SURFACE AND FOUL WATER DRAINAGE SCHEME

for

Mr NICK SKELTON

ERECTION OF A REPLACEMENT SINGLE RESIDENTIAL DWELLING

at

98 RIBCHESTER ROAD AND LAND ADJACENT 94 RIBCHESTER ROAD

CLAYTON-LE-DALE, BB1 9HQ

DECEMBER 2024

REFORD

Consulting Engineers Limited

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CONTENTS

1. INTRODUCTION

1.1 This surface and foul water drainage scheme has been produced on behalf of Mr Nick Skelton to discharge Conditions 9 and 12 of the planning approval from Ribble Valley Borough Council (Reference 3/2024/0302) for the construction of a replacement single residential dwelling at 98 Ribchester Road and land adjacent 94 Ribchester Road, Clayton-le-Dale, BB1 9HQ. A location plan is included within Appendix A.

1.2 Condition 9 states the following:

The surface water from the approved access, parking and turning areas shall be collected within the site and drained to a suitable internal outfall within the site boundary or constructed in porous materials. The scheme shall be implemented and thereafter retained in accordance with the above details prior to occupation of the dwelling.

1.3 Condition 12 states the following:

Prior to the commencement of development, a drainage scheme, which shall detail measures for the attenuation and the disposal of foul and surface waters, shall be submitted to and approved in writing by the Local Planning Authority. The surface water drainage scheme shall be in accordance with the hierarchy of drainage options outlined in the National Planning Practice Guidance and the Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015), or any subsequent replacement national guidance / standards, with evidence of an assessment of the site conditions to include site investigation and test results to confirm infiltrations rates to be submitted. For the avoidance of doubt, surface water must drain separate from the foul and unless otherwise agreed in writing by the Local Planning Authority, no surface water shall discharge to the public sewerage system either directly or indirectly.

No part of the development shall be occupied or brought into first use until the drainage works have been completed in accordance with the approved scheme. Thereafter the agreed scheme shall be retained, managed and maintained in accordance with the approved details.

1.4 This surface and foul water drainage scheme is to discharge Conditions 9 and 12 of the planning approval. It describes the existing site conditions and proposed development. It assesses the potential impact of proposals on existing drainage and includes a proposed scheme for the provision of new drainage to serve the proposed development.

2. BASE INFORMATION

Existing site

2.1 The application site lies on the northern side of Ribchester Road within the settlement boundary of Wilpshire and comprises a vacant parcel of land with a redundant random stone outbuilding fronting Ribchester Road that adjoins a row of cottages to the east.

2.2 The site is of an area approx. 0.07ha. Access is taken from Ribchester Road.

Site geology

2.3 The online Soilscapes Viewer has identified the site lying close to the boundary of the following soil types:

- Freely draining slightly acid loamy soils
- Slowly permeable seasonally wet acid loamy and clayey soils

Understanding of existing drainage local to the site

2.4 United Utilities sewer records identify a 225mm diameter public sewer within Ribchester Road flowing westwards. An extract from the sewer records is included within Appendix B.

2.5 There are no watercourses local to the site.

2.6 A private combined drainage system within the site collects surface water and foul water from the existing dwellings and discharges into the 225mm diameter public sewer that lies within Ribchester Road.

Proposed development

2.7 The development is for the erection of a single residential dwelling and attached single garage following the demolition of the existing dwelling 98 Ribchester Road.

3. PROPOSED DRAINAGE SCHEME

3.1 The proposed drainage layout is included within Appendix C.

Surface water drainage

3.2 In accordance with the National Standards for Sustainable Drainage, the surface water drainage scheme should incorporate the use of Sustainable Drainage (SUDS) where possible. The approach promotes the use infiltration features in the first instance. If drainage cannot be achieved solely through infiltration due to site conditions or contamination risks, the preferred options are (in order of preference):

(i) a controlled discharge to a local waterbody or watercourse, or

(ii) a controlled discharge into the public sewer network (depending on availability and capacity).

3.3 The rate and volume of discharge should strive to provide betterment and be restricted to the pre-development values as far as practicable.

