



**Proposed Change of Use**

**Rockley Dene Care Home**

**86 Park Road**

**Barnsley**

**S70 5AD**

## **Drainage Strategy**

**Project No. 1801**

**January 2025**

**Registered Office:** 25 Outer Circle Road, Lincoln, LN2 4JA

**Tel:** 07753 168226 - **Email:** [info@nc29.co.uk](mailto:info@nc29.co.uk) - **Web:** [www.nc29.co.uk](http://www.nc29.co.uk)

**Director:** C. Cook FIHE IEng N. Cook BA (Hons)

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## **Drainage Strategy**

### ***Introduction***

This drainage strategy has been developed as part of the planning application to show the site is being developed in a sustainable manner.

This report is to accompany NC29 Ltd drawings 1801-001 (Proposed Drainage Layout) and 1801-002 (Drainage Details), and its purpose is to support and explain the methodology behind the drainage strategy for the site.

The following sections describe in detail the methods and assumptions behind the drainage strategy and how the site is proposed to drain in a sustainable manner.

### ***Site Description***

The site is an existing residential care home leisure facility located off Park Road, Barnsley, S70 5AD. The centre of the site is located at approximately SE 35241 03851.

### ***Development Proposals***

The proposals for the development include the change of use to the existing facility into residential units.

### ***Surface Water Drainage Discharge***

For new developments there is a requirement to apply sustainable drainage principles (SuDS) to the disposal of surface water from the site. Generally, the aim should be to discharge surface water as high up the following hierarchy of drainage options as reasonably practicable:

1. Into the ground (infiltration);
2. To a surface water body;
3. To a surface water sewer or highway drain;
4. To a combined sewer.

### ***Infiltration***

Infiltration is the preferred method of water disposal as this reflects the natural ground conditions, recharges aquifers, lowers the risk of flooding as a result of urbanisation and lowers the chance of 'flash flooding'.

The bedrock geology local to the development site is identified as the Pennine Middle Coal Measures Formation – Sandstone. However, the existing buildings and root protection zones to the multiple trees within the curtilage of the site, would preclude the use of infiltration techniques as infiltration features would not be able to achieve a 5m offset from existing structures.

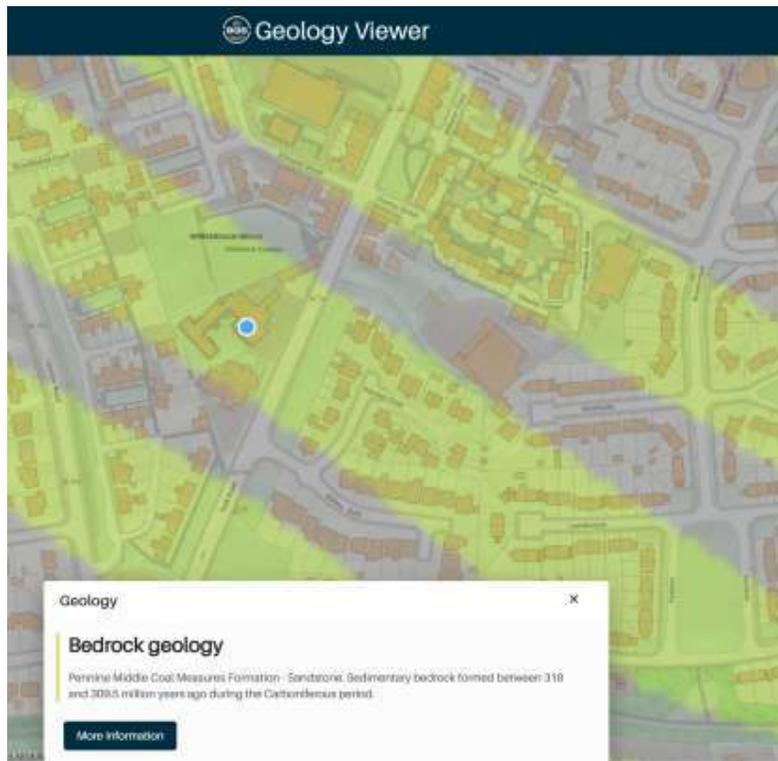


Figure 1 – Geological Map (Source: BGS Maps)

A search of the DEFRA 'Magic Map' shows that the development site is not within the vicinity of a 'Source Protection Zone', however infiltration devices are not considered viable. Figure 2 below is an extract from the DEFRA 'Magic Map' showing 'Source Protection Zone' indicatively presented in coloured layers.

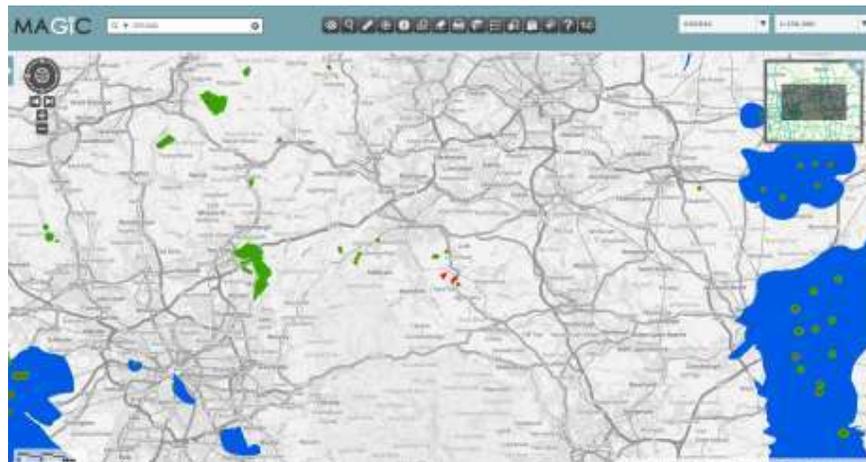


Figure 2 - Source Protection Zones (Source: DEFRA Magic Map)

## ***Alternative Drainage Options***

Discharge options for the proposed development have been assessed in accordance with the hierarchical approach set out in CIRIA's The SuDS Manual and Building Regulations.

Where possible, re-use of rainwater will be incorporated in the form of water butts, however infiltration is not considered to be viable, due to spatial constraints. With regards to the sustainable drainage hierarchy, an alternative method for disposing of surface water will need to be identified.

There are no watercourse within the vicinity of the site, however Yorkshire Water sewer maps indicate there is a combined sewer in Park Road, see **Appendix C**. The existing site appears to discharge surface water to the combined sewer in Park Road, therefore betterment will be applied in accordance with local planning policy and Yorkshire Water requirements.

Surface water discharge from the site will be via a combined sewer, subject to agreement with Yorkshire Water, via a flow control device and below-ground attenuation to provide betterment.

## ***Drainage Design***

### ***Surface Water - Roofs***

Roof water will be collected via traditional rainwater goods, from which the downpipes will discharge into water butts with an overflow into a below ground gravity drainage system. Existing rainwater goods will be utilised, where confirmed to be in a serviceable condition. Roof water flows will be directed towards the existing combined drainage via a proposed surface water sewer network, including a flow control device and below-ground attenuation. Drawings including a Proposed Drainage Layout and Construction Details have been included in **Appendix A**.

### ***Surface Water – Hard Landscaping***

Surface water runoff from the hard landscaped area, i.e. existing car park, will be collected via existing gullies. The existing gullies will be connected to the proposed surface water network, which will discharge into the existing combined drainage, via a flow control device and below-ground attenuation. Drawings including a Proposed Drainage Layout and Construction Details have been included in **Appendix A**.

### ***Proposed Site Discharge Rates***

The proposed drainage will be restricted to provide 30% betterment on the existing development for the 1 in 1 year return period.

$$2.78 \times 50\text{mm/hr} \times 0.256 \text{ Ha} = 35.6 \text{ l/s}$$

$$30\% \text{ betterment} = \mathbf{24.9 \text{ l/s}}$$

Hydraulic calculations have been included as **Appendix B** which demonstrate that the attenuation has been sized appropriately to ensure no flooding in the critical 1%AEP storm event including a 40% allowance for climate change.

