

**Whitely Hill Winery, Newsells Park Estate,
nr Barkway, Hertfordshire SG8 8DY**

**Surface Water Drainage
Planning Condition no.s 6&20 Discharge
23rd May 2024**



View of the Existing Site looking NW.
Bare area is where winery will be sited amongst the vines.

REPORT TO BE READ IN CONJUNCTION WITH

DRAWING No.s 1315-100A,101A, 102,110 & 111

AUTHOR

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1.0 INTRODUCTION

The purpose of this document is to partially describe the surface water drainage design for a proposed new winery to be built at Whitely Hill, nr Barkway, Hertfordshire. This design is written in response to the planning condition no.s 6 & 20 of the Planning Permission 23/01420/FP, as noted below:-

6. Prior to commencement of the development, details of a scheme for the disposing of surface water by a means of sustainable drainage system shall be submitted to and approved in writing by the Local Planning Authority in accordance with the approved drainage strategy (Newsells Park Estate - Whiteley Hill Winery Proposed Drainage Strategy by Solution Consulting Civil and Structural Engineers Ref 1315 no date). The scheme shall be implemented in full in accordance with the approved details prior to first use of the development. The submitted details shall:

- *Provide supporting calculations, using a CV value of 1, for all the drainage infrastructure (storage features and conveyance network) contained within the drawing "Underground drainage and externals plan" Sheets 1 of 2 and 2 of 2, drawing number 1315/100 dated 3 April 2023 by Solution Consulting Civil and Structural Engineers.*
- *An infiltration rate of 1.4m/s (note incorrectly stated) shall be used to design the infiltration features using appropriate safety factors in accordance with Table 25.2 of the SuDS Manual 2015.*
- *Demonstrates that the proposed surface water drainage system does not surcharge in the 100% AEP (1 in 1 year) critical storm duration, flood in the 3.33% AEP (1 in 30 year) plus climate change critical storm duration or the 1% AEP (1 in 100 year) critical storm duration.*
- *Demonstrates that any flooding that occurs when taking into account climate change for the 1% AEP (1 in 100 year) critical storm event in accordance with NPPF does not leave the site uncontrolled via overland flow routes.*
- *Details of how all surface water management features to be designed in accordance with The SuDS Manual (CIRIA C753, 2015), including appropriate treatment stages for water quality prior to discharge.*
- *Show how water would be managed in the event of failure of the pumped system for 24 hours and how flood resilience and resistance will ensure that flood impacts to vulnerable parts of the development will be minimized.*

Reason: To ensure the flood risk is adequately addressed and not increased in accordance with NPPF and Policies of North Herts Council

20. No development should commence until a scheme for surface water disposal has been submitted to and approved in writing by the Local Planning Authority. No drainage systems for the infiltration of surface water drainage into the ground is permitted other than with the express written consent of the Local Planning Authority, which may be given for those parts of the site where it has been demonstrated that there is no resultant unacceptable risk to controlled waters. The scheme shall be implemented in accordance with the approved details.

Reason: To ensure that the development does not contribute to, and is not put at unacceptable risk from or adversely affected by, unacceptable levels of water pollution caused by mobilised contaminants. This is in line with paragraph 174 of the National Planning Policy Framework, your local plan policy SP11 'Natural resources and sustainability' and relevant position statements within The Environment Agency's Approach to Groundwater Protection.

2.0 SOIL CONDITIONS

The site has been subject to an intrusive geotechnical investigation (ref GE21034 – 22nd September 2022) by GeoEnvironmental Services Ltd.

The soil conditions at the site reflected the expected geology of the area and comprise: -

Topsoil/Made Ground (up to 0.36m deep) over
Head deposits of silty sand (up to 0.4m deep) over
New Pit Chalk Formation.

Trial pits were dug to 3m depth, and ground water was not encountered.

This geology is suited to infiltration of surface water, and this was proven by 3no. BRE365 infiltration tests that were undertaken in chalk.

The site has shown no evidence of soil contamination.

The ground water is estimated to be some 35m deep meaning there is a large filtration potential within the natural chalk strata present.

3.0 SURFACE WATER HYDRAULIC MODELLING

The drainage system has been modelled using the FLOW programme by Causeway and uses the following design criteria:-

Design Storm Dataset FEH2022.

Infiltration rate $1.4 \times 10^{-5} \text{m/s}$ (0.0504m/hr)

CV=1.0 (both Winter and Summer)

The conveyance swale has been modelled as a 375mm dia pipe but it is clear that the conveyance swale will have a significantly greater capacity than the pipe.

The results of the hydraulic analysis are given in Appendix I.

The results show no surcharging of any manhole for the 1in30 year storm event plus 40% CC. In addition the system copes comfortably with the 1in100 year storm event plus 40% CC.

4.0 SURFACE WATER QUALITY

The surface water quality has been assessed using the Simple Index Approach tool by Hydraulic Research/CIRIA. The site is chalk with a low ground water level and so has a natural ability to provide filtration from any water discharged to ground.

Each area is treated as follows:-

Car Parking / Access Roads	Permeable paving with 300 th permeable subbase with direct infiltration
Building Roof	Infiltration via a crate soakaway with surface water pre-filtered by a conveyance swale
Winery Hardstanding/ Yard	Infiltration via a crate soakaway with surface water pre-filtered by a conveyance swale. In addition the surface water is passed through a petrol/oil and silt interceptor.



Laura Cooper
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APPENDIX I - SURFACE WATER HYDRAULIC CALCULATIONS

Hydraulic Analysis of the Surface Water Drainage Network including soakaway design –
Causeway Flow Software. – 1315

Calculation 1

Landscape Area (to west)

Calculation 2

Winery Yard & Buildings



Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Inverts
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	0.500
Time of Entry (mins)	5.00	Include Intermediate Ground	x
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)
S10	0.010	5.00	84.350	450	902.200	960.300	0.800
SA01	0.001	5.00	80.850	1500	912.600	948.700	0.850

Links (Input)

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	S10	SA01	15.579	0.600	83.550	80.000	3.550	4.4	110	5.07	50.0

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S10	902.200	960.300	84.350	0.800	450		0	1.000	83.550	110
SA01	912.600	948.700	80.850	0.850	1500		1	1.000	80.000	110

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x

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	40	0	0
30	40	0	0
100	0	0	0
100	40	0	0

Node SA01 Lined Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.05040	Invert Level (m)	80.000	Pit Length (m)	4.000
Side Inf Coefficient (m/hr)	0.05040	Time to half empty (mins)	293	Depth (m)	2.085
Safety Factor	2.0	Ring Diameter (m)	2.400	Inf Depth (m)	
Porosity	0.40	Pit Width (m)	4.000	Number Required	1

Results for 2 year +40% CC Critical Storm Duration. Lowest mass balance: 98.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S10	10	83.569	0.019	2.4	0.0077	0.0000	OK
240 minute summer	SA01	172	80.185	0.185	0.9	2.0133	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	S10	1.000	SA01	2.4	1.942	0.064	0.0669
240 minute summer	SA01	Infiltration		0.1			

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 98.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S10	10	83.580	0.030	6.2	0.0123	0.0000	OK
240 minute winter	SA01	232	80.467	0.467	1.2	5.0958	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	S10	1.000	SA01	6.2	2.265	0.164	0.0901
240 minute winter	SA01	Infiltration		0.2			

Results for 100 year Critical Storm Duration. Lowest mass balance: 98.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S10	10	83.579	0.029	5.7	0.0118	0.0000	OK
240 minute summer	SA01	228	80.435	0.435	1.8	4.7407	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	S10	1.000	SA01	5.7	2.187	0.151	0.0890
240 minute summer	SA01	Infiltration		0.2			



Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S10	10	83.584	0.034	7.9	0.0140	0.0000	OK
240 minute winter	SA01	236	80.650	0.650	1.7	7.0876	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	S10	1.000	SA01	7.9	2.278	0.210	0.0933
240 minute winter	SA01	Infiltration		0.2			

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Inverts
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	0.500
Time of Entry (mins)	5.00	Include Intermediate Ground	x
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)
S02	0.037	5.00	80.840	1200	537910.780	239011.060	0.700
S05	0.005	5.00	80.840	1050	537916.010	239005.250	0.940
S08	0.068	5.00	80.870	1200	537924.310	238996.140	1.170
S09	0.018	5.00	80.870	1200	537941.630	239011.680	1.670
S12	0.035	5.00	84.400	1200	537936.710	238980.950	4.200
S13	0.018	5.00	80.800	1200	537954.670	238997.120	0.840
Outlet			79.300	1800	537962.570	238926.590	1.700
S03	0.005	5.00	80.800	450	537926.200	239033.750	0.600
S04	0.009	5.00	80.840	450	537933.720	239025.400	0.750
S06			80.850	1050	537923.210	239004.200	0.850
S07	0.089	5.00	80.850	1200	537938.710	239018.150	0.950
S11	0.015	5.00	80.930	1200	537952.410	239002.490	1.430
S15	0.006	5.00	80.800	1050	537917.960	239008.120	0.640
S20			80.840	1500	537944.500	239014.280	1.790
S21			80.300	1200	537962.760	238990.990	1.500
S22			80.840	1200	537937.650	238968.370	2.340
S23			80.740	1200	537939.820	238951.890	2.440
S24			79.300	1800	537957.890	238931.820	1.530
S25			80.300	1200	537964.260	238992.330	1.450

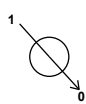
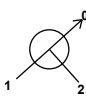
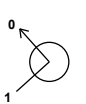
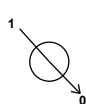
Links (Input)

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	S02	S05	7.817	0.600	80.140	79.900	0.240	32.6	160	5.07	50.0
2.001	S05	S08	12.324	0.600	79.900	79.700	0.200	61.6	225	5.19	50.0
2.002	S08	S09	23.270	0.600	79.700	79.200	0.500	46.5	225	5.40	50.0
1.002	S09	S20	3.873	0.600	79.200	79.050	0.150	25.8	300	5.43	50.0
1.003	S20	S25	29.534	0.600	79.050	78.850	0.200	147.7	375	5.77	50.0
1.004	S25	S21	2.011	0.600	78.850	78.800	0.050	40.2	375	5.78	50.0
1.005	S21	S22	33.796	0.600	78.800	78.500	0.300	112.7	375	6.16	50.0
1.006	S22	S23	16.622	0.600	78.500	78.300	0.200	83.1	375	6.30	50.0
1.007	S23	S24	27.006	0.600	78.300	77.770	0.530	51.0	375	6.48	50.0
1.008	S24	Outlet	7.018	0.600	77.770	77.600	0.170	41.3	375	6.52	50.0
1.000	S12	S13	24.167	0.600	80.200	79.960	0.240	100.7	225	5.31	50.0
1.001	S13	S09	19.546	0.600	79.960	79.200	0.760	25.7	300	5.41	50.0
3.000	S03	S04	11.237	0.600	80.200	80.090	0.110	102.2	160	5.18	50.0
3.001	S04	S20	15.488	0.600	80.090	79.050	1.040	14.9	160	5.28	50.0

Links (Input)

