

Our Ref: TS/BSO/E4519/17641

Your ref: SWM/2018/0471

11th March 2020

Flood and Water Management Team
Hampshire County Council
c/o
Barratt David Wilson Southampton Division
Tollbar House
Tollbar Way
Hedge End
Southampton
Hampshire
SO30 2UH

Dear Sirs

RE: APP/18/00450 – LAND AT FORTY ACRE FARM, HAVANT ROAD, HAVANT

Further to your letter dated 20th February 2020 in relation to the discharge of planning condition 16 relating to surface water we can provide the following information in relation to the queries and items raised.

- a) The surface water drainage design has not changed from the principles presented and approved within the Flood Risk Assessment as well as the last set of submitted detailed drainage strategy drawings which formed part of the planning consent. The design development that has occurred has centred around the addition of secondary drainage and on-plot drainage runs to service the new houses. This still connect to the main onsite surface water drainage system.
- b) A copy of the surface water calculations is included with this response. These include for all design storm events from the 1 year, 30 year and 100 year plus 40% climate change with an additional 10% for urban creep
- c) The 10% urban creep has been included in the Windes modelling through the “additional flow” input in the Design Criteria. This ensures that the additional 10% is included for all the storm events and thus compounds the peak simulation storm as well

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Consultants

Rogers Cory Partnership Limited
The Old School, Old School Road
Hook, Hampshire, RG27 9NJ

Registered in England & Wales No. 6222947
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d) The exceedance flow layout drawing has been updated to suite. This reflects the peak simulation event of the 1 in 100 year plus 40% (climate change) plus an additional 10% urban creep. There are three instances of minor flooding:

- i. 0.091m³ at pipe S5.000;
- ii. 2.938m³ at pipe S12.000;
- iii. 1.390m³ at pipe S23.000.

e) The plans indicating which organisation is responsible for the SuDS and adoptable drainage has been appended to an updated Maintenance Regime Report and included with this response.

f) This provided on drawing BSO/E4519/041 included with this response

Should you require any further information or have any queries regarding the above, please do not hesitate to contact us.

Yours sincerely

TERRY SEYMOUR

ENGINEERING DIRECTOR

Encl: Fee Proposal

Standard Conditions of Contract

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Micro Drainage Network 2017.1.2		

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SW1.SWS

Pipe Sizes SW1- windes export Manhole Sizes SW1- windes export

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	19.100	Add Flow / Climate Change (%)	10
Ratio R	0.350	Minimum Backdrop Height (m)	0.100
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for SW1.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	37.954	1.898	20.0	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	🔒
S1.001	21.741	1.087	20.0	0.090	0.00	0.0	0.600	o	225	Pipe/Conduit	🔒
S1.002	15.995	0.800	20.0	0.090	0.00	0.0	0.600	o	225	Pipe/Conduit	🔒
S2.000	35.876	0.209	172.0	0.104	5.00	0.0	0.600	o	375	Pipe/Conduit	🔒
S3.000	19.798	1.320	15.0	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	🔒
S2.001	15.939	0.049	325.0	0.167	0.00	0.0	0.600	o	375	Pipe/Conduit	🔒
S2.002	28.060	0.050	561.2	0.142	0.00	0.0	0.600	o	600	Pipe/Conduit	🔒
S1.003	34.487	0.069	499.8	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	🔒
S1.004	46.720	0.467	100.0	0.069	0.00	0.0	0.600	o	750	Pipe/Conduit	🔒

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.22	8.450	0.000	0.0	0.0	0.0	2.94	116.9	0.0
S1.001	50.00	5.34	6.552	0.090	0.0	0.0	1.2	2.94	116.9	13.4
S1.002	50.00	5.43	5.465	0.180	0.0	0.0	2.4	2.94	116.9	26.8
S2.000	50.00	5.43	3.665	0.104	0.0	0.0	1.4	1.38	152.3	15.5
S3.000	50.00	5.10	4.955	0.000	0.0	0.0	0.0	3.40	135.0	0.0
S2.001	50.00	5.70	3.456	0.271	0.0	0.0	3.7	1.00	110.4	40.4
S2.002	50.00	6.16	3.211	0.413	0.0	0.0	5.6	1.02	288.6	61.5
S1.003	50.00	6.62	3.014	0.593	0.0	0.0	8.0	1.24	550.0	88.3
S1.004	50.00	6.90	2.945	0.662	0.0	0.0	9.0	2.80	1236.4	98.6

