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DRAINAGE SCHEME DESIGN REPORT

112 CHURCH ST, LITTLEBOROUGH OL15 8AS

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STRUCTURAL | ENVIRONMENTAL | GEOTECHNICAL



HME Civil Engineering Limited. Registered in England: **15684044**

Client:

Ryan Martyn

ryan@astrolondon.co.uk

Site visit date and time:

25th January 2025 12:00.

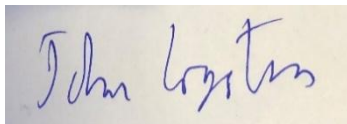
Site testing date and time:

6th February 2025 09:00.

Revision:

01 Second Revision

Document Compiled by:



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1. Introduction

Mr Ryan Martyn has appointed HME Civil Engineering to prepare a revised drainage strategy for the proposed pair of semi-detached dwellings at 112 Church Street, Littleborough, OL15 8AS, in support of the discharge of planning condition 5 (drainage).

This updated report has been prepared following consultation with United Utilities and sets out the findings from site visits, infiltration testing and a desktop survey. The purpose of the design is to provide a robust foul and surface water drainage solution in line with the latest standards, regulations, and the requirements highlighted in the United Utilities response.

The surface water hierarchy has been investigated as part of this assessment. Infiltration testing was carried out on 6th February 2025 in accordance with BRE 365, using a trial pit excavated on site (location shown in Figure 2). Weather conditions during testing were dry. The Phase 2 site investigation indicates that the majority of the underlying ground is clay, and no groundwater was encountered in the trial pit. Testing was repeated where possible to replicate representative site moisture conditions.

This report considers the results of testing, confirms the limited potential for infiltration drainage, and identifies the proposed points of foul and surface water discharge in agreement with United Utilities' requirements. The drainage scheme seeks to demonstrate compliance with the surface water hierarchy and ensures that the development can be sustainably drained without increasing flood risk or placing unnecessary burden on the public sewer network.