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)
4.000	S15	S06	6.552	0.600	80.160	80.000	0.160	41.0	160	5.07	50.0
4.001	S06	S07	20.853	0.600	80.000	79.900	0.100	208.5	160	5.55	50.0
4.002	S07	S11	20.807	0.600	79.900	79.500	0.400	52.0	225	5.74	50.0
4.003	S11	S21	15.472	0.600	79.500	78.800	0.700	22.1	225	5.83	50.0

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S02	537910.780	239011.060	80.840	0.700	1200		0	2.000	80.140	160
S05	537916.010	239005.250	80.840	0.940	1050		1	2.000	79.900	160
							0	2.001	79.900	225
S08	537924.310	238996.140	80.870	1.170	1200		1	2.001	79.700	225
							0	2.002	79.700	225
S09	537941.630	239011.680	80.870	1.670	1200		1	2.002	79.200	225
							2	1.001	79.200	300
							0	1.002	79.200	300
S12	537936.710	238980.950	84.400	4.200	1200					
							0	1.000	80.200	225
S13	537954.670	238997.120	80.800	0.840	1200		1	1.000	79.960	225
							0	1.001	79.960	300
Outlet	537962.570	238926.590	79.300	1.700	1800		1	1.008	77.600	375
S03	537926.200	239033.750	80.800	0.600	450					
							0	3.000	80.200	160
S04	537933.720	239025.400	80.840	0.750	450		1	3.000	80.090	160
							0	3.001	80.090	160
S06	537923.210	239004.200	80.850	0.850	1050		1	4.000	80.000	160
							0	4.001	80.000	160

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S07	537938.710	239018.150	80.850	0.950	1200		1 4.001	79.900	160
							0 4.002	79.900	225
S11	537952.410	239002.490	80.930	1.430	1200		1 4.002	79.500	225
							0 4.003	79.500	225
S15	537917.960	239008.120	80.800	0.640	1050		0 4.000	80.160	160
S20	537944.500	239014.280	80.840	1.790	1500		1 3.001	79.050	160
							2 1.002	79.050	300
							0 1.003	79.050	375
S21	537962.760	238990.990	80.300	1.500	1200		1 4.003	78.800	225
							2 1.004	78.800	375
							0 1.005	78.800	375
S22	537937.650	238968.370	80.840	2.340	1200		1 1.005	78.500	375
							0 1.006	78.500	375
S23	537939.820	238951.890	80.740	2.440	1200		1 1.006	78.300	375
							0 1.007	78.300	375
S24	537957.890	238931.820	79.300	1.530	1800		1 1.007	77.770	375
							0 1.008	77.770	375
S25	537964.260	238992.330	80.300	1.450	1200		1 1.003	78.850	375
							0 1.004	78.850	375

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x

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	40	0	0
30	40	0	0
100	0	0	0
100	40	0	0

Node Outlet Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.05040	Safety Factor	2.0	Invert Level (m)	76.800
Side Inf Coefficient (m/hr)	0.05040	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	310.0	0.0	1.200	310.0	0.0

Results for 2 year +40% CC Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S02	10	80.197	0.057	9.0	0.1237	0.0000	OK
15 minute summer	S05	10	79.959	0.059	10.1	0.0578	0.0000	OK
15 minute summer	S08	10	79.792	0.092	26.6	0.2111	0.0000	OK
15 minute summer	S09	10	79.313	0.113	43.4	0.1526	0.0000	OK
15 minute summer	S12	10	80.265	0.065	8.5	0.0839	0.0000	OK
15 minute summer	S13	10	80.009	0.049	12.8	0.0759	0.0000	OK
10080 minute winter	Outlet	9600	77.465	-0.135	1.0	195.8320	0.0000	OK
15 minute summer	S03	11	80.226	0.026	1.2	0.0086	0.0000	OK
15 minute summer	S04	10	80.117	0.027	3.4	0.0108	0.0000	OK
15 minute summer	S06	11	80.034	0.034	1.5	0.0293	0.0000	OK
15 minute summer	S07	10	79.993	0.093	23.0	0.2786	0.0000	OK
15 minute summer	S11	10	79.574	0.074	26.3	0.0991	0.0000	OK
15 minute summer	S15	10	80.183	0.023	1.5	0.0243	0.0000	OK
15 minute summer	S20	11	79.193	0.143	46.3	0.2518	0.0000	OK
15 minute summer	S21	11	78.970	0.170	72.8	0.1919	0.0000	OK
15 minute summer	S22	11	78.663	0.163	73.0	0.1842	0.0000	OK
15 minute summer	S23	11	78.435	0.135	72.8	0.1528	0.0000	OK
15 minute summer	S24	12	77.915	0.145	72.5	0.3698	0.0000	OK
15 minute summer	S25	11	79.004	0.154	46.8	0.1745	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	S02	2.000	S05	8.9	1.363	0.241	0.0512
15 minute summer	S05	2.001	S08	10.1	0.864	0.152	0.1457
15 minute summer	S08	2.002	S09	26.4	1.495	0.345	0.4105
15 minute summer	S09	1.002	S20	43.0	1.506	0.196	0.1109
15 minute summer	S12	1.000	S13	8.4	1.075	0.162	0.1898
15 minute summer	S13	1.001	S09	12.7	0.829	0.058	0.3101
10080 minute winter	Outlet	Infiltration		0.0			
15 minute summer	S03	3.000	S04	1.2	0.550	0.058	0.0246
15 minute summer	S04	3.001	S20	3.4	0.316	0.061	0.1630
15 minute summer	S06	4.001	S07	1.4	0.198	0.099	0.1568
15 minute summer	S07	4.002	S11	22.7	1.698	0.314	0.2782
15 minute summer	S11	4.003	S21	26.1	1.234	0.235	0.3359
15 minute summer	S15	4.000	S06	1.5	0.637	0.045	0.0158
15 minute summer	S20	1.003	S25	46.8	1.154	0.285	1.1973
15 minute summer	S21	1.005	S22	73.0	1.549	0.388	1.5936
15 minute summer	S22	1.006	S23	72.8	1.788	0.332	0.6782
15 minute summer	S23	1.007	S24	72.5	1.936	0.258	1.0126
15 minute summer	S24	1.008	Outlet	72.4	2.065	0.232	0.2465
15 minute summer	S25	1.004	S21	46.9	1.032	0.148	0.0916

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S02	10	80.242	0.102	22.8	0.2223	0.0000	OK
15 minute summer	S05	10	80.002	0.102	25.7	0.0987	0.0000	OK
15 minute summer	S08	10	79.878	0.178	67.5	0.4090	0.0000	OK
15 minute summer	S09	11	79.433	0.233	110.0	0.3135	0.0000	OK
15 minute summer	S12	10	80.308	0.108	21.6	0.1398	0.0000	OK
15 minute summer	S13	10	80.037	0.077	32.5	0.1204	0.0000	OK
10080 minute summer	Outlet	10320	78.140	0.540	4.3	396.0211	0.0000	OK
15 minute summer	S03	10	80.243	0.043	3.1	0.0139	0.0000	OK
15 minute summer	S04	10	80.133	0.043	8.6	0.0170	0.0000	OK
15 minute summer	S06	10	80.075	0.075	3.7	0.0651	0.0000	OK
15 minute summer	S07	10	80.068	0.168	58.4	0.5061	0.0000	OK
15 minute summer	S11	11	79.637	0.137	66.8	0.1831	0.0000	OK
15 minute summer	S15	10	80.196	0.036	3.7	0.0379	0.0000	OK
15 minute summer	S20	11	79.313	0.263	117.5	0.4641	0.0000	OK
15 minute summer	S21	11	79.137	0.337	184.0	0.3809	0.0000	OK
15 minute summer	S22	11	78.802	0.302	184.0	0.3416	0.0000	OK
15 minute summer	S23	11	78.542	0.242	183.6	0.2740	0.0000	OK
10080 minute summer	S24	10320	78.140	0.370	5.6	0.9418	0.0000	OK
15 minute summer	S25	11	79.173	0.323	118.0	0.3648	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	S02	2.000	S05	22.6	1.687	0.610	0.1049
15 minute summer	S05	2.001	S08	25.6	0.988	0.387	0.3152
15 minute summer	S08	2.002	S09	66.6	1.752	0.872	0.8556
15 minute summer	S09	1.002	S20	109.0	1.761	0.496	0.2402
15 minute summer	S12	1.000	S13	21.4	1.395	0.413	0.3720
15 minute summer	S13	1.001	S09	32.3	0.921	0.147	0.7125
10080 minute summer	Outlet	Infiltration		0.0			
15 minute summer	S03	3.000	S04	3.1	0.714	0.147	0.0481
15 minute summer	S04	3.001	S20	8.5	0.744	0.155	0.1882
15 minute summer	S06	4.001	S07	4.1	0.300	0.279	0.3052
15 minute summer	S07	4.002	S11	57.6	2.026	0.797	0.5910
15 minute summer	S11	4.003	S21	65.9	1.824	0.593	0.5027
15 minute summer	S15	4.000	S06	3.7	0.792	0.111	0.0413
15 minute summer	S20	1.003	S25	118.0	1.301	0.718	2.7072
15 minute summer	S21	1.005	S22	184.0	1.843	0.977	3.3710
15 minute summer	S22	1.006	S23	183.6	2.144	0.836	1.4163
15 minute summer	S23	1.007	S24	183.0	2.307	0.652	2.1412
10080 minute summer	S24	1.008	Outlet	4.3	0.887	0.014	0.7729
15 minute summer	S25	1.004	S21	118.1	1.188	0.373	0.2064

