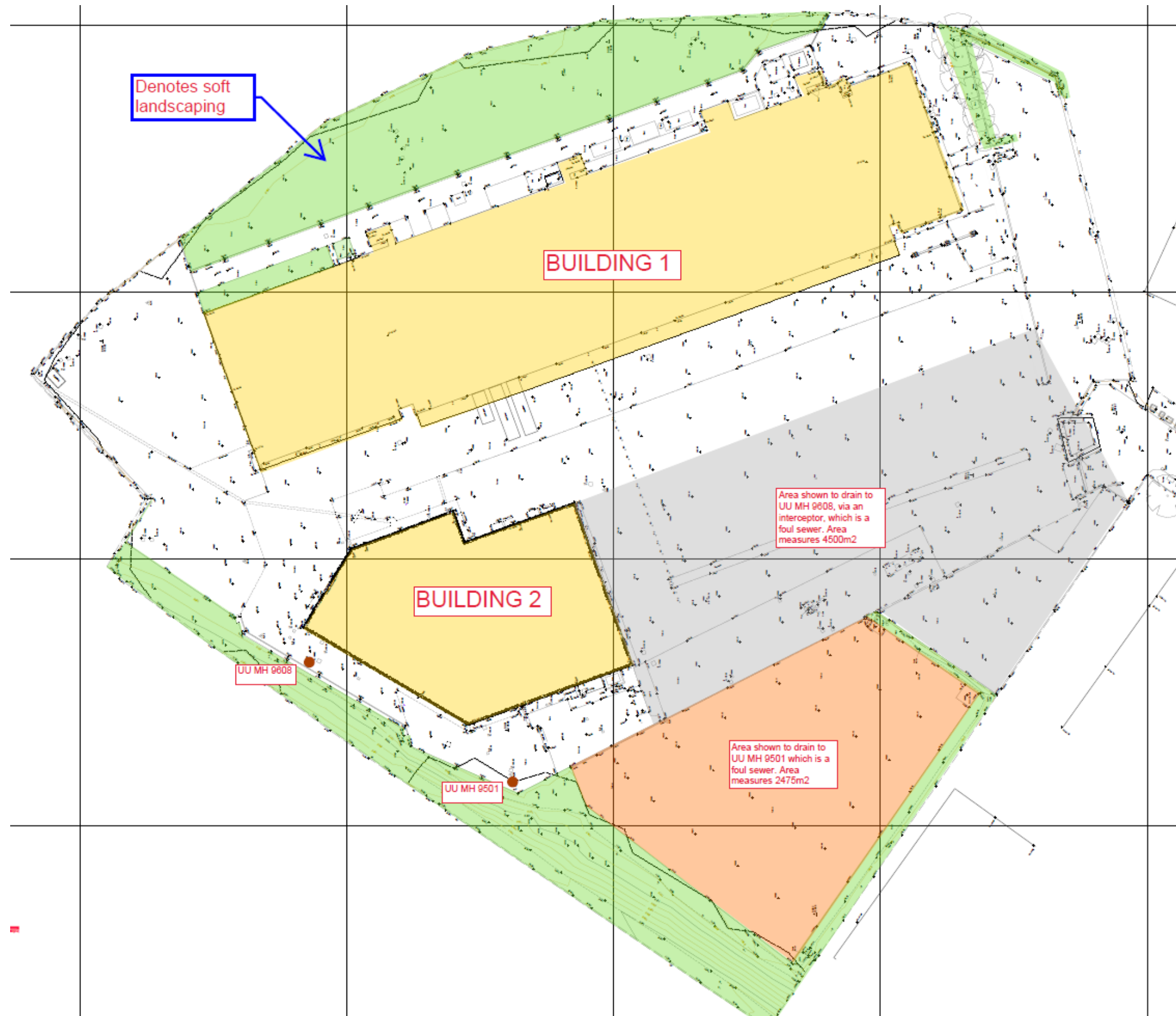
Appendix D United Utilities Sewer Record & Pre-Application Response





