

Job No: 2474E

14th January 2025

Rev: 05-02-25

Pennywood, Hollybush Ride, Finchampstead**Existing Surface Water Assessment and Improved Drainage Strategy****Surface Water Drainage**

It is our understanding that planning enforcement action has been taken against the developer, due to the hard-paving of the driveway and parking areas, which is contrary to the planning approval.

It has been requested that the drainage system be assessed and improved to accommodate a 1 in 100 year + 40% climate change event.

The original house and its garage had a roof area of 240m² and an adjacent parking hardstand of 24m², giving a total original impermeable area of 264m².

Using the Modified Rational Method we can calculate the original 1 in 1 year run-off rate as,

$A_p = 0.0264$ hectares (existing site)

Therefore existing 1 in 1 year site discharge approximates to:

$$Q = 2.78 \times 55 \times 0.0264 \times 1 = \underline{4.04 \text{ litres per second}}$$

(based on $T_c = 5$ mins, $R = 55\text{mm/hr}$, $C_v = 1$)

Having received surveyed information in respect of the already installed surface water drainage system, we can confirm that the current drainage will not accommodate a 1 in 100 year + 40% storm event, however to remedy this, we recommend that the channel drain at the rear of the patio be removed, and allow run-off from the patio to drain directly on to the soft landscaping which falls away from the house to the woodland, this would usually be the preferred method of draining a patio. Removing this run-off from approximately 400m² of hard standing significantly improves the performance of the surface water network.

In addition to this, after carrying out hydraulic-modelling, it has been established that storage attenuation should be provided in the volume of approximately 54 cubic metres, this can be provided in the form of geocellular storage units with overall dimensions of 6.5m wide, 11m long and 0.8m deep, the surface water will drain through these units, discharging to a flow control manhole with a flow restriction of 2 l/s, which is approximately of 50% of the existing 1 in 1 year flow rate. The surface water will ultimately discharge at a maximum rate of 2 l/s for all storms up to and including the 1 in 100 year +40% event, to a watercourse within woodland inside the site curtilage.

Hydraulic Modelling has been carried out to support this, and is attached at the end of this report, along with a Drainage Layout outlining the measures to be taken to improve the surface water drainage system on-site. The Hydraulic Modelling used FEH-22 rainfall data at a point within the site.

Maintenance Management Plan

The maintenance requirements for each proposed SuDS component is given below, based on the CIRIA report C753 "The SuDS Manual".

The maintenance of the private drainage system will be the responsibility of the property owner or their appointed maintenance company.

Drainage Pipes and Inspection Chambers/Manholes and Flow Control

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove sediment and debris from inspection chambers, gullies, channel drains and flow control manhole.	Annually
	Cleaning of gutters and any filters on downpipes.	Annually
	Remove any root ingress	As required
Occasional Maintenance	CCTV Survey of drains to check for cracking, misalignment, blockage.	10 year interval

Attenuation Tank

Maintenance Schedule	Required Action	Typical Frequency
Occasional Maintenance	CCTV Survey to check condition, to include jetting through and removal of any silt build-up.	10 year interval

D.J.Barton Associates	D J Barton Associates Limited		File: 2474 DRAINAGE ASSESSMENT FEH				Page 1	
			Network: Storm Network				Revised 21-02-25	
			Philip Barton					
			21/02/2025					

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	0.750	Preferred Cover Depth (m)	1.200				
Time of Entry (mins)	4.00	Include Intermediate Ground	✓				
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓				
Maximum Rainfall (mm/hr)	50.0						

Nodes						
Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)	
STORAGE			74.740		2.222	
S0			73.340	600	0.925	
S1			74.150	1200	1.652	
S2	0.021	4.00	74.970	600	1.300	
S3	0.005	4.00	75.030	600	0.993	
S4	0.006	4.00	75.080	600	0.946	
S5	0.006	4.00	75.080	600	0.852	
S6	0.009	4.00	75.030	600	1.098	
S7	0.005	4.00	75.040	600	0.985	
S8	0.005	4.00	75.030	600	0.855	
S9	0.013	4.00	75.080	600	0.800	
JUNCTION	0.023	4.00	74.850		0.540	
GATE ACO	0.007	4.00	74.740		0.340	

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	GATE ACO	JUNCTION	17.000	0.600	74.400	74.310	0.090	188.9	100	4.51	50.0
1.001_1	JUNCTION	S4	22.000	0.600	74.310	74.134	0.176	125.0	100	5.04	50.0
1.001	S4	S3	9.000	0.600	74.134	74.037	0.097	92.8	150	5.19	50.0
1.002	S3	S2	16.750	0.600	74.037	73.670	0.367	45.6	150	5.37	50.0
1.003	S2	STORAGE	6.000	0.600	73.670	73.183	0.487	12.3	150	5.41	50.0
1.004	STORAGE	S1	2.000	0.600	72.518	72.498	0.020	100.0	150	5.44	50.0
1.005	S1	S0	10.000	0.600	72.498	72.415	0.083	120.5	150	5.62	50.0
2.000	S9	S8	9.500	0.600	74.280	74.175	0.105	90.5	100	4.20	50.0
2.001	S8	S7	6.800	0.600	74.175	74.055	0.120	56.7	100	4.31	50.0
2.002	S7	S6	10.000	0.600	74.055	73.982	0.073	137.0	100	4.56	50.0
2.003	S6	S2	26.000	0.600	73.932	73.670	0.262	99.2	150	4.99	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)
1.000	0.556	4.4	0.9	0.240	0.440	0.007	0.0
1.001_1	0.686	5.4	4.1	0.440	0.846	0.030	0.0
1.001	1.043	18.4	5.7	0.796	0.843	0.042	0.0
1.002	1.493	26.4	6.4	0.843	1.150	0.047	0.0
1.003	2.886	51.0	13.6	1.150	1.407	0.100	0.0
1.004	1.005	17.8	13.6	2.072	1.502	0.100	0.0
1.005	0.914	16.2	13.6	1.502	0.775	0.100	0.0
2.000	0.809	6.4	1.8	0.700	0.755	0.013	0.0
2.001	1.025	8.1	2.4	0.755	0.885	0.018	0.0
2.002	0.655	5.1	3.1	0.885	0.948	0.023	0.0
2.003	1.009	17.8	4.3	0.948	1.150	0.032	0.0