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S02	10	80.235	0.095	20.9	0.2086	0.0000	OK
15 minute summer	S05	10	79.998	0.098	23.6	0.0953	0.0000	OK
15 minute summer	S08	10	79.863	0.163	62.0	0.3741	0.0000	OK
15 minute summer	S09	10	79.415	0.215	101.2	0.2895	0.0000	OK
15 minute summer	S12	10	80.302	0.102	19.8	0.1330	0.0000	OK
15 minute summer	S13	10	80.034	0.074	29.8	0.1152	0.0000	OK
10080 minute winter	Outlet	10260	77.929	0.329	1.6	333.3394	0.0000	OK
15 minute summer	S03	10	80.241	0.041	2.8	0.0132	0.0000	OK
15 minute summer	S04	10	80.131	0.041	7.9	0.0163	0.0000	OK
15 minute summer	S06	10	80.064	0.064	3.4	0.0556	0.0000	OK
15 minute summer	S07	10	80.057	0.157	53.4	0.4730	0.0000	OK
15 minute summer	S11	11	79.624	0.124	61.1	0.1666	0.0000	OK
15 minute summer	S15	10	80.195	0.035	3.4	0.0364	0.0000	OK
15 minute summer	S20	11	79.295	0.245	108.0	0.4325	0.0000	OK
15 minute summer	S21	11	79.106	0.306	169.5	0.3459	0.0000	OK
15 minute summer	S22	11	78.783	0.283	170.0	0.3201	0.0000	OK
15 minute summer	S23	11	78.529	0.229	169.7	0.2586	0.0000	OK
15 minute summer	S24	11	78.020	0.250	169.2	0.6373	0.0000	OK
15 minute summer	S25	11	79.142	0.292	108.5	0.3303	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	
15 minute summer	S02	2.000	S05	20.8	1.640	0.559	0.0990	
15 minute summer	S05	2.001	S08	23.5	0.983	0.354	0.2923	
15 minute summer	S08	2.002	S09	61.3	1.722	0.803	0.8138	
15 minute summer	S09	1.002	S20	100.2	1.733	0.456	0.2234	
15 minute summer	S12	1.000	S13	19.6	1.362	0.379	0.3493	
15 minute summer	S13	1.001	S09	29.6	0.914	0.135	0.6593	
10080 minute winter	Outlet	Infiltration		0.0				
15 minute summer	S03	3.000	S04	2.8	0.693	0.133	0.0451	
15 minute summer	S04	3.001	S20	7.8	0.755	0.143	0.1863	
15 minute summer	S06	4.001	S07	3.6	0.261	0.249	0.2864	
15 minute summer	S07	4.002	S11	52.6	2.020	0.728	0.5407	
15 minute summer	S11	4.003	S21	60.6	1.725	0.545	0.4815	
15 minute summer	S15	4.000	S06	3.4	0.782	0.102	0.0350	
15 minute summer	S20	1.003	S25	108.5	1.295	0.660	2.4848	
15 minute summer	S21	1.005	S22	170.0	1.831	0.902	3.1349	
15 minute summer	S22	1.006	S23	169.7	2.119	0.773	1.3264	
15 minute summer	S23	1.007	S24	169.2	2.277	0.602	2.0057	
15 minute summer	S24	1.008	Outlet	168.0	2.484	0.538	0.4745	
15 minute summer	S25	1.004	S21	108.9	1.173	0.344	0.1894	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S02	12	80.456	0.316	29.3	0.6916	0.0000	SURCHARGED
15 minute summer	S05	12	80.297	0.397	30.9	0.3863	0.0000	SURCHARGED
15 minute summer	S08	12	80.241	0.541	81.4	1.2413	0.0000	SURCHARGED
15 minute summer	S09	11	79.660	0.460	129.7	0.6191	0.0000	SURCHARGED
15 minute summer	S12	10	80.325	0.125	27.7	0.1623	0.0000	OK
15 minute summer	S13	10	80.048	0.088	41.8	0.1367	0.0000	OK
10080 minute summer	Outlet	10320	78.398	0.798	8.0	472.5367	0.0000	OK
15 minute summer	S03	10	80.249	0.049	4.0	0.0160	0.0000	OK
15 minute summer	S04	10	80.139	0.049	11.1	0.0194	0.0000	OK
15 minute summer	S06	11	80.178	0.178	4.8	0.1544	0.0000	SURCHARGED
15 minute summer	S07	11	80.166	0.266	73.9	0.7979	0.0000	SURCHARGED
15 minute summer	S11	12	79.742	0.242	81.7	0.3248	0.0000	SURCHARGED
15 minute summer	S15	10	80.201	0.041	4.8	0.0432	0.0000	OK
15 minute summer	S20	11	79.528	0.478	135.6	0.8441	0.0000	SURCHARGED
15 minute summer	S21	12	79.310	0.510	210.2	0.5763	0.0000	SURCHARGED
15 minute summer	S22	12	78.848	0.348	210.7	0.3941	0.0000	OK
15 minute summer	S23	12	78.571	0.271	211.2	0.3071	0.0000	OK
10080 minute summer	S24	10260	78.398	0.628	10.5	1.5973	0.0000	SURCHARGED
15 minute summer	S25	12	79.357	0.507	133.9	0.5730	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	S02	2.000	S05	27.1	1.801	0.729	0.1566
15 minute summer	S05	2.001	S08	32.9	0.976	0.496	0.4901
15 minute summer	S08	2.002	S09	74.4	1.870	0.973	0.9255
15 minute summer	S09	1.002	S20	124.9	1.790	0.569	0.2727
15 minute summer	S12	1.000	S13	27.5	1.488	0.530	0.4464
15 minute summer	S13	1.001	S09	41.5	0.937	0.189	0.8554
10080 minute summer	Outlet	Infiltration		0.0			
15 minute summer	S03	3.000	S04	4.0	0.766	0.190	0.0581
15 minute summer	S04	3.001	S20	11.0	0.732	0.200	0.1949
15 minute summer	S06	4.001	S07	5.9	0.435	0.407	0.4177
15 minute summer	S07	4.002	S11	69.8	2.026	0.966	0.8275
15 minute summer	S11	4.003	S21	82.5	2.093	0.742	0.6153
15 minute summer	S15	4.000	S06	4.8	0.788	0.144	0.0784
15 minute summer	S20	1.003	S25	133.9	1.321	0.815	3.2575
15 minute summer	S21	1.005	S22	210.7	1.910	1.118	3.6687
15 minute summer	S22	1.006	S23	211.2	2.175	0.962	1.5979
15 minute summer	S23	1.007	S24	211.4	2.359	0.753	2.4183
10080 minute summer	S24	1.008	Outlet	8.0	0.936	0.026	0.7741
15 minute summer	S25	1.004	S21	134.5	1.287	0.425	0.2218

APPENDIX II – DRAINAGE SCHEME DRAWINGS

Drawing no.	1315-100	Underground Drainage Layout – sht 1
Drawing no.	1315-101	Underground Drainage Layout – sht 2
Drawing no.	1315-102	Underground Drainage Layout – sht 3
Drawing no.	1315-110	Underground Drainage & External Works Details
Drawing no.	1315-111	infiltration Crate Soakaway and Swale Details

Notes.

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- This drawing is to be read in conjunction with the specification and all other relevant Engineer's, Architect's and specialist subcontractor's drawings.
 - Work to figured dimensions only.

NOTES (Underground Drainage)

- All drainage to conform to current British and/or European Standards and Part H of The Building Regulations. All fittings shall hold a current Agreement Certificate and be compliant with the appropriate British Standard for that item.
- All internal foul drainage runs are to be 100mmØ pipework laid at a minimum of 1:40 fall.
- Manhole cover levels are indicative and are to match the proposed ground levels.
- All foul stacks/vent pipes are to have long radius rest bends.
- All foul and rainwater pipes to have rodding access just above ground floor level.
- All internal channels/gullies to be roddable.
- Locations of Stub Stacks (SS), Soil Vent Pipes (SVP), Floor Sockets (FS) & Floor Gullies (FG) are schematic. Refer to M&E/Architects drawings for exact setting out.
- M&E Contractor to ensure the heads of the foul system are vented to open air.
- For above ground building drainage details refer to M&E drawings.
- All existing pipes that are to be retained are to be surveyed for condition and repaired/replaced where necessary.

KEY

- SDV Chamber Type & Size
Cover Type
CL xx.xx
IL xx.xx
- Manhole reference indicates type and size, cover ref, cover and invert levels
- FS Indicates a 100Ø floor socket
- YG Indicates a 225Ø Yard Gully
- RG Indicates a 450Ø PCC Road Gully with Ø400 Minged cover (DU288C by Durey)
- Channel Drain Indicates a channel drain
- WW Waste Drain
- FW Foul Water Drain
- SW Surface Water Drain
- Drain to be removed

MANHOLE COVER KEY

- D400x600Ø DUS5CA 600Ø class D400 solid top cast iron cover
- D400x450Ø DUS5CA 450Ø class B125 solid top cast iron cover
- B125x450Ø DUS5CA 450Ø class B125 recessed galv cover
- Cover references by Durey Castings Ltd (01324 272424)

NOTE
ALL NEW SURFACE WATER PIPES TO BE 160Ø uPVC UNO.
ALL NEW FOUL WATER PIPES TO BE 110Ø uPVC UNO.

All Drainage Details shown on drawing 1315-110.

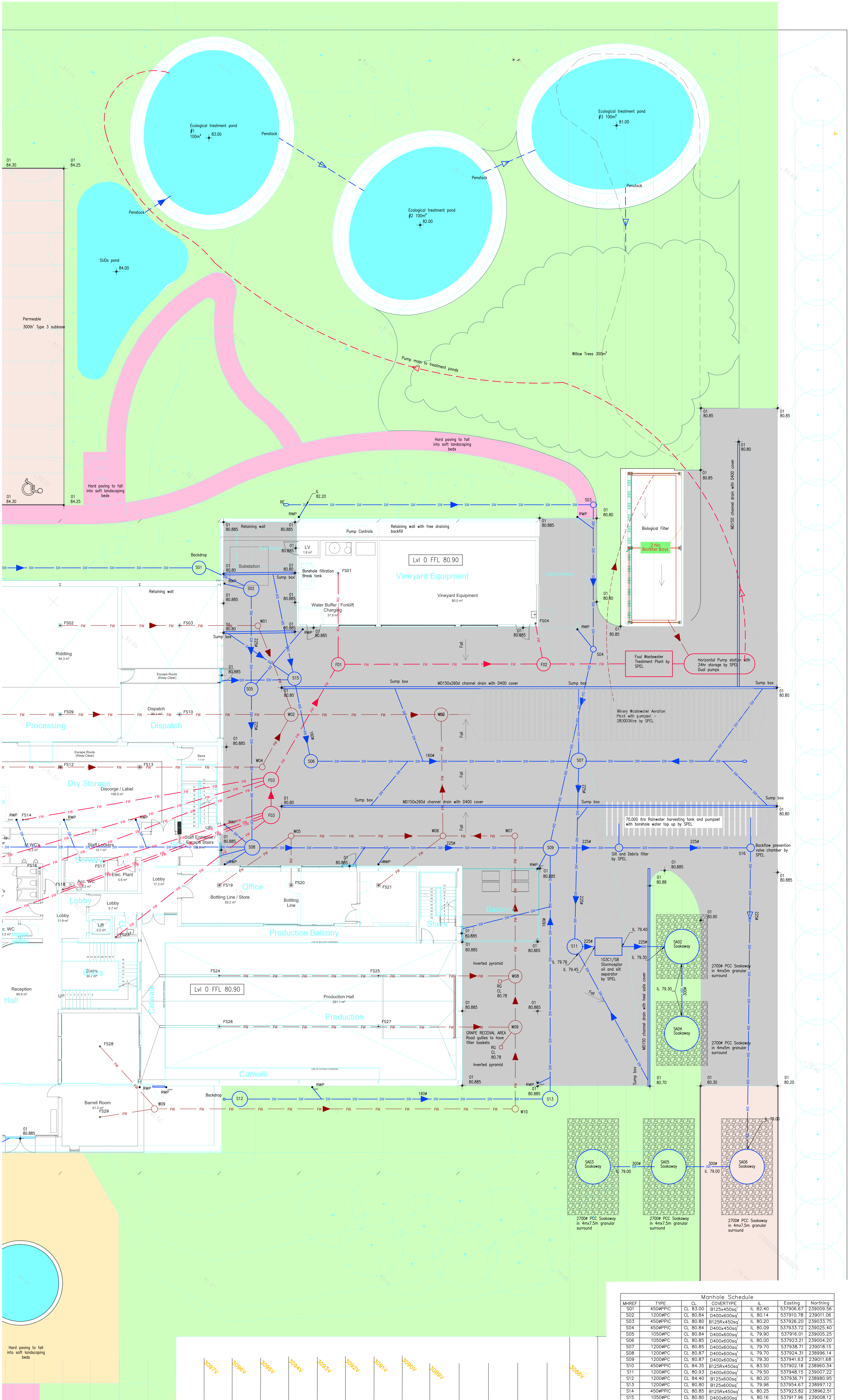
- KERB KEY
- EF Edging 50x150 PCC edging
- HB kerb 250x125 HB2 PCC kerb
- BN kerb 125x125BN surface PCC kerb
- TK kerb Transition between BN & HB2

NOTE
levels to HB, TK, BN kerbs are relative to the watermark levels NOT the top of kerb. If in doubt ask.