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Micro Drainage						Network 2017.1.2							
<u>Network Design Table for SW1.SWS</u>													
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design	
S1.005	7.396	0.103	72.0	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit			
S4.000	53.039	0.265	200.1	0.161	5.00	0.0	0.600	o	300	Pipe/Conduit			
S5.000	38.650	0.245	157.8	0.272	5.00	0.0	0.600	o	300	Pipe/Conduit			
S1.006	63.418	0.127	499.4	0.310	0.00	0.0	0.600	o	750	Pipe/Conduit			
S6.000	45.988	0.602	76.4	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit			
S1.007	17.258	0.035	493.1	0.145	0.00	0.0	0.600	o	750	Pipe/Conduit			
S7.000	26.107	0.537	48.6	0.152	5.00	0.0	0.600	o	300	Pipe/Conduit			
S1.008	35.663	0.807	44.2	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit			
S8.000	27.936	1.027	27.2	0.132	5.00	0.0	0.600	o	225	Pipe/Conduit			
S8.001	63.689	0.159	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit			
S9.000	48.374	0.605	80.0	0.082	5.00	0.0	0.600	o	225	Pipe/Conduit			
S8.002	60.197	0.590	102.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit			
<u>Network Results Table</u>													
PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)			
S1.005	50.00	6.93	2.478	0.662	0.0	0.0	9.0	3.30	1458.0	98.6			
S4.000	50.00	5.80	3.090	0.161	0.0	0.0	2.2	1.11	78.3	24.0			
S5.000	50.00	5.52	3.070	0.272	0.0	0.0	3.7	1.25	88.3	40.5			
S1.006	50.00	7.78	2.375	1.405	0.0	0.0	19.0	1.25	550.2	209.3			
S6.000	50.00	5.51	3.375	0.000	0.0	0.0	0.0	1.50	59.5	0.0			
S1.007	50.00	8.01	2.248	1.550	0.0	0.0	21.0	1.25	553.7	230.9			
S7.000	50.00	5.19	3.200	0.152	0.0	0.0	2.1	2.26	159.8	22.6			
S1.008	50.00	8.15	2.213	1.702	0.0	0.0	23.0	4.22	1862.7	253.5			
S8.000	50.00	5.18	3.972	0.132	0.0	0.0	1.8	2.52	100.1	19.7			
S8.001	50.00	6.24	2.719	0.132	0.0	0.0	1.8	1.01	160.7	19.7			
S9.000	50.00	5.55	3.390	0.082	0.0	0.0	1.1	1.46	58.2	12.2			
S8.002	50.00	6.73	2.560	0.214	0.0	0.0	2.9	2.01	320.1	31.9			
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Micro Drainage					Network 2017.1.2						
Network Design Table for SW1.SWS											
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S10.000	36.603	0.215	170.2	0.133	5.00	0.0	0.600	o	225	Pipe/Conduit	
S10.001	8.667	0.051	169.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S10.002	64.689	0.381	170.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S8.003	54.809	0.101	543.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S11.000	42.185	0.560	75.3	0.156	5.00	0.0	0.600	o	300	Pipe/Conduit	
S12.000	37.059	0.151	245.4	0.226	5.00	0.0	0.600	o	300	Pipe/Conduit	
S11.001	63.449	0.930	68.2	0.169	0.00	0.0	0.600	o	375	Pipe/Conduit	
S8.004	40.500	0.049	826.5	0.000	0.00	0.0	0.600	o	825	Pipe/Conduit	
S8.005	23.659	0.029	824.3	0.000	0.00	0.0	0.600	o	825	Pipe/Conduit	
S8.006	19.722	0.024	825.2	0.000	0.00	0.0	0.600	o	825	Pipe/Conduit	
S8.007	50.960	0.062	824.6	0.000	0.00	0.0	0.600	o	825	Pipe/Conduit	
S13.000	35.778	0.304	117.7	0.207	5.00	0.0	0.600	o	300	Pipe/Conduit	
S13.001	30.485	0.543	56.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S14.000	37.748	0.369	102.3	0.000	5.00	0.0	0.600	o	300	Pipe/Conduit	
Network Results Table											
PN	Rain (mm/hr)	T.C. (mins)	US/IL Σ (m)	I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	
S10.000	50.00	5.61	2.842	0.133	0.0	0.0	1.8	1.00	39.7	19.8	
S10.001	50.00	5.76	2.627	0.133	0.0	0.0	1.8	1.00	39.8	19.8	
S10.002	50.00	6.83	2.576	0.133	0.0	0.0	1.8	1.00	39.8	19.8	
S8.003	50.00	7.71	1.820	0.347	0.0	0.0	4.7	1.04	293.5	51.7	
S11.000	50.00	5.39	3.596	0.156	0.0	0.0	2.1	1.81	128.2	23.2	
S12.000	50.00	5.62	3.100	0.226	0.0	0.0	3.1	1.00	70.6	33.7	
