

Our Ref: JPC/P24-0122
24th November 2025 (By Email)

Arun District Council
The Arun Civic Centre
Maltravers Road
Littlehampton
West Sussex
BN17 5LF

CONSULTING ENGINEERS

8 Friday Street
Henley on Thames
RG9 1AH

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To whom it may concern,

RE: Application Ref: LU/76/25/PL – Discharge of conditions 9 & 10 for development at former Waitrose Site Avon Road Littlehampton BN17 6AT.

Please find below information that confirms that the proposed surface water drainage scheme satisfies the requirements set out in Condition 9 below and therefore supports the discharge of this condition.

Condition 9 - No development shall take place, apart from demolition of the building, clearance of the site or any necessary surveys/investigation work unless and until construction drawings of the proposed surface water drainage network, associated sustainable drainage components and flow control mechanisms and a construction method statement have been submitted to and approved in writing by the Local Planning Authority. The scheme shall then be constructed as per the agreed drawings, method statement, Flood Risk Assessment/Drainage Statement (Issue 2, Simpson TWS, April 2025) and the drawing "Proposed Drainage Scheme" (Dwg P24-0122-SK002 Rev P3, Mar25) and remaining in perpetuity for the lifetime of the development unless agreed in writing by the Local Planning Authority. No alteration to the agreed drainage scheme shall occur without prior written approval from the Local Planning Authority.

Reason: To ensure that the development achieves a high standard of sustainability and to comply with NPPF and Arun Local Plan policies W DM2 & policy W DM3. This is required to be a pre-commencement condition because it is necessary to implement the surface water drainage system prior to commencing any building works.

As per the Flood Risk Assessment & Drainage Statement (Issue 2 - 03/04/25) a surface water drainage scheme has been proposed that has been developed in line with national and local policy. The scheme would restrict surface water runoff from the site to a maximum allowable discharge rate of 2.0 l/s, before discharging to Southern Waters surface water sewer in Avon Road via the sites existing connection. This would closely match greenfield runoff rates and provide significant betterment over the existing situation. It would also comply with Southern Water requirements and fulfil BREEAM requirements in relation to surface water management.

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The scheme still comprises of a traditional network of below ground pipework for conveyance of surface water runoff that would surcharge into a below ground geocellular attenuation tank beneath an area of hard and soft landscaping that would provide capacity to store runoff on site for a 1 in 100 year rainfall event with 45% allowance for climate change. The attenuation tank has been fully co-ordinated with the soft landscaping design, with areas of planting above the attenuation tank designed as bioretention areas with 850mm minimum planting depth and filtration / protective geotextiles including drainage layer. These areas will also drain areas of surrounding hard landscaping, which have been designed with falls towards the areas of planting. The network of below ground pipework would discharge through a hydrodynamic proprietary treatment chamber, which would protect the attenuation tanks from silt and sediment.

Hydraulic analysis has been undertaken, which has confirmed that the surface water drainage scheme would store and attenuate surface water runoff from the development on site for all rainfall events up to and including the 1 in 100 year storm return period with 45% allowance for climate change, whilst surface water is gradually released at the maximum allowable discharge rate of 2.0 l/s.

This surface water drainage scheme is shown within the drawing 'P24-0122 103 T1 Engineering Layout' and whilst it differs slightly from the original scheme presented within the Flood Risk Assessment & Drainage Statement, through the change of location of the geocellular attenuation tanks, the core principal, outfall and discharge rate remain the same. The drawing 'P24-0122 105 T1 Drainage Construction Details' provides the relevant construction details for the components of the surface water drainage scheme.

The surface water drainage system would be private and would be maintained by the tenant that takes occupancy of the unit. A maintenance plan that was developed for the drainage scheme was included within the Flood Risk Assessment & Drainage Statement that would be incorporated into the developments Operation and Maintenance Manual and remains the same. The as-built drainage system would be operated and maintained by the tenant in accordance with the regime set out in the plan on occupation of the development.

Condition 10 - No development shall take place, apart from demolition of the building, clearance of the site or any necessary surveys/investigation work unless and until details of the proposed foul drainage system have been submitted to and approved in writing by the Local Planning Authority. The submission shall include details of siting, design, and subsequent management/maintenance). The proposed drainage system shall be designed and constructed to prevent the ingress of flood water into the sewerage network. No part of the new building shall be occupied until works for the disposal of sewage have been fully implemented in accordance with the approved details.

Reason: To ensure that the proposed development has a satisfactory means of disposing of foul sewerage in accordance with Arun Local Plan policies W DM1 and W DM3. This is required to be a pre-commencement condition because it is necessary to implement the foul water drainage system prior to commencing any building works.

As per the Flood Risk Assessment & Drainage Statement (Issue 2 - 03/04/25) a foul water drainage scheme has been proposed which comprises of a traditional network of below ground pipework discharging to Southern Water's foul water sewer in East Street via the sites existing connection. Thames Water have confirmed that the existing public sewer network can accommodate foul water flows from the development.

This foul water drainage scheme is shown within the drawing 'P24-0122 103 T1 Engineering Layout' which has been detailed further from the original scheme presented within the Flood Risk Assessment & Drainage Statement to include SVP inlets. The drawing 'P24-0122 105 T1 Drainage Construction Details' provides the relevant construction details for the components of the foul water drainage scheme.

The foul water drainage system would be private and would be maintained by the tenant that takes occupancy of the unit. A maintenance plan that was developed for the drainage scheme was included within the Flood Risk Assessment & Drainage Statement that would be incorporated into the developments Operation and Maintenance Manual and remains the same. The as-built drainage system would be operated and maintained by the tenant in accordance with the regime set out in the plan on occupation of the development.

Yours sincerely

James Chodorowski
SIMPSON|TWS

Encl:

1. Surface Water Drainage Network Simulation Results
2. Surcharged Outfall Simulation Results
3. Engineering Layout
4. Drainage Construction Detail
5. Drainage Management & Maintenance Plan

1. Surface Water Drainage Network Simulation Results

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.063	5.00	3.430	1200	502909.305	102180.118	0.900
S2		5.00	3.430	1200	502890.800	102186.122	1.500
S8		5.00	3.430	1200	502878.905	102190.142	0.900
S3			3.430	1200	502896.474	102202.914	1.590
S9	0.092	5.00	3.450	1200	502917.466	102195.681	1.020
S4		5.00	3.450	1200	502879.327	102208.873	1.795
S10		5.00	4.410	1200	502859.451	102209.507	1.200
S11		5.00	4.450	1200	502860.916	102213.844	2.220
S5	0.054		3.550	1200	502880.749	102212.453	2.150
S6			3.500	1200	502881.389	102214.348	2.170
S7			2.980	1200	502921.672	102200.736	1.690
S12		5.00	3.030	1200	502919.801	102202.876	1.200
MH-Y			2.620	1200	502928.920	102196.554	1.379

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	19.455	0.600	2.530	2.000	0.530	36.7	150	5.19	50.0
2.000	S8	S2	12.556	0.600	2.530	2.000	0.530	23.7	150	5.10	50.0
1.001	S2	S3	17.725	0.600	1.930	1.840	0.090	196.9	225	5.51	50.0
3.000	S9	S3	22.203	0.600	2.430	1.918	0.512	43.4	150	5.24	50.0
1.002	S3	S4	18.153	0.600	1.843	1.730	0.113	160.6	225	5.81	50.0
4.000	S10	S11	4.578	0.600	3.210	2.310	0.900	5.1	150	5.02	50.0
4.001	S11	S4	19.070	0.600	2.230	1.740	0.490	38.9	225	5.17	50.0
1.003	S4	S5	3.852	0.600	1.655	1.400	0.255	15.1	300	5.82	50.0
1.004	S5	S6	2.000	0.600	1.400	1.330	0.070	28.6	300	5.83	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	1.666	29.4	0.0	0.750	1.280	0.000	0.0	0	0.000
2.000	2.077	36.7	0.0	0.750	1.280	0.000	0.0	0	0.000
1.001	0.928	36.9	11.4	1.275	1.365	0.063	0.0	86	0.820
3.000	1.532	27.1	0.0	0.870	1.362	0.000	0.0	0	0.000
1.002	1.029	40.9	11.4	1.362	1.495	0.063	0.0	81	0.885
4.000	4.498	79.5	0.0	1.050	1.990	0.000	0.0	0	0.000
4.001	2.103	83.6	9.8	1.995	1.485	0.054	0.0	51	1.414
1.003	4.065	287.3	37.8	1.495	1.850	0.209	0.0	73	2.844
1.004	2.952	208.7	37.8	1.850	1.870	0.209	0.0	86	2.257

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	S7	42.521	0.600	1.330	1.290	0.040	1063.0	300	7.33	48.3
6.000	S12	S7	2.843	0.600	1.830	1.490	0.340	8.4	100	5.02	50.0
1.006	S7	MH-Y	8.368	0.600	1.290	1.241	0.049	170.8	100	7.57	47.5

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	0.474	33.5	36.5	1.870	1.390	0.209	0.0	300	0.480
6.000	2.689	21.1	1.6	1.100	1.390	0.009	0.0	19	1.607
1.006	0.585	4.6	37.5	1.590	1.279	0.218	0.0	100	0.601

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Starting Level (m)
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s) x
Summer CV	1.000	Drain Down Time (mins)	1440	Check Discharge Volume x
Winter CV	1.000	Additional Storage (m³/ha)	0.0	

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
30	40	0	0
100	0	0	0
100	45	0	0

Node S7 Online Hydro-Brake® Control

Flap Valve	x	Objective	(CU) Linear Discharge
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	1.290	Product Number	CTL-SCU-0043-2000-1010-2000
Design Depth (m)	1.010	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node S7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	945

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	78.0	0.0	1.000	78.0	0.0	1.001	0.0	0.0

Node S7 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Link	1.005
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	1.290	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	795	Diameter (mm)	1000

Node S7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	945

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	94.5	0.0	1.000	94.5	0.0	1.001	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
2 year 15 minute summer	114.502	32.400
2 year 15 minute winter	80.352	32.400
2 year 30 minute summer	74.329	21.033
2 year 30 minute winter	52.161	21.033
2 year 60 minute summer	50.327	13.300
2 year 60 minute winter	33.436	13.300
2 year 120 minute summer	34.834	9.206
2 year 120 minute winter	23.143	9.206
2 year 180 minute summer	27.763	7.144
2 year 180 minute winter	18.047	7.144
2 year 240 minute summer	22.267	5.885
2 year 240 minute winter	14.794	5.885
2 year 360 minute summer	17.076	4.394
2 year 360 minute winter	11.100	4.394
2 year 480 minute summer	13.383	3.537
2 year 480 minute winter	8.891	3.537
2 year 600 minute summer	10.889	2.978
2 year 600 minute winter	7.440	2.978
2 year 720 minute summer	9.641	2.584
2 year 720 minute winter	6.480	2.584
2 year 960 minute summer	7.827	2.061
2 year 960 minute winter	5.185	2.061
2 year 1440 minute summer	5.633	1.510
2 year 1440 minute winter	3.786	1.510
2 year 2160 minute summer	4.051	1.120
2 year 2160 minute winter	2.792	1.120
2 year 2880 minute summer	3.415	0.915
2 year 2880 minute winter	2.295	0.915
2 year 4320 minute summer	2.702	0.706
2 year 4320 minute winter	1.779	0.706
2 year 5760 minute summer	2.337	0.598
2 year 5760 minute winter	1.512	0.598
2 year 7200 minute summer	2.084	0.532
2 year 7200 minute winter	1.345	0.532
2 year 8640 minute summer	1.906	0.486
2 year 8640 minute winter	1.230	0.486
2 year 10080 minute summer	1.778	0.453