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Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
2.000 1	S5	S4	5.000	0.600	74.228	74.134	0.094	53.2	100	4.08	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)
2.000 1	1.059	8.3	0.8	0.752	0.846	0.006	0.0

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.750	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	0.840	Additional Storage (m ³ /ha)	20.0		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	0	0	0
30	0	0	0	100	40	0	0

Node S1 Online ACO Q-Brake Control

Flap Valve	x	Design Depth (m)	1.570	Min Node Diameter (mm)	1050
Replaces Downstream Link	✓	Design Flow (l/s)	2.0	Orifice Diameter (m)	0.062
Invert Level (m)	72.498	Min Outlet Diameter (m)	0.095		

Node STORAGE Geocellular Storage

	Structure				
Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	72.518	Slope (1:X)	200.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.800
Safety Factor	2.0	Width (m)	6.500	Inf Depth (m)	
Porosity	0.95	Length (m)	11.000		

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
2 year 15 minute summer	110.601	31.296	2 year 960 minute summer	7.650	2.015
2 year 15 minute winter	77.615	31.296	2 year 960 minute winter	5.068	2.015
2 year 30 minute summer	70.850	20.048	2 year 1440 minute summer	5.421	1.453
2 year 30 minute winter	49.719	20.048	2 year 1440 minute winter	3.643	1.453
2 year 60 minute summer	46.932	12.403	30 year 15 minute summer	318.817	90.214
2 year 60 minute winter	31.180	12.403	30 year 15 minute winter	223.731	90.214
2 year 120 minute summer	33.647	8.892	30 year 30 minute summer	206.774	58.510
2 year 120 minute winter	22.354	8.892	30 year 30 minute winter	145.105	58.510
2 year 180 minute summer	27.171	6.992	30 year 60 minute summer	137.788	36.413
2 year 180 minute winter	17.662	6.992	30 year 60 minute winter	91.543	36.413
2 year 240 minute summer	21.915	5.791	30 year 120 minute summer	84.667	22.375
2 year 240 minute winter	14.560	5.791	30 year 120 minute winter	56.251	22.375
2 year 360 minute summer	16.844	4.335	30 year 180 minute summer	64.176	16.515
2 year 360 minute winter	10.949	4.335	30 year 180 minute winter	41.716	16.515
2 year 480 minute summer	13.198	3.488	30 year 240 minute summer	49.947	13.200
2 year 480 minute winter	8.768	3.488	30 year 240 minute winter	33.184	13.200
2 year 600 minute summer	10.722	2.933	30 year 360 minute summer	36.932	9.504
2 year 600 minute winter	7.326	2.933	30 year 360 minute winter	24.007	9.504
2 year 720 minute summer	9.473	2.539	30 year 480 minute summer	28.252	7.466
2 year 720 minute winter	6.366	2.539	30 year 480 minute winter	18.770	7.466

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year 600 minute summer	22.567	6.172	100 year 960 minute summer	19.283	5.078
30 year 600 minute winter	15.419	6.172	100 year 960 minute winter	12.774	5.078
30 year 720 minute summer	19.683	5.275	100 year 1440 minute summer	13.227	3.545
30 year 720 minute winter	13.228	5.275	100 year 1440 minute winter	8.889	3.545
30 year 960 minute summer	15.603	4.109	100 year +40% CC 15 minute summer	569.165	161.054
30 year 960 minute winter	10.336	4.109	100 year +40% CC 15 minute winter	399.414	161.054
30 year 1440 minute summer	10.772	2.887	100 year +40% CC 30 minute summer	374.417	105.947
30 year 1440 minute winter	7.240	2.887	100 year +40% CC 30 minute winter	262.748	105.947
100 year 15 minute summer	406.546	115.039	100 year +40% CC 60 minute summer	250.584	66.222
100 year 15 minute winter	285.296	115.039	100 year +40% CC 60 minute winter	166.482	66.222
100 year 30 minute summer	267.440	75.676	100 year +40% CC 120 minute summer	150.356	39.735
100 year 30 minute winter	187.677	75.676	100 year +40% CC 120 minute winter	99.893	39.735
100 year 60 minute summer	178.989	47.301	100 year +40% CC 180 minute summer	113.011	29.082
100 year 60 minute winter	118.916	47.301	100 year +40% CC 180 minute winter	73.460	29.082
100 year 120 minute summer	107.397	28.382	100 year +40% CC 240 minute summer	87.579	23.144
100 year 120 minute winter	71.352	28.382	100 year +40% CC 240 minute winter	58.185	23.144
100 year 180 minute summer	80.722	20.773	100 year +40% CC 360 minute summer	64.474	16.591
100 year 180 minute winter	52.472	20.773	100 year +40% CC 360 minute winter	41.910	16.591
100 year 240 minute summer	62.556	16.532	100 year +40% CC 480 minute summer	49.209	13.005
100 year 240 minute winter	41.561	16.532	100 year +40% CC 480 minute winter	32.694	13.005
100 year 360 minute summer	46.053	11.851	100 year +40% CC 600 minute summer	39.234	10.732
100 year 360 minute winter	29.935	11.851	100 year +40% CC 600 minute winter	26.807	10.732
100 year 480 minute summer	35.150	9.289	100 year +40% CC 720 minute summer	34.165	9.157
100 year 480 minute winter	23.353	9.289	100 year +40% CC 720 minute winter	22.961	9.157
100 year 600 minute summer	28.025	7.665	100 year +40% CC 960 minute summer	26.997	7.109
100 year 600 minute winter	19.148	7.665	100 year +40% CC 960 minute winter	17.883	7.109
100 year 720 minute summer	24.404	6.540	100 year +40% CC 1440 minute summer	18.518	4.963
100 year 720 minute winter	16.401	6.540	100 year +40% CC 1440 minute winter	12.445	4.963