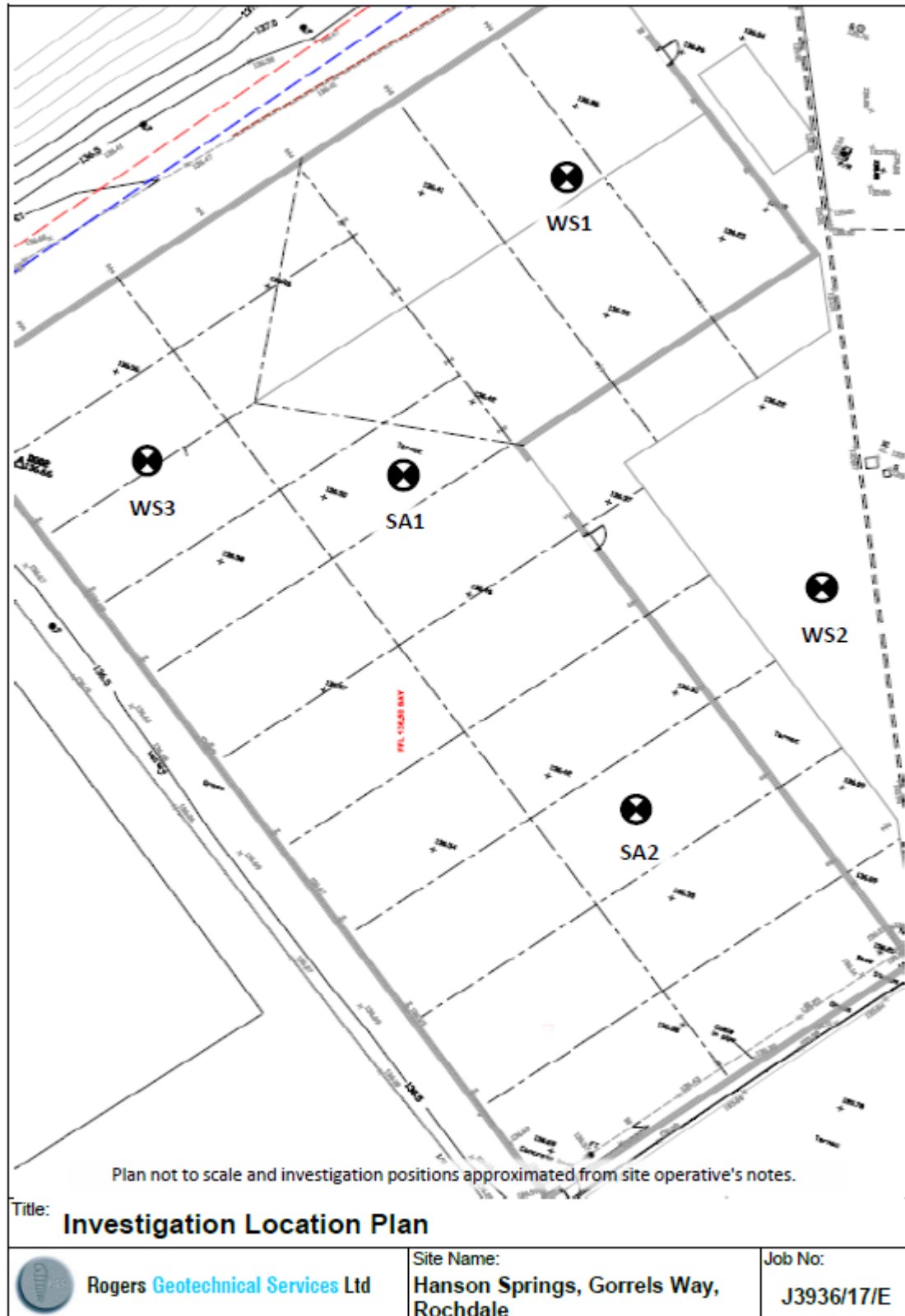


Appendix E Drained Areas





Appendix F Historic Ground Investigation Results





		Borehole Log					Borehole No. SA1 Sheet 1 of 2	
Project Name: Hanson Springs			Project No. J3936/17/E		Co-ords: -		Hole Type CP	
Location: Hanson Place, Gorrels Way, Rochdale, OL11 2PX.			Level:		Scale 1:50		Logged By IMY	
Client: Hanson Springs Ltd			Dates: 21/06/2017 - 22/06/2017					
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 1.00	B		0.30			CONCRETE. (Driller's description).
		0.25	D					
		1.00	D	N=18 (2,3/3,5,5,5)	1.00			Brown slightly gravelly, fine to medium SAND with low cobble content. Cobbles and gravel are well rounded. Gravel is fine to coarse of various lithologies.
		1.00 - 1.20	B					
		1.20	B					
		1.20 - 1.65	D					
		2.00		N=19 (3,4/5,5,5,4)				
		2.00 - 2.45	B					
		2.00 - 2.45	D					
		3.00		N=18 (3,3/4,4,5,5)				
		3.00 - 3.45	B					
		3.00 - 3.45	D					
		4.00		N=15 (2,3/4,3,4,4)				
		4.00 - 4.45	B					
		4.00 - 4.45	D					
		4.80		N=18 (2,2/3,3,6,6)	4.80			
		5.00	D					
		5.00 - 5.45	B					
5.00 - 5.45	D							
6.00		N=10 (1,2/2,3,3,2)						
6.00 - 6.45	B							
6.00 - 6.45	D							
7.00		N=8 (1,1/1,2,2,3)						
7.50	D							
7.50 - 7.95	B							
7.50 - 7.95	D							