3.4 The online Soilscapes Viewer has identified the site lying close to the boundary of the following soil types:

- Freely draining slightly acid loamy soils
- Slowly permeable seasonally wet acid loamy and clayey soils

3.5 Local knowledge has stated within a consultation letter that there is a serious concern relating to the location of a proposed soakaway within the development site near to the north facing existing stonewall as the area is identified as being heavily clay based. As such any soakaway would be open to a serious risk of flooding. Local excavations have confirmed the presence of clay based soils that impede infiltration.

3.6 In addition as a soakaway is to be positioned a minimum 5m away from any building / structure, there is insufficient room within the proposed curtilage of the dwelling in which to locate a soakaway.

3.7 The disposal of surface water back into the ground by the use of soakaways will therefore not be possible on this site.

3.8 There are no watercourses local to the site.

3.9 United Utilities sewer records identify a 225mm diameter public sewer within Ribchester Road flowing westwards. A private combined drainage system within the site collects surface water and foul water from the existing dwellings and discharges into the 225mm diameter public sewer that lies within Ribchester Road.

3.10 It is therefore intended that surface water runoff from the proposed single residential dwelling will be restricted to 2.0 l/s allowing surface water runoff generated by all rainfall events up to the 100 year critical rain storm plus 50% on stored volumes to discharge into an existing internal manhole on the drainage system within the site and the 225mm diameter public sewer that lies within Ribchester Road. The additional 50% is to allow for climate change and has been included in the surface water volume.

3.11 The proposed surface water drainage for the development will take runoff only from the roof of the proposed single residential dwelling, which with 10% added for urban creep has a total area of 140m^2.

3.12 The private drive is to comprise a gravel surface finish allowing surface water runoff to pass into the construction matrix or to run off at its edges where it will either infiltrate into the upper soil layers, evaporate or be taken up by the vegetation, thus dealing with the surface water at source. It has been determined that in order to cater for the 100 year critical rain storm plus 50% added for climate change, the depth of the sub-base under the private drive comprising open graded crushed rock shall be a minimum thickness of 240mm.

3.13 Similarly, surface water from the paths around the proposed dwelling will runoff to channel drains or to adjacent areas of gravel filter strips or planted beds where it will be allowed to infiltrate into the upper strata and will be either taken up by plants or evaporated thus also dealing with the surface water at source.

3.14 A surface water drainage design has been carried out for the proposed single residential dwelling for all events up to the 100 year critical rain storm plus 50% for climate change on stored volumes. Attenuation is provided within the drainage system of pipes and manholes. The surface water drainage design is included within Appendix C.

Foul water drainage

3.15 United Utilities sewer records identify a 225mm diameter public sewer within Ribchester Road flowing westwards.

3.16 It is therefore intended that foul water from the single residential dwelling will be collected by a piped system and discharged into the existing drainage system within the site and the public sewer that flows westwards within Ribchester Road.

4. SUMMARY AND CONCLUSIONS

4.1 This surface and foul water drainage scheme has been produced on behalf of Mr Nick Skelton to discharge Conditions 9 and 12 of the planning approval from Ribble Valley Borough Council (Reference 3/2024/0302) for the construction of a replacement single residential dwelling at 98 Ribchester Road and land adjacent 94 Ribchester Road, Clayton-le-Dale, BB1 9HQ.