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.80%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	STORAGE	90	72.654	0.136	5.4	7.3427	0.0000	OK
15 minute summer	S0	1	72.415	0.000	1.4	0.0000	0.0000	OK
120 minute winter	S1	90	72.653	0.155	3.4	0.1757	0.0000	SURCHARGED
15 minute winter	S2	10	73.728	0.058	15.0	0.0353	0.0000	OK
15 minute winter	S3	10	74.090	0.053	7.0	0.0205	0.0000	OK
15 minute winter	S4	10	74.198	0.064	6.3	0.0263	0.0000	OK
15 minute winter	S5	10	74.250	0.022	0.9	0.0094	0.0000	OK
15 minute winter	S6	10	73.986	0.054	4.9	0.0240	0.0000	OK
15 minute winter	S7	10	74.119	0.064	3.6	0.0245	0.0000	OK
15 minute winter	S8	10	74.217	0.042	2.8	0.0167	0.0000	OK
15 minute summer	S9	10	74.320	0.040	2.0	0.0241	0.0000	OK
15 minute winter	JUNCTION	10	74.381	0.071	4.6	0.0609	0.0000	OK
15 minute winter	GATE ACO	10	74.434	0.034	1.1	0.0139	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	STORAGE	1.004	S1	3.8	0.571	0.216	0.0295	
120 minute winter	S1	ACO Q-Brake	S0	1.6				14.9
15 minute winter	S2	1.003	STORAGE	14.8	2.420	0.290	0.0366	
15 minute winter	S3	1.002	S2	6.9	1.164	0.263	0.1000	
15 minute winter	S4	1.001	S3	6.2	0.973	0.338	0.0576	
15 minute winter	S5	2.000_1	S4	0.9	0.289	0.108	0.0165	
15 minute winter	S6	2.003	S2	4.8	0.806	0.270	0.1558	
15 minute winter	S7	2.002	S6	3.5	0.687	0.682	0.0511	
15 minute winter	S8	2.001	S7	2.8	0.675	0.347	0.0285	
15 minute summer	S9	2.000	S8	2.0	0.670	0.315	0.0284	
15 minute winter	JUNCTION	1.001_1	S4	4.5	0.797	0.835	0.1242	
15 minute winter	GATE ACO	1.000	JUNCTION	1.1	0.260	0.249	0.0707	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.80%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	STORAGE	118	72.934	0.416	13.2	26.3601	0.0000	SURCHARGED
15 minute summer	S0	1	72.415	0.000	2.0	0.0000	0.0000	OK
120 minute winter	S1	118	72.933	0.435	2.7	0.4923	0.0000	SURCHARGED
15 minute winter	S2	10	73.773	0.103	36.6	0.0624	0.0000	OK
15 minute winter	S3	11	74.124	0.087	16.2	0.0334	0.0000	OK
15 minute winter	S4	11	74.241	0.107	14.1	0.0438	0.0000	OK
15 minute winter	S5	10	74.266	0.038	2.6	0.0163	0.0000	OK
15 minute winter	S6	10	74.022	0.090	11.7	0.0404	0.0000	OK
15 minute winter	S7	11	74.280	0.225	8.3	0.0865	0.0000	SURCHARGED
15 minute winter	S8	11	74.381	0.206	6.9	0.0823	0.0000	SURCHARGED
15 minute winter	S9	11	74.452	0.172	5.6	0.1046	0.0000	SURCHARGED
15 minute winter	JUNCTION	11	74.849	0.539	10.9	0.4595	0.0000	FLOOD RISK
15 minute summer	GATE ACO	10	74.740	0.340	3.0	0.1789	0.0000	FLOOD RISK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	STORAGE	1.004	S1	4.6	0.647	0.261	0.0352	
120 minute winter	S1	ACO Q-Brake	S0	2.0				35.4
15 minute winter	S2	1.003	STORAGE	36.4	2.972	0.713	0.0734	
15 minute winter	S3	1.002	S2	16.1	1.380	0.609	0.1968	
15 minute winter	S4	1.001	S3	14.1	1.168	0.764	0.1082	
15 minute winter	S5	2.000_1	S4	2.6	0.441	0.313	0.0265	
15 minute winter	S6	2.003	S2	11.6	0.982	0.650	0.3117	
15 minute winter	S7	2.002	S6	8.2	1.044	1.586	0.0761	
15 minute winter	S8	2.001	S7	6.4	0.821	0.798	0.0532	
15 minute summer	S9	2.000	S8	5.2	0.789	0.819	0.0743	
15 minute winter	JUNCTION	1.001_1	S4	9.6	1.233	1.790	0.1721	
15 minute summer	GATE ACO	1.000	JUNCTION	3.1	0.401	0.718	0.1330	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.80%