### **Finished Floor Levels**

In line with best practice and in accordance with Building Regulations, the finished ground floor levels will generally be raised 150mm above ground levels where practicable, other than local areas where level access is to be provided.

### **Maintenance**

It is crucial that the elements mentioned in the drainage elements are maintained to a sufficient standard to ensure that the devices can still function. The responsibility for maintaining the proposed drainage network will be the landowner.

<b>Drainage Component</b>	<b>Required Action</b>	<b>Typical Frequency</b>
Pipework, chambers flow control devices, and silt traps	Stabilise adjacent areas	As required
	Remove weeds	As required
	Clear any poor performing structures	As required
	Inspect all structures for poor operation	Three monthly, 48 hours after large storms
	Monitor inspection chambers. Inspect silt accumulation rates and determine silt clearance frequencies.	Annually

Generally, the maintenance requirements for SuDS are either from CIRIA 753, or manufacturer's guidance.

### **Geo-Cellular Attenuation Maintenance**

<b>Maintenance schedule</b>	<b>Required action</b>	<b>Typical frequency</b>
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

Figure 4 – Geo-Cellular Attenuation Maintenance Requirements (Source: CIRIA 753)

## ***Foul Proposal***

In contrast to surface water drainage, the preferred method of foul water disposal is via sewers, which will connect into the Yorkshire Water combined water sewer network before eventually reaching a wastewater recycling centre where the water will receive treatment.

In some instances other disposal methods such as drainage fields, private waste treatment plants, cesspits or septic tanks can be considered, but given the proximity of the combined sewer it is unlikely that these will be considered an option and therefore a sewer connection will be proposed.

There is a combined sewer in Park Road highway, however there appears to be an existing combined drainage network serving the site, which discharges into the sewer on Park Road. The proposed change of use will utilise existing drainage where proven to be in a serviceable condition, and add additional drainage where necessary to serve the change of use. An indirect sewer connection will therefore be made, subject to agreement with Yorkshire Water.

The design proposal is for the foul effluent to be collected from the proposed residential units via below ground drainage and gravity falls to connect onto the existing combined drainage within the curtilage of the site.

In accordance with 'Design and Construction Guidance' the proposed peak foul flows have been calculated as follows:

4000 litres per dwelling per day

24 apartments x 0.05 l/s = **1.2 l/s**

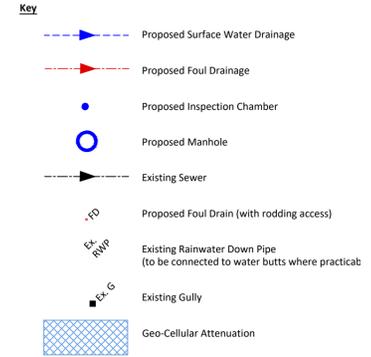
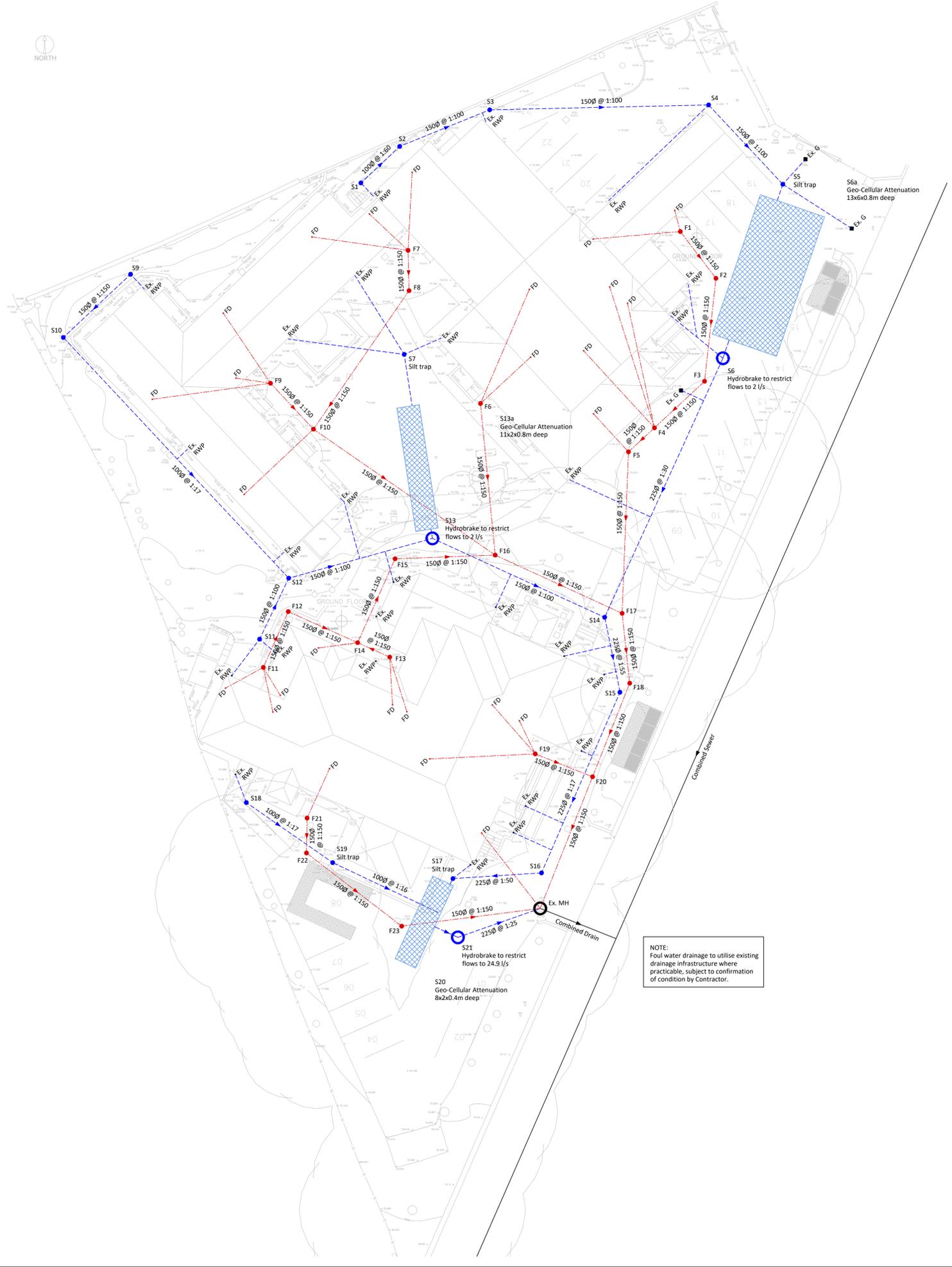
## **Conclusion**

- This drainage strategy document demonstrates that the site can be drained appropriately including the use of a Sustainable Drainage System.
- All storm water, up to and including the 1 in 100 year event + 40% climate change events are stored below ground.
- The proposals do not increase the risk of flooding and are therefore compatible with the requirements of NPPF.
- Is it assumed infiltration is not viable due to spatial constraints.
- A preliminary proposed drainage layout can be found on NC29 Ltd drawing 1801-001.
- Finished floor levels will be set at a minimum of 150mm above existing ground levels where practicable.