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
2 year 10080 minute winter	1.147	0.453
30 year 15 minute summer	294.886	83.443
30 year 15 minute winter	206.938	83.443
30 year 30 minute summer	195.202	55.236
30 year 30 minute winter	136.984	55.236
30 year 60 minute summer	132.612	35.046
30 year 60 minute winter	88.105	35.046
30 year 120 minute summer	80.470	21.266
30 year 120 minute winter	53.462	21.266
30 year 180 minute summer	60.875	15.665
30 year 180 minute winter	39.570	15.665
30 year 240 minute summer	47.430	12.534
30 year 240 minute winter	31.511	12.534
30 year 360 minute summer	35.249	9.071
30 year 360 minute winter	22.913	9.071
30 year 480 minute summer	27.142	7.173
30 year 480 minute winter	18.033	7.173
30 year 600 minute summer	21.813	5.966
30 year 600 minute winter	14.904	5.966
30 year 720 minute summer	19.130	5.127
30 year 720 minute winter	12.856	5.127
30 year 960 minute summer	15.302	4.029
30 year 960 minute winter	10.136	4.029
30 year 1440 minute summer	10.747	2.880
30 year 1440 minute winter	7.223	2.880
30 year 2160 minute summer	7.505	2.074
30 year 2160 minute winter	5.171	2.074
30 year 2880 minute summer	6.175	1.655
30 year 2880 minute winter	4.150	1.655
30 year 4320 minute summer	4.684	1.225
30 year 4320 minute winter	3.085	1.225
30 year 5760 minute summer	3.915	1.002
30 year 5760 minute winter	2.534	1.002
30 year 7200 minute summer	3.397	0.867
30 year 7200 minute winter	2.192	0.867
30 year 8640 minute summer	3.036	0.775
30 year 8640 minute winter	1.960	0.775
30 year 10080 minute summer	2.775	0.708
30 year 10080 minute winter	1.791	0.708
30 year +40% CC 15 minute summer	412.840	116.820
30 year +40% CC 15 minute winter	289.713	116.820
30 year +40% CC 30 minute summer	273.283	77.330
30 year +40% CC 30 minute winter	191.778	77.330
30 year +40% CC 60 minute summer	185.657	49.064
30 year +40% CC 60 minute winter	123.346	49.064
30 year +40% CC 120 minute summer	112.658	29.772
30 year +40% CC 120 minute winter	74.847	29.772
30 year +40% CC 180 minute summer	85.225	21.931
30 year +40% CC 180 minute winter	55.398	21.931
30 year +40% CC 240 minute summer	66.401	17.548
30 year +40% CC 240 minute winter	44.116	17.548
30 year +40% CC 360 minute summer	49.348	12.699

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year +40% CC 360 minute winter	32.078	12.699
30 year +40% CC 480 minute summer	37.999	10.042
30 year +40% CC 480 minute winter	25.246	10.042
30 year +40% CC 600 minute summer	30.538	8.353
30 year +40% CC 600 minute winter	20.865	8.353
30 year +40% CC 720 minute summer	26.782	7.178
30 year +40% CC 720 minute winter	17.999	7.178
30 year +40% CC 960 minute summer	21.422	5.641
30 year +40% CC 960 minute winter	14.191	5.641
30 year +40% CC 1440 minute summer	15.046	4.032
30 year +40% CC 1440 minute winter	10.112	4.032
30 year +40% CC 2160 minute summer	10.507	2.904
30 year +40% CC 2160 minute winter	7.240	2.904
30 year +40% CC 2880 minute summer	8.645	2.317
30 year +40% CC 2880 minute winter	5.810	2.317
30 year +40% CC 4320 minute summer	6.557	1.714
30 year +40% CC 4320 minute winter	4.318	1.714
30 year +40% CC 5760 minute summer	5.481	1.403
30 year +40% CC 5760 minute winter	3.548	1.403
30 year +40% CC 7200 minute summer	4.756	1.213
30 year +40% CC 7200 minute winter	3.069	1.213
30 year +40% CC 8640 minute summer	4.251	1.084
30 year +40% CC 8640 minute winter	2.744	1.084
30 year +40% CC 10080 minute summer	3.885	0.991
30 year +40% CC 10080 minute winter	2.507	0.991
100 year 15 minute summer	370.669	104.887
100 year 15 minute winter	260.119	104.887
100 year 30 minute summer	248.124	70.211
100 year 30 minute winter	174.122	70.211
100 year 60 minute summer	169.543	44.805
100 year 60 minute winter	112.641	44.805
100 year 120 minute summer	101.019	26.696
100 year 120 minute winter	67.115	26.696
100 year 180 minute summer	76.017	19.562
100 year 180 minute winter	49.413	19.562
100 year 240 minute summer	59.139	15.629
100 year 240 minute winter	39.291	15.629
100 year 360 minute summer	43.993	11.321
100 year 360 minute winter	28.597	11.321
100 year 480 minute summer	33.947	8.971
100 year 480 minute winter	22.553	8.971
100 year 600 minute summer	27.330	7.475
100 year 600 minute winter	18.673	7.475
100 year 720 minute summer	24.002	6.433
100 year 720 minute winter	16.131	6.433
100 year 960 minute summer	19.232	5.064
100 year 960 minute winter	12.739	5.064
100 year 1440 minute summer	13.500	3.618
100 year 1440 minute winter	9.073	3.618
100 year 2160 minute summer	9.386	2.594
100 year 2160 minute winter	6.467	2.594
100 year 2880 minute summer	7.680	2.058

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year 2880 minute winter	5.161	2.058
100 year 4320 minute summer	5.750	1.503
100 year 4320 minute winter	3.787	1.503
100 year 5760 minute summer	4.748	1.215
100 year 5760 minute winter	3.073	1.215
100 year 7200 minute summer	4.077	1.040
100 year 7200 minute winter	2.631	1.040
100 year 8640 minute summer	3.611	0.921
100 year 8640 minute winter	2.330	0.921
100 year 10080 minute summer	3.273	0.835
100 year 10080 minute winter	2.112	0.835
100 year +45% CC 15 minute summer	537.470	152.086
100 year +45% CC 15 minute winter	377.172	152.086
100 year +45% CC 30 minute summer	359.780	101.805
100 year +45% CC 30 minute winter	252.477	101.805
100 year +45% CC 60 minute summer	245.838	64.968
100 year +45% CC 60 minute winter	163.329	64.968
100 year +45% CC 120 minute summer	146.478	38.710
100 year +45% CC 120 minute winter	97.316	38.710
100 year +45% CC 180 minute summer	110.225	28.365
100 year +45% CC 180 minute winter	71.649	28.365
100 year +45% CC 240 minute summer	85.751	22.662
100 year +45% CC 240 minute winter	56.971	22.662
100 year +45% CC 360 minute summer	63.790	16.415
100 year +45% CC 360 minute winter	41.465	16.415
100 year +45% CC 480 minute summer	49.223	13.008
100 year +45% CC 480 minute winter	32.702	13.008
100 year +45% CC 600 minute summer	39.628	10.839
100 year +45% CC 600 minute winter	27.076	10.839
100 year +45% CC 720 minute summer	34.804	9.328
100 year +45% CC 720 minute winter	23.390	9.328
100 year +45% CC 960 minute summer	27.886	7.343
100 year +45% CC 960 minute winter	18.472	7.343
100 year +45% CC 1440 minute summer	19.575	5.246
100 year +45% CC 1440 minute winter	13.156	5.246
100 year +45% CC 2160 minute summer	13.610	3.761
100 year +45% CC 2160 minute winter	9.378	3.761
100 year +45% CC 2880 minute summer	11.136	2.984
100 year +45% CC 2880 minute winter	7.484	2.984
100 year +45% CC 4320 minute summer	8.337	2.180
100 year +45% CC 4320 minute winter	5.490	2.180
100 year +45% CC 5760 minute summer	6.884	1.762
100 year +45% CC 5760 minute winter	4.456	1.762
100 year +45% CC 7200 minute summer	5.911	1.508
100 year +45% CC 7200 minute winter	3.815	1.508
100 year +45% CC 8640 minute summer	5.235	1.336
100 year +45% CC 8640 minute winter	3.379	1.336
100 year +45% CC 10080 minute summer	4.746	1.211
100 year +45% CC 10080 minute winter	3.063	1.211

Results for 2 year Critical Storm Duration. Lowest mass balance: 97.28%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	1	2.530	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S2	10	2.020	0.090	11.8	0.1022	0.0000	OK
15 minute summer	S8	1	2.530	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S3	11	1.928	0.088	11.6	0.0993	0.0000	OK
15 minute summer	S9	1	2.430	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S4	10	1.740	0.085	38.3	0.0967	0.0000	OK
15 minute summer	S10	1	3.210	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S11	10	2.284	0.054	10.1	0.0611	0.0000	OK
15 minute summer	S5	10	1.546	0.146	38.2	0.1653	0.0000	OK
480 minute winter	S6	392	1.539	0.209	15.5	0.2362	0.0000	OK
480 minute winter	S7	392	1.539	0.249	5.2	41.7480	0.0000	SURCHARGED
15 minute summer	S12	10	1.850	0.020	1.7	0.0230	0.0000	OK
480 minute winter	MH-Y	392	1.273	0.032	1.0	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 summer	S1	1.000	S2	0.0	0.000	0.000	0.0139	
15 minute summer	S2	1.001	S3	11.6	0.801	0.314	0.2567	
15 minute summer	S8	2.000	S2	0.0	0.000	0.000	0.0090	
15 minute summer	S3	1.002	S4	11.6	0.870	0.283	0.2410	
15 minute summer	S9	3.000	S3	0.0	0.000	0.000	0.0054	
15 minute summer	S4	1.003	S5	38.2	1.541	0.133	0.0974	
15 minute summer	S10	4.000	S11	0.0	0.000	0.000	0.0000	
15 minute summer	S11	4.001	S4	10.0	1.398	0.119	0.1363	
15 minute summer	S5	1.004	S6	38.0	1.037	0.182	0.0851	
480 minute winter	S6	1.005	S7	5.0	0.266	0.150	2.4432	
480 minute winter	S7	1.006	MH-Y	1.0	0.463	0.218	0.0181	59.3
15 minute summer	S12	6.000	S7	1.7	1.545	0.080	0.0031	