S11.001	50.00	6.10	2.874	0.551	0.0	0.0	7.5	2.20	242.6	82.1	
S8.004	49.72	8.37	1.494	0.898	0.0	0.0	12.1	1.02	547.7	133.0	
S8.005	48.63	8.76	1.445	0.898	0.0	0.0	12.1	1.03	548.5	133.0	
S8.006	47.76	9.08	1.416	0.898	0.0	0.0	12.1	1.03	548.2	133.0	
S8.007	45.68	9.90	1.392	0.898	0.0	0.0	12.1	1.03	548.4	133.0	
S13.000	50.00	5.41	3.687	0.207	0.0	0.0	2.8	1.45	102.4	30.8	
S13.001	50.00	5.65	3.383	0.207	0.0	0.0	2.8	2.10	148.6	30.8	
S14.000	50.00	5.40	3.210	0.000	0.0	0.0	0.0	1.55	109.9	0.0	
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Micro Drainage					Network 2017.1.2						
<u>Network Design Table for SW1.SWS</u>											
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S15.000	15.428	0.908	17.0	0.132	5.00	0.0	0.600	o	225	Pipe/Conduit	
S16.000	43.919	0.149	294.8	0.248	5.00	0.0	0.600	o	375	Pipe/Conduit	
S15.001	35.610	0.123	289.5	0.136	0.00	0.0	0.600	o	375	Pipe/Conduit	
S15.002	12.129	1.002	12.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S17.000	14.783	1.019	14.5	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	
S17.001	20.903	0.128	163.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S17.002	14.071	0.083	170.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S15.003	26.178	0.447	58.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S15.004	14.969	0.255	58.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S18.000	39.625	0.624	63.5	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	
S15.005	53.482	0.244	219.2	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S13.002	20.559	0.041	501.4	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
S13.003	35.836	0.072	497.7	0.359	0.00	0.0	0.600	o	750	Pipe/Conduit	
<u>Network Results Table</u>											
PN	Rain (mm/hr)	T.C. (mins)	US/IL Σ (m)	I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	
S15.000	50.00	5.08	8.875	0.132	0.0	0.0	1.8	3.19	126.8	19.7	
S16.000	50.00	5.70	6.364	0.248	0.0	0.0	3.4	1.05	116.0	36.9	
S15.001	50.00	6.26	6.215	0.516	0.0	0.0	7.0	1.06	117.0	76.9	
S15.002	50.00	6.30	6.092	0.516	0.0	0.0	7.0	5.23	577.9	76.9	
S17.000	50.00	5.07	5.095	0.000	0.0	0.0	0.0	3.45	137.3	0.0	
S17.001	50.00	5.41	4.076	0.000	0.0	0.0	0.0	1.02	40.6	0.0	
S17.002	50.00	5.65	3.945	0.000	0.0	0.0	0.0	1.00	39.8	0.0	
S15.003	50.00	6.48	3.712	0.516	0.0	0.0	7.0	2.37	261.9	76.9	
S15.004	50.00	6.58	3.265	0.516	0.0	0.0	7.0	2.37	261.6	76.9	
S18.000	50.00	5.40	3.784	0.000	0.0	0.0	0.0	1.64	65.4	0.0	
S15.005	50.00	7.24	2.935	0.516	0.0	0.0	7.0	1.37	217.8	76.9	
S13.002	50.00	7.51	2.391	0.723	0.0	0.0	9.8	1.24	549.1	107.7	
S13.003	50.00	7.99	2.350	1.082	0.0	0.0	14.7	1.25	551.1	161.2	
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<u>Network Design Table for SW1.SWS</u>											
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S19.000	24.246	0.143	169.6	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	
S20.000	12.406	0.203	61.1	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	
S19.001	38.414	0.324	118.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S13.004	14.528	0.029	501.0	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
S13.005	36.366	0.093	391.0	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
S13.006	38.453	0.447	86.0	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
S13.007	27.407	0.305	90.0	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
S1.009	33.125	0.040	828.1	0.000	0.00	0.0	0.600	o	825	Pipe/Conduit	
S1.010	83.161	0.101	825.0	0.000	0.00	0.0	0.600	o	825	Pipe/Conduit	
S1.011	47.986	0.052	921.0	0.000	0.00	0.0	0.600	o	825	Pipe/Conduit	
S21.000	24.592	0.766	32.1	0.094	5.00	0.0	0.600	o	225	Pipe/Conduit	
S21.001	6.767	0.344	19.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S21.002	50.495	2.103	24.0	0.143	0.00	0.0	0.600	o	225	Pipe/Conduit	