## **Appendices**

### ***Appendix A – Proposed Drainage Drawings***



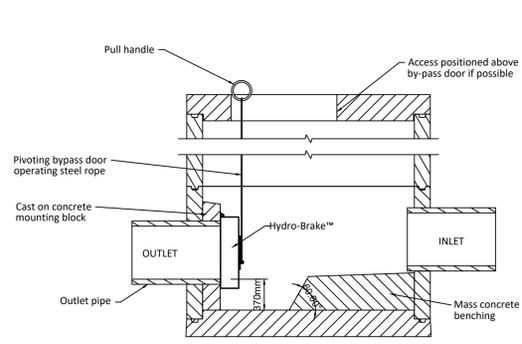
- Notes**
1. Do not scale this drawing.
  2. This drawing is to be read in conjunction with all other project drawings and specifications.
  3. All dimensions are in millimetres unless stated otherwise.
  4. Should there be any conflict between the details indicated on this drawing and those indicated on other drawings the Project Engineer shall be informed prior to construction.
  5. Until technical approval has been obtained from the relevant authority, it should be understood that all drawings issued are preliminary and not for construction. Should the contractor commence site work prior to such approval being given, it is entirely at their own risk.
  6. Drawing to be read in conjunction with 1153-002.
  7. All 1000 proposed drainage pipes shown are to be laid at a minimum gradient of 1:80.
  8. All 1500 proposed drainage pipes shown are to be laid at a minimum gradient of 1:150.
  9. All existing land drains encountered on site during construction are to be re-connected.
  10. Temporary protection to be provided to drainage work during construction as necessary.
  11. Topographical survey and architectural layout based on third party information.
  12. Anticipated foul flow rates calculated using discharge unit method to BS EN 12056-2.
  13. Drawing to be read in conjunction with Causeway Flow design pack.
  14. Pipes to be structured walled to BS EN 13476, Polypropylene to BE EN 1852 or PVC-U to BS EN 1401.
  15. Both clay and concrete pipes shall be strength class 120 (100/150mm min crushing strength 28kN/m). Thermoplastic pipes shall have a minimum ring stiffness of SN4.
  16. Pipes which run adjacent to buildings shall be installed in strict accordance with Building Regulations Part H, clauses 2.23 to 2.25.
  17. Class Z concrete bed and surround to all foul and surface water pipes with less than 900mm cover depth. Type 5 granular bed and surround to all foul and surface water pipes with greater than 900mm cover depth.
  18. All manholes and inspection chambers subject to vehicular trafficking to have D400 load-rated covers and frames to BS EN 124. All manholes and inspection chambers not subject to vehicular trafficking to have B125 load-rated covers and frames to BS EN 124.
  19. Concrete to be GEN1 unless specified otherwise.
  20. The first flexible joint in pipes adjoining a manhole shall be a maximum length of 600mm from the inside face of the manhole, connecting to a rocker pipe. The length of the rocker pipe shall be 600mm.
  21. All foul and surface water pipes to be constructed to Building Regulations Part H.
  22. Geo-cellular units to be Polystorm PSM1A or similar approved.
  23. Geo-cellular units to be installed in accordance with manufacturer's instructions and specification.
  24. Manufacturer to provide structural calculations to relevant industry guidance which confirm the product is suitable for use at the proposed depth and expected loading conditions.
  25. Hydro-Brake devices or similar approved to achieve flow restrictions as shown.
- CDM Requirements**
- Risk - Deep excavation**  
**Control method** - Contractor to design trench support to depths shown on drawings and in the manhole schedule, appropriate to the ground conditions.
- Risk - Water ingress into excavations, including ground water**  
**Control method** - Contractor to specify method of dealing with ingress of water into excavations, in particular if ground water is experienced. Contractor to undertake trench inspections prior to entry into any excavation, and again if left overnight or if conditions change.

Revision	Details	Date

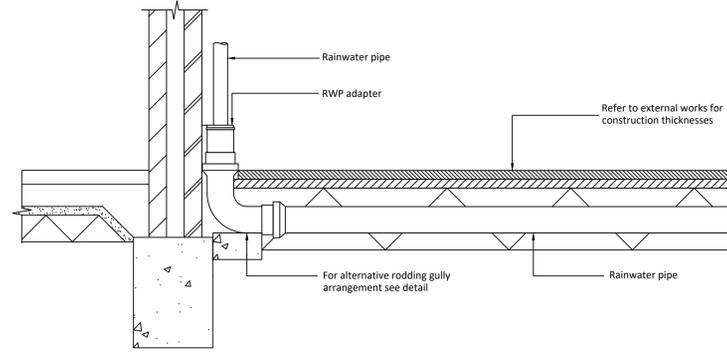
NC29 Ltd

25 Outer Circle Road  
Lincoln, LN2 4JA  
Tel : 07753 168226 Web: www.nc29.co.uk  
Email : info@nc29.co.uk

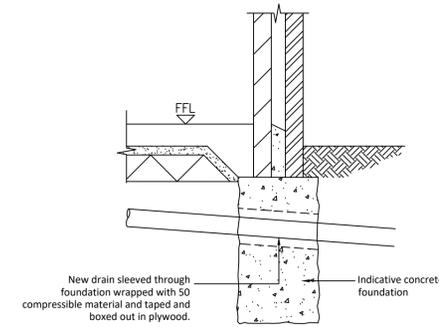
Project	Proposed Change of Use 86 Park Road, Worsborough		
Client	Kruidberg Capital		
Title	Proposed Drainage Layout		
Drawn	CC	Checked	CC
Date	Jan 2025	Scale	1:200
Number	1801/001	Status	Preliminary



**Typical Hydro-Brake Detail**  
Scale 1:20



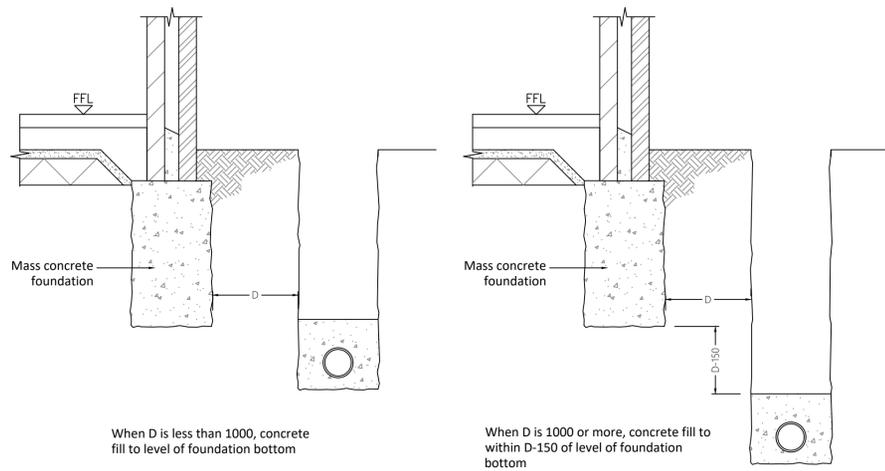
**Typical Rainwater Pipe Detail**  
Scale 1:20



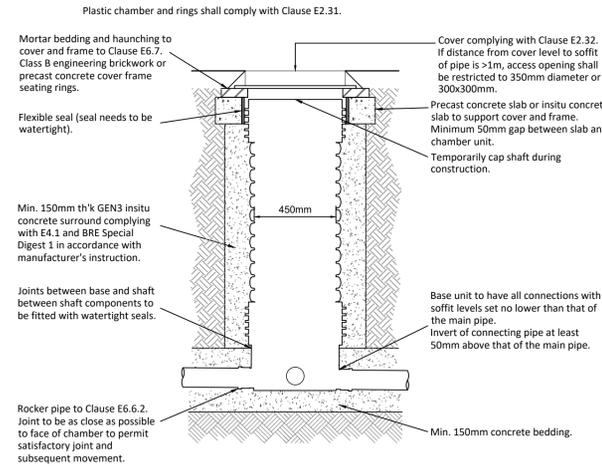
**Drain Sleeved Through Foundation Detail**  
Scale 1:20

- Notes**
- Do not scale this drawing.
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  - Both clay and concrete pipes shall be strength class 120 (100/150mm min crushing strength 28kN/m).
  - Thermoplastic pipes shall have a minimum ring stiffness of S<sub>N4</sub>.
  - Pipes which run adjacent to buildings shall be installed in strict accordance with Building Regulations Part H, clauses 2.23 to 2.25.
  - Class 2 concrete bed and surround to all foul and surface water pipes with less than 900mm cover depth. Type 5 granular bed and surround to all foul and surface water pipes with greater than 900mm cover depth.
  - All manholes and inspection chambers subject to vehicular trafficking to have D400 load-rated covers and frames to BS EN 124. All manholes and inspection chambers not subject to vehicular trafficking to have B125 load-rated covers and frames to BS EN 124.
  - Concrete to be GEN1 unless specified otherwise.
  - The first flexible joint in pipes adjoining a manhole shall be a maximum length of 600mm from the inside face of the manhole, connecting to a rocker pipe. The length of the rocker pipe shall be 600mm.
  - All foul and surface water pipes to be constructed to Building Regulations Part H.
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  - Geo-cellular units to be installed in accordance with manufacturer's instructions and specification.
  - Manufacturer to provide structural calculations to relevant industry guidance which confirm the product is suitable for use at the proposed depth and expected loading conditions.
  - Hydro-Brake devices or similar approved to achieve flow restrictions as shown.