Results for 30 year Critical Storm Duration. Lowest mass balance: 97.28%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	1	2.530	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S2	11	2.096	0.166	30.3	0.1877	0.0000	OK
15 minute summer	S8	1	2.530	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S3	11	2.035	0.195	29.6	0.2205	0.0000	OK
15 minute summer	S9	1	2.430	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S4	11	1.988	0.333	98.8	0.3764	0.0000	SURCHARGED
15 minute summer	S10	1	3.210	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S11	9	2.317	0.087	26.0	0.0983	0.0000	OK
15 minute summer	S5	11	1.917	0.517	92.0	0.5843	0.0000	SURCHARGED
15 minute summer	S6	11	1.859	0.529	91.8	0.5983	0.0000	SURCHARGED
480 minute winter	S7	464	1.834	0.544	10.7	93.9636	0.0000	SURCHARGED
15 minute summer	S12	10	1.864	0.034	4.3	0.0383	0.0000	OK
480 minute winter	MH-Y	464	1.279	0.038	1.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	0.0	0.000	0.000	0.1158	
15 minute summer	S2	1.001	S3	29.6	0.993	0.802	0.6024	
15 minute summer	S8	2.000	S2	0.0	0.000	0.000	0.0747	
15 minute summer	S3	1.002	S4	30.1	1.068	0.737	0.6887	
15 minute summer	S9	3.000	S3	0.0	0.000	0.000	0.1636	
15 minute summer	S4	1.003	S5	92.0	1.564	0.320	0.2713	
15 minute summer	S10	4.000	S11	0.0	0.000	0.000	0.0006	
15 minute summer	S11	4.001	S4	25.9	1.646	0.310	0.5073	
15 minute summer	S5	1.004	S6	91.8	1.303	0.440	0.1408	
15 minute summer	S6	1.005	S7	91.3	1.584	2.726	2.5325	
480 minute winter	S7	1.006	MH-Y	1.5	0.513	0.317	0.0238	113.3
15 minute summer	S12	6.000	S7	4.3	1.964	0.203	0.0062	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 97.28%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	12	2.569	0.039	1.3	0.0440	0.0000	OK
15 minute summer	S2	11	2.565	0.635	42.5	0.7176	0.0000	SURCHARGED
15 minute summer	S8	12	2.557	0.027	1.7	0.0304	0.0000	OK
15 minute summer	S3	11	2.454	0.614	36.2	0.6949	0.0000	SURCHARGED
15 minute summer	S9	12	2.462	0.032	0.6	0.0363	0.0000	OK
15 minute summer	S4	11	2.353	0.698	123.7	0.7898	0.0000	SURCHARGED
15 minute summer	S10	1	3.210	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S11	12	2.415	0.185	36.4	0.2089	0.0000	OK
15 minute summer	S5	11	2.228	0.828	122.1	0.9367	0.0000	SURCHARGED
15 minute summer	S6	11	2.128	0.798	121.1	0.9026	0.0000	SURCHARGED
480 minute winter	S7	464	2.067	0.777	17.2	135.3828	0.0000	SURCHARGED
480 minute winter	S12	464	2.067	0.237	0.6	0.2679	0.0000	SURCHARGED
480 minute winter	MH-Y	464	1.283	0.042	1.7	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 summer	S1	1.000	S2	-1.3	-0.122	-0.043	0.2065	
15 minute summer	S2	1.001	S3	36.2	1.032	0.983	0.7049	
15 minute summer	S8	2.000	S2	-1.7	-0.158	-0.046	0.1239	
15 minute summer	S3	1.002	S4	41.4	1.047	1.013	0.7220	
15 minute summer	S9	3.000	S3	-0.6	0.266	-0.022	0.2260	
15 minute summer	S4	1.003	S5	122.1	1.734	0.425	0.2713	
15 minute summer	S10	4.000	S11	0.0	0.000	0.000	0.0300	
15 minute summer	S11	4.001	S4	34.2	1.652	0.408	0.7118	
15 minute summer	S5	1.004	S6	121.1	1.719	0.580	0.1408	
15 minute summer	S6	1.005	S7	120.4	1.887	3.594	2.9943	
480 minute winter	S7	1.006	MH-Y	1.7	0.538	0.376	0.0269	143.8
480 minute winter	S12	6.000	S7	0.6	1.026	0.028	0.0222	

Results for 100 year Critical Storm Duration. Lowest mass balance: 97.28%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	1	2.530	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S2	12	2.405	0.475	38.1	0.5377	0.0000	SURCHARGED
15 minute summer	S8	1	2.530	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S3	12	2.316	0.476	33.6	0.5383	0.0000	SURCHARGED
15 minute summer	S9	1	2.430	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S4	11	2.225	0.570	114.6	0.6442	0.0000	SURCHARGED
15 minute summer	S10	1	3.210	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S11	11	2.327	0.097	32.7	0.1102	0.0000	OK
15 minute summer	S5	11	2.118	0.718	112.7	0.8117	0.0000	SURCHARGED
15 minute summer	S6	12	2.034	0.704	111.7	0.7963	0.0000	SURCHARGED
480 minute winter	S7	464	1.978	0.688	13.9	119.6493	0.0000	SURCHARGED
480 minute winter	S12	464	1.978	0.148	0.6	0.1678	0.0000	SURCHARGED
480 minute winter	MH-Y	464	1.282	0.041	1.6	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 summer	S1	1.000	S2	0.0	0.000	0.000	0.1713	
15 minute summer	S2	1.001	S3	33.6	1.018	0.912	0.7049	
15 minute summer	S8	2.000	S2	0.0	0.000	0.000	0.1105	
15 minute summer	S3	1.002	S4	37.4	1.143	0.913	0.7220	
15 minute summer	S9	3.000	S3	0.0	0.000	0.000	0.1954	
15 minute summer	S4	1.003	S5	112.7	1.601	0.392	0.2713	
15 minute summer	S10	4.000	S11	0.0	0.000	0.000	0.0026	
15 minute summer	S11	4.001	S4	32.6	1.746	0.389	0.5363	
15 minute summer	S5	1.004	S6	111.7	1.587	0.535	0.1408	
15 minute summer	S6	1.005	S7	111.1	1.783	3.317	2.9139	
480 minute winter	S7	1.006	MH-Y	1.6	0.529	0.355	0.0258	132.9
480 minute winter	S12	6.000	S7	0.6	1.026	0.028	0.0222	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 97.28%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	12	3.090	0.560	9.3	0.6328	0.0000	SURCHARGED
15 minute summer	S2	12	3.082	1.152	55.3	1.3031	0.0000	SURCHARGED
15 minute summer	S8	12	3.087	0.557	6.3	0.6303	0.0000	SURCHARGED
15 minute summer	S3	12	2.926	1.086	46.7	1.2281	0.0000	SURCHARGED
15 minute summer	S9	12	2.937	0.507	9.1	0.5730	0.0000	SURCHARGED
15 minute summer	S4	12	2.760	1.105	152.5	1.2499	0.0000	SURCHARGED
15 minute summer	S10	1	3.210	0.000	0.0	0.0000	0.0000	OK
15 minute summer	S11	12	2.896	0.666	47.4	0.7534	0.0000	SURCHARGED
15 minute summer	S5	12	2.580	1.180	149.8	1.3344	0.0000	SURCHARGED
15 minute summer	S6	12	2.430	1.100	148.0	1.2444	0.0000	SURCHARGED
600 minute winter	S7	585	2.389	1.099	17.2	178.1419	0.0000	SURCHARGED
600 minute winter	S12	585	2.389	0.559	0.7	0.6320	0.0000	SURCHARGED
600 minute winter	MH-Y	585	1.287	0.046	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 summer	S1	1.000	S2	-9.3	-0.546	-0.316	0.3425	
15 minute summer	S2	1.001	S3	42.7	1.074	1.158	0.7049	
15 minute summer	S8	2.000	S2	7.3	0.433	0.198	0.2210	
15 minute summer	S3	1.002	S4	51.7	1.299	1.263	0.7220	
15 minute summer	S9	3.000	S3	-9.1	-0.589	-0.338	0.3909	
15 minute summer	S4	1.003	S5	149.8	2.128	0.521	0.2713	
15 minute summer	S10	4.000	S11	0.0	0.000	0.000	0.0403	
15 minute summer	S11	4.001	S4	43.0	1.698	0.515	0.7584	
15 minute summer	S5	1.004	S6	148.0	2.102	0.709	0.1408	
15 minute summer	S6	1.005	S7	150.3	2.147	4.488	2.9943	
600 minute winter	S7	1.006	MH-Y	2.0	0.563	0.443	0.0303	179.4
600 minute winter	S12	6.000	S7	0.7	0.944	0.033	0.0222	

2. Surcharged Outfall Simulation Results

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.063	5.00	3.430	1200	502909.305	102180.118	0.900
S2		5.00	3.430	1200	502890.800	102186.122	1.500
S8		5.00	3.430	1200	502878.905	102190.142	0.900
S3			3.430	1200	502896.474	102202.914	1.590
S9	0.092	5.00	3.450	1200	502917.466	102195.681	1.020
S4		5.00	3.450	1200	502879.327	102208.873	1.795
S10		5.00	4.410	1200	502859.451	102209.507	1.200
S11		5.00	4.450	1200	502860.916	102213.844	2.220
S5	0.054		3.550	1200	502880.749	102212.453	2.150
S6			3.500	1200	502881.389	102214.348	2.170
S7			2.980	1200	502921.672	102200.736	1.690
S12		5.00	3.030	1200	502919.801	102202.876	1.200
MH-Y			2.620	1200	502928.920	102196.554	1.379

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	19.455	0.600	2.530	2.000	0.530	36.7	150	5.19	50.0
2.000	S8	S2	12.556	0.600	2.530	2.000	0.530	23.7	150	5.10	50.0
1.001	S2	S3	17.725	0.600	1.930	1.840	0.090	196.9	225	5.51	50.0
3.000	S9	S3	22.203	0.600	2.430	1.918	0.512	43.4	150	5.24	50.0
1.002	S3	S4	18.153	0.600	1.843	1.730	0.113	160.6	225	5.81	50.0
4.000	S10	S11	4.578	0.600	3.210	2.310	0.900	5.1	150	5.02	50.0
4.001	S11	S4	19.070	0.600	2.230	1.740	0.490	38.9	225	5.17	50.0
1.003	S4	S5	3.852	0.600	1.655	1.400	0.255	15.1	300	5.82	50.0
1.004	S5	S6	2.000	0.600	1.400	1.330	0.070	28.6	300	5.83	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	1.666	29.4	0.0	0.750	1.280	0.000	0.0	0	0.000
2.000	2.077	36.7	0.0	0.750	1.280	0.000	0.0	0	0.000
1.001	0.928	36.9	11.4	1.275	1.365	0.063	0.0	86	0.820
3.000	1.532	27.1	0.0	0.870	1.362	0.000	0.0	0	0.000
1.002	1.029	40.9	11.4	1.362	1.495	0.063	0.0	81	0.885
4.000	4.498	79.5	0.0	1.050	1.990	0.000	0.0	0	0.000
4.001	2.103	83.6	9.8	1.995	1.485	0.054	0.0	51	1.414
1.003	4.065	287.3	37.8	1.495	1.850	0.209	0.0	73	2.844
1.004	2.952	208.7	37.8	1.850	1.870	0.209	0.0	86	2.257

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	S7	42.521	0.600	1.330	1.290	0.040	1063.0	300	7.33	48.3
6.000	S12	S7	2.843	0.600	1.830	1.490	0.340	8.4	100	5.02	50.0
1.006	S7	MH-Y	8.368	0.600	1.290	1.241	0.049	170.8	100	7.57	47.5

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	0.474	33.5	36.5	1.870	1.390	0.209	0.0	300	0.480
6.000	2.689	21.1	1.6	1.100	1.390	0.009	0.0	19	1.607
1.006	0.585	4.6	37.5	1.590	1.279	0.218	0.0	100	0.601

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Starting Level (m)
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s) x
Summer CV	1.000	Drain Down Time (mins)	1440	Check Discharge Volume x
Winter CV	1.000	Additional Storage (m³/ha)	0.0	

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

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

Node S7 Online Hydro-Brake® Control

Flap Valve	x	Objective	(CU) Linear Discharge
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	1.290	Product Number	CTL-SCU-0043-2000-1010-2000
Design Depth (m)	1.010	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node S7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	78.0	0.0	1.000	78.0	0.0	1.001	0.0	0.0

Node S7 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Link	1.005
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	1.290	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)		Diameter (mm)	1000

Node S7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	1.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	94.5	0.0	1.000	94.5	0.0	1.001	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year 15 minute summer	294.886	83.443	30 year 720 minute winter	12.856	5.127
30 year 15 minute winter	206.938	83.443	30 year 960 minute summer	15.302	4.029
30 year 30 minute summer	195.202	55.236	30 year 960 minute winter	10.136	4.029
30 year 30 minute winter	136.984	55.236	30 year 1440 minute summer	10.747	2.880
30 year 60 minute summer	132.612	35.046	30 year 1440 minute winter	7.223	2.880
30 year 60 minute winter	88.105	35.046	30 year 2160 minute summer	7.505	2.074
30 year 120 minute summer	80.470	21.266	30 year 2160 minute winter	5.171	2.074
30 year 120 minute winter	53.462	21.266	30 year 2880 minute summer	6.175	1.655
30 year 180 minute summer	60.875	15.665	30 year 2880 minute winter	4.150	1.655
30 year 180 minute winter	39.570	15.665	30 year 4320 minute summer	4.684	1.225
30 year 240 minute summer	47.430	12.534	30 year 4320 minute winter	3.085	1.225
30 year 240 minute winter	31.511	12.534	30 year 5760 minute summer	3.915	1.002
30 year 360 minute summer	35.249	9.071	30 year 5760 minute winter	2.534	1.002
30 year 360 minute winter	22.913	9.071	30 year 7200 minute summer	3.397	0.867
30 year 480 minute summer	27.142	7.173	30 year 7200 minute winter	2.192	0.867
30 year 480 minute winter	18.033	7.173	30 year 8640 minute summer	3.036	0.775
30 year 600 minute summer	21.813	5.966	30 year 8640 minute winter	1.960	0.775
30 year 600 minute winter	14.904	5.966	30 year 10080 minute summer	2.775	0.708
30 year 720 minute summer	19.130	5.127	30 year 10080 minute winter	1.791	0.708