S22.000	40.971	0.102	401.7	0.268	5.00	0.0	0.600	o	450	Pipe/Conduit	
S22.001	15.602	0.284	54.9	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
<u>Network Results Table</u>											
PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	
S19.000	50.00	5.40	3.270	0.000	0.0	0.0	0.0	1.00	39.8	0.0	
S20.000	50.00	5.12	3.330	0.000	0.0	0.0	0.0	1.68	66.6	0.0	
S19.001	50.00	5.94	3.127	0.000	0.0	0.0	0.0	1.20	47.7	0.0	
S13.004	50.00	8.19	2.278	1.082	0.0	0.0	14.7	1.24	549.3	161.2	
S13.005	49.02	8.62	2.249	1.082	0.0	0.0	14.7	1.41	622.5	161.2	
S13.006	48.43	8.83	2.156	1.082	0.0	0.0	14.7	3.02	1333.5	161.2	
S13.007	48.01	8.98	1.709	1.082	0.0	0.0	14.7	2.95	1303.6	161.2	
S1.009	44.44	10.44	1.330	3.682	0.0	0.0	44.3	1.02	547.2	487.4	
S1.010	41.68	11.80	1.290	3.682	0.0	0.0	44.3	1.03	548.2	487.4	
S1.011	40.21	12.62	1.189	3.682	0.0	0.0	44.3	0.97	518.5	487.4	
S21.000	50.00	5.18	6.116	0.094	0.0	0.0	1.3	2.32	92.1	14.0	
S21.001	50.00	5.21	5.276	0.094	0.0	0.0	1.3	2.96	117.8	14.0	
S21.002	50.00	5.53	4.932	0.237	0.0	0.0	3.2	2.68	106.6	35.3	
S22.000	50.00	5.68	2.990	0.268	0.0	0.0	3.6	1.01	160.3	39.9	
S22.001	50.00	5.77	2.888	0.268	0.0	0.0	3.6	2.75	437.0	39.9	
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Network Design Table for SW1.SWS											
PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S21.003	13.753	0.028	491.2	0.203	0.00	0.0	0.600	o	750	Pipe/Conduit	
S21.004	17.181	0.034	505.3	0.189	0.00	0.0	0.600	o	750	Pipe/Conduit	
S21.005	24.128	0.048	502.7	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
S21.006	22.163	0.044	500.3	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
S21.007	13.831	0.028	494.0	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
S23.000	40.826	0.240	170.1	0.104	5.00	0.0	0.600	o	225	Pipe/Conduit	
S23.001	18.522	0.812	22.8	0.154	0.00	0.0	0.600	o	225	Pipe/Conduit	
S21.008	55.835	0.108	517.0	0.125	0.00	0.0	0.600	o	750	Pipe/Conduit	
S24.000	30.689	0.521	58.9	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	
S25.000	10.501	0.711	14.8	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	
S21.009	12.084	0.020	604.2	0.380	0.00	0.0	0.600	o	750	Pipe/Conduit	
S21.010	20.312	0.041	495.4	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
S21.011	38.098	0.076	501.3	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
S21.012	145.475	0.490	296.9	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit	
S1.012	15.154	0.029	522.5	0.000	0.00	0.0	0.600	o	825	Pipe/Conduit	
Network Results Table											
PN	Rain (mm/hr)	T.C. (mins)	US/IL E (m)	I.Area (ha)	Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	
S21.003	50.00	5.95	2.304	0.708	0.0	0.0	9.6	1.26	554.8	105.5	
S21.004	50.00	6.19	2.276	0.897	0.0	0.0	12.1	1.24	546.9	133.6	
S21.005	50.00	6.51	2.242	0.897	0.0	0.0	12.1	1.24	548.4	133.6	
S21.006	50.00	6.81	2.194	0.897	0.0	0.0	12.1	1.24	549.7	133.6	
S21.007	50.00	6.99	2.150	0.897	0.0	0.0	12.1	1.25	553.3	133.6	
S23.000	50.00	5.68	3.699	0.104	0.0	0.0	1.4	1.00	39.7	15.5	
S23.001	50.00	5.79	3.459	0.258	0.0	0.0	3.5	2.75	109.4	38.4	
S21.008	50.00	7.75	2.122	1.280	0.0	0.0	17.3	1.22	540.7	190.7	
S24.000	50.00	5.30	3.060	0.000	0.0	0.0	0.0	1.71	67.9	0.0	
S25.000	50.00	5.05	3.250	0.000	0.0	0.0	0.0	3.42	136.1	0.0	
S21.009	50.00	7.93	2.014	1.660	0.0	0.0	22.5	1.13	499.7	247.3	
S21.010	50.00	8.20	1.994	1.660	0.0	0.0	22.5	1.25	552.4	247.3	
S21.011	48.76	8.71	1.778	1.660	0.0	0.0	22.5	1.24	549.1	247.3	
S21.012	44.97	10.21	1.702	1.660	0.0	0.0	22.5	1.62	715.2	247.3	
S1.012	39.87	12.82	1.137	5.342	0.0	0.0	57.7	1.29	690.6	634.5	
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Online Controls for SW1.SWS