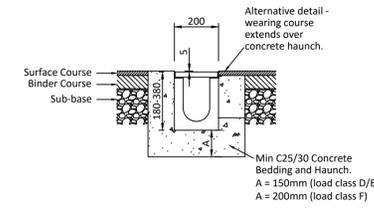
- CDM Requirements**
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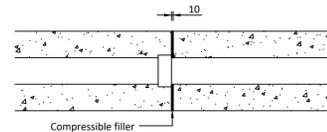
**Pipe Protection Near Foundation Details**  
Scale 1:20



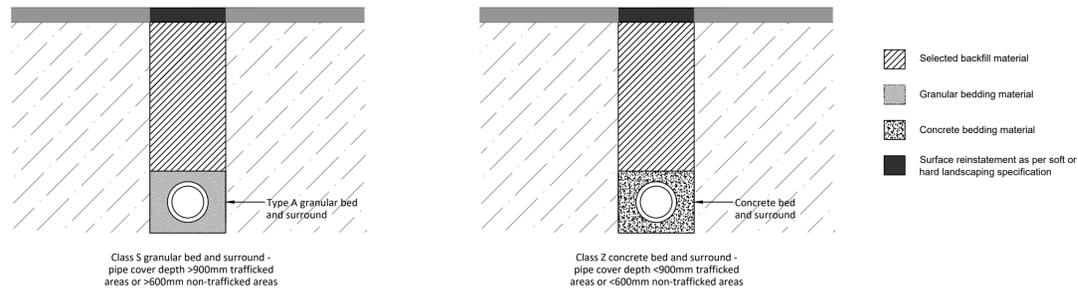
**Typical Inspection Chamber Detail**  
Scale 1:20



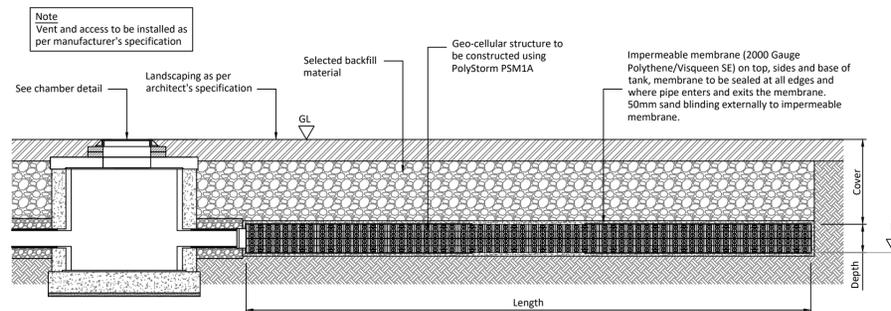
**Typical Linear Drain Detail**  
Scale 1:20



**Typical Flexible Joint to Concrete Bed and Surround Detail**  
Scale 1:20



**Typical Pipe Bedding Details**  
Scale 1:50



**Typical Geo-Cellular Attenuation Details**  
Scale 1:50

Revision	Details	Date
269 Lincoln Road North Hykeham, Lincoln, LN6 8NH Tel : 07753 168226 Web: www.nc29.co.uk Email : info@nc29.co.uk		
Project	Proposed Change of Use 86 Park Road, Worsborough	
Client	Kruidberg Capital	
Title	Proposed Drainage Details	
Drawn	CC	Checked CC
Date	Jan 2025	Scale As Shown
Number	1801/002	Status Preliminary

*Appendix B – Surface Water Calculations*

### Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	2.000
Ratio-R	0.400	Preferred Cover Depth (m)	0.600
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	✓

### Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.006	4.00	74.505	450	435239.983	403857.807	0.700
S2	0.006	4.00	74.458	450	435243.412	403861.028	0.783
S3	0.006	4.00	74.374	450	435251.362	403864.250	0.785
S4	0.034	4.00	74.236	450	435270.703	403864.681	0.839
S5	0.034	4.00	74.080	1125	435277.260	403857.686	0.854
S6	0.034	4.00	74.132	1200	435271.966	403842.350	1.400
S7	0.012	4.00	74.442	450	435243.815	403842.688	0.700
S9	0.006	4.00	74.900	450	435219.637	403849.753	0.700
S10	0.006	4.00	74.960	450	435213.700	403844.181	0.897
S11	0.006	4.00	73.100	450	435231.035	403817.591	0.750
S12	0.012	4.00	74.102	450	435233.610	403822.965	1.812
S13	0.012	4.00	73.500	1200	435246.304	403826.473	1.341
S14	0.006	4.00	73.374	1125	435261.520	403819.517	1.456
S15	0.006	4.00	72.617	1125	435262.870	403812.907	0.825
S16	0.006	4.00	71.565	1125	435255.942	403796.985	0.825
S17	0.006	4.00	71.400	1125	435248.114	403796.485	0.825
S18	0.006	4.00	72.311	450	435229.860	403803.186	0.700
S19	0.006	4.00	71.766	450	435237.494	403797.891	0.700
S20	0.006	4.00	71.280	1125	435246.785	403793.511	1.000
S21	0.040	4.00	71.085	1500	435248.554	403791.302	0.900
Ex MH			70.723	1200	435255.830	403793.856	0.900

### 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	S1	S2	4.705	0.600	73.805	73.725	0.080	58.8	100	4.08	50.0
1.001	S2	S3	8.578	0.600	73.675	73.589	0.086	99.7	150	4.22	50.0
1.002	S3	S4	19.346	0.600	73.589	73.397	0.192	100.8	150	4.54	50.0
1.003	S4	S5	9.588	0.600	73.397	73.301	0.096	99.9	150	4.70	50.0
1.004	S5	S6	16.224	0.600	73.226	72.732	0.494	32.8	225	4.82	50.0

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	1.006	7.9	0.8	0.600	0.633	0.006	0.0	21	0.642
1.001	1.006	17.8	1.6	0.633	0.635	0.012	0.0	31	0.629
1.002	1.001	17.7	2.4	0.635	0.689	0.018	0.0	38	0.706
1.003	1.005	17.8	7.0	0.689	0.629	0.052	0.0	66	0.950
1.004	2.290	91.1	11.7	0.629	1.175	0.086	0.0	54	1.585

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)
1.005	S6	S14	25.109	0.600	72.732	71.918	0.814	30.8	225	5.00	50.0
4.000	S7	S13	16.405	0.600	73.742	72.209	1.533	10.7	100	4.12	50.0
2.000	S9	S10	8.142	0.600	74.200	74.063	0.137	59.4	100	4.14	50.0
2.001	S10	S12	29.095	0.600	74.063	72.340	1.723	16.9	100	4.39	50.0
3.000	S11	S12	5.959	0.600	72.350	72.290	0.060	99.3	150	4.10	50.0
2.002	S12	S13	13.170	0.600	72.290	72.159	0.131	100.5	150	4.61	50.0
2.003	S13	S14	16.731	0.600	72.159	71.993	0.166	100.8	150	4.89	50.0
1.006	S14	S15	6.746	0.600	71.918	71.792	0.126	53.5	225	5.06	50.0
1.007	S15	S16	17.364	0.600	71.792	70.740	1.052	16.5	225	5.15	50.0
1.008	S16	S17	7.844	0.600	70.740	70.575	0.165	47.5	225	5.22	50.0
1.009	S17	S20	3.257	0.600	70.575	70.280	0.295	11.0	225	5.23	50.0
5.000	S18	S19	9.291	0.600	71.611	71.066	0.545	17.0	100	4.08	50.0
5.001	S19	S20	10.272	0.600	71.066	70.405	0.661	15.5	100	4.17	50.0
1.010	S20	S21	2.830	0.600	70.280	70.260	0.020	141.5	225	5.27	50.0
1.011	S21	Ex MH	7.711	0.600	70.185	69.823	0.362	21.3	300	5.31	50.0