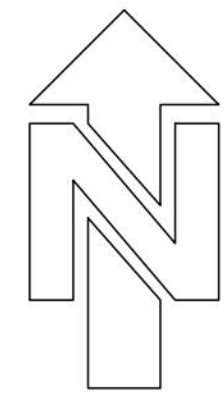
Results for 30 year Critical Storm Duration. Lowest mass balance: 98.93%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	1	2.530	0.000	0.0	0.0000	0.0000	OK
10080 minute summer	S2	6180	2.427	0.497	0.5	0.5621	0.0000	SURCHARGED
15 minute summer	S8	1	2.530	0.000	0.0	0.0000	0.0000	OK
10080 minute summer	S3	6180	2.427	0.587	0.5	0.6639	0.0000	SURCHARGED
15 minute summer	S9	1	2.430	0.000	0.0	0.0000	0.0000	OK
10080 minute summer	S4	6180	2.427	0.772	1.5	0.8731	0.0000	SURCHARGED
15 minute summer	S10	1	3.210	0.000	0.0	0.0000	0.0000	OK
10080 minute summer	S11	6180	2.427	0.197	0.4	0.2228	0.0000	OK
10080 minute summer	S5	6180	2.427	1.027	2.0	1.1615	0.0000	SURCHARGED
10080 minute summer	S6	6180	2.427	1.097	1.8	1.2407	0.0000	SURCHARGED
10080 minute summer	S7	6180	2.427	1.137	1.6	178.6734	0.0000	SURCHARGED
10080 minute summer	S12	6180	2.427	0.597	0.1	0.6752	0.0000	SURCHARGED
15 minute summer	MH-Y	1	2.341	1.100	0.0	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 summer	S1	1.000	S2	0.0	0.000	0.000	0.1157	
10080 minute summer	S2	1.001	S3	0.5	0.279	0.014	0.7049	
15 minute summer	S8	2.000	S2	0.0	0.000	0.000	0.0747	
10080 minute summer	S3	1.002	S4	0.4	0.310	0.011	0.7220	
15 minute summer	S9	3.000	S3	0.0	0.000	0.000	0.1635	
10080 minute summer	S4	1.003	S5	2.0	0.593	0.007	0.2713	
15 minute summer	S10	4.000	S11	0.0	0.000	0.000	0.0006	
10080 minute summer	S11	4.001	S4	0.4	0.497	0.005	0.7308	
10080 minute summer	S5	1.004	S6	1.8	0.179	0.009	0.1408	
10080 minute summer	S6	1.005	S7	1.5	0.111	0.044	2.9943	
10080 minute summer	S7	1.006	MH-Y	0.7	0.085	0.145	0.0655	63.6
10080 minute summer	S12	6.000	S7	0.1	0.021	0.005	0.0222	

3. Engineering Layout

DO NOT SCALE



ENGINEERING NOTES

- This drawing to be read in conjunction with all relevant Architects, Engineers and Subcontractors drawings and details.
- This drawing is based on topographical survey by Point 2 Surveyors Ltd.
Drawing Number LS2838/T
Dated June 2024
- All levels relate to levels given on survey drawing.
- Refer to Architects drawings for details of all paving types & patterns, soft landscaping, fences, gates & bollards.
- For lighting, service supplies & ducting requirements, refer to M&E drawings.
- All works to be carried out in accordance with BS EN 752 "Drain and sewer systems outside buildings" and the current edition of The Building Regulations "Approved document H".
- New drainage connections are to be made with appropriate lengths of rocker pipes & couplings.
- All manhole chamber covers to be installed parallel to final kerbs, edgings, paving joints or building lines as appropriate.
- This drawing details all below ground drainage up to finished floor level. For details of drainage above finished floor level, refer to Architects drawings.
- All stack connections under buildings to be minimum 100mm diameter solid PVC-U to BS EN 1401-1/BS4660 & laid at a minimum gradient of 1 in 40 unless otherwise noted. If the stack is greater than 100mm then the diameter of the connection is to be increased to match it.
- All RWP connections to be minimum 100mm diameter solid PVC-U to BS EN 1401-1/BS4660 & laid at a minimum gradient of 1 in 80 unless otherwise noted. If the RWP is greater than 100mm then the diameter of the connection is to be increased to match it.
- All private foul water pipework up to 150mm in diameter to be PVC-U to BS EN 1401-1/BS4660.
- All private surface water pipework up to 150mm in diameter to be solid PVC-U to BS EN 1401-1/BS4660. All private surface water pipework 225mm and above to be structured wall plastic sewer pipe complying with clause 518 of the specification for highway works.
- Concrete manholes shall comply with BS EN 1917 and BS 5911-3.
- Plastic chambers shall comply with BS 7158.
- All adoptable foul water and surface water pipework up to 225mm in diameter to be Kitemark certified Vitrited Clay (VC) with flexible spigot and socket joints and shall comply with the requirements of BS EN 295. All adoptable foul water and surface water pipework 300mm and above to be concrete sewer pipe with flexible spigot and socket joints and shall comply with the requirements of BS EN 1916 and BS 5911: Part 1.
- On completion of development all drainage shall be jet cleaned and CCTV surveyed.
- Redundant drainage & services marked to be removed are to be dug out with chambers demolished & void filled with Type 1 material to clause 803 & 806.
- All road gully connections to be minimum 150mm diameter solid PVC-U pipework to BS EN 1401-1/BS4660 and laid at a minimum gradient of 1 in 150.
- All existing services shown are based on an underground utility survey by Three Sixty Group. Location of all services in close proximity to works should be confirmed by means of trial pits under supervision of statutory undertaker & in accordance with HSE document "Avoiding Danger from Underground Services".
- Where foul drainage connections run through the foundation refer to 'DETAIL OF A PIPE PASSING THROUGH SECTION 1-1 (240122-SIM-00-FN-DR-S-13101)' on drawing 'P24-0122 105 Drainage Construction Details'.

CONTRACTOR TO PRODUCE/RECORD PHOTOGRAPHS, COPIES OF INSTALLATION CONTRACTS & WRITTEN CONFIRMATION DURING CONSTRUCTION FOR INCLUSION IN VERIFICATION REPORT TO DEMONSTRATE THAT THE APPROVED SUSTAINABLE DRAINAGE SCHEME HAS BEEN COMPLETED IN ACCORDANCE WITH THE SUBMITTED FINAL DETAILED DRAINAGE DESIGNS. THE SUSTAINABLE DRAINAGE SCHEME SHALL BE MANAGED AND MAINTAINED THEREAFTER IN ACCORDANCE WITH THE AGREED MAINTENANCE AND MAINTENANCE PLAN FOR ALL OF THE PROPOSED DRAINAGE COMPONENTS.

T1	TENDER ISSUE.	JPC	31.10.25
P1	FIRST ISSUE.	JPC	27.06.25
MR	REVISION	BY	DATE

DRAWING STATUS

TENDER

DRAWING TITLE

ENGINEERING LAYOUT

PROJECT

PREMIER INN
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Drawn	Chkd	Scales	Date
JPC	GC	1:200@A1	JUN25