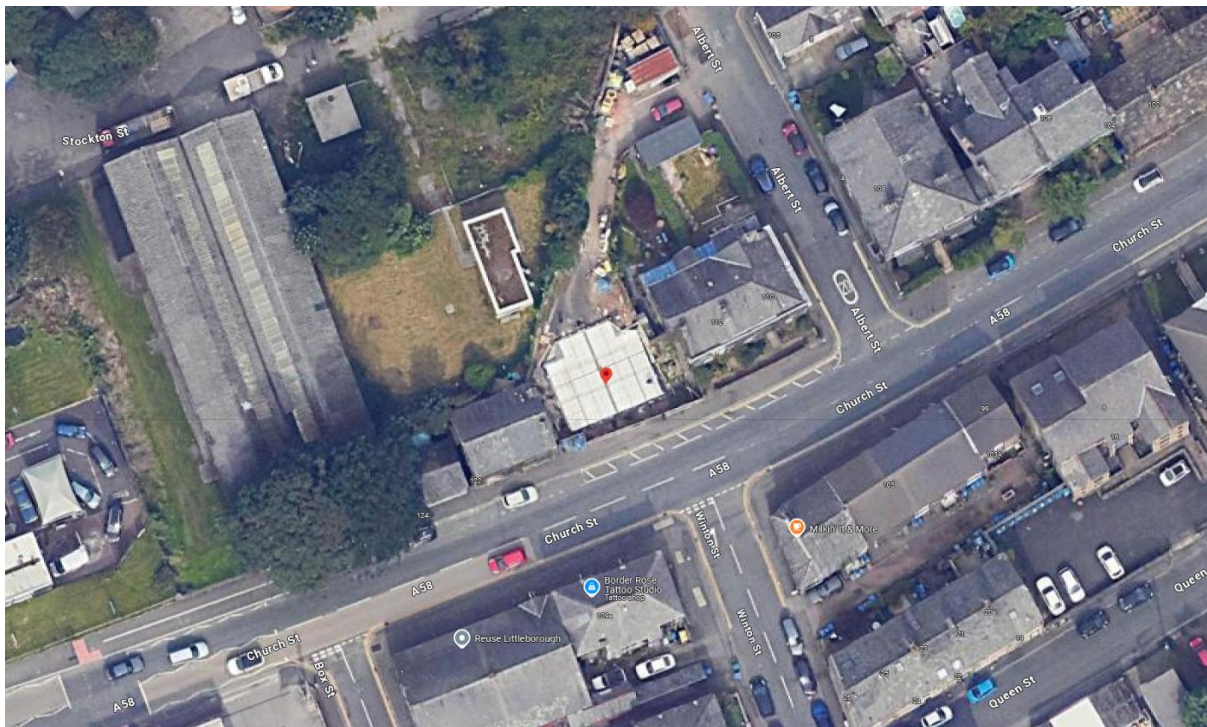


Figure 1 Site Location (112 church St, Littleborough OL15 8AS.)

2. Infiltration Testing

On the 6th February 2025 HME Civil Engineering Consultants undertook infiltration testing on the site, to determine the suitability of the existing sites strata for soakaway discharges, including permeability.

The field investigations are required to confirm infiltration rates. The procedure followed was to excavate 1nr soakage trial pit (due to the site constraints) to the same depth as anticipated in the full-size soakaway. The pit was dug to 1m below the anticipated invert level of the drain discharging to the soakaway.

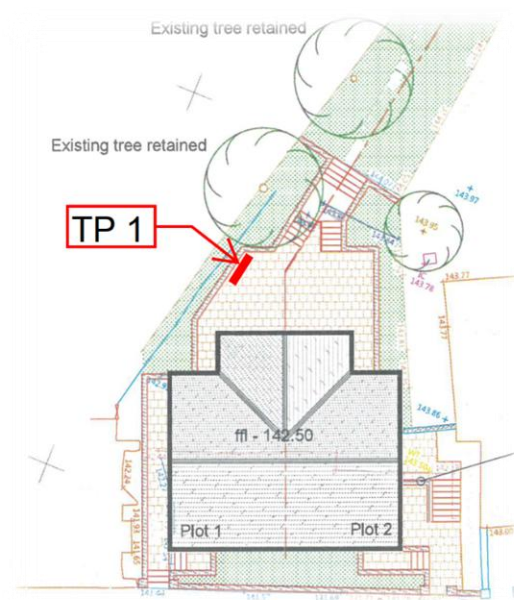
Overall depths of excavation were 1.5m. The soakage trial pit was also 1.5m long and 0.3m wide. The trail pit had vertical sides trimmed square and there was no requirement for granular material to be used in these tests.

Measurements of the soakage trial pit were carefully taken before trials. For safety reasons HME Civil Engineering Consultants did not enter the soakage trial pit. The inflow was rapid as could be achievable for the site (IBC Tank), and filled with 1000mm depth of water, as near to the anticipated design invert level of the drain as possible to effectively test the permeability of the ground.

HME took care to ensure that the inflow did not cause the walls of the soakage trial pit to collapse.

HME filled the soakage trial pit and allowed it to drain two times until a cut off time was reached. Each time recording the water level in 50mm intervals, which was determined as sufficiently close to clearly define water level versus time. The fillings of the soakage trial pit was on the same day.

Prior to testing, the pits were well soaked and saturated by HME Civil Engineering Consultants.



HME Civil Engineering Limited – Drainage Design

2.1. Test Results

The trial pit was dug using hand tools due to the site access constraints, to enable the infiltration testing. The pit was dug, saturated prior to testing and then filled twice, on the same day. TP1 images pre and post testing can be seen below.

Trial Pit 1 photos: 300W x 1500L x 1500D





2.1.1. Trial Pit 1

See below test results showing depth below ground and the time, for trial pit 1. The worst case results, highlighted in **Red**, are to be used for calculation purposes.