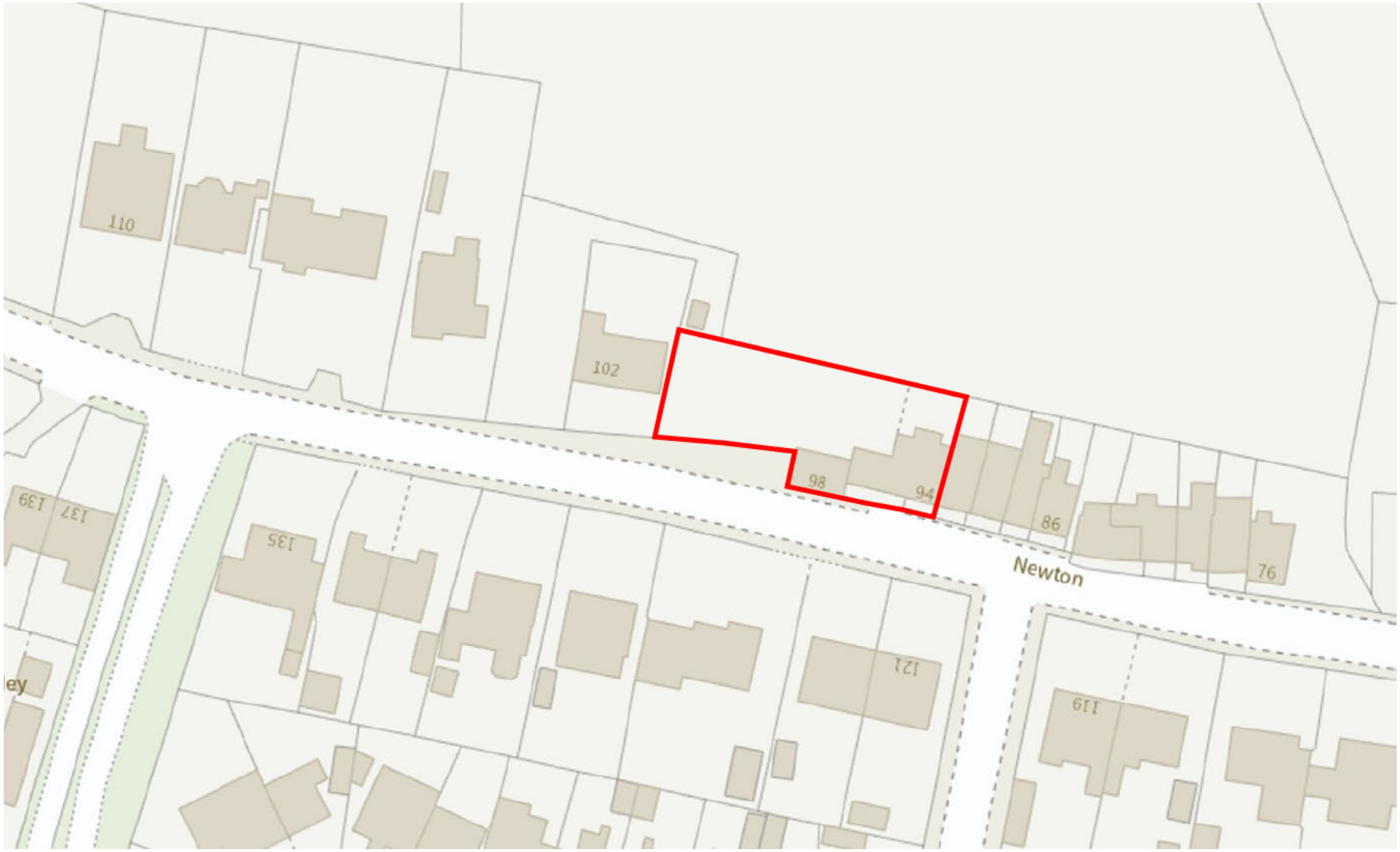
4.2 Infiltration of surface water back into the ground is not feasible on this site.

4.3 There are no watercourses local to the development site.

4.4 Surface water runoff from the proposed single residential dwelling will be controlled to 2 l/s, prior to a controlled discharge into an existing internal manhole on the drainage system within the site and the 225mm diameter public sewer that lies within Ribchester Road.

4.5 Foul water from the proposed single residential dwelling will be collected by a piped system and discharged into the existing drainage system within the site and the public sewer that flows westwards within Ribchester Road.