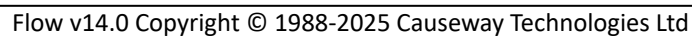
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	STORAGE	180	73.101	0.583	12.1	37.7525	0.0000	SURCHARGED
15 minute summer	S0	1	72.415	0.000	2.0	0.0000	0.0000	OK
180 minute winter	S1	180	73.101	0.603	3.2	0.6821	0.0000	SURCHARGED
15 minute winter	S2	10	73.793	0.123	44.9	0.0745	0.0000	OK
15 minute winter	S3	11	74.138	0.101	19.7	0.0387	0.0000	OK
15 minute winter	S4	11	74.260	0.126	17.2	0.0517	0.0000	OK
15 minute winter	S5	10	74.272	0.044	3.3	0.0186	0.0000	OK
15 minute winter	S6	11	74.035	0.103	14.0	0.0459	0.0000	OK
15 minute winter	S7	11	74.379	0.324	10.0	0.1244	0.0000	SURCHARGED
15 minute winter	S8	11	74.521	0.346	8.5	0.1383	0.0000	SURCHARGED
15 minute winter	S9	11	74.626	0.346	7.2	0.2103	0.0000	SURCHARGED
15 minute summer	JUNCTION	10	74.850	0.540	13.4	0.6628	0.0000	FLOOD RISK
15 minute summer	GATE ACO	9	74.740	0.340	4.5	0.2952	0.0000	FLOOD RISK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	STORAGE	1.004	S1	3.8	0.616	0.213	0.0352	
30 minute winter	S1	ACO Q-Brake	S0	2.0				27.9
15 minute winter	S2	1.003	STORAGE	44.5	3.055	0.872	0.0872	
15 minute winter	S3	1.002	S2	19.7	1.423	0.747	0.2345	
15 minute winter	S4	1.001	S3	17.2	1.205	0.933	0.1279	
15 minute summer	S5	2.000_1	S4	3.3	0.511	0.397	0.0278	
15 minute winter	S6	2.003	S2	14.0	1.012	0.785	0.3663	
15 minute winter	S7	2.002	S6	9.7	1.237	1.881	0.0772	
15 minute winter	S8	2.001	S7	7.6	0.975	0.947	0.0532	
15 minute winter	S9	2.000	S8	5.7	0.794	0.900	0.0743	
15 minute winter	JUNCTION	1.001_1	S4	11.6	1.478	2.146	0.1721	
15 minute winter	GATE ACO	1.000	JUNCTION	3.8	0.488	0.874	0.1330	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.80%

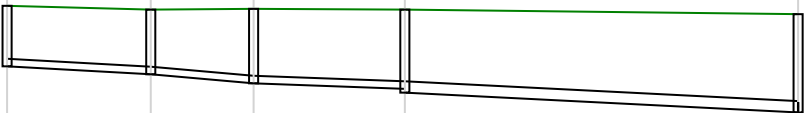
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	STORAGE	176	74.108	1.590	17.0	52.5088	0.0000	SURCHARGED
15 minute summer	S0	1	72.415	0.000	2.0	0.0000	0.0000	OK
180 minute winter	S1	176	74.109	1.611	3.1	1.8220	0.0000	FLOOD RISK
180 minute winter	S2	176	74.110	0.440	17.0	0.2667	0.0000	SURCHARGED
15 minute winter	S3	12	74.317	0.280	23.0	0.1074	0.0000	SURCHARGED
15 minute winter	S4	12	74.483	0.349	20.7	0.1431	0.0000	SURCHARGED
15 minute winter	S5	12	74.503	0.275	4.7	0.1165	0.0000	SURCHARGED
15 minute winter	S6	11	74.246	0.314	17.0	0.1405	0.0000	SURCHARGED
15 minute winter	S7	12	74.682	0.627	12.5	0.2409	0.0000	SURCHARGED
15 minute winter	S8	12	74.884	0.709	11.2	0.2837	0.0000	FLOOD RISK
15 minute winter	S9	12	75.028	0.748	10.1	0.4551	0.0000	FLOOD RISK
15 minute summer	JUNCTION	9	74.850	0.540	18.0	1.1613	0.0000	FLOOD RISK
15 minute summer	GATE ACO	9	74.740	0.340	6.1	0.5498	0.0000	FLOOD RISK