KEY

- Permeable Surface
- Bound Gravel
- Rock Setts
- Concrete
- Wetlands
- Landscaping
- Permeable Paving

Manhole Schedule						
MHREF	TYPE	CL	COVER TYPE	IL	Easting	Northing
S01	450ØPPC <td>CL 83.00</td> <td>B125x450Øsq<td>IL 82.40</td><td>537906.67</td><td>239009.56</td></td>	CL 83.00	B125x450Øsq <td>IL 82.40</td> <td>537906.67</td> <td>239009.56</td>	IL 82.40	537906.67	239009.56
S02	1200ØPC <td>CL 80.84</td> <td>D400x600Øsq<td>IL 80.14</td><td>537910.78</td><td>239011.06</td></td>	CL 80.84	D400x600Øsq <td>IL 80.14</td> <td>537910.78</td> <td>239011.06</td>	IL 80.14	537910.78	239011.06
S03	450ØPPC <td>CL 80.80</td> <td>B125Rx450Øsq<td>IL 80.20</td><td>537926.20</td><td>239033.75</td></td>	CL 80.80	B125Rx450Øsq <td>IL 80.20</td> <td>537926.20</td> <td>239033.75</td>	IL 80.20	537926.20	239033.75
S04	450ØPPC <td>CL 80.84</td> <td>D400x450Øsq<td>IL 80.09</td><td>537933.72</td><td>239025.40</td></td>	CL 80.84	D400x450Øsq <td>IL 80.09</td> <td>537933.72</td> <td>239025.40</td>	IL 80.09	537933.72	239025.40
S05	1050ØPC <td>CL 80.84</td> <td>D400x600Øsq<td>IL 79.90</td><td>537916.01</td><td>239005.25</td></td>	CL 80.84	D400x600Øsq <td>IL 79.90</td> <td>537916.01</td> <td>239005.25</td>	IL 79.90	537916.01	239005.25
S06	1050ØPC <td>CL 80.85</td> <td>D400x600Øsq<td>IL 80.00</td><td>537923.21</td><td>239004.20</td></td>	CL 80.85	D400x600Øsq <td>IL 80.00</td> <td>537923.21</td> <td>239004.20</td>	IL 80.00	537923.21	239004.20
S07	1200ØPC <td>CL 80.85</td> <td>D400x600Øsq<td>IL 79.70</td><td>537938.71</td><td>239018.15</td></td>	CL 80.85	D400x600Øsq <td>IL 79.70</td> <td>537938.71</td> <td>239018.15</td>	IL 79.70	537938.71	239018.15
S08	1200ØPC <td>CL 80.87</td> <td>D400x600Øsq<td>IL 79.70</td><td>537924.31</td><td>238996.14</td></td>	CL 80.87	D400x600Øsq <td>IL 79.70</td> <td>537924.31</td> <td>238996.14</td>	IL 79.70	537924.31	238996.14
S09	1200ØPC <td>CL 80.87</td> <td>D400x600Øsq<td>IL 79.30</td><td>537941.63</td><td>239011.68</td></td>	CL 80.87	D400x600Øsq <td>IL 79.30</td> <td>537941.63</td> <td>239011.68</td>	IL 79.30	537941.63	239011.68
S10	450ØPPC <td>CL 84.35</td> <td>B125Rx450Øsq<td>IL 83.50</td><td>537902.18</td><td>238960.34</td></td>	CL 84.35	B125Rx450Øsq <td>IL 83.50</td> <td>537902.18</td> <td>238960.34</td>	IL 83.50	537902.18	238960.34
S11	1200ØPC <td>CL 80.93</td> <td>D400x600Øsq<td>IL 79.50</td><td>537948.15</td><td>239007.22</td></td>	CL 80.93	D400x600Øsq <td>IL 79.50</td> <td>537948.15</td> <td>239007.22</td>	IL 79.50	537948.15	239007.22
S12	1200ØPC <td>CL 84.40</td> <td>B125x600Øsq<td>IL 80.20</td><td>537936.71</td><td>238980.95</td></td>	CL 84.40	B125x600Øsq <td>IL 80.20</td> <td>537936.71</td> <td>238980.95</td>	IL 80.20	537936.71	238980.95
S13	1200ØPC <td>CL 80.80</td> <td>B125x600Øsq<td>IL 79.96</td><td>537954.67</td><td>238997.12</td></td>	CL 80.80	B125x600Øsq <td>IL 79.96</td> <td>537954.67</td> <td>238997.12</td>	IL 79.96	537954.67	238997.12
S14	450ØPPC <td>CL 80.85</td> <td>B125Rx450Øsq<td>IL 80.25</td><td>537923.82</td><td>238962.51</td></td>	CL 80.85	B125Rx450Øsq <td>IL 80.25</td> <td>537923.82</td> <td>238962.51</td>	IL 80.25	537923.82	238962.51
S15	1050ØPC <td>CL 80.80</td> <td>D400x600Øsq<td>IL 80.16</td><td>537917.96</td><td>239008.12</td></td>	CL 80.80	D400x600Øsq <td>IL 80.16</td> <td>537917.96</td> <td>239008.12</td>	IL 80.16	537917.96	239008.12
S16	600ØGRP <td>CL 80.84</td> <td>D400x600Øsq<td>IL 79.10</td><td>537953.18</td><td>239022.10</td></td>	CL 80.84	D400x600Øsq <td>IL 79.10</td> <td>537953.18</td> <td>239022.10</td>	IL 79.10	537953.18	239022.10
SA01	1500ø Soakaway <td>CL 82.00</td> <td>B125x600Øsq<td>Base IL 78.00</td><td>537912.61</td><td>238948.75</td></td>	CL 82.00	B125x600Øsq <td>Base IL 78.00</td> <td>537912.61</td> <td>238948.75</td>	Base IL 78.00	537912.61	238948.75
SA02	2700ø Soakaway <td>CL 80.75</td> <td>B125x600Øsq<td>Base IL 77.50</td><td>537954.35</td><td>239012.80</td></td>	CL 80.75	B125x600Øsq <td>Base IL 77.50</td> <td>537954.35</td> <td>239012.80</td>	Base IL 77.50	537954.35	239012.80
SA03	2700ø Soakaway <td>CL 79.90</td> <td>B125x600Øsq<td>Base IL 75.90</td><td>537960.68</td><td>238995.44</td></td>	CL 79.90	B125x600Øsq <td>Base IL 75.90</td> <td>537960.68</td> <td>238995.44</td>	Base IL 75.90	537960.68	238995.44
SA04	2700ø Soakaway <td>CL 80.75</td> <td>B125x600Øsq<td>Base IL 77.50</td><td>537958.88</td><td>239007.77</td></td>	CL 80.75	B125x600Øsq <td>Base IL 77.50</td> <td>537958.88</td> <td>239007.77</td>	Base IL 77.50	537958.88	239007.77
SA05	2700ø Soakaway <td>CL 79.90</td> <td>B125x600Øsq<td>Base IL 75.90</td><td>537965.06</td><td>238999.39</td></td>	CL 79.90	B125x600Øsq <td>Base IL 75.90</td> <td>537965.06</td> <td>238999.39</td>	Base IL 75.90	537965.06	238999.39
SA06	2700ø Soakaway <td>CL 79.90</td> <td>B125x600Øsq<td>Base IL 75.90</td><td>537969.59</td><td>239003.46</td></td>	CL 79.90	B125x600Øsq <td>Base IL 75.90</td> <td>537969.59</td> <td>239003.46</td>	Base IL 75.90	537969.59	239003.46



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- Work to figured dimensions only.

NOTES (Underground Drainage)

- All drainage to conform to current British and/or European Standards and Part H of The Building Regulations. All fittings shall hold a current Agreement Certificate and be compliant with the appropriate British Standard for that item.
- All internal foul drainage runs are to be 100mmØ pipework laid at a minimum of 1:40 fall.
- Manhole cover levels are indicative and are to match the proposed ground levels.
- All foul stacks/vent pipes are to have long radius rest bends.
- All foul and rainwater pipes to have rodding access just above ground floor level.
- All internal channels/gullies to be roddable.
- Locations of Stub Stacks (SS), Soil Vent Pipes (SVP), Floor Sockets (FS) & Floor Gullies (FG) are schematic. Refer to M&E/Architects drawings for exact setting out.
- M&E Contractor to ensure the heads of the foul system are vented to open air.
- For above ground building drainage details refer to M&E drawings.
- All existing pipes that are to be retained are to be surveyed for condition and repaired/replaced where necessary.

KEY

Manhole reference indicates type and size, cover ref, cover and invert levels

Indicates a 1000 floor socket

Indicates a 225sq Yard Gully

Indicates a 450sq PCC Road Gully with D400 ringed cover (DU388C by Durey)

Indicates a channel drain

Wine Waste Drain

Foul Water Drain

Surface Water Drain

Drain to be removed

MANHOLE COVER KEY

D400x600sq DU35CA 600sq class D400 solid top cast iron cover

D400x450sq DU35CA 450sq class B125 solid top cast iron cover

B125x450sq DU131A 450sq class B125 recessed gully cover

Cover references by Durey Castings Ltd (01324 272424)

NOTE

ALL NEW SURFACE WATER PIPES TO BE 1000 uPVC UNO.

ALL NEW FOUL WATER PIPES TO BE 1100 uPVC UNO.

All Drainage Details shown on drawing 1315-110

KERB KEY

EF Edging 50x150 PCC edging

HB kerb 250x125 H82 PCC kerb

BN kerb 125x125 bullnose PCC kerb

TK kerb Transition between BN & H82

NOTE

Levels to HB, TK, BN kerbs are relative to the watermark levels NOT the top of kerb. If in doubt ask.