APPENDIX A

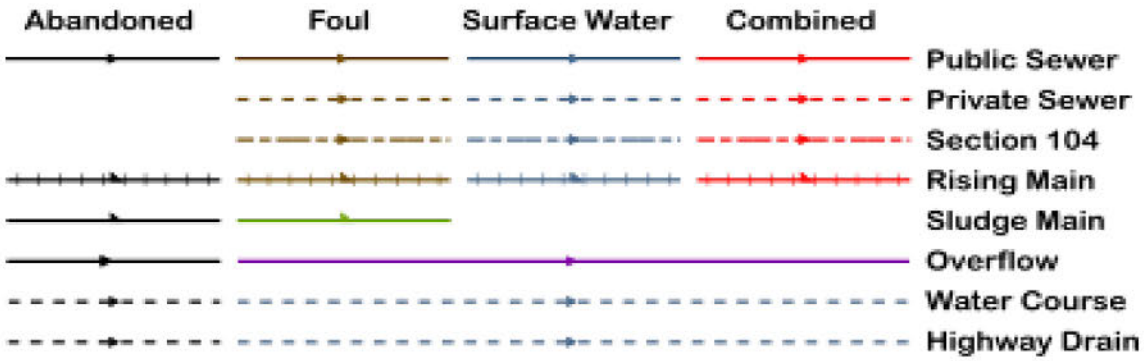


LOCATION PLAN

APPENDIX B

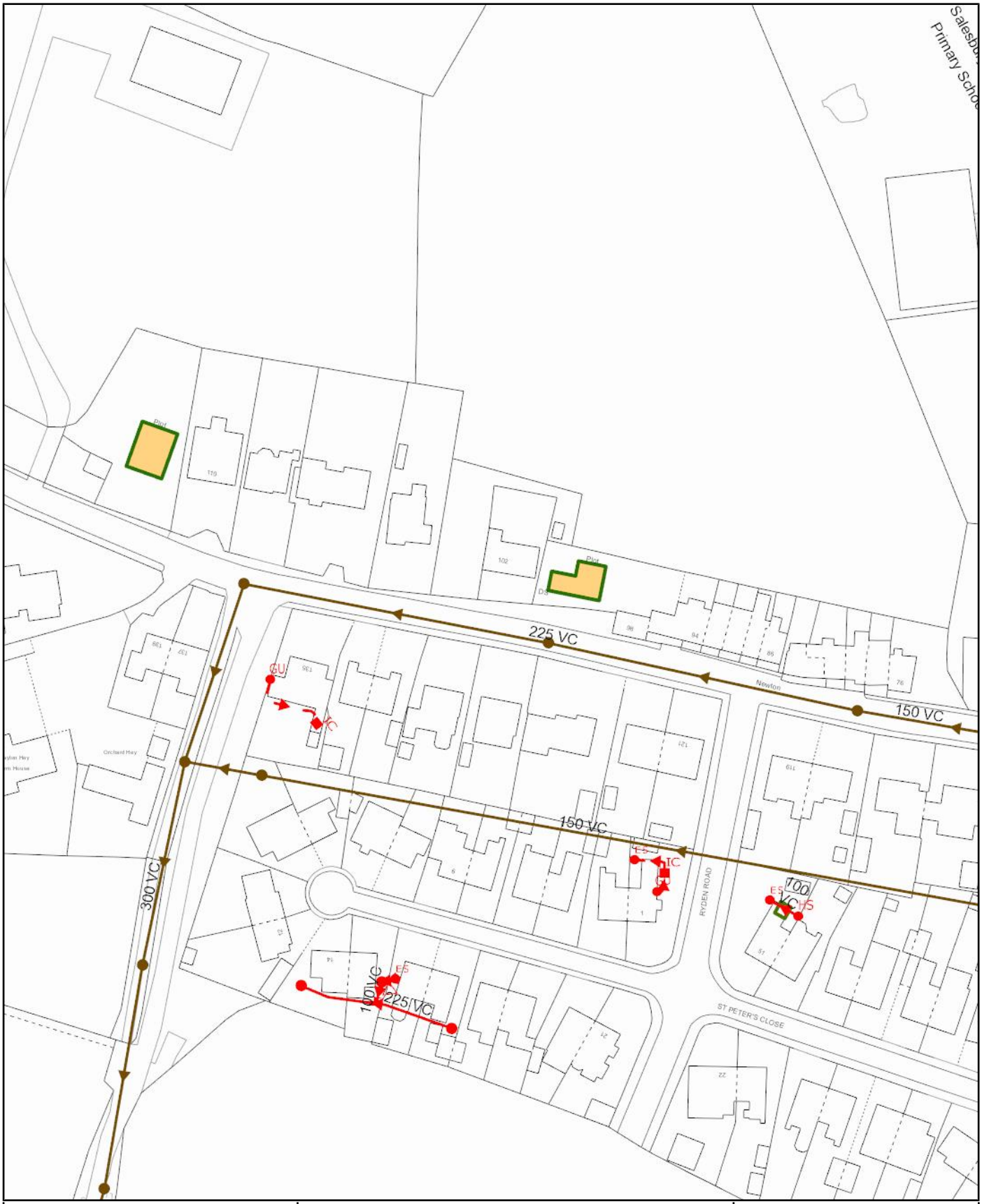
United Utilities
Water for the North West