Location	Test pit size	Test number	Depth below ground (mm)	Time
Test Pit 1	300W x 1500L x1500D	1	500	0m 0s
			550	0m 30s
			600	01m 15s
			650	2m 0s
			700	3m 12s
			750	5m 17s
			800	12m 2s
			850	33m 55s
			900	1h 19m 10s
			950	2hr 52m 50s
			1000	5hr 25m 12s
			Test aborted at 6hrs. no further percolation.	
Location	Test pit size	Test number	Depth below ground (mm)	Time
Test Pit 1	300W x 1200L x1500D	2	500	0m 0s
			550	0m 40s
			600	01m 28s
			650	2m 20s
			700	3m 45s
			750	6m 3s
			800	14m 46s
			850	48m 10s
			900	1h 56m 10s
			950	3hr 59m 50s
			975mm	Test aborted at 6hrs. (975mm achieved) no further percolation.

2.2. Testing Conclusion

Poor percolation was found during testing. Both tests 1 and 2 had to be aborted due to the 6 hour cut off time being reached. The test was abandoned at pit 1 after 6 hours due to the underlying clay and resulting slow rate of infiltration.

There is existing clay soil at the depth below ground where infiltration would be required for a soakaway system, the clay ground conditions encountered has very fine particles that are tightly packed together, limiting the space for water to seep through. It was evident from the testing, that water will pool within the pit instead of draining effectively into the surrounding soil. Therefore, this would pose a high risk of localised flooding during periods of increased rain fall.

Soakaways are not suitable in this location. Given the sites topography and constraints, there were no other suitable locations for a soakaway to be suited due to the close proximity of the properties and the requirement to locate a soakaway 5m from a property. It is therefore not possible to discharge surface water by soakaway.

3. Alternatives to Soakaway

In accordance with the surface water drainage hierarchy (NPPF, Building Regulations Part H, and United Utilities guidance), the disposal options for surface water generated by the proposed development at 112 Church Street, Littleborough have been considered in the following order of priority:

Infiltration (Soakaway)

Infiltration testing was undertaken on 6th February 2025 in accordance with BRE 365 methodology.

The trial pit investigation confirmed that the site is underlain predominantly by clay, as identified in the Phase 2 ground investigation.

Testing demonstrated negligible infiltration capacity, and no groundwater was observed within the trial pit.

As a result, the use of soakaways or other infiltration-based solutions is not feasible for this development.

Discharge to Watercourse

A review of Ordnance Survey mapping, United Utilities records and site walkover surveys confirmed there are no existing watercourses, streams or culverted channels within, or immediately adjacent to, the site boundary.

There is therefore no viable opportunity to discharge surface water runoff to a natural watercourse.

Discharge to Surface Water Sewer

A 225mm diameter public surface water sewer exists within Church Street. However, following investigation this option has been deemed unsuitable for use for the following reasons:

The sewer was found to be heavily blocked and silted up, preventing survey confirmation of condition or connectivity.

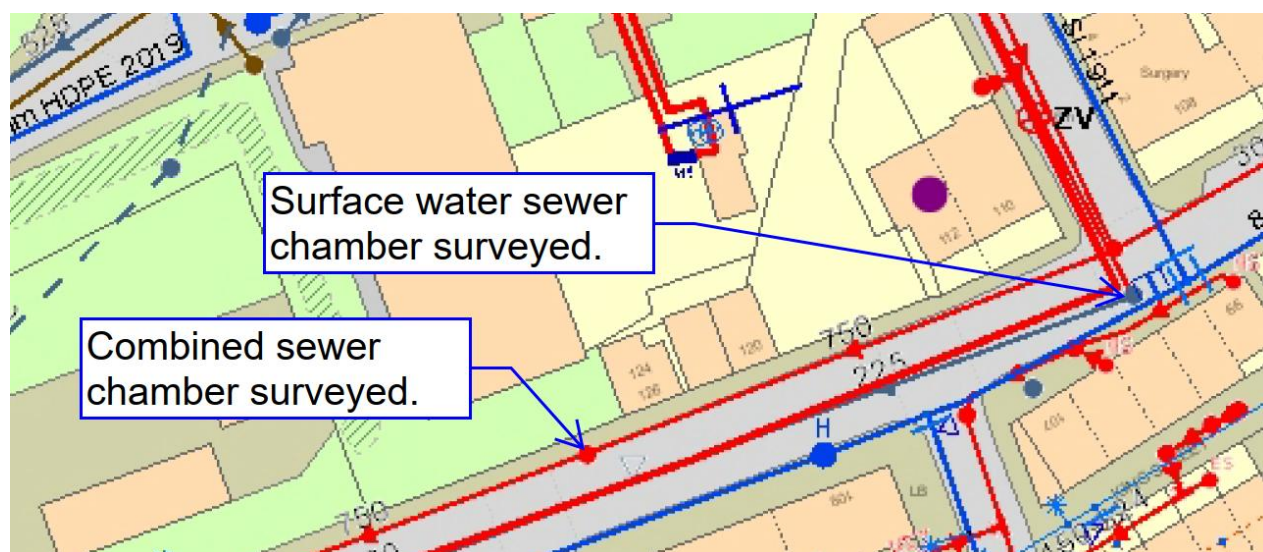
The crown level of the pipe is approximately 500mm below the carriageway surface, which is not compliant with current highway drainage installation specifications.