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)
1.005	2.364	94.0	16.3	1.175	1.231	0.120	0.0	63	1.779
4.000	2.376	18.7	1.6	0.600	1.191	0.012	0.0	20	1.454
2.000	1.001	7.9	0.8	0.600	0.797	0.006	0.0	21	0.639
2.001	1.889	14.8	1.6	0.797	1.662	0.012	0.0	22	1.235
3.000	1.008	17.8	0.8	0.600	1.662	0.006	0.0	22	0.512
2.002	1.002	17.7	4.1	1.662	1.191	0.030	0.0	49	0.816
2.003	1.001	17.7	7.3	1.191	1.231	0.054	0.0	67	0.953
1.006	1.791	71.2	24.4	1.231	0.600	0.180	0.0	91	1.630
1.007	3.236	128.7	25.2	0.600	0.600	0.186	0.0	67	2.527
1.008	1.902	75.6	26.0	0.600	0.600	0.192	0.0	91	1.730
1.009	3.960	157.4	26.8	0.600	0.775	0.198	0.0	63	2.982
5.000	1.880	14.8	0.8	0.600	0.600	0.006	0.0	16	1.004
5.001	1.969	15.5	1.6	0.600	0.775	0.012	0.0	22	1.288
1.010	1.097	43.6	29.3	0.775	0.600	0.216	0.0	135	1.173
1.011	3.421	241.8	34.7	0.600	0.600	0.256	0.0	76	2.456

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	4.705	58.8	100	Circular	74.505	73.805	0.600	74.458	73.725	0.633
1.001	8.578	99.7	150	Circular	74.458	73.675	0.633	74.374	73.589	0.635
1.002	19.346	100.8	150	Circular	74.374	73.589	0.635	74.236	73.397	0.689
1.003	9.588	99.9	150	Circular	74.236	73.397	0.689	74.080	73.301	0.629
1.004	16.224	32.8	225	Circular	74.080	73.226	0.629	74.132	72.732	1.175

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	450	Manhole	PPIC	S2	450	Manhole	PPIC
1.001	S2	450	Manhole	PPIC	S3	450	Manhole	PPIC
1.002	S3	450	Manhole	PPIC	S4	450	Manhole	PPIC
1.003	S4	450	Manhole	PPIC	S5	1125	Manhole	PPIC
1.004	S5	1125	Manhole	PPIC	S6	1200	Manhole	PPIC

### Pipeline Schedule

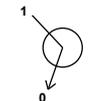
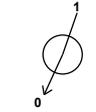
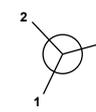
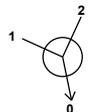
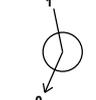
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.005	25.109	30.8	225	Circular	74.132	72.732	1.175	73.374	71.918	1.231
4.000	16.405	10.7	100	Circular	74.442	73.742	0.600	73.500	72.209	1.191
2.000	8.142	59.4	100	Circular	74.900	74.200	0.600	74.960	74.063	0.797
2.001	29.095	16.9	100	Circular	74.960	74.063	0.797	74.102	72.340	1.662
3.000	5.959	99.3	150	Circular	73.100	72.350	0.600	74.102	72.290	1.662
2.002	13.170	100.5	150	Circular	74.102	72.290	1.662	73.500	72.159	1.191
2.003	16.731	100.8	150	Circular	73.500	72.159	1.191	73.374	71.993	1.231
1.006	6.746	53.5	225	Circular	73.374	71.918	1.231	72.617	71.792	0.600
1.007	17.364	16.5	225	Circular	72.617	71.792	0.600	71.565	70.740	0.600
1.008	7.844	47.5	225	Circular	71.565	70.740	0.600	71.400	70.575	0.600
1.009	3.257	11.0	225	Circular	71.400	70.575	0.600	71.280	70.280	0.775
5.000	9.291	17.0	100	Circular	72.311	71.611	0.600	71.766	71.066	0.600
5.001	10.272	15.5	100	Circular	71.766	71.066	0.600	71.280	70.405	0.775
1.010	2.830	141.5	225	Circular	71.280	70.280	0.775	71.085	70.260	0.600
1.011	7.711	21.3	300	Circular	71.085	70.185	0.600	70.723	69.823	0.600

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.005	S6	1200	Manhole	PPIC	S14	1125	Manhole	PPIC
4.000	S7	450	Manhole	PPIC	S13	1200	Manhole	Adoptable
2.000	S9	450	Manhole	Adoptable	S10	450	Manhole	Adoptable
2.001	S10	450	Manhole	Adoptable	S12	450	Manhole	Adoptable
3.000	S11	450	Manhole	PPIC	S12	450	Manhole	Adoptable
2.002	S12	450	Manhole	Adoptable	S13	1200	Manhole	Adoptable
2.003	S13	1200	Manhole	Adoptable	S14	1125	Manhole	PPIC
1.006	S14	1125	Manhole	PPIC	S15	1125	Manhole	PPIC
1.007	S15	1125	Manhole	PPIC	S16	1125	Manhole	PPIC
1.008	S16	1125	Manhole	PPIC	S17	1125	Manhole	PPIC
1.009	S17	1125	Manhole	PPIC	S20	1125	Manhole	PPIC
5.000	S18	450	Manhole	PPIC	S19	450	Manhole	PPIC
5.001	S19	450	Manhole	PPIC	S20	1125	Manhole	PPIC
1.010	S20	1125	Manhole	PPIC	S21	1500	Manhole	PPIC
1.011	S21	1500	Manhole	PPIC	Ex MH	1200	Manhole	PPIC

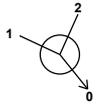
### Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1	435239.983	403857.807	74.505	0.700	450				
						0	1.000	73.805	100
S2	435243.412	403861.028	74.458	0.783	450				
						0	1.001	73.675	150
S3	435251.362	403864.250	74.374	0.785	450				
						1	1.001	73.589	150
						0	1.002	73.589	150

**Manhole Schedule**

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S4	435270.703	403864.681	74.236	0.839	450		1	1.002	73.397	150
							0	1.003	73.397	150
S5	435277.260	403857.686	74.080	0.854	1125		1	1.003	73.301	150
							0	1.004	73.226	225
S6	435271.966	403842.350	74.132	1.400	1200		1	1.004	72.732	225
							0	1.005	72.732	225
S7	435243.815	403842.688	74.442	0.700	450		0	4.000	73.742	100
S9	435219.637	403849.753	74.900	0.700	450		0	2.000	74.200	100
S10	435213.700	403844.181	74.960	0.897	450		1	2.000	74.063	100
							0	2.001	74.063	100
S11	435231.035	403817.591	73.100	0.750	450		0	3.000	72.350	150
S12	435233.610	403822.965	74.102	1.812	450		1	3.000	72.290	150
							2	2.001	72.340	100
							0	2.002	72.290	150
S13	435246.304	403826.473	73.500	1.341	1200		1	4.000	72.209	100
							2	2.002	72.159	150
							0	2.003	72.159	150
S14	435261.520	403819.517	73.374	1.456	1125		1	2.003	71.993	150
							2	1.005	71.918	225
							0	1.006	71.918	225
S15	435262.870	403812.907	72.617	0.825	1125		1	1.006	71.792	225
							0	1.007	71.792	225
S16	435255.942	403796.985	71.565	0.825	1125		1	1.007	70.740	225
							0	1.008	70.740	225
S17	435248.114	403796.485	71.400	0.825	1125		1	1.008	70.575	225
							0	1.009	70.575	225

**Manhole Schedule**

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S18	435229.860	403803.186	72.311	0.700	450		0	5.000	71.611	100
S19	435237.494	403797.891	71.766	0.700	450		1	5.000	71.066	100
S20	435246.785	403793.511	71.280	1.000	1125		0	5.001	71.066	100
							1	5.001	70.405	100
S21	435248.554	403791.302	71.085	0.900	1500		1	1.009	70.280	225
							0	1.010	70.280	225
Ex MH	435255.830	403793.856	70.723	0.900	1200		1	1.010	70.260	225
							0	1.011	70.185	300
							1	1.011	69.823	300