Purpose of Issue

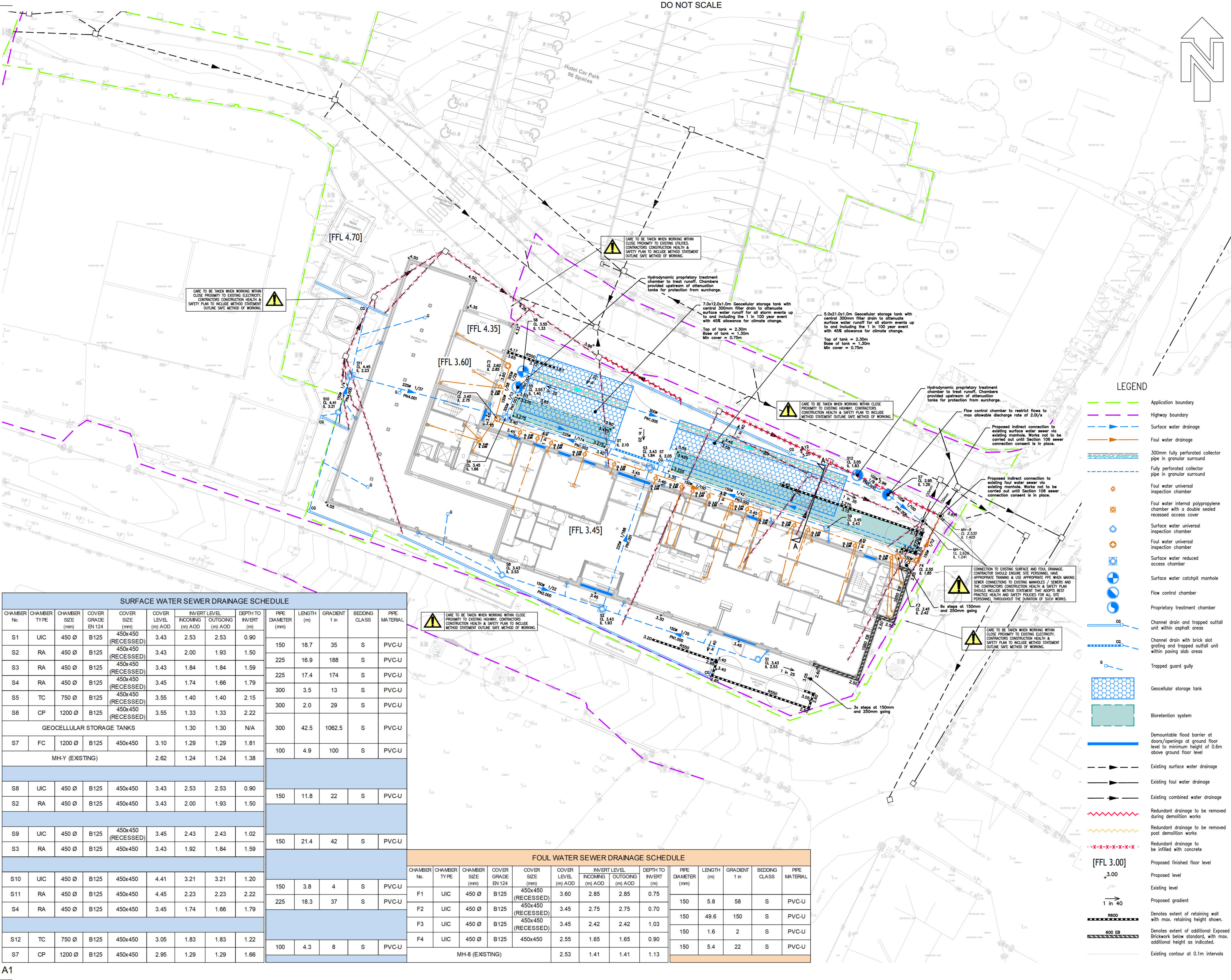
STAGE 4

Drawing Number

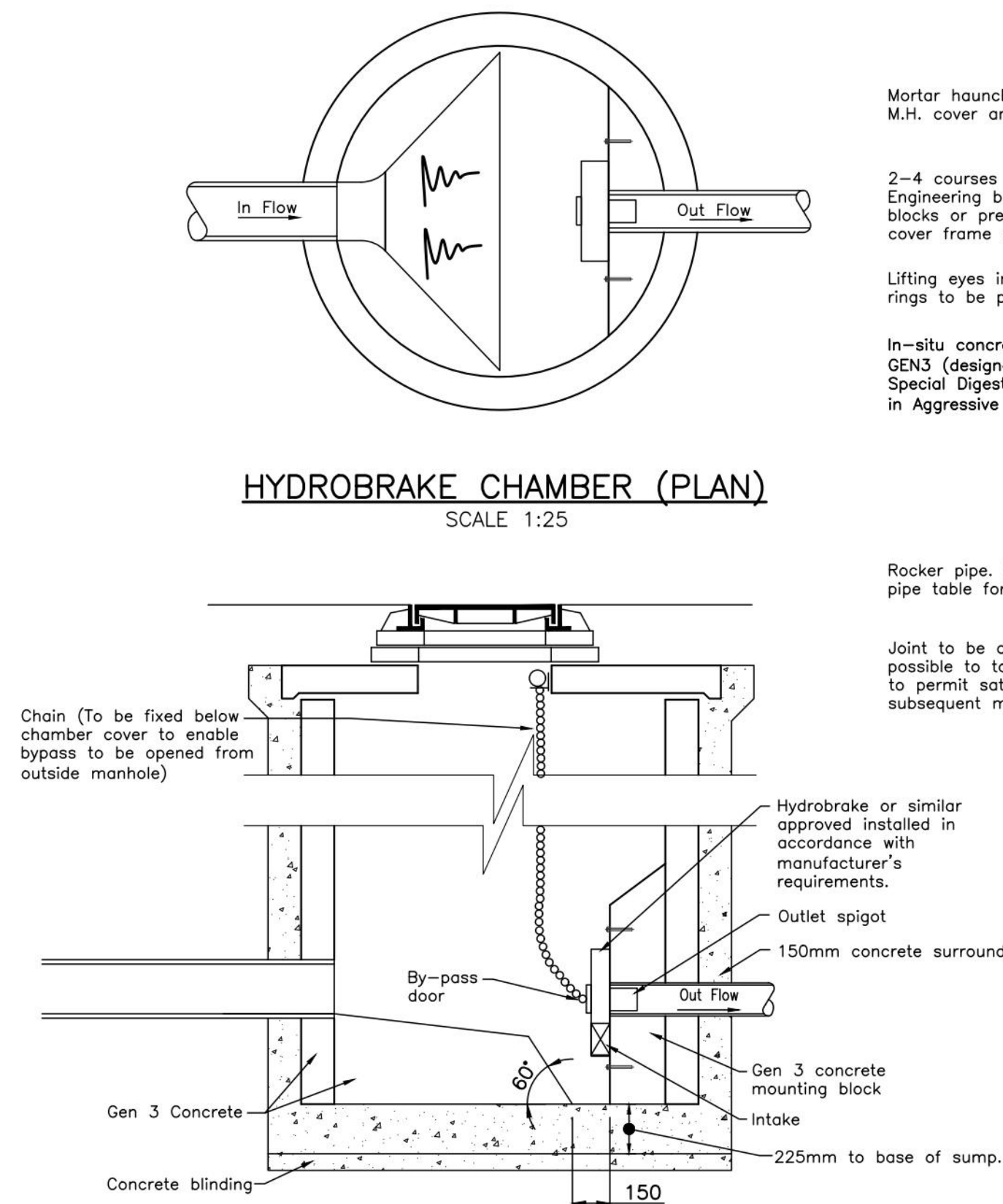
P24-0122 103

Revision

T1



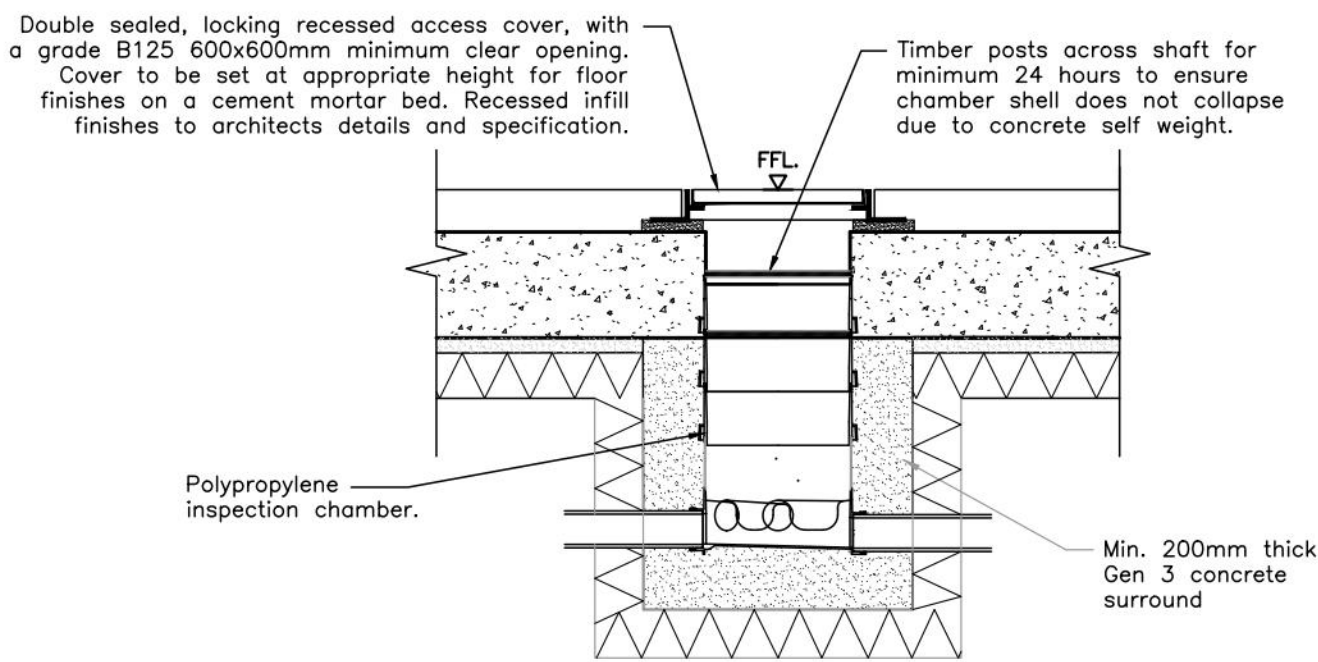
4. Drainage Construction Details



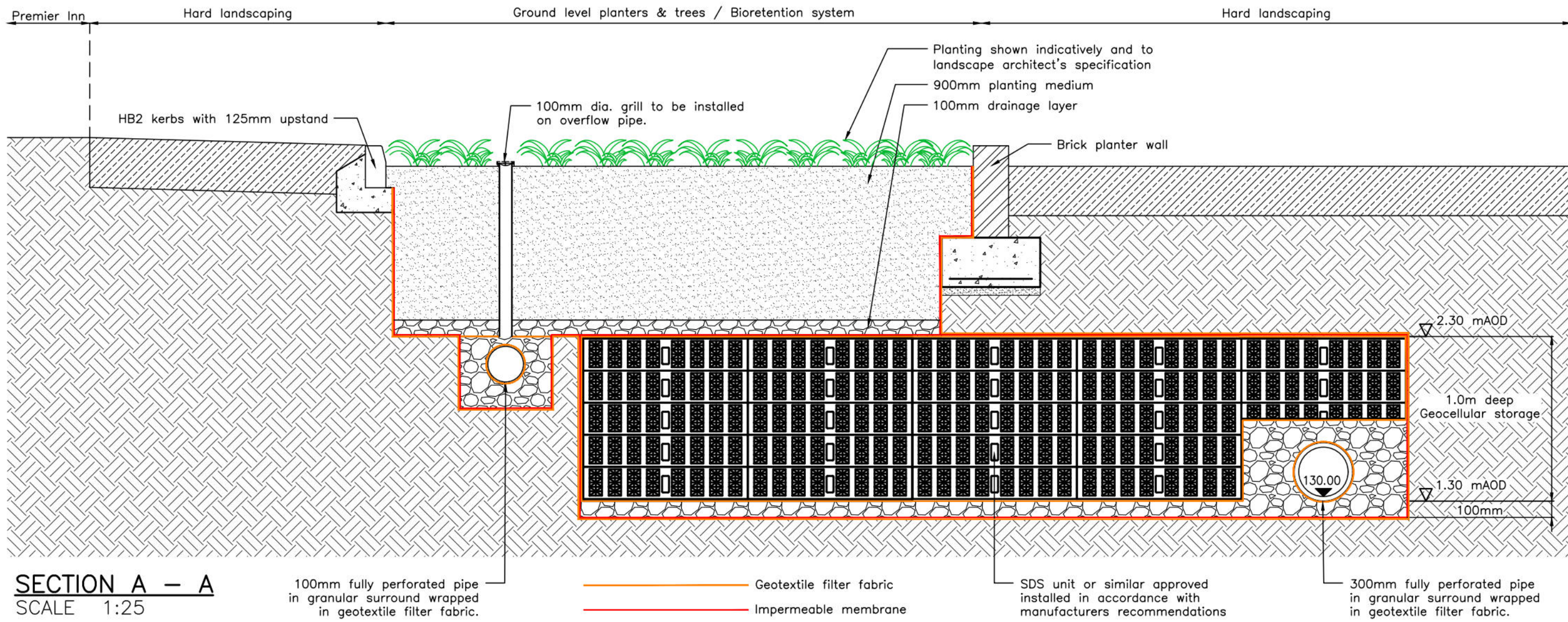
HYDROBRAKE CHAMBER (SECTION)
SCALE 1:25

Notes:

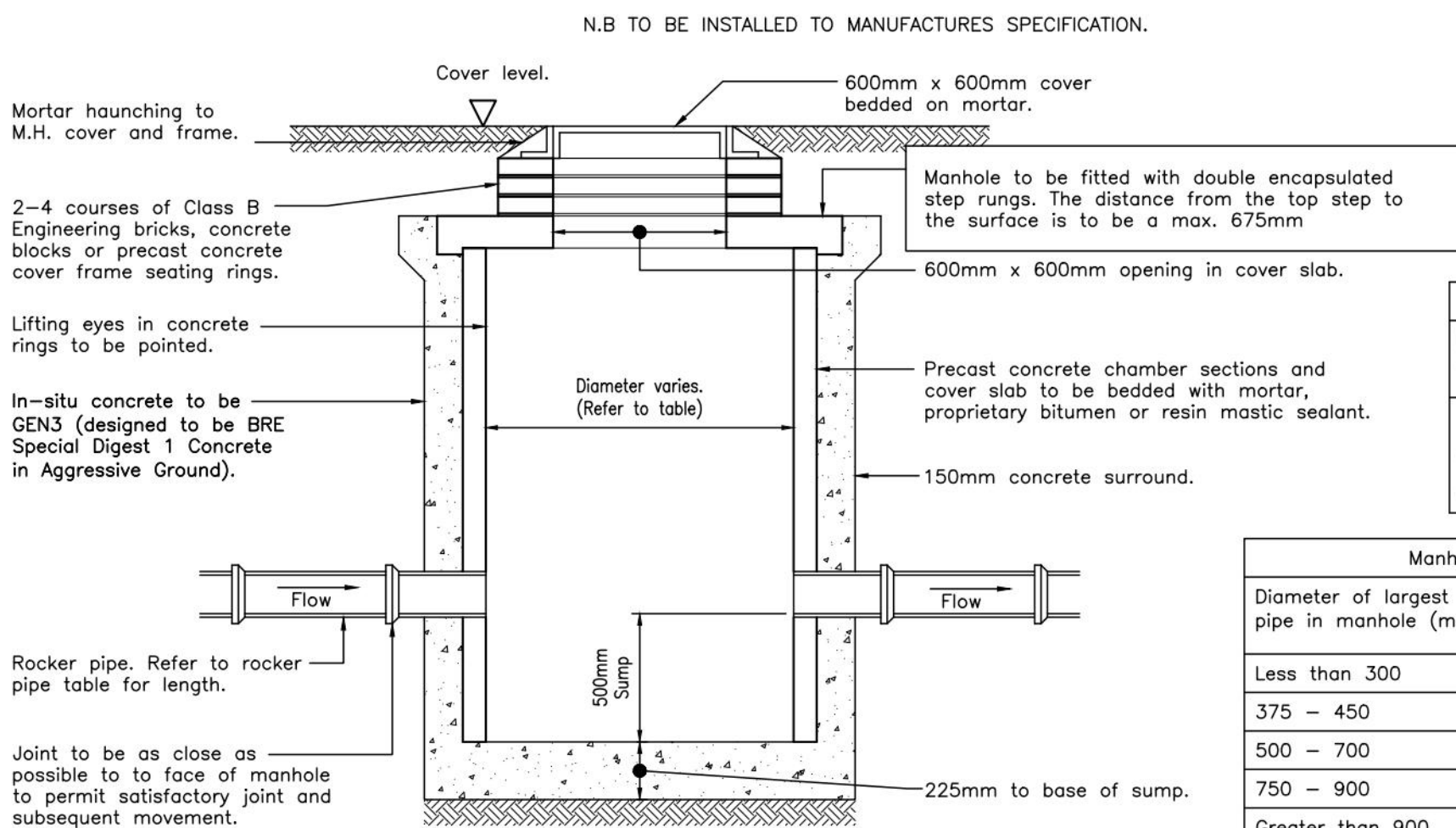
- Chamber cover to be positioned directly above by-pass door.
- Dimensions are indicative only and are dependant on type of control device used. Refer to manufacturer's specifications for details.
- Hydrobrake flow control chamber to limit flows to 2.0 l/s for all storm events up to & including the 1 in 100 year storm plus 45% allowance for climate change. hydrobrake type - CL-SOU-0043-2000-1010-2000 design head - 1.01m orifice diameter - 0.043m
- For chamber construction details refer to surface water catchpit manhole construction details.