Hydro-Brake® Optimum Manhole: S11, DS/PN: S1.010, Volume (m³): 24.7

Unit Reference	MD-SHE-0131-1050-2191-1050
Design Head (m)	2.191
Design Flow (l/s)	10.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	131
Invert Level (m)	1.290
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.191	10.5
Flush-Flo™	0.578	9.9
Kick-Flo®	1.176	7.8
Mean Flow over Head Range	-	8.9

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

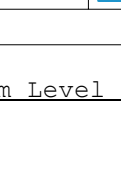
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.7	1.200	7.9	3.000	12.2	7.000	18.2
0.200	8.3	1.400	8.5	3.500	13.1	7.500	18.9
0.300	9.2	1.600	9.1	4.000	14.0	8.000	19.5
0.400	9.6	1.800	9.6	4.500	14.8	8.500	20.0
0.500	9.8	2.000	10.1	5.000	15.5	9.000	20.6
0.600	9.9	2.200	10.5	5.500	16.3	9.500	21.1
0.800	9.7	2.400	11.0	6.000	16.9		
1.000	9.1	2.600	11.4	6.500	17.6		

Hydro-Brake® Optimum Manhole: S77, DS/PN: S21.010, Volume (m³): 10.9

Unit Reference	MD-SHE-0131-1050-2191-1050
Design Head (m)	2.191
Design Flow (l/s)	10.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	131
Invert Level (m)	1.994
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1500

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<u>Hydro-Brake® Optimum Manhole: S77, DS/PN: S21.010, Volume (m³): 10.9</u> <table border="1"> <thead> <tr> <th>Control Points</th> <th>Head (m)</th> <th>Flow (l/s)</th> </tr> </thead> <tbody> <tr> <td>Design Point (Calculated)</td> <td>2.191</td> <td>10.5</td> </tr> <tr> <td>Flush-Flo™</td> <td>0.578</td> <td>9.9</td> </tr> <tr> <td>Kick-Flo®</td> <td>1.176</td> <td>7.8</td> </tr> <tr> <td>Mean Flow over Head Range</td> <td>-</td> <td>8.9</td> </tr> </tbody> </table> The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Flow (l/s)</th> <th>Depth (m)</th> <th>Flow (l/s)</th> <th>Depth (m)</th> <th>Flow (l/s)</th> <th>Depth (m)</th> <th>Flow (l/s)</th> </tr> </thead> <tbody> <tr><td>0.100</td><td>4.7</td><td>1.200</td><td>7.9</td><td>3.000</td><td>12.2</td><td>7.000</td><td>18.2</td></tr> <tr><td>0.200</td><td>8.3</td><td>1.400</td><td>8.5</td><td>3.500</td><td>13.1</td><td>7.500</td><td>18.9</td></tr> <tr><td>0.300</td><td>9.2</td><td>1.600</td><td>9.1</td><td>4.000</td><td>14.0</td><td>8.000</td><td>19.5</td></tr> <tr><td>0.400</td><td>9.6</td><td>1.800</td><td>9.6</td><td>4.500</td><td>14.8</td><td>8.500</td><td>20.0</td></tr> <tr><td>0.500</td><td>9.8</td><td>2.000</td><td>10.1</td><td>5.000</td><td>15.5</td><td>9.000</td><td>20.6</td></tr> <tr><td>0.600</td><td>9.9</td><td>2.200</td><td>10.5</td><td>5.500</td><td>16.3</td><td>9.500</td><td>21.1</td></tr> <tr><td>0.800</td><td>9.7</td><td>2.400</td><td>11.0</td><td>6.000</td><td>16.9</td><td></td><td></td></tr> <tr><td>1.000</td><td>9.1</td><td>2.600</td><td>11.4</td><td>6.500</td><td>17.6</td><td></td><td></td></tr> </tbody> </table>			Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	2.191	10.5	Flush-Flo™	0.578	9.9	Kick-Flo®	1.176	7.8	Mean Flow over Head Range	-	8.9	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	4.7	1.200	7.9	3.000	12.2	7.000	18.2	0.200	8.3	1.400	8.5	3.500	13.1	7.500	18.9	0.300	9.2	1.600	9.1	4.000	14.0	8.000	19.5	0.400	9.6	1.800	9.6	4.500	14.8	8.500	20.0	0.500	9.8	2.000	10.1	5.000	15.5	9.000	20.6	0.600	9.9	2.200	10.5	5.500	16.3	9.500	21.1	0.800	9.7	2.400	11.0	6.000	16.9			1.000	9.1	2.600	11.4	6.500	17.6		
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<u>Storage Structures for SW1.SWS</u> <u>Tank or Pond Manhole: S22, DS/PN: S8.005</u> Invert Level (m) 3.100 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>464.0</td><td>1.000</td><td>785.0</td><td>1.300</td><td>905.0</td></tr></table> <u>Tank or Pond Manhole: S54, DS/PN: S13.006</u> Invert Level (m) 3.100 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>357.0</td><td>1.000</td><td>705.0</td><td>1.300</td><td>822.0</td></tr></table> <u>Tank or Pond Manhole: S10, DS/PN: S1.009</u> Invert Level (m) 3.100 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>472.0</td><td>1.000</td><td>705.0</td><td>1.300</td><td>822.0</td></tr></table> <u>Tank or Pond Manhole: S11, DS/PN: S1.010</u> Invert Level (m) 3.700 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>957.0</td><td>0.400</td><td>1179.0</td></tr></table> <u>Tank or Pond Manhole: S77, DS/PN: S21.010</u> Invert Level (m) 3.100 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>1788.0</td><td>1.000</td><td>2355.0</td><td>1.300</td><td>2459.0</td></tr></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	464.0	1.000	785.0	1.300	905.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	357.0	1.000	705.0	1.300	822.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	472.0	1.000	705.0	1.300	822.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	957.0	0.400	1179.0	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	1788.0	1.000	2355.0	1.300	2459.0
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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for SW1.SWS