Wastewater Symbology



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

- Manhole
- HS Head of System
- ES Extent of Survey
- RE Rodding Eye
- IN Inlet
- DP Discharge Point
- HY Vortex
- PE Penstock
- WO Washout Chamber
- VA Valve
- AV Air Valve
- NRV Non Return Valve
- SO Soakaway
- GU Gully
- CA Cascade
- FM Flow Meter
- HA Hatch Box
- OI Oil Interceptor
- SM Summit
- DS Drop Shaft
- OP Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- IC Inspection Chamber
- Bifurcation Chamber
- LH Lamp Hole
- T Junction / Saddle
- CA Catchpit
- VC Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- T Network Storage Tank
- V Sewer Overflow
- WwTW Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- CK Control Kiosk
- DNM Network Monitoring Point
- Change of Characteristic



Scale:	1:1250	**SEWER RECORDS**	United Utilities Water for the North West
Date:	12/11/2024		
Address or Site Reference:	94 ribchester road		
Printed by:	Property Searches		

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

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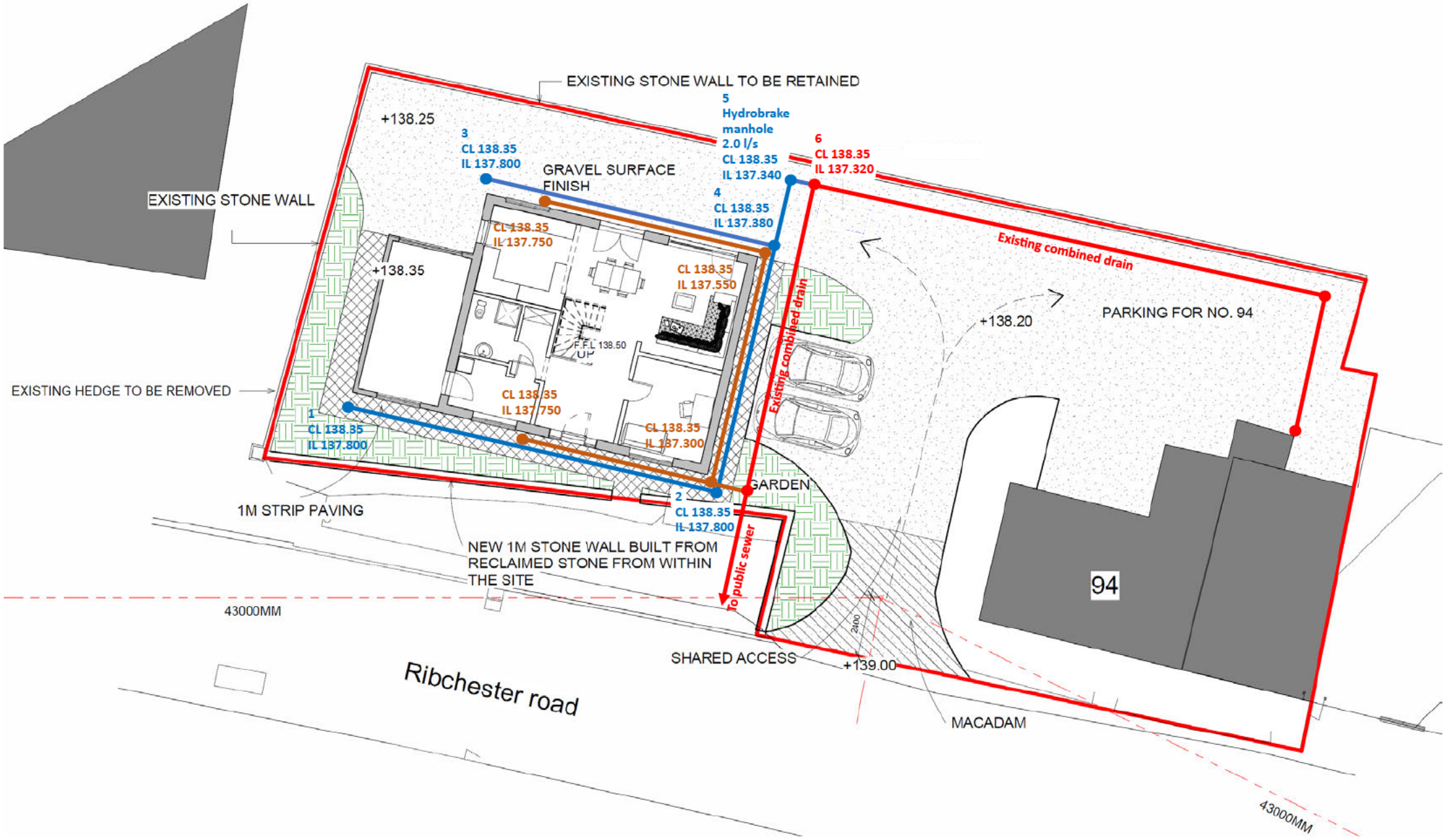
APPENDIX C