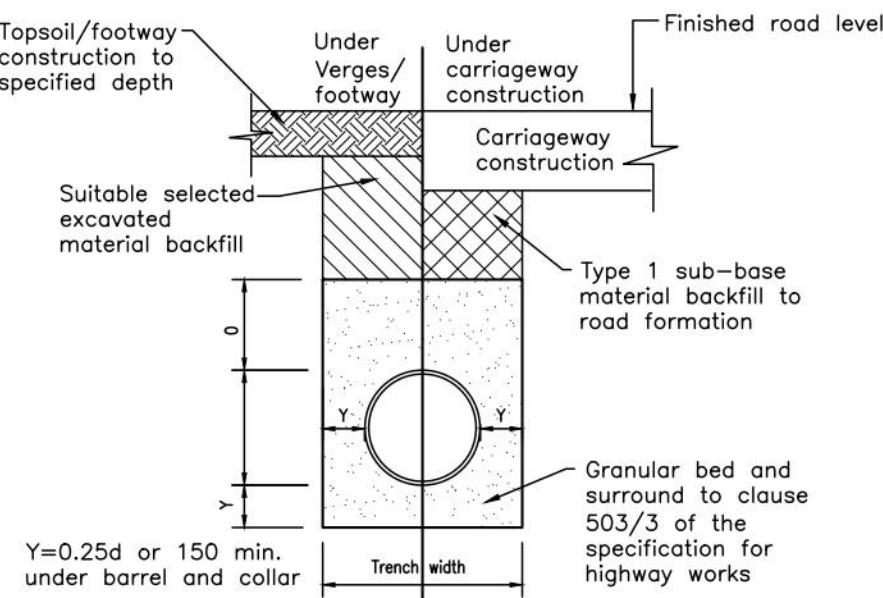
INTERNAL POLYPROPYLENE CHAMBER WITH A DOUBLE SEALED, RECESSED ACCESS COVER



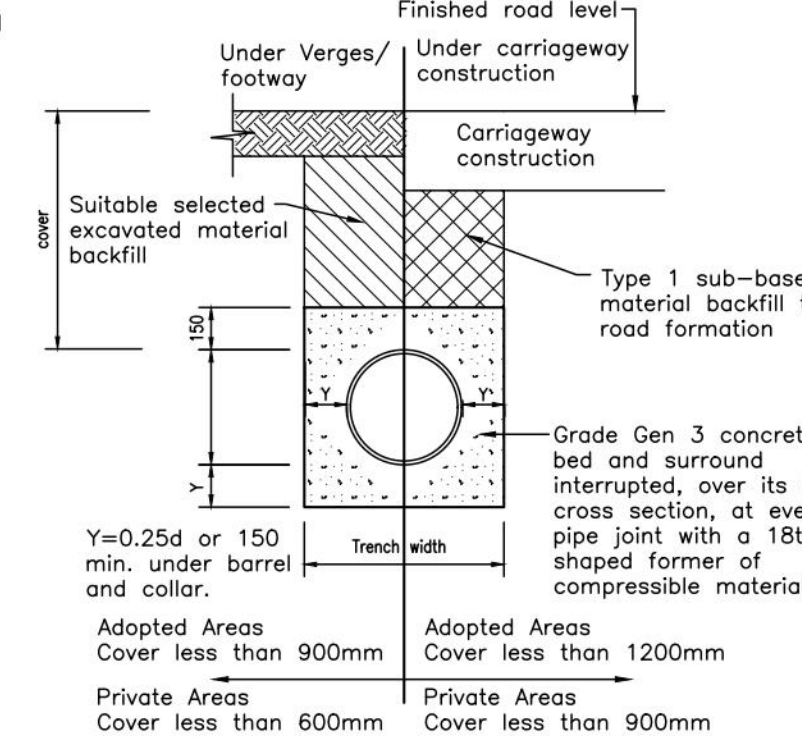
SECTION A - A
SCALE 1:25



CONCRETE CATCHPIT MANHOLE
SCALE 1:25

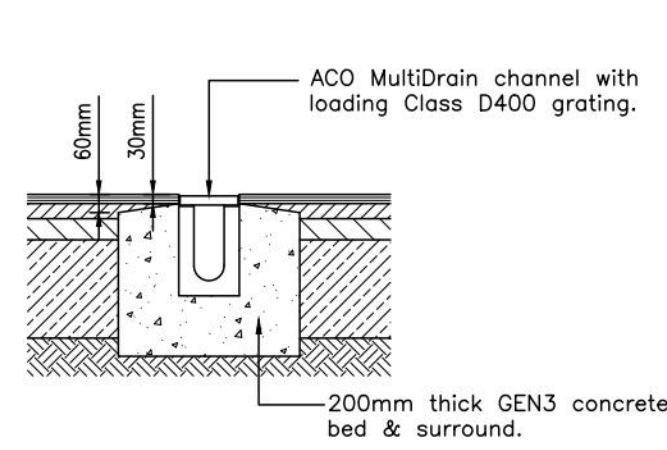


Class S Granular Surround

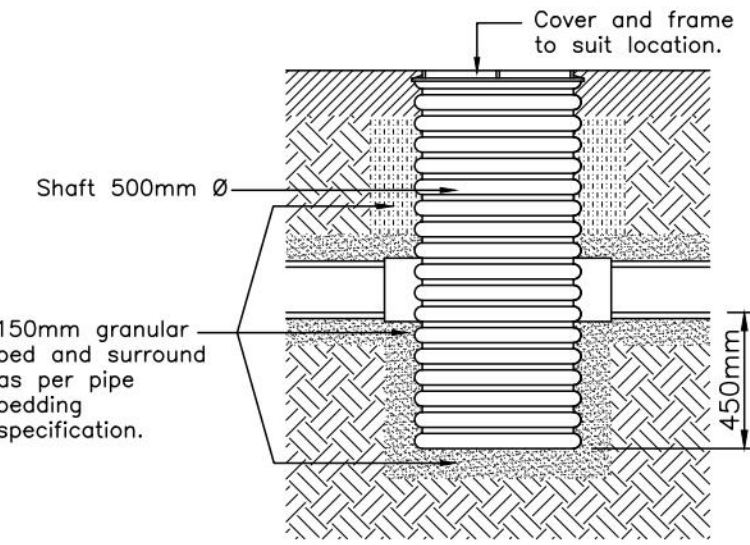


Class Z Concrete surround

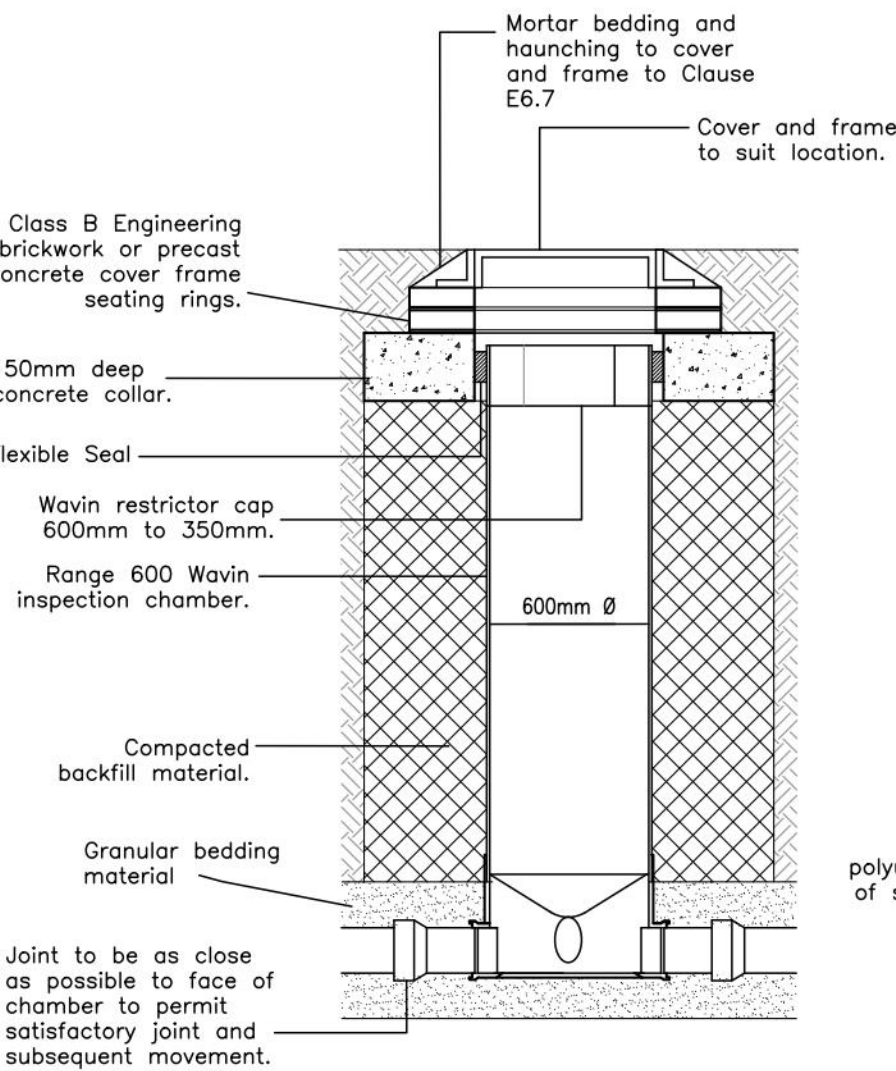
PIPE BEDDING DETAILS



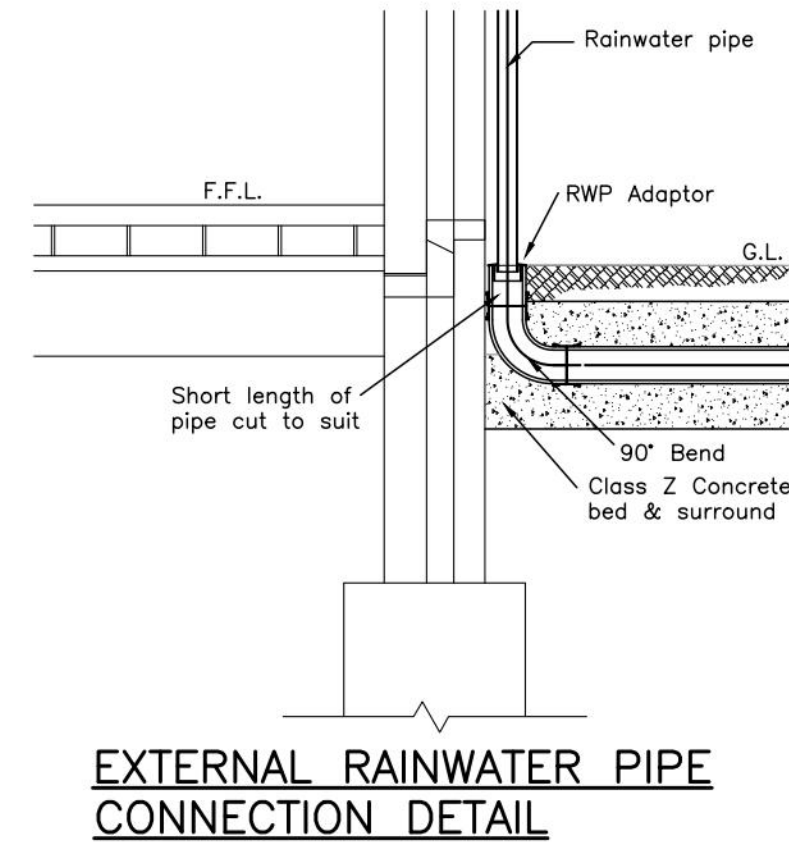
TYPICAL ACO MULTIDRAIN CHANNEL SECTION WITHIN TARMAC CIRCULATION AREAS



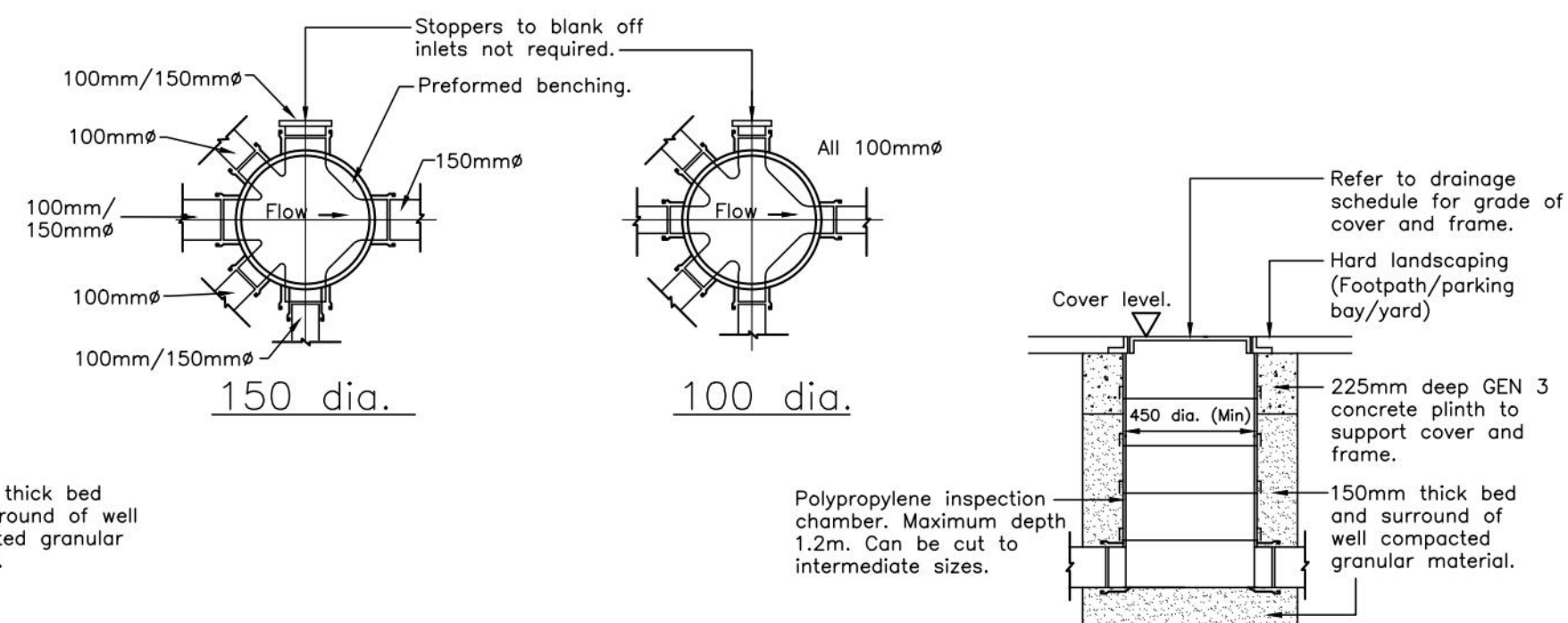
SILT TRAP



TYPICAL WAVIN RANGE 600 INSPECTION CHAMBER DETAIL (R600)