8.50		N=9 (1,2/2,2,2,3)						
9.00	D							
9.00 - 9.45	B							
9.00 - 9.45	D							
9.60			9.60					
9.60	D							
10.00			10.00					
								Continued on next sheet

Remarks
 Awaiting access: 0.33 hrs, induction: 0.25 hrs. Trial pit to 1.2m depth. Cased to 15.0m depth.





				Borehole Log			Borehole No. SA1 Sheet 2 of 2			
Project Name: Hanson Springs				Project No. J3936/17/E		Co-ords: -		Hole Type CP		
Location: Hanson Place, Gorrels Way, Rochdale, OL11 2PX.				Level:		Scale 1:50		Logged By IMY		
Client: Hanson Springs Ltd				Dates: 21/06/2017 - 22/06/2017						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		10.50		N=36 (2,4/10,10,8,8)				Stiff becoming firm brown, silty laminated CLAY with frequent inclusions of silt.		
		10.50 - 10.95	B							
		10.50 - 10.95	D							
		11.50	D							
		12.00		N=12 (2,2/2,3,3,4)						
		12.00 - 12.45	B							
		12.00 - 12.45	D							
		13.00	D							
		13.50 - 13.95	U							
		14.00	D							
15.00		N=14 (2,2/3,3,4,4)								
15.00 - 15.45	D									
					15.45		End of borehole at 15.45 m			
									16	
									17	
									18	
									19	
									20	

Remarks Awaiting access: 0.33 hrs, induction: 0.25 hrs. Trial pit to 1.2m depth. Cased to 15.0m depth.									
---	--	--	--	--	--	--	--	---	--