KEY

Permeable Surface

Bound Gravel

Rock Setts

Concrete

Wetlands

Landscaping

Permeable Paving

Manhole Schedule							
MhREF	TYPE	CL	COVER TYPE	IL	Easting	Northing	
S01	450øPPHC	CL 83.00	B125x450sq	IL 82.40	537906.67	239005.66	
S02	1200øPC	CL 80.84	D400x600sq	IL 80.14	537910.78	239011.06	
S03	450øPPHC	CL 80.80	B125x450sq	IL 80.20	537926.20	239033.75	
S04	450øPPHC	CL 80.84	D400x450sq	IL 80.09	537933.72	239025.40	
S05	1050øPPHC	CL 80.84	D400x600sq	IL 79.90	537916.01	239005.25	
S06	1050øPPHC	CL 80.85	D400x600sq	IL 80.00	537923.21	239004.20	
S07	1200øPPHC	CL 80.85	D400x600sq	IL 79.70	537938.71	239018.15	
S08	1200øPPHC	CL 80.87	D400x600sq	IL 79.70	537924.31	238996.14	
S09	1200øPPHC	CL 80.87	D400x600sq	IL 79.30	537947.63	239011.68	
S10	450øPPHC	CL 84.35	B125x450sq	IL 83.50	537902.18	238960.34	
S11	1200øPPHC	CL 80.93	D400x600sq	IL 79.50	537948.15	239007.22	
S12	1200øPPHC	CL 84.40	B125x600sq	IL 80.20	537936.71	238980.95	
S13	1200øPPHC	CL 80.80	B125x600sq	IL 79.36	537954.67	238997.12	
S14	450øPPHC	CL 80.85	B125x450sq	IL 80.25	537923.82	238962.51	
S15	1050øPPHC	CL 80.80	D400x600sq	IL 80.16	537917.96	239008.12	
S16	600øGRP	CL 80.84	D400x600sq	IL 79.10	537953.18	239022.10	
SA01	1500ø Soakaway	CL 82.00	B125x600sq	Base IL 78.00	537912.61	238948.75	
SA02	2700ø Soakaway	CL 80.75	B125x600sq	Base IL 77.50	537954.35	239012.80	
SA03	2700ø Soakaway	CL 79.90	B125x600sq	Base IL 75.90	537960.68	238995.44	
SA04	2700ø Soakaway	CL 80.75	B125x600sq	Base IL 77.50	537958.88	239007.77	
SA05	2700ø Soakaway	CL 79.90	B125x600sq	Base IL 75.90	537965.06	238999.39	
SA06	2700ø Soakaway	CL 79.90	B125x600sq	Base IL 75.90	537969.59	239003.46	

STATUS

PLANNING

PROJECT

Whiteley Hill Winery

CLIENT

Newsells Park Estate

ARCHITECT

Designclubed

TITLE

Underground Drainage and
Externals Plan Sheet 2 of 2

Job No. 1315

DATE 03.04.2023

SCALE 1:1000AD

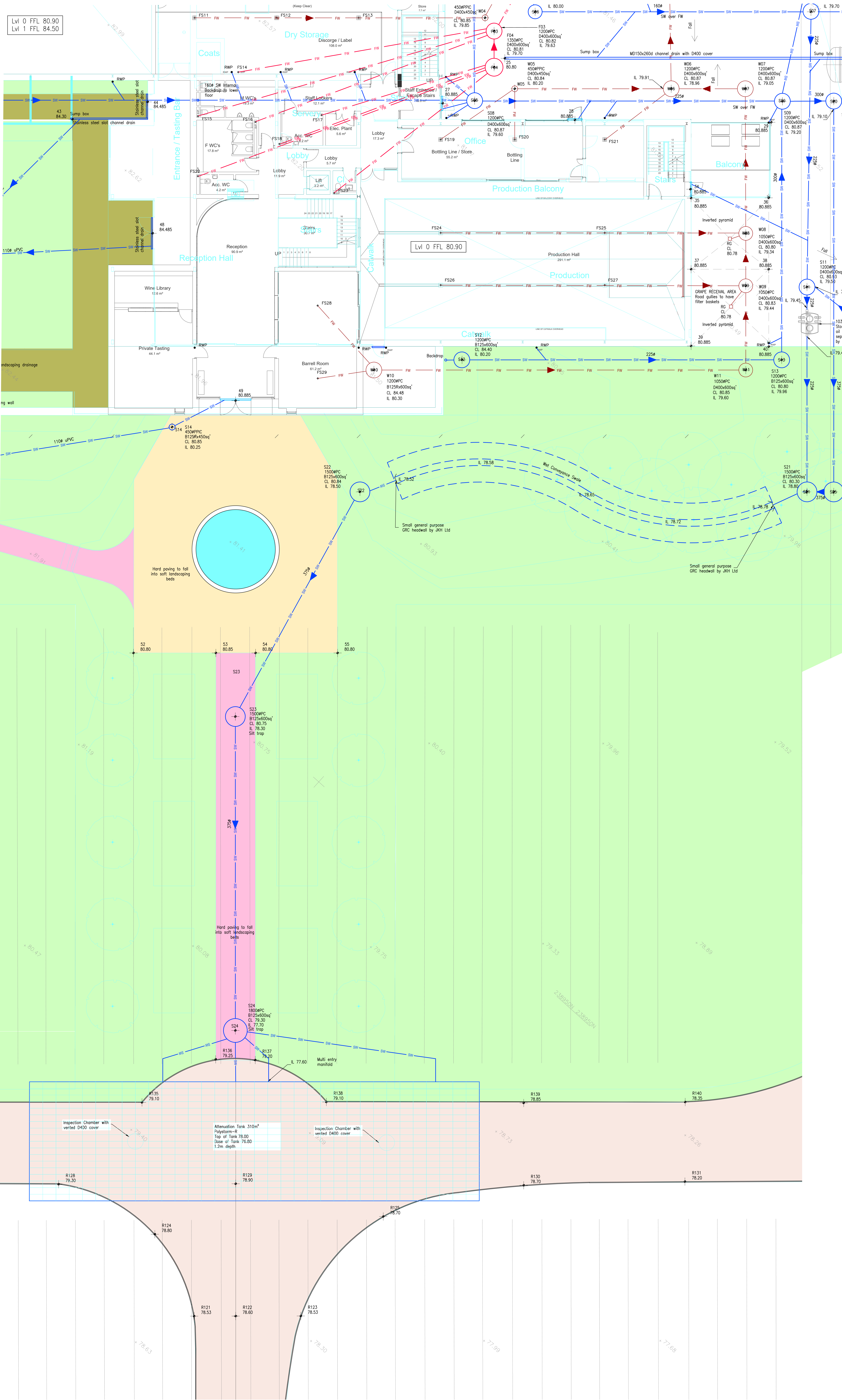
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CHECKED SBB

SOLUTION CONSULTING CIVIL & STRUCTURAL ENGINEERS

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E-mail: enquiries@solution.co.uk

Lvl 0 FFL 80.90
Lvl 1 FFL 84.50



Notes.

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- This drawing is to be read in conjunction with the specification and all other relevant Engineer's, Architect's and specialist subcontractor's drawings.
 - Work to figured dimensions only.

NOTES (Underground Drainage)

- All drainage to conform to current British and/or European Standards and Part H of The Building Regulations. All fittings shall hold a current Agreement Certificate and be compliant with the appropriate British Standard for that item.
- All internal foul drainage runs are to be 100mmØ pipework laid at a minimum of 1:40 fall.
- Manhole cover levels are indicative and are to match the proposed ground levels.
- All foul stacks/vent pipes are to have long radius rest bends.
- All foul and rainwater pipes to have rodding access just above ground floor level.
- All internal channels/gullies to be roddable.
- Locations of Stub Stacks (SS), Soil Vent Pipes (SVP), Floor Sockets (FS) & Floor Gullies (FG) are schematic. Refer to M&E/Architects drawings for exact setting out.
- M&E Contractor to ensure the heads of the foul system are vented to open air.
- For above ground building drainage details refer to M&E drawings.
- All existing pipes that are to be retained are to be surveyed for condition and repaired/replaced where necessary.

KEY

- Manhole reference indicates type and size, cover ref, cover and invert levels
- Indicates a 1000 floor socket
- Indicates a 225sq Yard Gully
- Indicates a 450sq POC Road Gully with D400 ringed cover (00388C by Durey)
- Indicates a channel drain
- Wine Waste Drain
- Foul Water Drain
- Surface Water Drain
- Drain to be removed

MANHOLE COVER KEY

- D400x600sq' DU35CA 600sq' class D400 solid top cast iron cover
- D400x450sq' DU35CA 450sq' class B125 solid top cast iron cover
- B125x450sq' DU35CA 450sq' class B125 recessed gully cover
- Cover references by Durey Castings Ltd (01324 272424)

NOTE
ALL NEW SURFACE WATER PIPES TO BE 1100 uPVC UNO.
ALL NEW FOUL WATER PIPES TO BE 1100 uPVC UNO.

All Drainage Details shown on drawing 1315-110

- KEY
- EF Edging 50x150 POC edging
- HB kerb 250x125 H82 POC kerb
- BN kerb 125x125N ballnose POC kerb
- TK kerb Transition between BN & H82
- NOTE
levels to HB, TK, BN kerbs are relative to the watermark levels NOT the top of kerb. If in doubt ask.

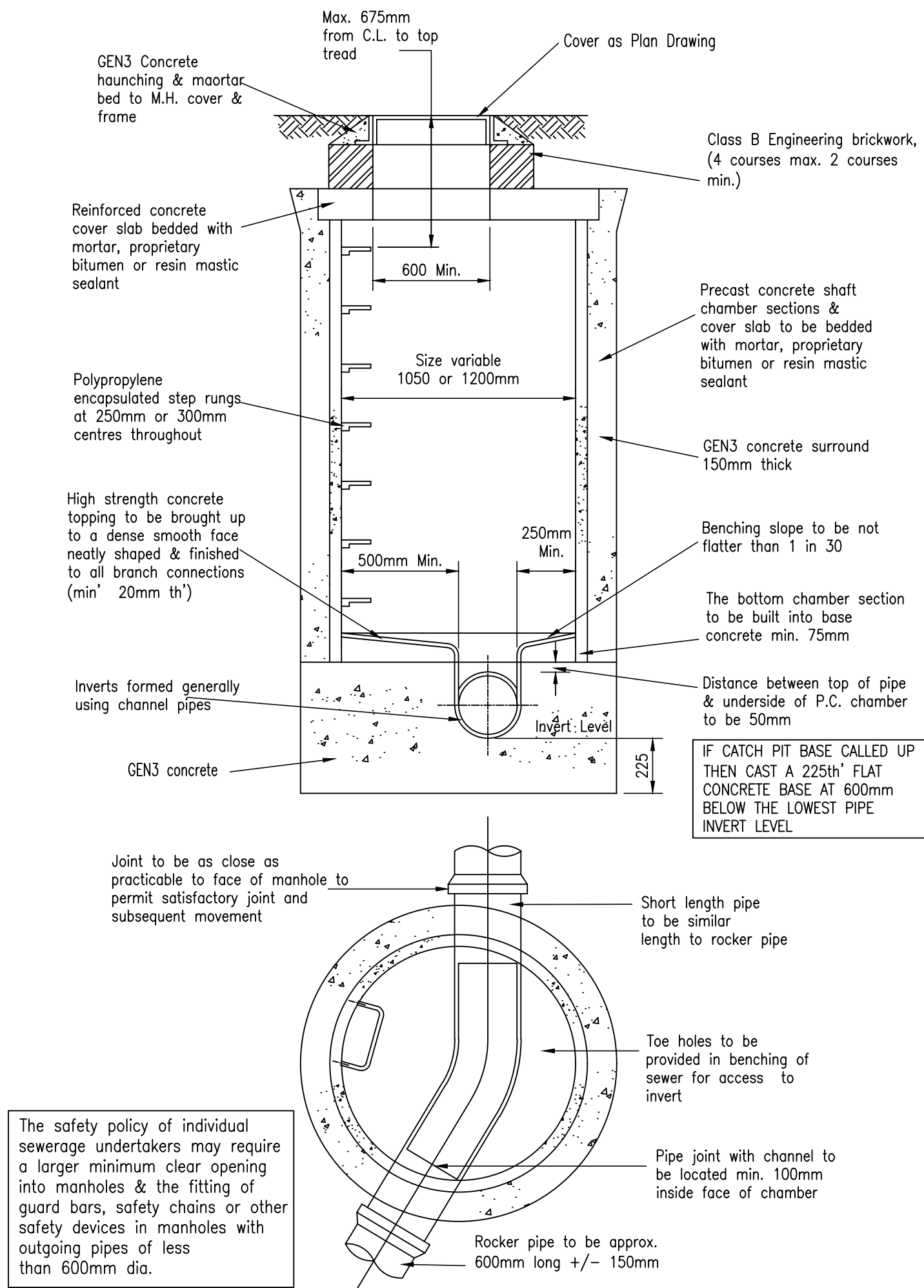
- KEY
- Permeable Surface
- Bound Gravel
- Rock Setts
- Concrete
- Wetlands
- Landscaping
- Permeable Paving
- Porcelain Paving
- Asphalt Bitumast