The nearest accessible chamber (that was surveyed) is located at a level approximately 700mm higher than the proposed development, which would result in a significant depth difference, preventing gravity connection without extensive and costly regrading.

Connection would necessitate a full road closure on Church Street, a heavily trafficked commuter route, leading to substantial disruption to the local community.

Undertaking new trenching works into the adopted carriageway would create unnecessary long-term maintenance liability. For these reasons, connection to the 225mm surface water sewer has been discounted as a feasible option.



Discharge to Combined Sewer

A 750mm diameter combined public sewer is located within the vicinity of the site. This sewer already receives both foul and surface water flows, including runoff from existing road gullies.

A survey and dye testing exercise has confirmed the existence of a private connection from the buildings- which were previously constructed on the new development site, which discharges into this combined sewer by means of a saddle connection.

The proposed drainage scheme will utilise this existing connection point to discharge both foul and attenuated surface water flows from the new dwellings. See below dye test proving the route - CH6, CH7 and combined sewer chamber surveyed.

CH6:



CH7:



Combined sewer chamber surveyed (dye test):



4. Drainage Design Parameters and Strategy

As per the planning conditions a maximum discharge rate of 5l/s has been used for the drainage calculations with a 40% uplift for climate change.

Attenuation will be provided by an oversized pipe and large chambers. Flow restriction has been provided with a vortex flow control device and an orifice. Both sides of the property drain down to the same existing sewer so will require attenuation so the combined flow rate is limited to 5l/s.

The foul water from both properties has also been connected into manhole C3.

5. United Utilities Liaison

RE: 112 Church Street Drainage DC/25/549 - 25/00165/DOC UPDATED INFORMATION

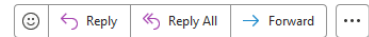


seweradoptions@uuplc.co.uk

To: Henry Emsley
Cc: ryan@superiorlawn.co.uk

You replied to this message on 14/10/2025 12:27.

This message is part of a tracked conversation. Click here to find all related messages or to open the original flagged message.
Click here to download pictures. To help protect your privacy, Outlook prevented automatic download of some pictures in this message.



Tue 14/10/2025 08:31

Hello Henry

Thank you for all the information provided.

I can confirm that a surface water connection using the existing connection to the 750mm diameter combined is your most viable option and it is acceptable in principle.

You may use this chain of e-mail to support United Utilities' recommendation of discharge of drainage conditions.

If I can be of any further support.

Kind Regards

Gulshan



Water for the North West

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Upcoming Leave: 27th Oct to 7th of Nov

6. Detailed Drainage Design

As requested in the planning permission, drainage calculations have been carried out using MicroDrainage 2020 the results of which are shown in Appendix A.

The as built drainage will need some modification as shown in the detailed design drawing in Appendix B. The majority of the site to the North of the proposed residences will be drained to a section of oversized 450mm diameter pipe which will be connected to a minimum 1350mm diameter chamber which will contain an ACO Q-Brake. It is recommended that a proprietary ACO twin wall chamber is used and installed in accordance with the manufacturer's recommendations.