		Borehole Log					Borehole No. SA2 Sheet 1 of 2			
Project Name: Hanson Springs			Project No. J3936/17/E		Co-ords: -		Hole Type CP			
Location: Hanson Place, Gorrels Way, Rochdale, OL11 2PX.			Level:		Scale 1:50		Logged By IMY			
Client: Hanson Springs Ltd			Dates: 22/06/2017 - 23/06/2017							
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.20 - 0.30	B		0.20		 CONCRETE. (Driller's description).			
		0.30 - 0.90	B		0.30					
		0.90 - 1.20	B	N=17 (2,2/3,5,5,4)	0.90				 MADE GROUND (Brown sandy sub-angular to sub-rounded, fine to coarse GRAVEL of brick). Dark brown slightly gravelly SAND. Gravel is sub-angular to well rounded, fine to coarse of various lithologies.	
		1.20	B							
		1.20 - 1.65	B							
		1.20 - 1.65	D							
		2.00	B	N=21 (3,5/5,5,6,5)	2.00					
		2.00 - 2.45								
		2.00 - 2.45								D
		3.00	B	N=12 (1,2/3,3,3,3)	3.00					
		3.00 - 3.45								
		3.00 - 3.45								D
		4.00	B	N=14 (1,2/3,3,4,4)	4.00					
		4.00 - 4.45								
		4.00 - 4.45								D
		5.00	B	N=13 (2,2/3,3,4,3)	5.00					
		5.00 - 5.45								
		5.00 - 5.45								D
6.00	B	N=10 (2,2/2,2,3,3)	6.00							
6.00 - 6.45										
6.00 - 6.45					D					
7.00	D	N=9 (1,2/2,2,2,3)	7.00							
7.50	B									
7.50 - 7.95	D									
8.40	D	N=7 (1,1/1,2,2,2)	8.40							
7.50 - 7.95	B									
7.50 - 7.95	D									
9.00	B	N=7 (1,1/1,2,2,2)	8.90							
9.00 - 9.45										
9.00 - 9.45					D					
10.00	D									

Continued on next sheet

Remarks
Trial pit to 1.2m depth. Cased to 15.0m depth.

AGS



Well		Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
Water Strikes	Depth (m)	Type	Results					
	10.50 - 10.95	U		10.50				
	11.00	D						
	12.00		N=23 (3,4/4,5,7,7)					
	12.00 - 12.45	B						
	12.00 - 12.45	D						
	13.00	D						
	13.50		N=2 (1,0/1,0,1,0)					
	13.50 - 13.95	B						
	13.50 - 13.95	D						
	14.00	D						
	15.00		N=6 (1,2/1,1,2,2)					
	15.00 - 15.45	D		15.45				
End of borehole at 15.45 m								

Remarks
Trial pit to 1.2m depth. Cased to 15.0m depth.

AGS



						Borehole Log			Borehole No. WS1		
Project Name: Hanson Springs						Project No. J3936/17/E		Co-ords:		Sheet 1 of 1	
Location: Hanson Place, Gorrels Way, Rochdale, OL11 2PX.						Level:		Scale 1:50		Hole Type WLS	
Client: Hanson Springs Ltd						Dates: 05/07/2017		Logged By IMY			
Well	Water Strikes	Samples and In Situ Testing					Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Dia. (mm)	TCR (%)	Results					
		0.20		85	100		0.20			ASPHALT.	
		1.50	D	75	100		1.50			Medium dense becoming loose, brown, slightly gravelly silty uniformly graded medium SAND. Gravel is well rounded, fine to coarse of various lithologies.	1
							2.30			1.6m - 2.3m Becomes loose	2
				65	100					Loose becoming medium dense, brown uniformly graded medium SAND with frequent becoming occasional beds (<5mm thick) of silty clay.	3
				55	95					3.6m - 5.0m Becomes medium dense, 5.7m - 4.3m Becomes SAND interbedded with clay.	4
		55	80			5.00			End of Borehole at 5.00m	5	
										6	
										7	
										8	
										9	
										10	