**Simulation Settings**

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	20.000	Additional Storage (m <sup>3</sup> /ha)	20.0
Ratio-R	0.400	Starting Level (m)	
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	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 %)
2	0	0	0
30	0	0	0
100	40	0	0

**Node S21 Online Hydro-Brake® Control**

Flap Valve	x	Objective (HE)	Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	70.185	Product Number	CTL-SHE-0218-2490-1000-2490
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.300
Design Flow (l/s)	24.9	Min Node Diameter (mm)	1500

### Node S13 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	72.159	Product Number	CTL-SHE-0068-2000-0950-2000
Design Depth (m)	0.950	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

### Node S6 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	72.732	Product Number	CTL-SHE-0071-2000-0750-2000
Design Depth (m)	0.750	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

### Node S20 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	70.280	Depth (m)	0.400
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	11	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	2.000	Number Required	1
Porosity	0.95	Pit Length (m)	8.000		

### Node S6 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	72.732	Depth (m)	0.800
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	6.000	Number Required	1
Porosity	0.95	Pit Length (m)	13.000		

### Node S13 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	72.159	Depth (m)	0.800
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	98	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	2.000	Number Required	1
Porosity	0.95	Pit Length (m)	11.000		

**Results for 2 year Critical Storm Duration. Lowest mass balance: 99.75%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	S1	10	73.833	0.028	1.2	0.0091	0.0000	OK
15 minute summer	S2	10	73.713	0.038	2.4	0.0119	0.0000	OK
15 minute winter	S3	10	73.635	0.046	3.6	0.0142	0.0000	OK
15 minute winter	S4	10	73.484	0.087	10.2	0.0847	0.0000	OK
15 minute summer	S5	9	73.296	0.070	16.7	0.1259	0.0000	OK
120 minute winter	S6	92	72.893	0.161	6.9	12.2089	0.0000	OK
15 minute summer	S7	10	73.766	0.024	2.3	0.0120	0.0000	OK
15 minute summer	S9	10	74.227	0.027	1.2	0.0089	0.0000	OK
15 minute winter	S10	10	74.090	0.027	2.4	0.0080	0.0000	OK
15 minute winter	S11	10	72.376	0.026	1.2	0.0084	0.0000	OK
15 minute summer	S12	10	72.351	0.061	5.9	0.0179	0.0000	OK
60 minute winter	S13	44	72.324	0.165	5.1	3.6643	0.0000	SURCHARGED
30 minute winter	S14	20	71.959	0.041	4.4	0.0438	0.0000	OK
15 minute winter	S15	11	71.823	0.031	5.3	0.0353	0.0000	OK
15 minute winter	S16	11	70.788	0.048	6.3	0.0546	0.0000	OK
15 minute winter	S17	11	70.608	0.033	7.3	0.0375	0.0000	OK
15 minute winter	S18	10	71.630	0.019	1.2	0.0064	0.0000	OK
15 minute winter	S19	10	71.093	0.027	2.4	0.0090	0.0000	OK
15 minute winter	S20	12	70.363	0.083	10.7	1.3619	0.0000	OK
15 minute winter	S21	11	70.339	0.154	15.4	0.4098	0.0000	OK
15 minute summer	Ex MH	1	69.823	0.000	14.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	S1	1.000	S2	1.2	0.705	0.152	0.0080	
15 minute summer	S2	1.001	S3	2.4	0.597	0.135	0.0345	
15 minute winter	S3	1.002	S4	3.6	0.474	0.202	0.1466	
15 minute winter	S4	1.003	S5	10.1	0.994	0.567	0.0972	
15 minute summer	S5	1.004	S6	16.8	2.027	0.185	0.1695	
120 minute winter	S6	Hydro-Brake®	S14	2.0				
15 minute summer	S7	4.000	S13	2.3	1.578	0.124	0.0594	
15 minute summer	S9	2.000	S10	1.2	0.696	0.153	0.0141	
15 minute winter	S10	2.001	S12	2.4	1.376	0.161	0.0504	
15 minute winter	S11	3.000	S12	1.2	0.286	0.067	0.0258	
15 minute summer	S12	2.002	S13	5.9	0.884	0.333	0.1295	
60 minute winter	S13	Hydro-Brake®	S14	1.9				
30 minute winter	S14	1.006	S15	4.4	1.088	0.061	0.0273	
15 minute winter	S15	1.007	S16	5.3	1.127	0.041	0.0821	
15 minute winter	S16	1.008	S17	6.3	1.302	0.083	0.0383	
15 minute winter	S17	1.009	S20	7.3	1.318	0.046	0.0273	
15 minute winter	S18	5.000	S19	1.2	0.864	0.081	0.0130	
15 minute winter	S19	5.001	S20	2.4	1.405	0.155	0.0175	
15 minute winter	S20	1.010	S21	9.8	0.810	0.224	0.0362	
15 minute winter	S21	Hydro-Brake®	Ex MH	15.2				20.4

**Results for 30 year Critical Storm Duration. Lowest mass balance: 99.75%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	S1	10	73.844	0.039	2.2	0.0127	0.0000	OK
15 minute winter	S2	10	73.729	0.054	4.4	0.0167	0.0000	OK
15 minute winter	S3	10	73.652	0.063	6.6	0.0197	0.0000	OK
15 minute winter	S4	10	73.561	0.164	19.0	0.1586	0.0000	SURCHARGED
15 minute summer	S5	9	73.320	0.094	30.7	0.1690	0.0000	OK
120 minute winter	S6	116	73.090	0.358	13.1	27.1330	0.0000	SURCHARGED
15 minute winter	S7	10	73.775	0.033	4.4	0.0167	0.0000	OK
15 minute winter	S9	10	74.237	0.037	2.2	0.0124	0.0000	OK
15 minute summer	S10	10	74.101	0.038	4.4	0.0111	0.0000	OK
60 minute winter	S11	49	72.522	0.172	1.1	0.0548	0.0000	SURCHARGED
60 minute winter	S12	49	72.522	0.232	5.3	0.0674	0.0000	SURCHARGED
60 minute winter	S13	49	72.521	0.362	9.2	8.0457	0.0000	SURCHARGED
15 minute winter	S14	10	71.965	0.047	6.0	0.0511	0.0000	OK
15 minute winter	S15	10	71.830	0.038	8.2	0.0436	0.0000	OK
15 minute winter	S16	10	70.802	0.062	10.3	0.0707	0.0000	OK
15 minute winter	S17	10	70.618	0.043	12.5	0.0487	0.0000	OK
15 minute winter	S18	10	71.637	0.026	2.2	0.0086	0.0000	OK
15 minute winter	S19	10	71.104	0.038	4.4	0.0125	0.0000	OK
15 minute winter	S20	12	70.452	0.172	19.1	2.7986	0.0000	OK
15 minute winter	S21	12	70.445	0.260	25.5	0.6907	0.0000	OK
15 minute summer	Ex MH	1	69.823	0.000	24.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	S1	1.000	S2	2.2	0.827	0.278	0.0125	
15 minute winter	S2	1.001	S3	4.4	0.694	0.247	0.0544	
15 minute winter	S3	1.002	S4	6.6	0.501	0.372	0.2384	
15 minute winter	S4	1.003	S5	18.5	1.085	1.040	0.1596	
15 minute summer	S5	1.004	S6	30.8	2.143	0.338	0.3420	
120 minute winter	S6	Hydro-Brake®	S14	2.0				
15 minute winter	S7	4.000	S13	4.4	1.634	0.236	0.0828	
15 minute winter	S9	2.000	S10	2.2	0.816	0.280	0.0220	
15 minute summer	S10	2.001	S12	4.4	1.629	0.296	0.1039	
60 minute winter	S11	3.000	S12	1.1	0.274	0.060	0.1049	
60 minute winter	S12	2.002	S13	5.0	0.735	0.283	0.2319	
60 minute winter	S13	Hydro-Brake®	S14	2.0				
15 minute winter	S14	1.006	S15	6.0	1.137	0.084	0.0356	
15 minute winter	S15	1.007	S16	8.1	1.237	0.063	0.1160	
15 minute winter	S16	1.008	S17	10.3	1.471	0.136	0.0554	
15 minute winter	S17	1.009	S20	12.5	1.450	0.079	0.0603	
15 minute winter	S18	5.000	S19	2.2	1.018	0.149	0.0202	
15 minute winter	S19	5.001	S20	4.4	1.655	0.284	0.0285	
15 minute winter	S20	1.010	S21	17.0	0.862	0.389	0.0954	
15 minute winter	S21	Hydro-Brake®	Ex MH	24.4				39.2