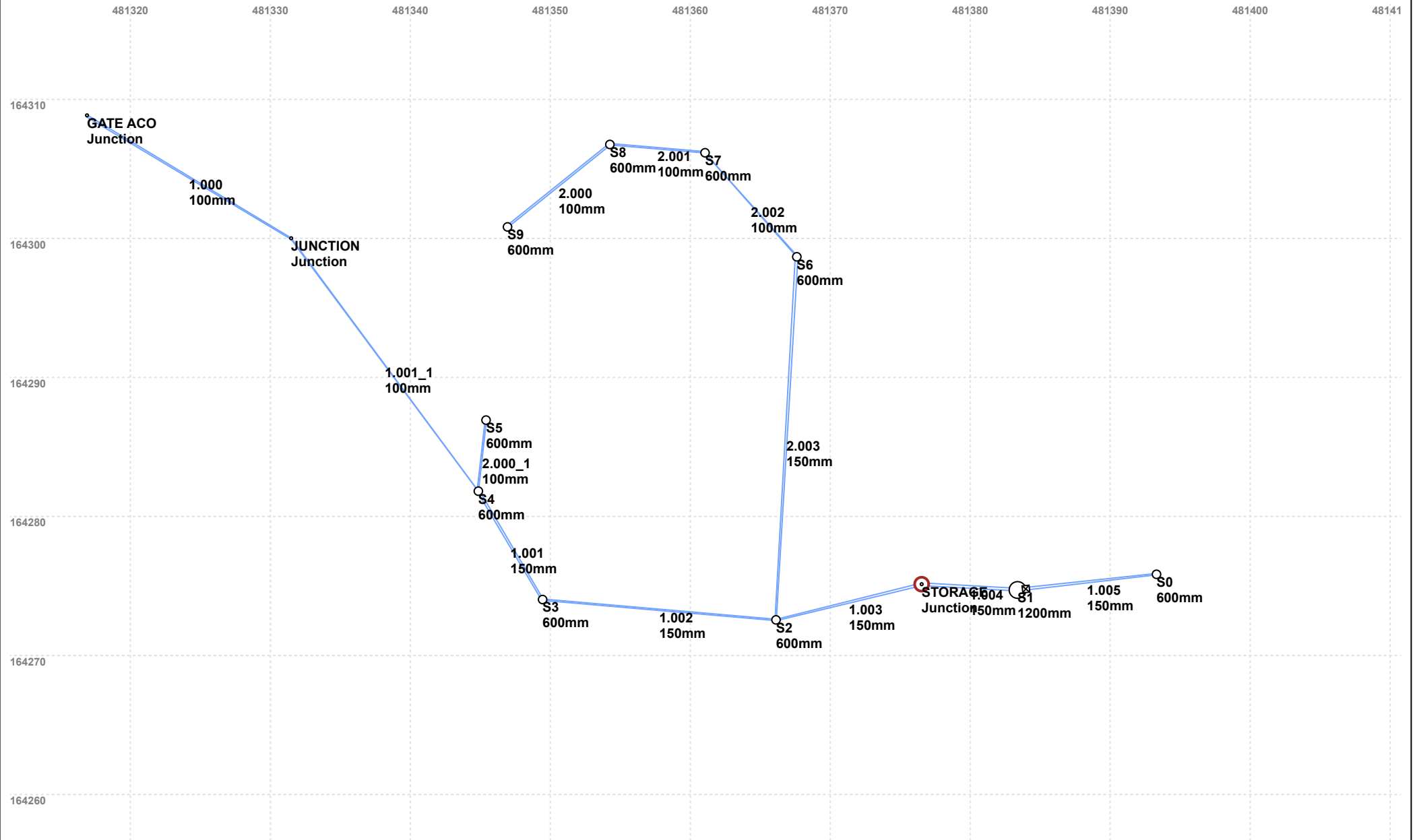
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	STORAGE	1.004	S1	4.9	0.691	0.276	0.0352	
180 minute winter	S1	ACO Q-Brake	S0	2.0				36.0
15 minute winter	S2	1.003	STORAGE	52.4	3.036	1.028	0.1056	
15 minute winter	S3	1.002	S2	25.0	1.508	0.947	0.2949	
15 minute winter	S4	1.001	S3	20.8	1.222	1.127	0.1584	
15 minute summer	S5	2.000_1	S4	4.0	0.548	0.477	0.0391	
15 minute winter	S6	2.003	S2	17.0	1.027	0.955	0.4577	
15 minute summer	S7	2.002	S6	12.0	1.536	2.336	0.0782	
15 minute winter	S8	2.001	S7	9.1	1.164	1.131	0.0532	
15 minute winter	S9	2.000	S8	7.3	0.933	1.149	0.0743	
15 minute winter	JUNCTION	1.001_1	S4	14.1	1.808	2.624	0.1721	
15 minute winter	GATE ACO	1.000	JUNCTION	5.1	0.647	1.160	0.1330	