EXTERNAL RAINWATER PIPE CONNECTION DETAIL

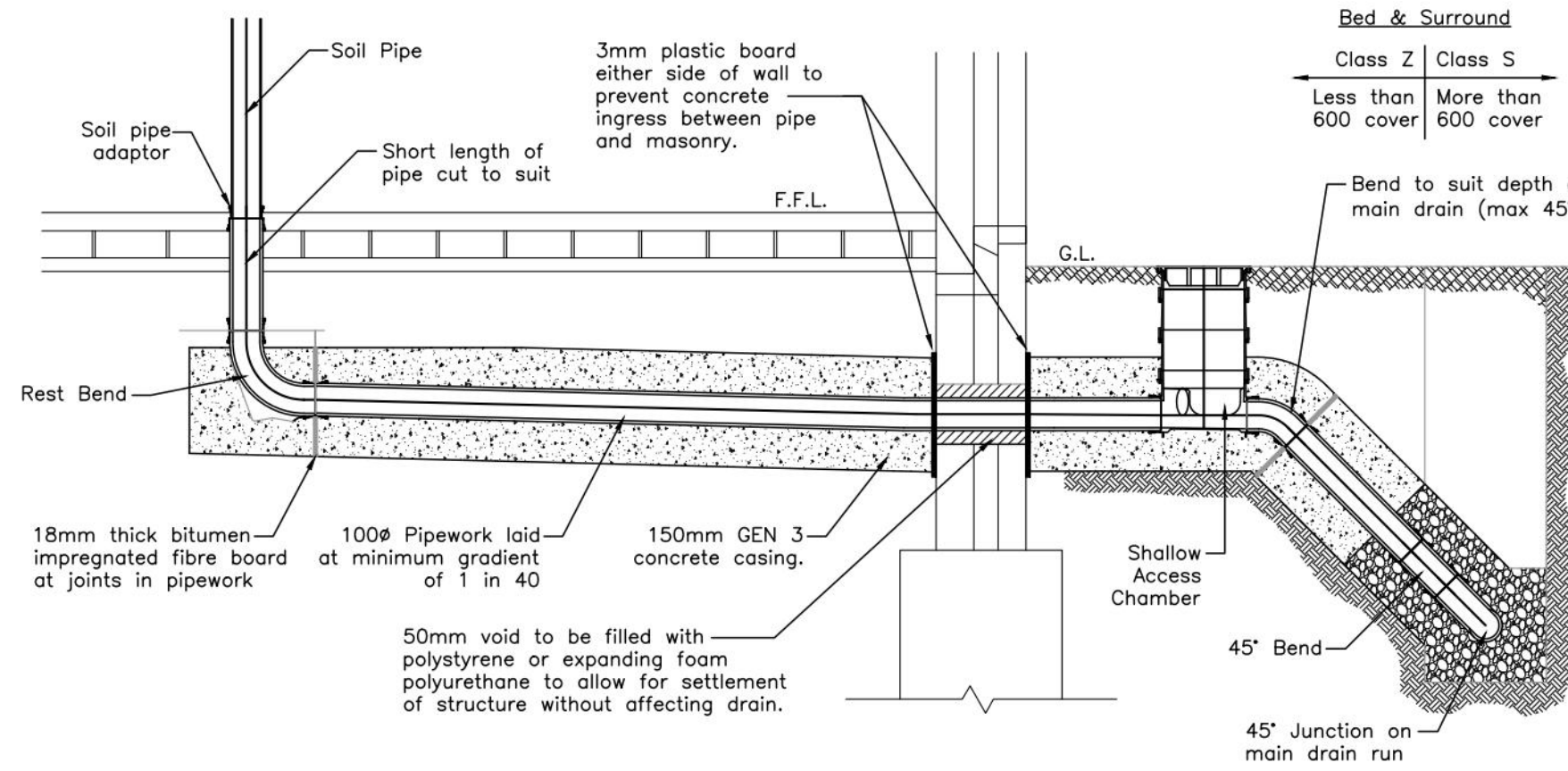


UIC SITED IN SOFT LANDSCAPING

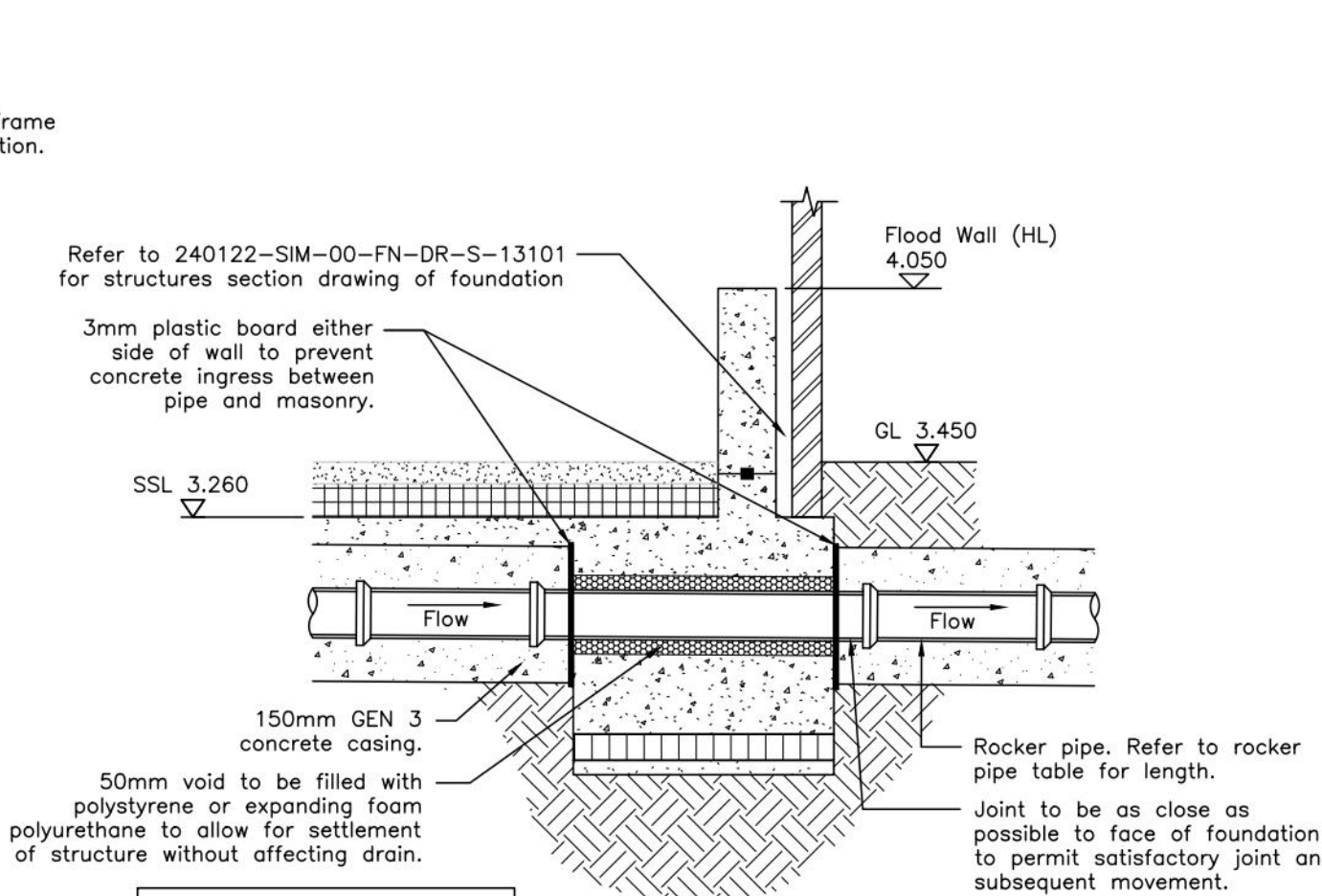
UIC SITED IN HARD LANDSCAPING

UNIVERSAL INSPECTION CHAMBER (UIC) - POLYPROPYLENE

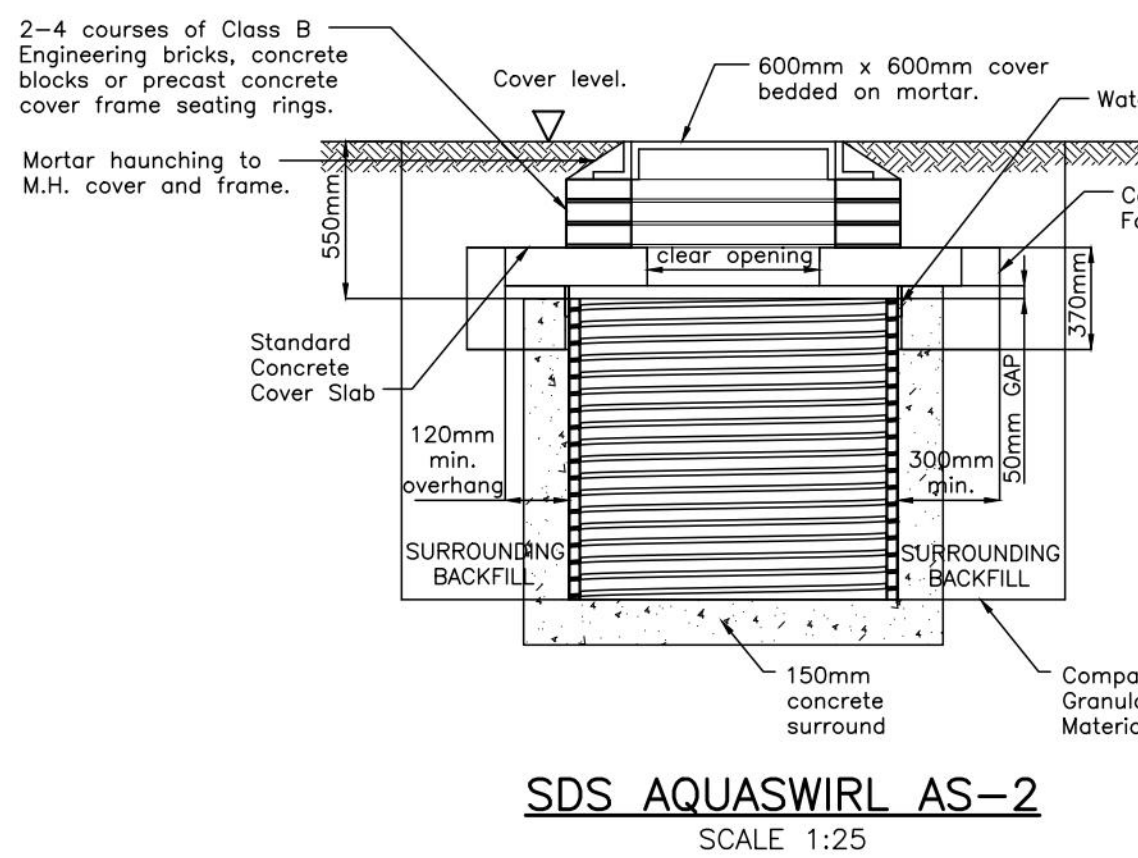
Max. Depth from cover level to invert of pipe 1.2m



TYPICAL SOIL VENT PIPE & SHALLOW ACCESS CHAMBER DETAIL



DETAIL OF A PIPE PASSING THROUGH SECTION 1-1 (240122-SIM-00-FN-DR-S-13101)



SDS AQUASWIRL AS-2
SCALE 1:25

NOTE
Private drainage to be constructed in accordance with the Building Regulations "Approved Document H".
Refer to P24-0122 103 Engineering Layout for Section A-A.

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P1	FIRST ISSUE.	JPC	27.06.25
MK	REVISION	BY	DATE

DRAWING STATUS

TENDER

DRAWING TITLE

DRAINAGE CONSTRUCTION DETAILS

PROJECT

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Drawn JPC

Checkd GJC

Scales AS SHOWN

Date JUN25

Purpose of Issue STAGE 4

Drawing Number P24-0122 105

Revision T1

5. Drainage Management & Maintenance Plan

Drainage Management & Maintenance Plan

Premier Inn Anchor Springs, Littlehampton

Whitbread PLC run a national chain of hotels under the Premier Inn brand which are maintained by their estate maintenance team. The developments drainage system would be maintained as part of the estate and this plan sets out the maintenance approach.

The drainage system comprises separate foul water and surface water drainage networks that comprise of traditional systems of below ground pipework. The systems discharge to foul and surface water sewers that are owned and operated by Southern Water. The surface water drainage system is designed to control, treat and attenuate surface water runoff as follows:

- Surface water runoff from the development discharges to the surface water sewer in Avon Road via an existing connection fitted with a flow control chamber that restricts surface water flows from the development to a maximum allowable discharge rate of 2.0 l/s.
- Runoff is conveyed by a traditional network of below ground pipework that is designed to surcharge into a below ground attenuation tank located in the area of hard/soft landscaping between the hotel building and Avon Road. The attenuation tank provides capacity to store runoff on site for a required 1 in 100 year rainfall event with 45% allowance for climate change.
- The attenuation tank is laid on a protective geotextile filter fabric and wrapped in an impermeable geomembrane to prevent groundwater from entering.
- The attenuation tank has been fully co-ordinated with the soft landscaping design with areas of planting above the attenuation tank designed as bioretention areas with 850mm minimum planting depth and filtration / protective geotextiles including drainage layer. These areas also drain areas of surrounding hard landscaping, which have been designed with falls towards the areas of planting as shown by design contours on the drainage scheme drawing.
- Remaining areas of hard landscaping are drained using linear drainage channels to prevent runoff from discharging on to the public highway. The linear drainage in turn discharges to the network of below ground pipework.
- All roofwater runoff is drained by rainwater down pipes to the network of below ground pipework.
- The network of below ground pipework discharges through a hydrodynamic proprietary treatment chamber, which would prevent silt and sediment from entering the attenuation tank.

The Maintenance Contractor tasked with carrying out any maintenance works should provide a risk assessment and method statement that adopts best practice health and safety policies for maintenance personnel throughout the duration of any maintenance works. Measures may include:

- Ensure the use of safe systems of work and procedures are followed.

Ref.:	P25-0158	Issue:	1	Issue Date:	03/04/25
Author:	JPC	Office:	Henley	Checked by:	GSC

- Certificated operatives only to be used for all confined space entry.
- Ensure appropriate PPE is worn at all times including the use of safety goggles, ear defenders and other relevant equipment when using high pressure jetting.
- Do not work in weather conditions where flooding or surging is likely.
- Erect barriers where appropriate and provide adequate lighting.
- No operations to be carried out by operatives working alone.
- Time maintenance to not conflict with other on-site activities.
- Method statement to be prepared and approved prior to entry into confined space.

The drainage system should be operated and maintained in accordance with the regime set out in the *Tables 1 to 5* below.

Table 1: Below Ground Drainage System - Operation and Maintenance Requirements

Maintenance schedule	Required action	Frequency
Regular maintenance	Remove all litter and debris from external hard landscaped areas and adjacent landscaping, which may pose a risk to the performance of the system.	Monthly.
	Remove build-up of sediment / silt in catch-pits and dispose of oils / petrol residues using safe standard practices.	As required.
	Stabilise and mow adjacent landscaped areas and remove weeds.	
Remedial actions	Repair or rehabilitate inlet and outlets to ensure they are in good condition and operating as designed.	
	Remediate any landscaping, which has raised to within 50mm of the level of adjacent hard landscaping.	
Monitoring	Check of all inlets / outlets for blockages or evidence of physical damage with any necessary remedial action or clearance carried out if required.	Monthly for first 3 months of operation, then every 6 months & following severe rainfall events.
	Inspect all surfaces for ponding, or silt accumulation. Record areas where water is ponding for more than 48 hours and carry out any remedial work deemed necessary.	After severe storms.

Table 2: Geocellular Storage Tanks - Operation and Maintenance Requirements

Maintenance schedule	Required action	Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for first 3 months of operation, then every 6 months.
	Debris removal from catchment surface (where may cause risks to performance).	Monthly.
	Where rainfall infiltrates into blocks from above, check surface of filter for blockage by silt, algae or other matter. Remove and replace surface infiltration medium as necessary.	Monthly / after severe storms.
	Remove sediment from pre-treatment structures.	Annually, or as required.
Remedial actions	Repair/rehabilitation of 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 and after large storms.

Table 3: Bioretention Rain Garden - Operation and Maintenance Requirements

Maintenance schedule	Required action	Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for first 3 months of operation, then every 6 months.
	Debris removal from catchment surface (where may	Monthly.

	cause risks to performance).	
	Where rainfall infiltrates into blocks from above, check surface of filter for blockage by silt, algae or other matter. Remove and replace surface infiltration medium as necessary.	Monthly / after severe storms.
	Remove sediment from pre-treatment structures.	Annually, or as required.
Remedial actions	Repair/rehabilitation of 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 and after large storms.

Table 4: Flow Control Chambers - Operation and Maintenance Requirements

Maintenance schedule	Required action	Frequency
Regular maintenance	Cleaning off the flow control device of any debris/sediment	As required
Remedial Actions	Flow control device repairs. Repair of erosion damage, or damage to chamber.	As required
Monitoring	Inspection of the chamber for debris and sediment build up.	Monthly for first 3 months, thereafter, every 6 months and following severe storm events.

Table 5: Proprietary Treatment Chamber - Operation and Maintenance Requirements

Maintenance schedule	Required action	Frequency
Regular maintenance	Remove litter and debris and inspect for sediment, oil and grease accumulation	Six monthly
	Change the filter media	As recommended by manufacturer
	Remove, sediment, oil, grease and floatable	As necessary – indicated by system inspections or immediately following significant spill
Remedial Actions	Replace malfunctioning parts or structures	As required
Monitoring	Inspect for evidence of poor operation	Six monthly
	Inspect filter media and establish appropriate replacement frequencies	Six monthly
	Inspect sediment accumulation rates and establish appropriate removal frequencies	Monthly during first half year of operation, then every six months