**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.75%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	S1	11	73.934	0.129	4.0	0.0427	0.0000	SURCHARGED
15 minute winter	S2	11	73.912	0.237	7.9	0.0741	0.0000	SURCHARGED
15 minute winter	S3	11	73.893	0.304	10.4	0.0950	0.0000	SURCHARGED
15 minute winter	S4	10	73.817	0.420	31.2	0.4072	0.0000	SURCHARGED
180 minute winter	S5	176	73.493	0.267	12.7	0.4781	0.0000	SURCHARGED
180 minute winter	S6	176	73.493	0.761	17.7	57.6232	0.0000	SURCHARGED
15 minute winter	S7	10	73.788	0.046	8.0	0.0230	0.0000	OK
15 minute summer	S9	10	74.253	0.053	4.0	0.0176	0.0000	OK
15 minute winter	S10	10	74.115	0.052	8.0	0.0154	0.0000	OK
60 minute winter	S11	60	72.973	0.623	2.0	0.1987	0.0000	FLOOD RISK
60 minute winter	S12	60	72.973	0.683	9.2	0.1987	0.0000	SURCHARGED
60 minute winter	S13	60	72.971	0.812	15.9	17.7936	0.0000	SURCHARGED
15 minute winter	S14	10	71.973	0.055	8.0	0.0593	0.0000	OK
15 minute winter	S15	10	71.838	0.046	12.0	0.0527	0.0000	OK
15 minute winter	S16	14	71.045	0.305	16.0	0.3473	0.0000	SURCHARGED
15 minute winter	S17	14	71.041	0.466	20.0	0.5306	0.0000	SURCHARGED
15 minute winter	S18	10	71.647	0.036	4.0	0.0118	0.0000	OK
15 minute winter	S19	10	71.117	0.051	8.0	0.0169	0.0000	OK
15 minute winter	S20	14	71.038	0.758	32.0	6.9315	0.0000	FLOOD RISK
15 minute winter	S21	14	71.032	0.847	36.6	2.2486	0.0000	FLOOD RISK
15 minute summer	Ex MH	1	69.823	0.000	24.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	S1	1.000	S2	4.1	0.902	0.514	0.0368	
15 minute winter	S2	1.001	S3	7.9	0.723	0.442	0.1510	
15 minute winter	S3	1.002	S4	11.8	0.669	0.666	0.3406	
15 minute winter	S4	1.003	S5	30.6	1.741	1.725	0.1671	
180 minute winter	S5	1.004	S6	12.7	1.284	0.139	0.6452	
180 minute winter	S6	Hydro-Brake®	S14	2.0				
15 minute winter	S7	4.000	S13	8.0	1.735	0.429	0.0929	
15 minute summer	S9	2.000	S10	4.0	0.951	0.509	0.0343	
15 minute winter	S10	2.001	S12	8.0	1.576	0.539	0.1743	
60 minute winter	S11	3.000	S12	1.3	0.289	0.074	0.1049	
60 minute winter	S12	2.002	S13	8.1	0.846	0.459	0.2319	
60 minute winter	S13	Hydro-Brake®	S14	2.0				
15 minute winter	S14	1.006	S15	8.0	1.198	0.112	0.0451	
15 minute winter	S15	1.007	S16	12.0	1.431	0.093	0.3819	
15 minute winter	S16	1.008	S17	16.0	1.638	0.212	0.3120	
15 minute winter	S17	1.009	S20	20.0	1.569	0.127	0.1295	
15 minute winter	S18	5.000	S19	4.0	1.227	0.271	0.0304	
15 minute winter	S19	5.001	S20	8.0	1.810	0.517	0.0609	
15 minute winter	S20	1.010	S21	22.0	0.863	0.503	0.1126	
15 minute winter	S21	Hydro-Brake®	Ex MH	24.9				67.2

**Appendix C – Yorkshire Water Maps**

## YORKSHIRE WATER PROTECTION OF MAINS AND SERVICES

1. The position of Yorkshire Water Services Ltd (YWS) apparatus shown on the existing mains record drawing(s) indicates the **general** position and nature of our apparatus and the accuracy of this information cannot be guaranteed. Any damage to YWS apparatus as a result of your works may have serious consequences and you will be held responsible for all costs incurred. Prior to commencing major works, the exact location of apparatus must be determined on site, if necessary by excavating trial holes. The actual position of such apparatus and that of service pipes which have not been indicated must be established on site by contacting the Customer Helpline on 0845 124 24 24 for both water and sewerage.
2. The public sewer and water network is lawfully retained in its existing position and the sewerage and water undertaker is entitled to have it remain so without any disturbance. The provisions of section 159 of the Water Industry Act 1991 provides that the undertaker may "inspect, maintain, adjust, repair or alter" the network. Those rights are given to enable the undertaker to perform its statutory duties. Any development of the land or any other action that unacceptably hindered the exercise of those rights would be unlawful. The provisions contained in Section 185 of the Water Industry Act 1991 state that where it is reasonable to do so, a person may require the water supply undertaker to alter or remove a pipe where it is necessary to enable that person to carry out a proposed change of use of the land. The provisions contained in Section 185 also require the person making the request to pay the full cost of carrying out the necessary works.
3. Ground levels over existing YWS apparatus are to be maintained. Sewers in highways will **generally** be laid to give 1200mm of cover from finished ground level working to kerb races, other permanent identification of the limits of the road or to an agreed line and level. Substantial increases or decreases to this 1200mm depth of cover will result in the sewer being re-laid at your expense. Water mains and services will **generally** be laid with a minimum of 750mm depth of cover however some mains and services usually those installed over 50 years ago may have less ground cover.
4. If surface levels are to be decreased / increased significantly the effects on existing water supply apparatus will be carefully considered and if any alterations are necessary, the costs of the alterations will be recharged to you in full. Outlets on fire hydrants must be no more than 300mm below the new levels and all surface boxes must be adjusted as part of the scheme.
5. To enable future repair works to be carried out without hindrance; any pipe, cable, duct, etc. installed parallel to a water main or service pipe should not be installed directly over or within 300mm of a water main or service pipe or 1000mm of a waste water asset. Where a pipe, cable, duct, etc. crosses a main or service it should preferably cross perpendicular or at an angle of no less than 45° and with a minimum clearance of 150mm. These requirements apply to activities within an existing highway and are relevant to the installation of pipes, cables, ducts, etc. up to and including 250mm in diameter (*see illustration below*). Necessary protection measures for installations greater than 250mm in diameter and/or in private land will need to be agreed on an individual basis. Installations within a new development site must comply with the National Joint Utilities Group publication Volume 2: NJUG Guidelines On The Positioning Of Underground Utilities Apparatus For New Development Sites.
6. All excavation works near to YW apparatus should be by hand digging only.
7. Backfilling with a suitable material to a minimum 300mm above YW apparatus is required.
8. Adequate support must be provided where any works pass under YW apparatus.
9. Jointing chambers, lighting columns and other structures must be installed in such a way that future repair or maintenance works to YW apparatus will not be hindered.
10. Apparatus such as; railings, sign posts, etc. must not be placed in such a way that they prevent access to or full operation of controlling valves, hydrants or similar apparatus. YWS surface boxes must not be covered or buried. Any adjustment, alteration or replacement of manhole covers must be agreed on site prior to the commencement of the works with a YWS Inspector who may be contacted via our Call Centre on 0845 124 24 24.
11. Explosives shall not be used within 100 metres of any Yorkshire Water Services apparatus or installations.
12. Vibrating plant should not be used directly over any apparatus. Movement or operation by vehicles or heavy plant is not to be permitted in the immediate vicinity of YWS plant or apparatus unless there has been prior consultation and, if necessary, adequate protection provided without cost to YWS.
13. **Under no circumstances** should thrust boring or similar trenchless techniques commence until the actual position of the Company's mains/services along the proposed route have been confirmed by trial holes.
14. Any alterations to the highway should be notified following the procedures outlined in the New Road and Street Works Act 1991 Code of Practice; Measures Necessary Where Apparatus Is Affected By Major Works (Diversionary Works).
15. You will be held responsible for any damage or loss to YWS apparatus during and after completion of work, caused by yourselves, your servant or agent. Any damage caused or observed to YWS plant or apparatus should be immediately reported to YWS. Should YW incur any costs as a result of non-compliance with the above, all costs will be rechargeable in full.
16. You should ensure that nothing is done on the site to prejudice the safety or operation of YWS employees, plant or apparatus.
17. In accordance with the New Roads and Street Works Act 1991, Chapter 22, Part 3, Section 80. The location of any identified YW asset "*which is not marked, or is wrongly marked, on the records made available*" should be communicated back to Yorkshire Water. The location of the apparatus should be identified on copies of the supplied plans which should be returned to Yorkshire Water (Asset Records Team) with photographic supporting evidence where possible.
18. The Government has decided that responsibility for private sewers serving two or more properties and lateral drains (the section of pipe beyond the boundary of a single property, connecting it to the public sewer) will be transferred to the water companies on Oct 1 2011.