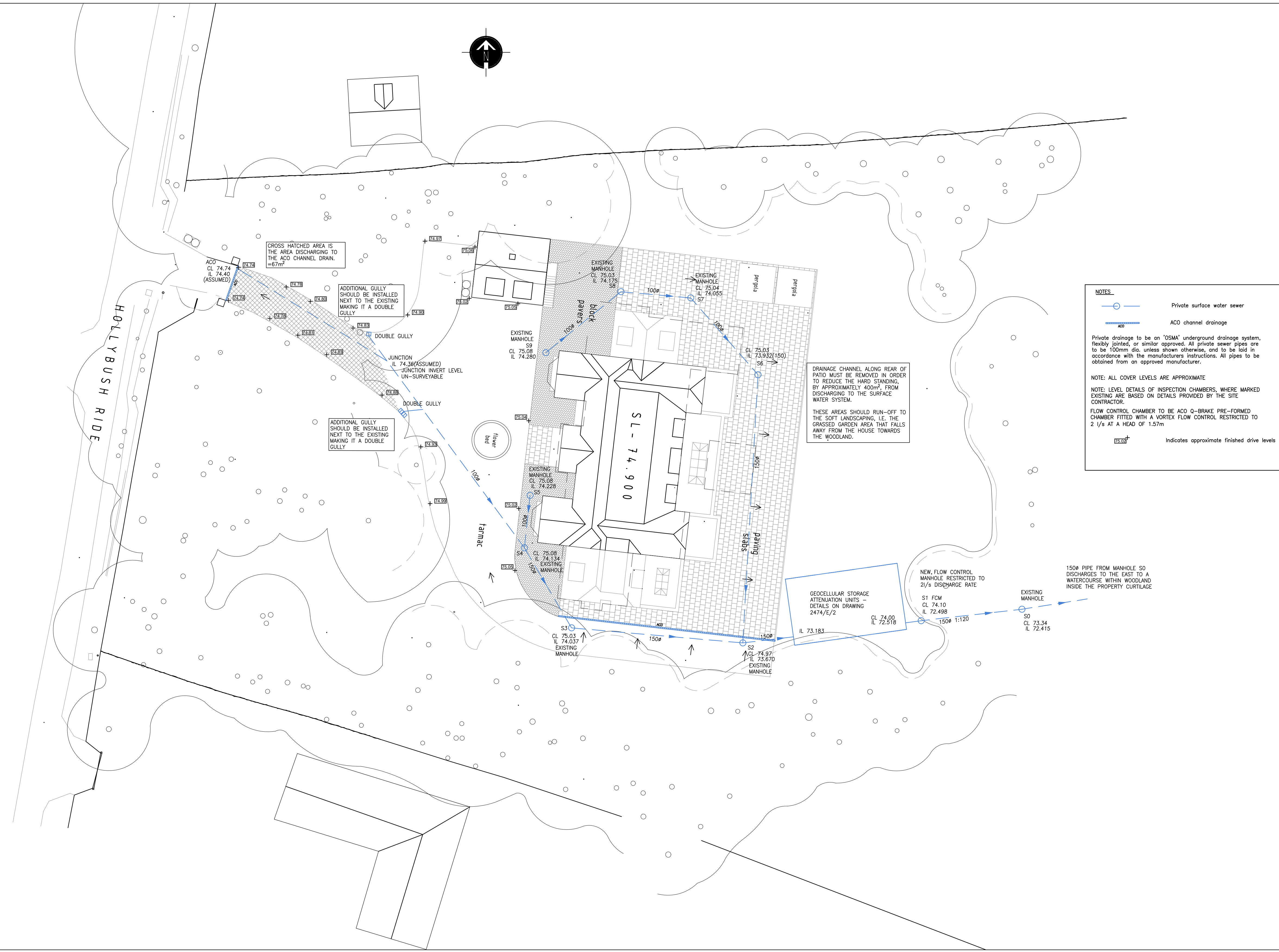
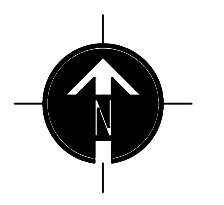


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Node Name	S9	S8	S7	S6	S2
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) 69.000					
	2.000	2.001	2.002	2.003	
	100mm	100mm	100mm	150mm	
	90.5	56.7	137.0	99.2	
	75.080	75.030	75.040	75.030	74.970
Invert Level (m)	74.280	74.175	74.055	73.982	73.670
Length (m)	9.500	6.800	10.000	26.000	





NOTES

Private surface water sewer

ACO channel drainage

Private drainage to be on 'OSMA' underground drainage system, flexibly jointed, or similar approved. All private sewer pipes are to be 100mm dia. unless shown otherwise, and to be laid in accordance with the manufacturers instructions. All pipes to be obtained from an approved manufacturer.

NOTE: ALL COVER LEVELS ARE APPROXIMATE

NOTE: LEVEL DETAILS OF INSPECTION CHAMBERS, WHERE MARKED EXISTING ARE BASED ON DETAILS PROVIDED BY THE SITE CONTRACTOR.

FLOW CONTROL CHAMBER TO BE ACO Q-BRAKE PRE-FORMED CHAMBER FITTED WITH A VORTEX FLOW CONTROL RESTRICTED TO 2 1/s AT A HEAD OF 1.57m