The Q-Brake shall have the following details:

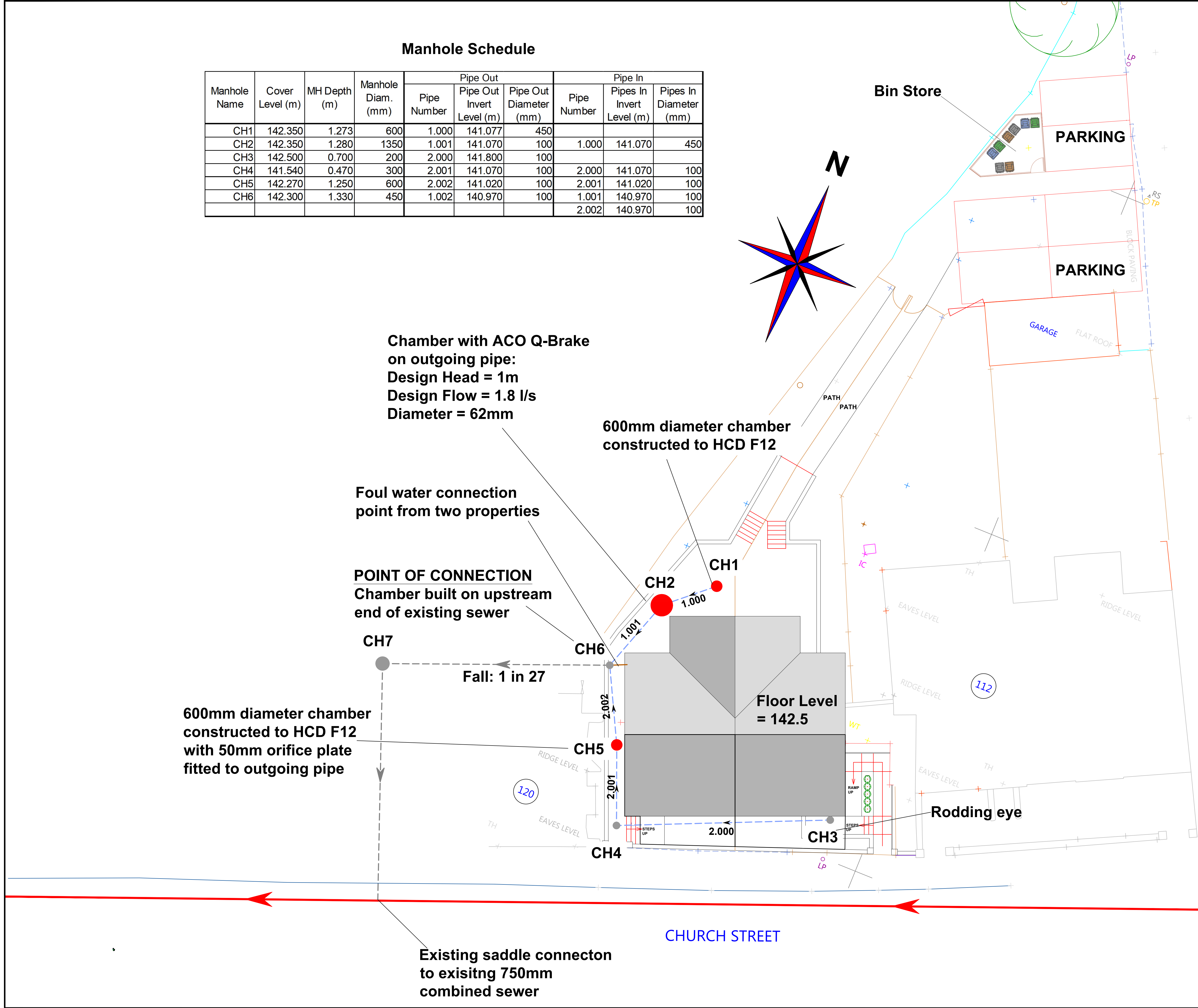
- Design Head: 1 m
- Design flow: 1.8 l/s
- Diameter: 62mm

The only modification to the south of the site will be the installation of a 600mm diameter chamber with a 50mm orifice plate fitted to the outfall pipe. This chamber will be installed as shown on the line of the existing pipe without modification to its levels.