PROPOSED DRAINAGE LAYOUT

APPENDIX D

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	75.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	18.800	Minimum Backdrop Height (m)	2.000
Ratio-R	0.300	Preferred Cover Depth (m)	0.450
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
1	0.004	5.00	138.350	100	0.550
2	0.003	5.00	138.350	450	0.800
3	0.004	5.00	138.350	100	0.550
4	0.003	5.00	138.350	450	0.970
5			138.350	1200	1.010
6			138.350	1200	1.030

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Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	15.000	0.600	137.800	137.550	0.250	60.0	100	5.25	55.9
1.001	2	4	10.000	0.600	137.550	137.380	0.170	58.8	100	5.42	55.2
2.000	3	4	12.000	0.600	137.800	137.380	0.420	28.6	100	5.14	56.4
1.002	4	5	2.000	0.600	137.380	137.340	0.040	50.0	100	5.45	55.1
1.003	5	6	1.000	0.600	137.340	137.320	0.020	50.0	100	5.46	55.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.996	7.8	0.6	0.450	0.700	0.004	0.0	19	0.592
1.001	1.006	7.9	1.0	0.700	0.870	0.007	0.0	25	0.696
2.000	1.449	11.4	0.6	0.450	0.870	0.004	0.0	16	0.773
1.002	1.092	8.6	2.1	0.870	0.910	0.014	0.0	34	0.906
1.003	1.092	8.6	2.1	0.910	0.930	0.014	0.0	34	0.906

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	138.350	0.550	100	0	1.000	137.800	100
2	138.350	0.800	450	1	1.000	137.550	100
				0	1.001	137.550	100
3	138.350	0.550	100	0	2.000	137.800	100

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Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
4	138.350	0.970	450	1	2.000	137.380	100
				2	1.001	137.380	100
				0	1.002	137.380	100
5	138.350	1.010	1200	1	1.002	137.340	100
				0	1.003	137.340	100
6	138.350	1.030	1200	1	1.003	137.320	100