Private pumping stations will also transfer during the period 1 October 2011 – 1 Oct 2016. Records of these assets may not yet be shown on the existing mains record drawing(s). If you encounter any of these assets you must inform Yorkshire Water Services Ltd (YWS).

19. Please note that the information supplied on the enclosed plans is reproduced from Ordnance Survey material with the permission of the Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office, © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Licence Number AC0000857457.
20. This information is for guidance only and the position and depth of any YW apparatus is approximate only. Likewise, the nature and condition of any YW apparatus cannot be guaranteed. YW has no responsibility for recording the locations of privately owned apparatus. As of 1 October 2011, there may be some lateral drains and/or public sewers which are not documented on YW records but may still be present. For the avoidance of doubt, this information is not a substitute for appropriate professional and/or legal advice. YW accepts no responsibility for any inaccuracy or omissions in this information. The actual position of YW apparatus must be determined on site by excavating trial holes by hand. YW requires a minimum of two working days' written notice of the intention to excavate any trial holes before any excavation can be undertaken. If there are any queries in this respect please contact Yorkshire Water on 0845 124 24 24.

## Property Identifier

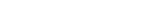


## Sewer Legend

	Combined Sewer		S24 Combined Sewer
	Surface Water Sewer		S24 Surface Water Sewer
	Foul Sewer		S24 Foul Sewer
	Section 104 Sewer		Rising Main
	Overflow Sewer		Abandoned Sewer
	Manhole		Syphone Sewer & Vacuum Sewer
	Pumping Station		Public Sewer Treatment Works

Please note that the direction of flow arrows may not always appear depending on the scale of the map.

## Water Legend

	Water Main 4" and below
	Water Main 4" and above
	Raw Water Main
	Private Water Main
	Fire Hydrant
	Pumping Station
	The assets in this area are the responsibility of another Water Undertaker

# WORSBROUGH BRIDGE

Allotment Gardens

Rockley Dene  
(Nursing Home)

Shelter

Issues

74.7m

150mm=Asbestos=Cement=1979

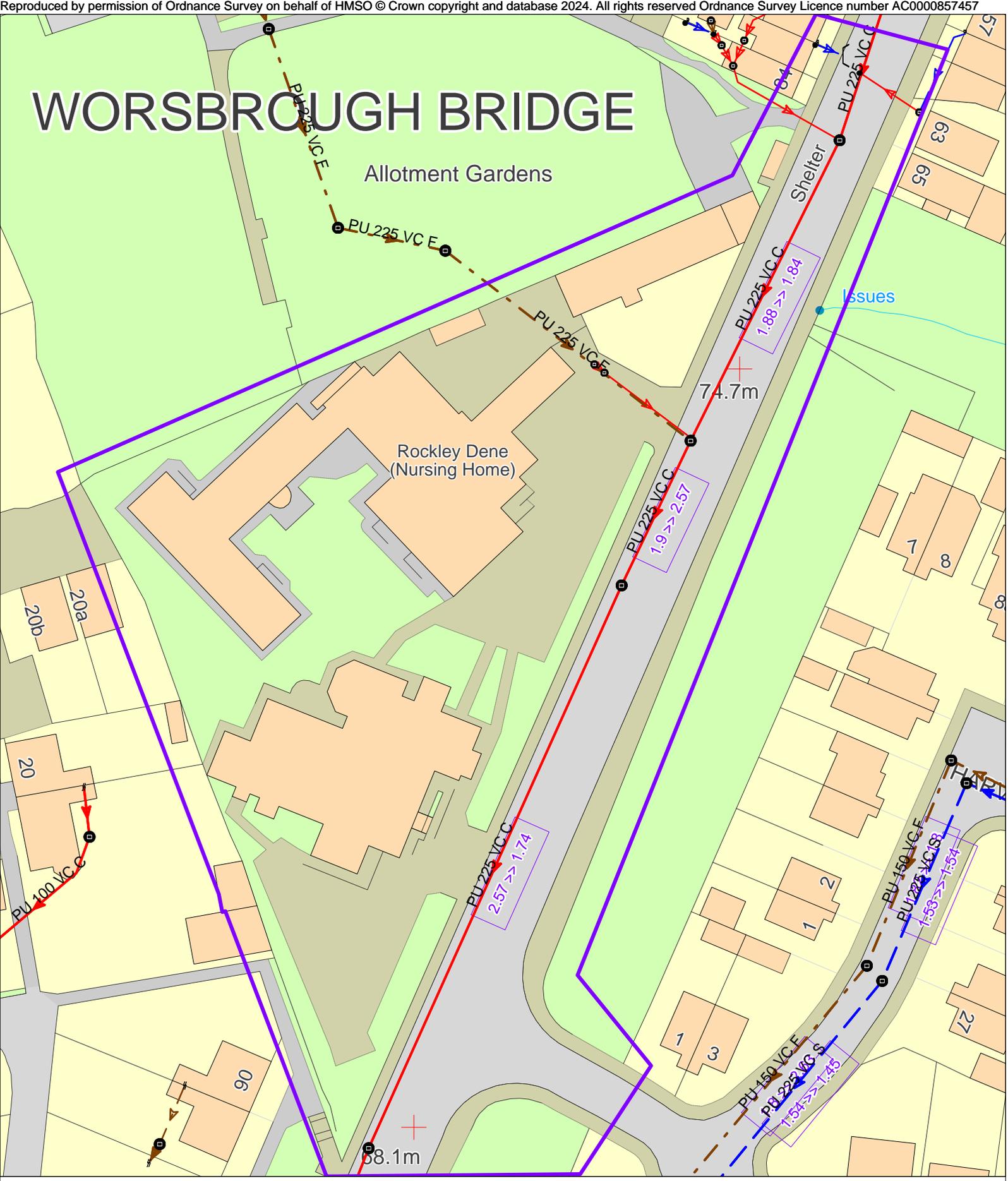
110mm=PV/Cu=1994

110mm=PV/Cu=1994

68.1m

Public Clean Water Network 20/01/2025 14:03:56 OS Grid Coordinates: 435198 : 403755 Map Name : SE3503NW svcGISSafeMovePD

# WORSBROUGH BRIDGE



Public Waste Water Network 20/01/2025 14:03:58 OS Grid Coordinates: 435198 : 403755 Map Name : SE3503NW svcGISSafeMovePD