Manhole Schedule									
MHREF	TYPE	CL	CONVERT	TYPE	IL	Easting	Northing		
F01	1050wPC	CL 80.82	D400x600sq'		IL 79.46	537919.74	239011.22		
F02	1050wPC	CL 80.82	D400x600sq'		IL 79.26	537931.63	239002.93		
F03	1200wPC	CL 80.82	D400x600sq'		IL 79.83	537921.88	239001.04		
F04	1350wPC	CL 80.81	D400x600sq'		IL 79.70	537923.71	238999.01		
S01	1200wPC	CL 84.20	B125x450sq'		IL 80.25	537906.67	239009.56		
S02	1200wPC	CL 80.84	D400x600sq'		IL 80.14	537910.78	239011.06		
S03	450wPC	CL 80.80	B125x450sq'		IL 80.20	537926.20	239033.75		
S04	450wPC	CL 80.84	D400x450sq'		IL 80.09	537933.72	239025.40		
S05	1050wPC	CL 80.84	D400x600sq'		IL 79.90	537916.01	239005.25		
S06	1050wPC	CL 80.85	D400x600sq'		IL 80.00	537923.21	239004.20		
S07	1200wPC	CL 80.85	D400x600sq'		IL 79.70	537938.71	239016.15		
S08	1200wPC	CL 80.87	D400x600sq'		IL 79.60	537924.31	238996.14		
S09	1200wPC	CL 80.87	D400x600sq'		IL 79.20	537941.63	239011.68		
S10	450wPC	CL 84.35	B125x450sq'		IL 83.50	537902.18	238960.34		
S11	1200wPC	CL 80.93	D400x600sq'		IL 79.50	537952.41	239002.49		
S12	1200wPC	CL 84.40	B125x600sq'		IL 80.20	537936.71	238980.95		
S13	1200wPC	CL 80.80	B125x600sq'		IL 79.96	537954.67	238997.12		
S14	450wPC	CL 80.85	B125x450sq'		IL 80.25	537923.82	238962.51		
S15	1050wPC	CL 80.80	D400x600sq'		IL 80.16	537917.96	239008.12		
S16	600wPC	CL 80.84	D400x600sq'		IL 79.05	537945.56	239015.24		
S17	600wPC	CL 80.84	D400x600sq'		IL 78.95	537953.18	239022.10		
S18	1200wPC	CL 79.90	D400x600sq'		IL 78.85	537972.70	238999.93		
S20	1500wPC	CL 80.84	D400x600sq'		IL 79.05	537944.50	239014.28		
S21	1500wPC	CL 80.30	B125x600sq'		IL 78.80	537962.76	238990.99		
S22	1500wPC	CL 80.84	B125x600sq'		IL 78.50	537937.65	238968.37		
S23	1500wPC	CL 80.75	B125x600sq'		IL 78.30	537942.01	238949.45		
S24	1800wPC	CL 79.30	B125x600sq'		IL 77.70	537957.89	238931.82		
S25	1500wPC	CL 80.30	B125x600sq'		IL 78.85	537964.27	238992.34		
S401	2400w Soakaway	CL 82.00	B125x600sq'	Base	IL 78.00	537972.61	238948.75		
W01	450wPC	CL 80.81	D400x450sq'		IL 79.83	537913.08	239009.27		
W02	1050wPC	CL 80.85	D400x600sq'		IL 79.65	537919.64	239005.86		
W03	1200wPC	CL 80.87	D400x600sq'		IL 78.84	537928.32	239013.68		
W04	450wPC	CL 80.85	D400x450sq'		IL 79.85	537920.70	239001.33		
W05	450wPC	CL 80.84	D400x450sq'		IL 80.20	537925.96	238998.84		
W06	1200wPC	CL 80.87	D400x600sq'		IL 78.96	537934.75	239006.75		
W07	1200wPC	CL 80.87	D400x600sq'		IL 79.05	537938.91	239010.50		
W08	1050wPC	CL 80.80	D400x600sq'		IL 79.34	537946.25	239002.40		
W09	1050wPC	CL 80.83	D400x600sq'		IL 79.44	537948.90	238999.46		
W10	1200wPC	CL 84.48	B125x600sq'		IL 80.30	537932.27	238975.92		
W11	1050wPC	CL 80.85	D400x600sq'		IL 79.60	537953.16	238994.73		

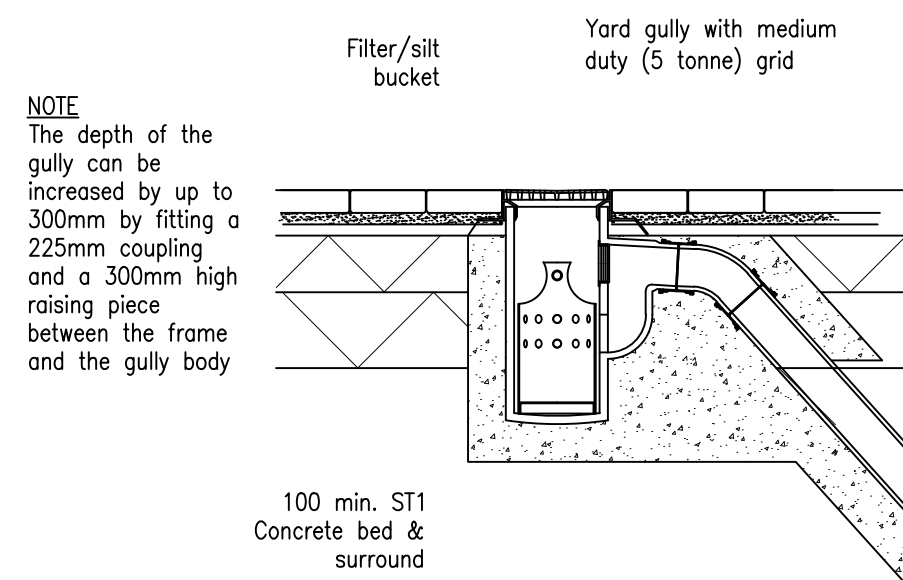
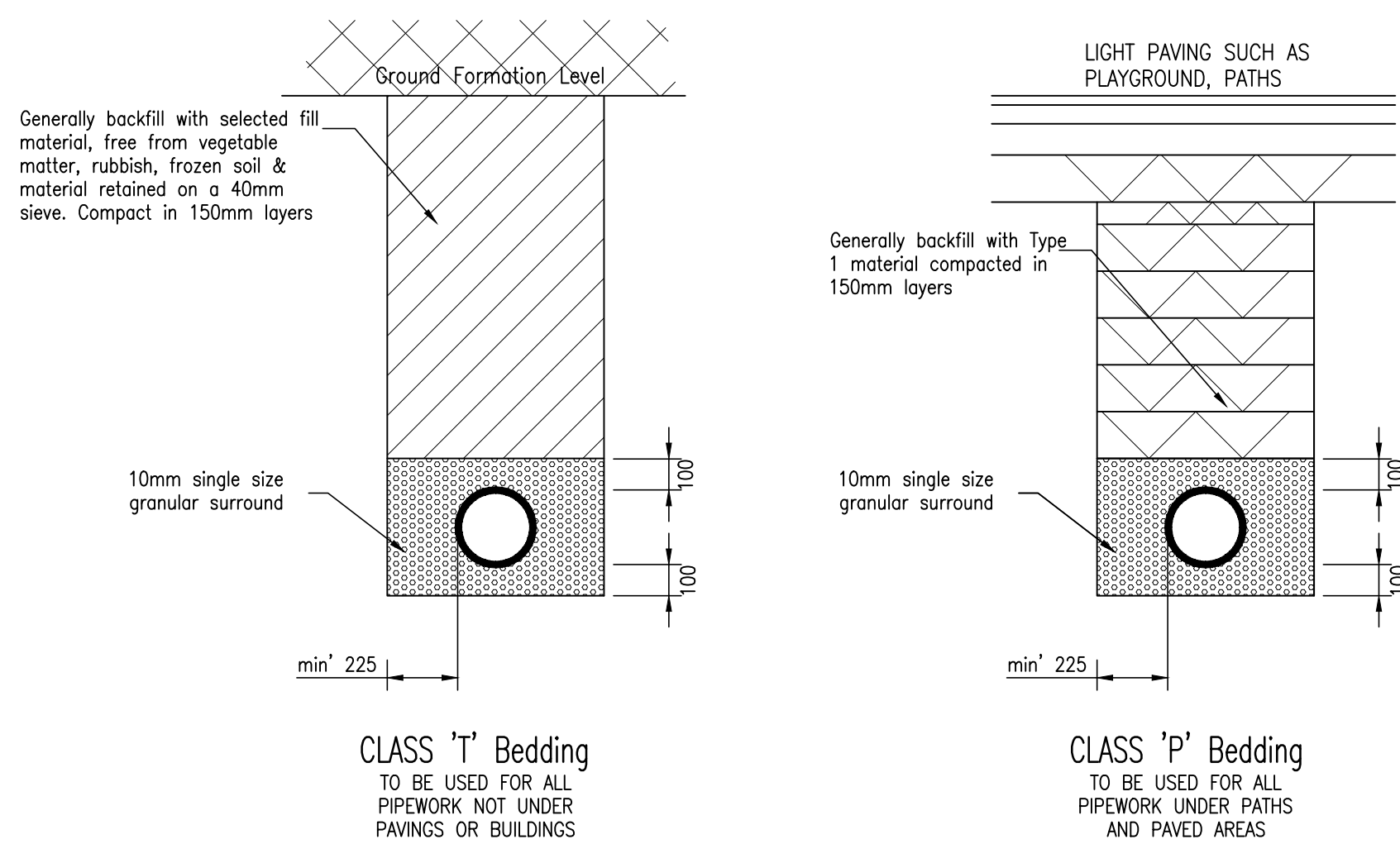
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CLIENT Newsells Park Estate				
ARCHITECT Designcubed				
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Job No: 1315	DATE 03.04.2023	SCALE 1:1000AD		
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SOLUTION CONSULTING CIVIL & STRUCTURAL ENGINEERS HAWTHORNE HOUSE, COWARDS LANE, CODICOTE HERTFORDSHIRE, SG4 8UN TELEPHONE: 01438 820110, MOB: 07903 162414 E-mail: enquiries@solution.co.uk				

Notes.