Simulation Settings

Rainfall Methodology	FSR	Summer CV	0.750	Drain Down Time (mins)	240
FSR Region	England and Wales	Winter CV	0.840	Additional Storage (m³/ha)	20.0
M5-60 (mm)	18.800	Analysis Speed	Normal	Check Discharge Rate(s)	x
Ratio-R	0.300	Skip Steady State	x	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	100	0	0	0
30	0	0	0	100	50	0	0

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Node 5 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	137.340	Product Number	CTL-SHE-0067-2000-1000-2000
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

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Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	11	137.817	0.017	0.5	0.0026	0.0000	OK
15 minute winter	2	10	137.572	0.022	0.9	0.0052	0.0000	OK
15 minute winter	3	11	137.814	0.014	0.5	0.0022	0.0000	OK
15 minute winter	4	13	137.421	0.041	1.7	0.0090	0.0000	OK
15 minute winter	5	12	137.424	0.084	1.6	0.0950	0.0000	OK
15 minute summer	6	1	137.320	0.000	1.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	0.5	0.465	0.064	0.0162	
15 minute winter	2	1.001	4	0.8	0.508	0.106	0.0202	
15 minute winter	3	2.000	4	0.5	0.469	0.044	0.0212	
15 minute winter	4	1.002	5	1.6	0.595	0.187	0.0098	
15 minute winter	5	Hydro-Brake®	6	1.5				0.8

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Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	137.826	0.026	1.2	0.0040	0.0000	OK
15 minute winter	2	14	137.607	0.057	2.1	0.0132	0.0000	OK
15 minute winter	3	10	137.822	0.022	1.2	0.0033	0.0000	OK
15 minute winter	4	14	137.604	0.224	4.1	0.0495	0.0000	SURCHARGED
15 minute winter	5	14	137.600	0.260	2.8	0.2943	0.0000	SURCHARGED
15 minute summer	6	1	137.320	0.000	1.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	1.2	0.584	0.149	0.0416	
15 minute winter	2	1.001	4	2.0	0.517	0.252	0.0619	
15 minute winter	3	2.000	4	1.2	0.413	0.103	0.0545	
15 minute winter	4	1.002	5	2.8	0.608	0.324	0.0156	
15 minute winter	5	Hydro-Brake®	6	1.9				1.9

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Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	137.830	0.029	1.5	0.0045	0.0000	OK
30 minute winter	2	23	137.714	0.164	2.1	0.0385	0.0000	SURCHARGED
15 minute winter	3	10	137.825	0.024	1.5	0.0037	0.0000	OK
30 minute winter	4	23	137.711	0.331	4.2	0.0732	0.0000	SURCHARGED
30 minute winter	5	23	137.707	0.367	2.9	0.4154	0.0000	SURCHARGED
15 minute summer	6	1	137.320	0.000	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	1.5	0.618	0.188	0.0715	
30 minute winter	2	1.001	4	2.1	0.501	0.265	0.0782	
15 minute winter	3	2.000	4	1.5	0.393	0.130	0.0558	
30 minute winter	4	1.002	5	2.9	0.595	0.337	0.0156	
30 minute winter	5	Hydro-Brake®	6	2.0				3.4

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Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	1	26	137.994	0.194	1.9	0.0297	0.0000	SURCHARGED
30 minute winter	2	26	137.993	0.443	3.3	0.1037	0.0000	SURCHARGED
30 minute winter	3	26	137.992	0.192	1.9	0.0293	0.0000	SURCHARGED
30 minute winter	4	26	137.991	0.611	4.9	0.1350	0.0000	SURCHARGED
30 minute winter	5	26	137.988	0.648	3.3	0.7330	0.0000	SURCHARGED
15 minute summer	6	1	137.320	0.000	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	1	1.000	2	1.9	0.614	0.243	0.1174	
30 minute winter	2	1.001	4	2.1	0.488	0.267	0.0782	
30 minute winter	3	2.000	4	1.9	0.385	0.167	0.0939	
30 minute winter	4	1.002	5	3.3	0.608	0.388	0.0156	
30 minute winter	5	Hydro-Brake®	6	2.0				5.1

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