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	10.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	5
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.350
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	19.100	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	360 Winter	1	+0%				
S1.001	S2	15 Winter	1	+0%				
S1.002	S3	15 Winter	1	+0%	100/15 Summer			
S2.000	S38	15 Winter	1	+0%	100/15 Summer			
S3.000	S39a	360 Winter	1	+0%				
S2.001	S39	15 Winter	1	+0%	30/30 Summer			
S2.002	S40	15 Winter	1	+0%	30/30 Winter			
S1.003	S4	480 Winter	1	+0%	30/30 Winter			
S1.004	S5	480 Winter	1	+0%	30/30 Summer			
S1.005	S6	480 Winter	1	+0%	1/240 Winter			
S4.000	S34	480 Winter	1	+0%	30/15 Summer			
S5.000	S37	480 Winter	1	+0%	30/15 Summer	100/30 Summer		
S1.006	S7	480 Winter	1	+0%	1/60 Winter			
S6.000	S8a	360 Winter	1	+0%	30/30 Winter			
S1.007	S8	480 Winter	1	+0%	1/60 Summer			
S7.000	S9a	15 Winter	1	+0%	30/30 Summer			
S1.008	S9	480 Winter	1	+0%	1/30 Winter			

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<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS</u>							
PN	US/MH Name	Storm	Return Climate Period Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S8.000	S17	15 Winter	1	+0%	100/600 Winter		
S8.001	S18	480 Winter	1	+0%	1/120 Winter		
S9.000	S32	15 Winter	1	+0%	30/180 Winter		
S8.002	S19	480 Winter	1	+0%	1/60 Summer		
S10.000	S24	480 Winter	1	+0%	1/60 Summer		
S10.001	S25	480 Winter	1	+0%	1/30 Winter		
S10.002	S26	480 Winter	1	+0%	1/30 Summer		
S8.003	S20	480 Winter	1	+0%	1/15 Summer		
S11.000	S27	15 Winter	1	+0%	100/15 Summer		
S12.000	S31	480 Winter	1	+0%	30/15 Summer	100/15 Summer	
S11.001	S28	480 Winter	1	+0%	30/15 Summer		
S8.004	S29	480 Winter	1	+0%	1/15 Summer		
S8.005	S22	480 Winter	1	+0%	1/15 Summer		
S8.006	S36	480 Winter	1	+0%	1/15 Summer		
S8.007	S23	480 Winter	1	+0%	1/15 Summer		
S13.000	S64	15 Winter	1	+0%	100/15 Summer		
S13.001	S65	15 Winter	1	+0%	30/240 Winter		
S14.000	S49a	480 Winter	1	+0%	30/120 Summer		
S15.000	S42	15 Winter	1	+0%			
S16.000	S59	15 Winter	1	+0%	30/15 Summer		
S15.001	S43	15 Winter	1	+0%	30/15 Summer		
S15.002	S44	15 Winter	1	+0%			
S17.000	S46	360 Winter	1	+0%			
S17.001	S47	360 Winter	1	+0%	100/15 Summer		
S17.002	S45a	360 Winter	1	+0%	100/15 Summer		
S15.003	S45	15 Winter	1	+0%	100/15 Summer		
S15.004	S81	15 Winter	1	+0%	30/15 Winter		
S18.000	S55	360 Winter	1	+0%	100/120 Winter		
S15.005	S48	480 Winter	1	+0%	30/15 Summer		
S13.002	S49	480 Winter	1	+0%	1/120 Summer		
S13.003	S50	480 Winter	1	+0%	1/60 Winter		
S19.000	S56b	360 Winter	1	+0%	30/120 Summer		
S20.000	S56a	360 Winter	1	+0%	30/120 Winter		
S19.001	S56	480 Winter	1	+0%	30/30 Winter		
S13.004	S51	480 Winter	1	+0%	1/60 Summer		
S13.005	S52	480 Winter	1	+0%	1/60 Summer		
S13.006	S54	480 Winter	1	+0%	1/30 Winter		
S13.007	S62	480 Winter	1	+0%	1/15 Summer		
S1.009	S10	480 Winter	1	+0%	1/15 Summer		
S1.010	S11	480 Winter	1	+0%	1/15 Summer		
S1.011	S12	1440 Winter	1	+0%			
S21.000	S66	15 Winter	1	+0%	100/15 Summer		
S21.001	S67	15 Winter	1	+0%	100/15 Summer		
S21.002	S68	15 Winter	1	+0%	100/15 Summer		
S22.000	S80	60 Winter	1	+0%	30/15 Summer		
S22.001	S80a	60 Winter	1	+0%	30/15 Summer		
S21.003	S69	180 Winter	1	+0%	1/15 Winter		
S21.004	S70	180 Winter	1	+0%	1/15 Winter		
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The Old School
Old School Road
Hook RG27 9NJ

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File SW1.MDX

Micro Drainage

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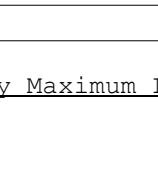
1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)