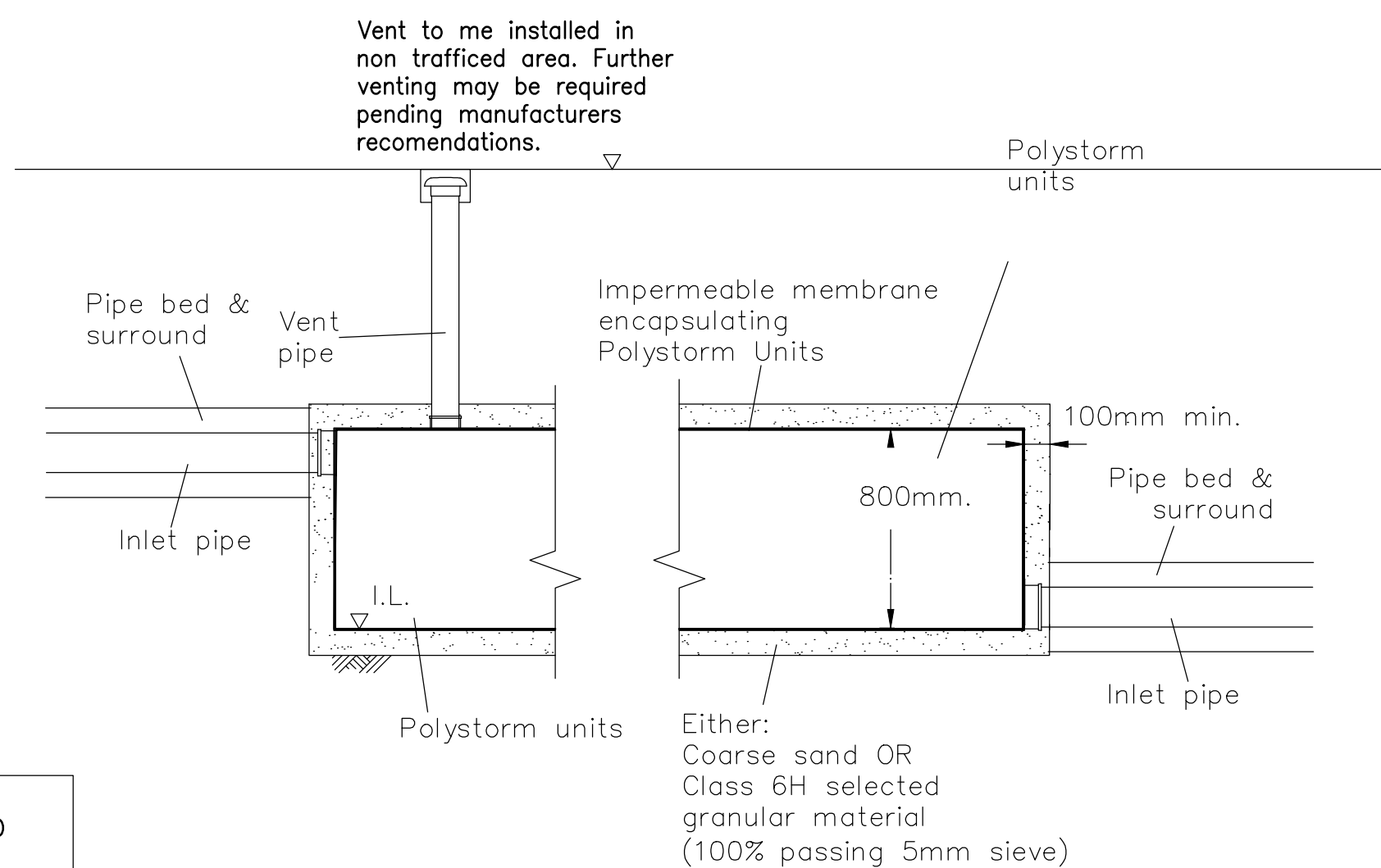
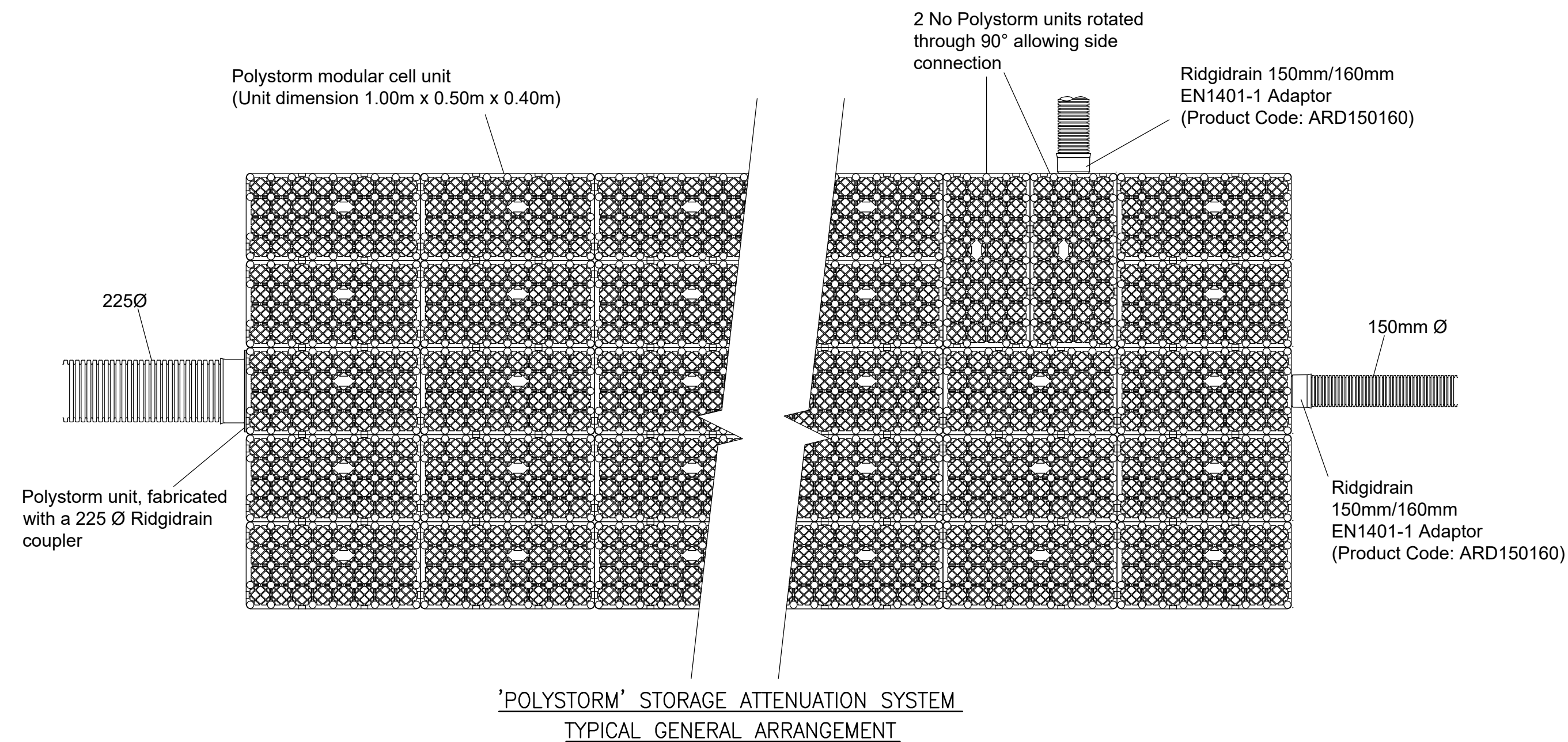
Indicates approximate finished drive levels