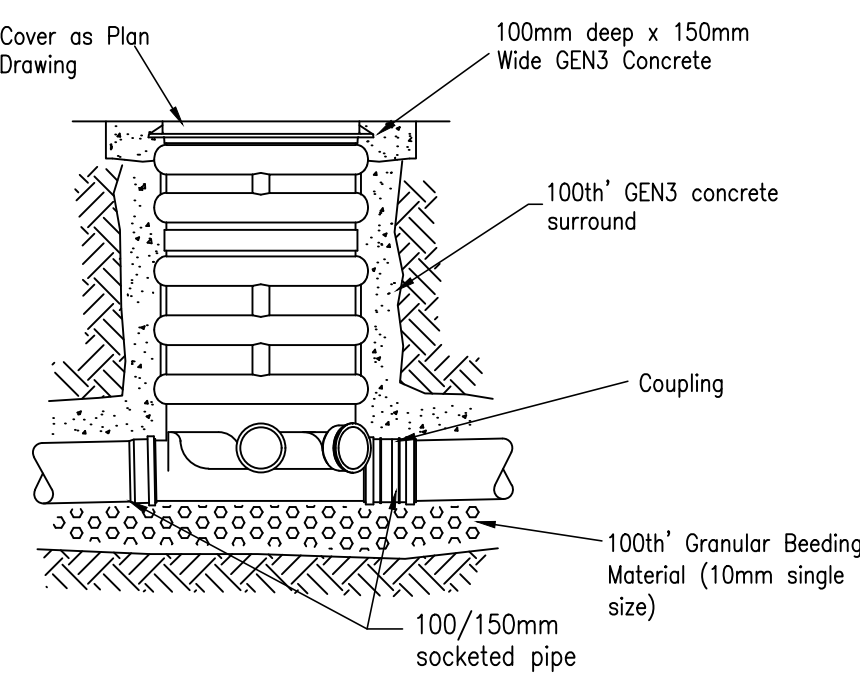
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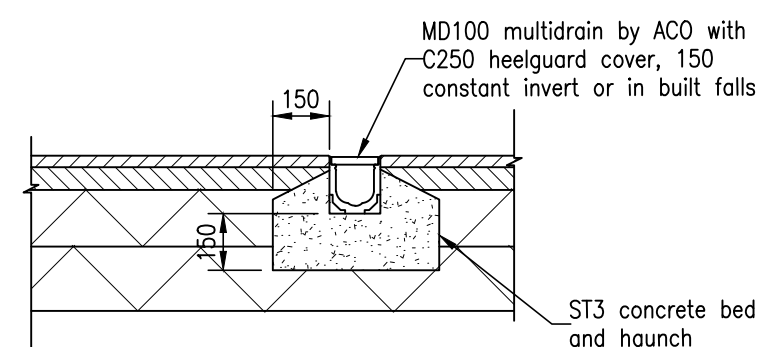
TYPICAL 1050 or 1200 Dia.
P.C. MANHOLE
Depth to soffit up to 3m deep



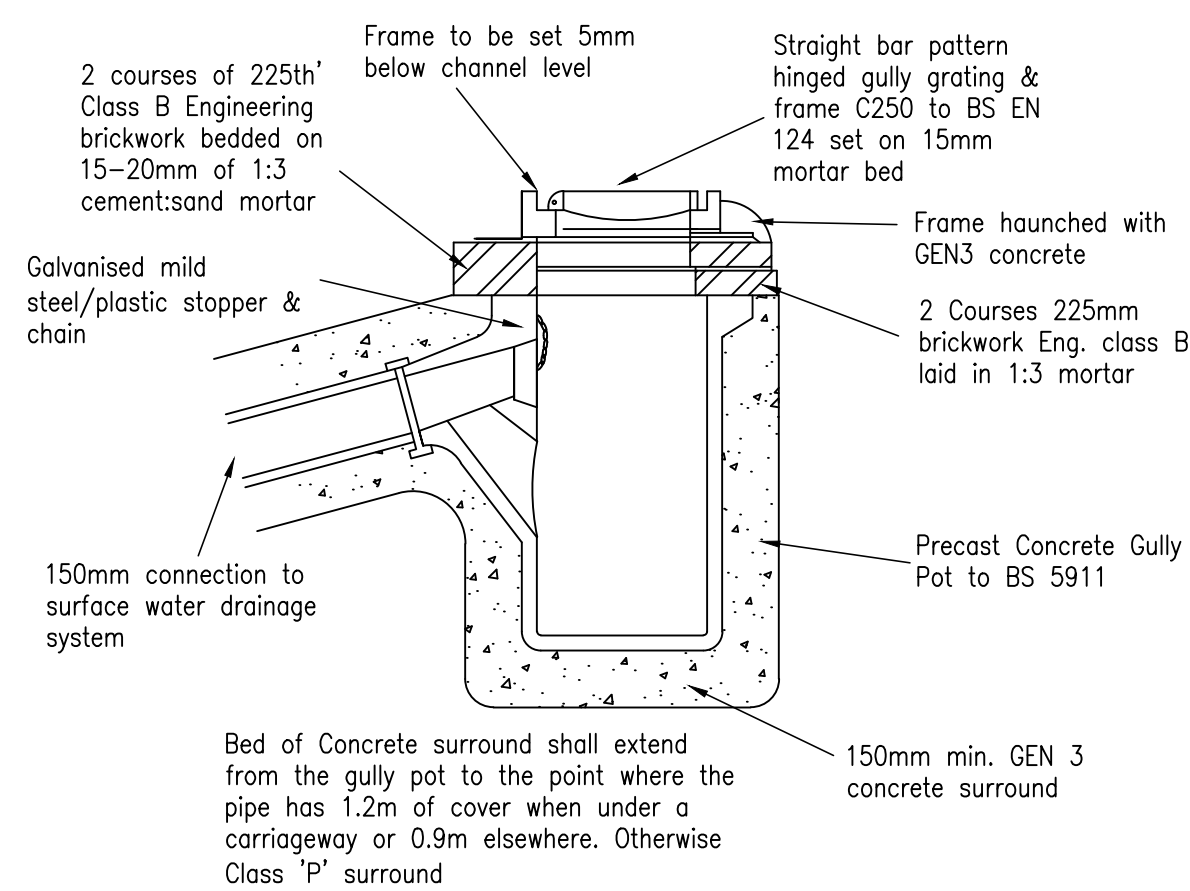
TYPICAL YARD GULLY DETAIL



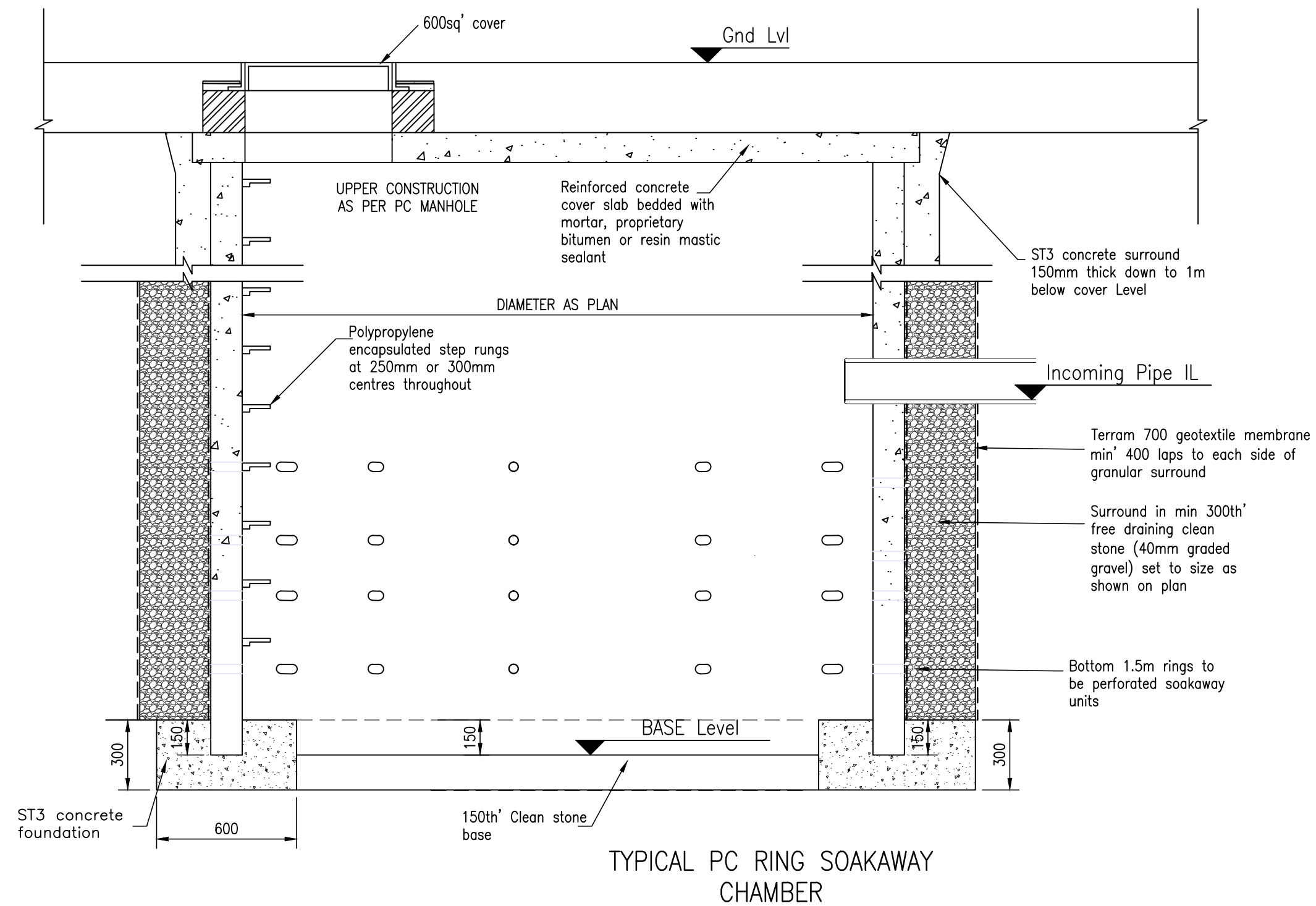
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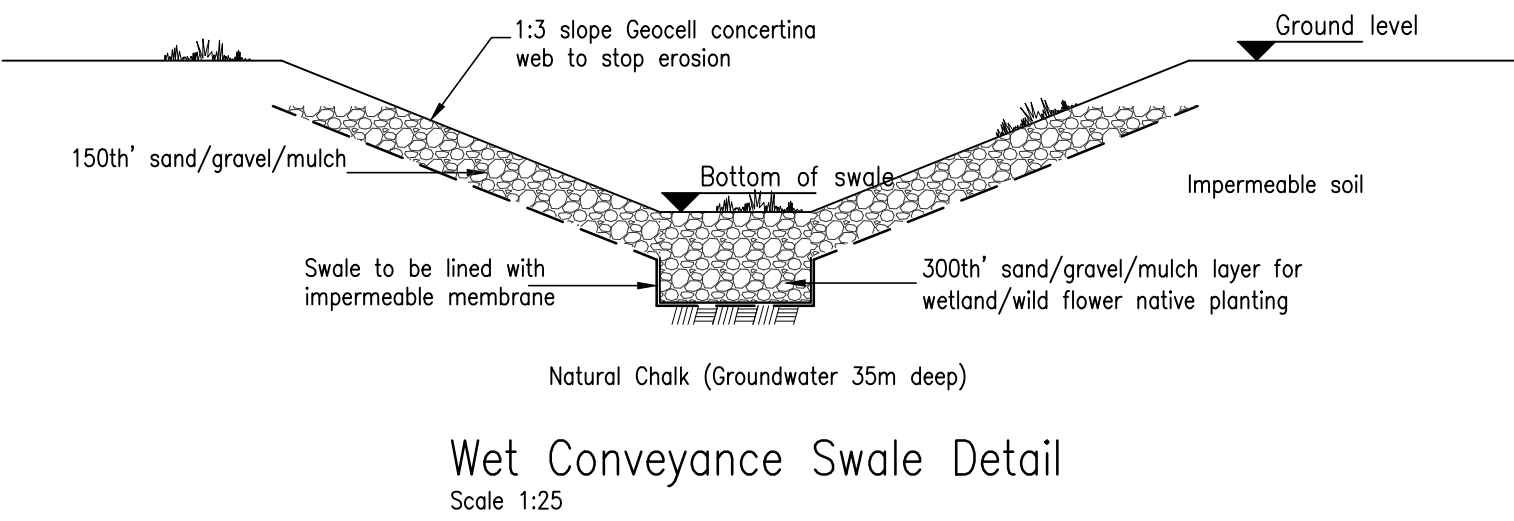
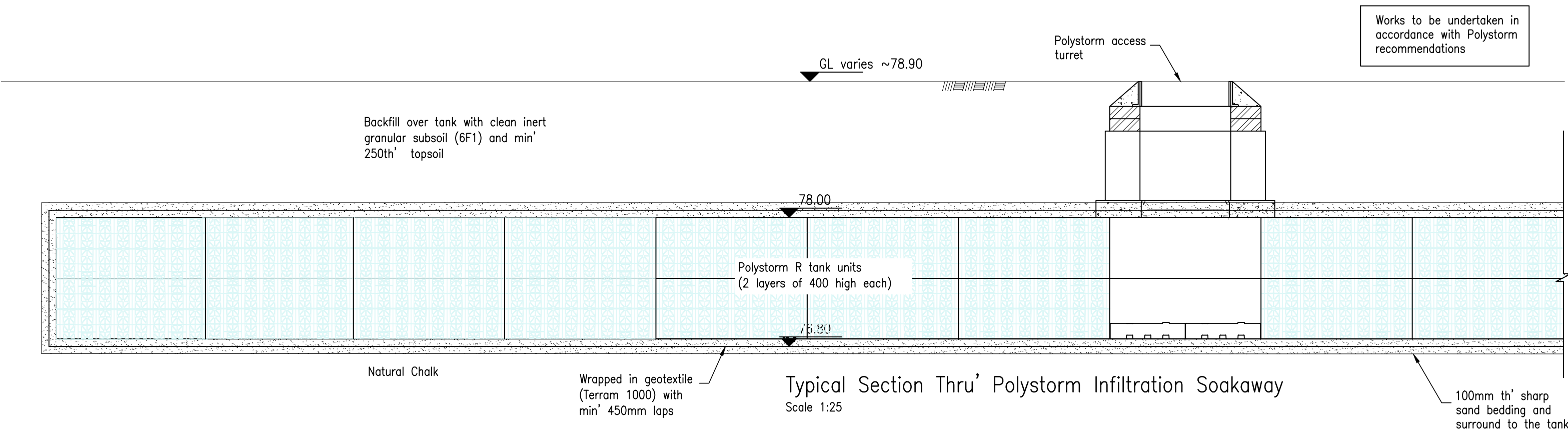
CHANNEL DRAIN
Scale 1:20