for SW1.SWS

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S8.000	S17	4.040	-0.157	0.000	0.20		18.4	OK	
S8.001	S18	3.246	0.077	0.000	0.02		2.5	SURCHARGED	
S9.000	S32	3.459	-0.156	0.000	0.20		11.4	OK	
S8.002	S19	3.246	0.236	0.000	0.03		9.7	SURCHARGED	
S10.000	S24	3.249	0.182	0.000	0.07		2.6	SURCHARGED	
S10.001	S25	3.248	0.396	0.000	0.09		2.9	SURCHARGED	
S10.002	S26	3.247	0.446	0.000	0.06		2.3	SURCHARGED	
S8.003	S20	3.246	0.826	0.000	0.02		5.6	SURCHARGED	
S11.000	S27	3.683	-0.213	0.000	0.18		21.5	OK	
S12.000	S31	3.250	-0.150	0.000	0.07		4.5	OK	4
S11.001	S28	3.249	0.000	0.000	0.06		13.2	OK	
S8.004	S29	3.246	0.927	0.000	0.03		14.7	SURCHARGED	
S8.005	S22	3.246	0.976	0.000	0.02		7.1	SURCHARGED	
S8.006	S36	3.248	1.007	0.000	0.03		6.5	SURCHARGED	
S8.007	S23	3.248	1.031	0.000	0.01		5.9	SURCHARGED	
S13.000	S64	3.801	-0.186	0.000	0.30		28.4	OK	
S13.001	S65	3.477	-0.206	0.000	0.21		28.6	OK	
S14.000	S49a	3.247	-0.263	0.000	0.00		0.0	OK	
S15.000	S42	8.936	-0.164	0.000	0.16		18.4	OK	
S16.000	S59	6.512	-0.227	0.000	0.32		33.6	OK	
S15.001	S43	6.432	-0.158	0.000	0.62		65.6	OK	
S15.002	S44	6.195	-0.272	0.000	0.17		65.9	OK	
S17.000	S46	5.095	-0.225	0.000	0.00		0.0	OK	
S17.001	S47	4.076	-0.225	0.000	0.00		0.0	OK	
S17.002	S45a	3.945	-0.225	0.000	0.00		0.0	OK	
S15.003	S45	3.849	-0.238	0.000	0.29		65.9	OK	
S15.004	S81	3.414	-0.226	0.000	0.33		65.5	OK	
S18.000	S55	3.784	-0.225	0.000	0.00		0.0	OK	
S15.005	S48	3.247	-0.138	0.000	0.05		10.1	OK	
S13.002	S49	3.247	0.106	0.000	0.04		13.4	SURCHARGED	
S13.003	S50	3.247	0.147	0.000	0.04		19.2	SURCHARGED	
S19.000	S56b	3.270	-0.225	0.000	0.00		0.0	OK	
S20.000	S56a	3.330	-0.225	0.000	0.00		0.0	OK	
S19.001	S56	3.247	-0.105	0.000	0.00		0.1	OK	
S13.004	S51	3.247	0.219	0.000	0.07		18.8	SURCHARGED	
S13.005	S52	3.247	0.248	0.000	0.04		18.6	SURCHARGED	
S13.006	S54	3.247	0.341	0.000	0.01		15.4	SURCHARGED	
S13.007	S62	3.248	0.789	0.000	0.02		15.3	SURCHARGED	
S1.009	S10	3.248	1.093	0.000	0.06		24.4	SURCHARGED	
S1.010	S11	3.314	1.199	0.000	0.02		9.9	SURCHARGED	
S1.011	S12	1.303	-0.711	0.000	0.02		10.1	OK	
S21.000	S66	6.175	-0.166	0.000	0.15		13.1	OK	
S21.001	S67	5.336	-0.165	0.000	0.16		13.0	OK	
S21.002	S68	5.016	-0.141	0.000	0.29		30.0	OK	
S22.000	S80	3.165	-0.275	0.000	0.14		20.4	OK	