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE ARCHITECTS LAYOUT. ANY DISCREPANCIES ARE TO BE REPORTED IMMEDIATELY

THIS DRAWING IS NOT TO BE USED FOR SETTING OUT OF BUILDINGS

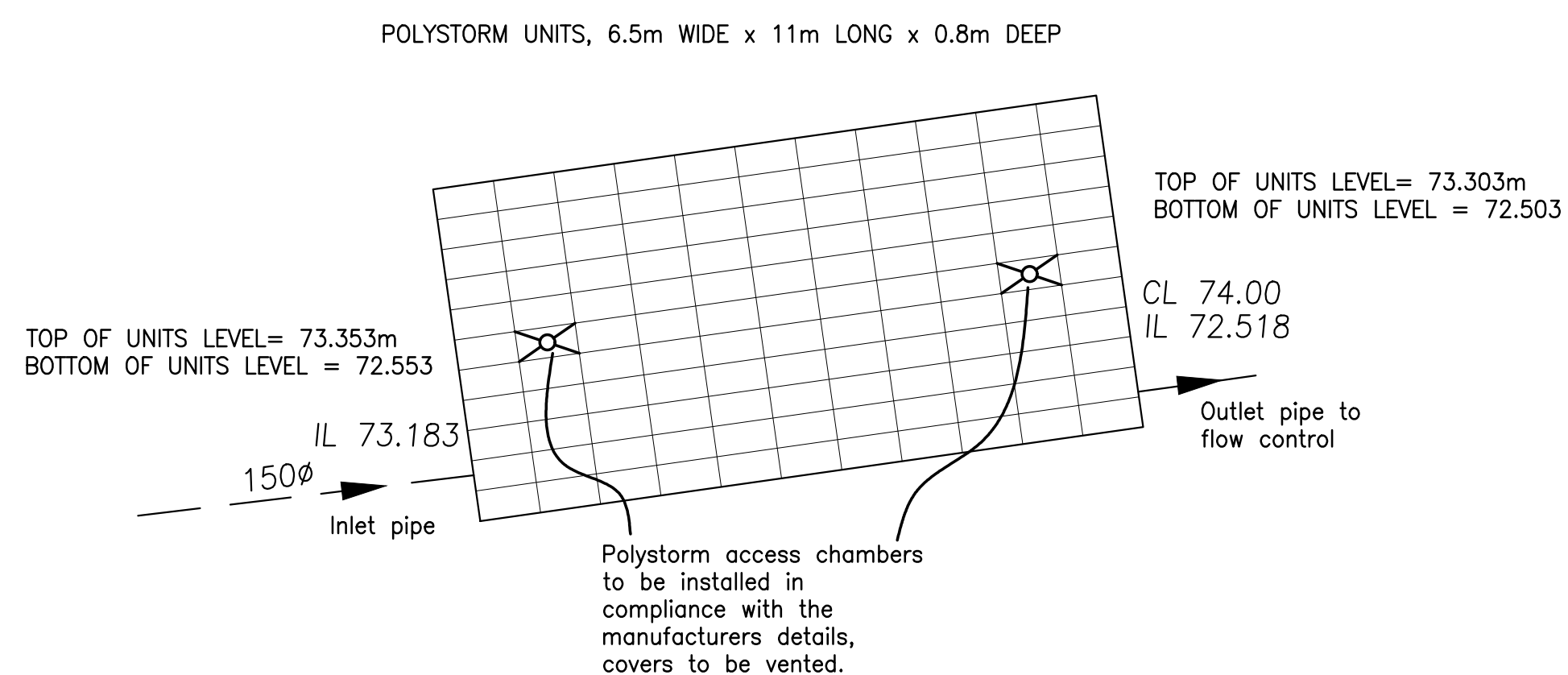
REVISION:
A. 21-02-25 ATTENUATION INCREASED IN SIZE AND FINISHED LEVELS ADDED
B. 05-03-25 AREA DISCHARGING TO ACO AT THE GATE SHOWN HATCHED. ADDITIONAL GULLIES ADDED AND FLOW RATE CORRECTED.

D.J.Barton Associates CIVIL & STRUCTURAL ENGINEERING CONSULTANTS Tel: Kelvedon (01376) 573247 Email: djbarton@btinternet.com		
Client	MRS LI	
Job	PENNYWOOD, HOLLYBUSH RIDE FINCHAMPSTEAD	
Title	SURFACE WATER DRAINAGE STRATEGY	
Scale	1 IN 200	Drg. No.
Date	JANUARY 2025	2474/E/1
Rev.	B	



NOTE: STORAGE TO BE CONSTRUCTED USING A 'POLYSTORM' STORAGE SYSTEM MANUFACTURED BY POLYPIPE (TEL. NO: 01509 615100)

TO BE CONSTRUCTED IN FULL COMPLIANCE WITH THE MANUFACTURERS RECOMMENDATIONS.



REVISION:
A. 21-02-25 STORAGE ATTENUATION INCREASED IN SIZE

D.J.Barton Associates CIVIL & STRUCTURAL ENGINEERING CONSULTANTS Tel: (01376) 573247 E-mail: djbarton@btinternet.com		
Client	MRS LI	
Job	PENNYWOOD, HOLLYBUSH RIDE FINCHAMPSTEAD	
Title	STORAGE ATTENUATION TANK DETAILS	
Scale	NTS	Drg. No.
Date	JANUARY 2025	2474/E/2
		Rev. A