The combination of these controls will result in a maximum outfall from the site of 5l/s for all return period storms up to 100 years with a 40% uplift applied for climate change. The microdrainage calculations also show that no surface water flooding will occur on the site.

Manhole Schedule

Manhole Name	Cover Level (m)	MH Depth (m)	Manhole Diam. (mm)	Pipe Out			Pipe In		
				Pipe Number	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipe Number	Pipes In Invert Level (m)	Pipes In Diameter (mm)
CH1	142.350	1.273	600	1.000	141.077	450			
CH2	142.350	1.280	1350	1.001	141.070	100	1.000	141.070	450
CH3	142.500	0.700	200	2.000	141.800	100			
CH4	141.540	0.470	300	2.001	141.070	100	2.000	141.070	100
CH5	142.270	1.250	600	2.002	141.020	100	2.001	141.020	100
CH6	142.300	1.330	450	1.002	140.970	100	1.001	140.970	100
							2.002	140.970	100



NOTES:

- All levels are Above Ordinance Datum
- For additional details see the Drainage Scheme Design Report.
- All roof and other surface water collection to the north of the site shall be connected to, or upstream of CH2.

KEY:

- SURFACE WATER DRAIN
- FOUL WATER DRAIN
- EXISTING 100MM COMBINED DRAIN
- EXISTING 750MM COMBINED SEWER

- CHAMBER
- EXISTING CHAMBER
- FLOW

Revision	Date	Description
Revision	Date	Description
Revision	Date	Description
C	27/10/25	Route to outfall added and notes updated
B	13/05/25	Point of connection and existing sewer annotated
A	18/02/25	First Issue

HME

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Project

112 CHURCH STREET
LITTLEBOROUGH

Drawing Title

DRAINAGE LAYOUT PLAN

Drawing Number

CHURCH_GA_1

Drawn:

Date: 13/05/25

Scale: NTS

Rev: C

Innovyze	Network 2020.1.3
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30 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1)
for Existing

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 2 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

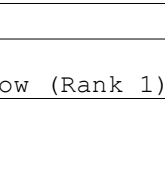
Rainfall Model	FSR	Ratio R	0.250
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720,
 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640,
 10080
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 40, 40, 40

									Water
	US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow
PN	Name	Storm	Period	Change		Surcharge	Flood	Overflow	Act.
E1.000	E1	15	Winter	30	+40%	30/15	Summer		141.757
E1.001	E2	240	Summer	30	+40%	1/15	Summer		141.290
E2.000	E3	15	Winter	30	+40%				141.821
E2.001	E4	15	Winter	30	+40%	30/15	Summer		141.371
E2.002	E5	15	Winter	30	+40%	1/15	Summer		141.358
E1.002	E6	15	Winter	30	+40%	100/15	Summer		141.070

PN	US/MH Name	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)		
E1.000	E1	0.230	0.000	0.04			5.3	SURCHARGED	
E1.001	E2	0.120	0.000	0.22			1.8	SURCHARGED	
E2.000	E3	-0.079	0.000	0.10			1.6	OK	

Date 18/02/2025 File CHURCH.MDX				Page 6	
					
Innovyze		Network 2020.1.3			

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	2	Number of Storage Structures	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.250
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

Profile(s)

Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080	Summer and Winter
Return Period(s) (years)	1, 30, 100	
Climate Change (%)	40, 40, 40	

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
E1.000	E1	15 Winter	100	+40%	30/15 Summer				142.085
E1.001	E2	60 Winter	100	+40%	1/15 Summer				142.344
E2.000	E3	15 Winter	100	+40%					141.823
E2.001	E4	15 Winter	100	+40%	30/15 Summer				141.529
E2.002	E5	15 Winter	100	+40%	1/15 Summer				141.508
E1.002	E6	15 Winter	100	+40%	100/15 Summer				141.082

PN	US/MH Name	Depth (m)	Surcharged Volume (m³)	Flooded Flow / Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
E1.000	E1	0.558	0.000	0.05		6.5	FLOOD RISK	
E1.001	E2	1.174	0.000	0.25		2.0	FLOOD RISK	
E2.000	E3	-0.077	0.000	0.12		2.0	OK	

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