ROAD GULLY (RG) DETAIL
SCALE 1:20



REV.	AMENDMENTS	BY	DATE	CHECKED
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PLANNING				
PROJECT				
Whiteley Hill Winery				
CLIENT				
Newsells Park Estate				
ARCHITECT				
Designcubed				
TITLE				
Underground Drainage Details				
Job No.	1315	DATE	25.05.2023	
DRAWING No.	110	SCALE	1:200A1	
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		CHECKED	SRB	



Notes.

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 2. Work to figured dimensions only.

-	-	-	-	-
REV.	AMENDMENTS	BY	DATE	CHECKED
STATUS PLANNING				
PROJECT Whiteley Hill Winery				
CLIENT Newsells Park Estate				
ARCHITECT Designcubed				
TITLE Attenuation Tank and Wet Conveyance Swale Details				
Job No.	1315	DATE	20.05.2024	
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SOLUTION CONSULTING CIVIL & STRUCTURAL ENGINEERS				
HAWTHORNE HOUSE, COWARDS LANE, CODICOTE HERTFORDSHIRE, SG4 8UN TELEPHONE: 01438 820110, MOB: 07903 162414 E-mail: enquiries@solutionce.co.uk				

APPENDIX III – WATER QUALITY ASSESSMENT

Simple Index Approach by Hydraulics Research

Car Park

Building Roof Water

Winery Hardstanding/Yard

SUMMARY TABLE		DESIGN CONDITIONS			
		1	2	3	4
Land Use Type Pollution Hazard Level Pollution Hazard Indices TSS Metals Hydrocarbons	Non-residential car parking with frequent change (eg hospitals, retail) Medium 0.7 0.6 0.7				
SuDS components proposed		SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B			
Component 1	Pervious pavement (where the pavement is not designed as an infiltration component)				
Component 2	None				
Component 3	None				
SuDS Pollution Mitigation Indices TSS Metals Hydrocarbons	 0.7 0.6 0.7				
Groundwater protection type Groundwater protection Pollution Mitigation Indices TSS Metals Hydrocarbons	Pervious pavement underlain by 300 mm minimum depth of soils with good contamination attenuation potential 0.7 0.6 0.7	All designs must include a minimum of 1 m unsaturated depth of subsoil or aquifer material between the infiltration surface and the maximum likely groundwater level. Infiltration components should always be preceded by upstream component(s) that trap(s) silt, or designed specifically to retain sediment in a separate lined zone, easily accessible for maintenance, such that the sediment will not be re-suspended in subsequent events	The permeable pavement must include a suitable filtration layer provides treatment and must include a geotextile at the base separating the foundation from the sub-grade. The underlying soils must provide good contaminant attenuation potential (eg as recommended in Sniffer 2008 (a) and (b) / Scott Wilson (2010) or other appropriate guidance). Alternative depth and soil combinations must provide equivalent protection to the underlying groundwater		
Combined Pollution Mitigation Indices TSS Metals Hydrocarbons Acceptability of Pollution Mitigation TSS Metals Hydrocarbons	 >0.95 >0.95 Sufficient Sufficient Sufficient	0.9 Reference to local planning documents should also be made to identify any additional protection required for sites due to habitat conservation (see Chapter 7 The SuDS design process). The implications of developments on or within close proximity to an area with an environmental designation, such as a Site of Special Scientific Interest (SSSI), should be considered via consultation with relevant conservation bodies such as Natural England			

SUMMARY TABLE		DESIGN CONDITIONS			
		1	2	3	4
Land Use Type Pollution Hazard Level Pollution Hazard Indices TSS Metals Hydrocarbons	Commercial/Industrial roofing: Low potential for metal leaching Low 0.3 0.4 0.05	This classification should be informed by an assessment of the leachability of metals from the adopted roofing materials. Particular risks are likely to be posed by materials that include copper and galvanised steel			
SuDS components proposed		SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B			
Component 1	Swale				
Component 2	None				
Component 3	None				
SuDS Pollution Mitigation Indices TSS Metals Hydrocarbons	 0.5 0.6 0.6				
Groundwater protection type Groundwater protection Pollution Mitigation Indices TSS Metals Hydrocarbons	Infiltration trench with suitable depth of filtration material underlain by 300 mm minimum depth of soils with good contamination attenuation potential 0.4 0.4 0.4	All designs must include a minimum of 1 m unsaturated depth of subsoil or aquifer material between the infiltration surface and the maximum likely groundwater level. Infiltration components should always be preceded by upstream component(s) that trap(s) silt, or designed specifically to retain sediment in a separate lined zone, easily accessible for maintenance, such that the sediment will not be re-suspended in subsequent events	The infiltration trench must include a suitable depth filtration layer that provides treatment (ie graded gravel with sufficient smaller particles but not single size coarse aggregate such as 20mm gravel). The underlying soils must provide good contaminant attenuation potential (eg as recommended in Sniffer 2008 (a) and (b) / Scott Wilson (2010) or other appropriate guidance). Alternative depth and soil combinations must provide equivalent protection to the underlying groundwater		
Combined Pollution Mitigation Indices TSS Metals Hydrocarbons Acceptability of Pollution Mitigation TSS Metals Hydrocarbons	 Sufficient Sufficient Sufficient	0.7 0.8 0.8 Reference to local planning documents should also be made to identify any additional protection required for sites due to habitat conservation (see Chapter 7 The SuDS design process). The implications of developments on or within close proximity to an area with an environmental designation, such as a Site of Special Scientific Interest (SSSI), should be considered via consultation with relevant conservation bodies such as Natural England			

SUMMARY TABLE		DESIGN CONDITIONS			
		1	2	3	4
Land Use Type Pollution Hazard Level Pollution Hazard Indices TSS Metals Hydrocarbons	Standard commercial yard or delivery area Medium 0.7 0.6 0.7	This classification is not appropriate for haulage yards, lorry parks, waste management areas, or chemical storage/handling zones			
SuDS components proposed		SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B			
Component 1	Swale				
Component 2	None				
Component 3	None				
SuDS Pollution Mitigation Indices TSS Metals Hydrocarbons	 	0.5 0.6 0.6			
Groundwater protection type Groundwater protection Pollution Mitigation Indices TSS Metals Hydrocarbons	Infiltration trench with suitable depth of filtration material underlain by 300 mm minimum depth of soils with good contamination attenuation potential 0.4 0.4 0.4	All designs must include a minimum of 1 m unsaturated depth of subsoil or aquifer material between the infiltration surface and the maximum likely groundwater level. Infiltration components should always be preceded by upstream component(s) that trap(s) silt, or designed specifically to retain sediment in a separate lined zone, easily accessible for maintenance, such that the sediment will not be re-suspended in subsequent events	The infiltration trench must include a suitable depth filtration layer that provides treatment (ie graded gravel with sufficient smaller particles but not single size coarse aggregate such as 20mm gravel). The underlying soils must provide good contaminant attenuation potential (eg as recommended in Sniffer 2008 (a) and (b) / Scott Wilson (2010) or other appropriate guidance). Alternative depth and soil combinations must provide equivalent protection to the underlying groundwater		
Combined Pollution Mitigation Indices TSS Metals Hydrocarbons Acceptability of Pollution Mitigation TSS Metals Hydrocarbons	 Sufficient Sufficient Sufficient	0.7 0.8 0.8 Reference to local planning documents should also be made to identify any additional protection required for sites due to habitat conservation (see Chapter 7 The SuDS design process). The implications of developments on or within close proximity to an area with an environmental designation, such as a Site of Special Scientific Interest (SSSI), should be considered via consultation with relevant conservation bodies such as Natural England			