Remarks	
---------	---



Well		Samples and In Situ Testing					Depth (m)	Level (m)	Legend	Stratum Description
Water	Strikes	Depth (m)	Type	Dia. (mm)	TCR (%)	Results				
				85	100		0.20			ASPHALT.
		1.00	SPT			N=31 (2,3/7,9,8,7)				Medium dense, brown becoming light brown, slightly gravelly uniformly graded medium SAND. Gravel is well rounded, fine to coarse of various lithologies.
		2.00	SPT	75	100					
		2.50	D	65	95					1.85m - 2.0m. Occasional thin beds of clay present. Slight hydrocarbon odour noted.
		2.70								
		3.00	SPT			N=10 (2,2/2,3,3,2)				
				55	75					
		4.00	SPT			N=15 (1,3/3,3,4,5)	4.00			End of Borehole at 4.00m
Remarks										





Well		Samples and In Situ Testing				Depth (m)	Level (m)	Legend	Stratum Description
Water Strikes	Depth (m)	Type	Dia. (mm)	TCR (%)	Results				
			85	80		0.20			ASPHALT.
						0.30			MADE GROUND (Light brown sandy GRAVEL. Gravel is sub-angular to sub-rounded, fine to coarse of limestone).
			75	100		0.40			MADE GROUND (Light grey sandy GRAVEL. Gravel is sub-angular to sub-rounded, fine to coarse of mudstone and siltstone).
			65	100					Medium dense light brown, slightly gravelly uniformly graded medium SAND. Gravel is well rounded, fine to coarse of various lithologies.
	3.00 - 4.00	B				3.00			
									End of Borehole at 4.00m
Remarks									

AGS



Appendix G Soakaway Calculations



Existing Building:

Quick Storage Estimate

Input

Input Type

User Input

Area (ha)

0.044

Volumetric Runoff Coefficient

0.750

Discharge Rate (L/s)

0.0

Infiltration Rate (m/hr)

0.018

Safety Factor

2.0

Quick

Calculate

Create New

From Library

All

FSR

Method

FSR

Number of Storms

18

Max. Run Time (mins)

2880

Results

Quick Storage Estimate variables require approximate storage of between 55m³ - 55m³.

With Infiltration storage is reduced to between 16m³ - 39m³.

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

New Building:

Quick Storage Estimate

Input

Input Type

User Input

Area (ha)

0.248

Volumetric Runoff Coefficient

0.750

Discharge Rate (L/s)

0.0

Infiltration Rate (m/hr)

0.036

Safety Factor

2.0

Quick

Calculate

Calculate

Create New

From Library

All

FSR

Method

FSR

Number of Storms

18

Max. Run Time (mins)

2880

Results

Quick Storage Estimate variables require approximate storage of between 311m³ - 311m³.

With Infiltration storage is reduced to between 92m³ - 218m³.

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



Service Yard:

Quick Storage Estimate

Input Type

User Input

▼

Area (ha)

0.069

Volumetric Runoff Coefficient

0.750

Discharge Rate (L/s)

0.0

Infiltration Rate (m/hr)

0.036

Safety Factor

2.0

Quick

▼

Calculate

Calculate

☐ Create New

☒ From Library

☒ All

☒ FSR

...

Method

FSR

Number of Storms

18

Max. Run Time (mins)

2880

Results

Quick Storage Estimate variables require approximate storage of between 87m³ - 87m³.

With Infiltration storage is reduced to between 25m³ - 61m³.

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

Additional Service Yard:

Quick Storage Estimate

Input Type

User Input

▼

Area (ha)

0.36

Volumetric Runoff Coefficient

0.750

Discharge Rate (L/s)

0.0

Infiltration Rate (m/hr)

0.036

Safety Factor

2.0

Quick

▼

Calculate

☐ Create New

☒ From Library

☒ All

☒ FSR

...

Method

FSR

Number of Storms

18

Max. Run Time (mins)

2880

Results

Quick Storage Estimate variables require approximate storage of between 452m³ - 452m³.

With Infiltration storage is reduced to between 133m³ - 316m³.

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



Appendix H Drainage Schematic





Appendix I Maintenance Recommendations



Attenuation Tank

Extract from CIRIA SuDS Manual 2015

TABLE 21.3 Operation and maintenance requirements for attenuation storage tanks

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required