S22.001	S80a	3.156	-0.182	0.000	0.07		20.3	OK	
S21.003	S69	3.153	0.099	0.000	0.09		24.6	SURCHARGED	

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<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for SW1.SWS</u>									
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S21.004	S70	3.152	0.126	0.000	0.10		31.2	SURCHARGED	
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for SW1.SWS

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	10.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	5
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.350
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.100	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	360 Winter	30	+0%				
S1.001	S2	15 Winter	30	+0%				
S1.002	S3	15 Winter	30	+0%	100/15 Summer			
S2.000	S38	120 Winter	30	+0%	100/15 Summer			
S3.000	S39a	360 Winter	30	+0%				
S2.001	S39	120 Winter	30	+0%	30/30 Summer			
S2.002	S40	120 Winter	30	+0%	30/30 Winter			
S1.003	S4	120 Winter	30	+0%	30/30 Winter			
S1.004	S5	120 Winter	30	+0%	30/30 Summer			
S1.005	S6	180 Winter	30	+0%	1/240 Winter			
S4.000	S34	180 Winter	30	+0%	30/15 Summer			
S5.000	S37	180 Winter	30	+0%	30/15 Summer	100/30 Summer		
S1.006	S7	180 Winter	30	+0%	1/60 Winter			
S6.000	S8a	180 Winter	30	+0%	30/30 Winter			
S1.007	S8	180 Winter	30	+0%	1/60 Summer			
S7.000	S9a	180 Winter	30	+0%	30/30 Summer			
S1.008	S9	180 Winter	30	+0%	1/30 Winter			

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<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for SW1.SWS</u>											
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.			
S8.000	S17	15 Winter	30	+0%	100/600 Winter						
S8.001	S18	960 Winter	30	+0%	1/120 Winter						
S9.000	S32	960 Winter	30	+0%	30/180 Winter						
S8.002	S19	960 Winter	30	+0%	1/60 Summer						
S10.000	S24	960 Winter	30	+0%	1/60 Summer						
S10.001	S25	960 Winter	30	+0%	1/30 Winter						
S10.002	S26	960 Winter	30	+0%	1/30 Summer						
S8.003	S20	960 Winter	30	+0%	1/15 Summer						
S11.000	S27	960 Winter	30	+0%	100/15 Summer						
S12.000	S31	960 Winter	30	+0%	30/15 Summer	100/15 Summer					
S11.001	S28	960 Winter	30	+0%	30/15 Summer						
S8.004	S29	960 Winter	30	+0%	1/15 Summer						
S8.005	S22	960 Winter	30	+0%	1/15 Summer						
S8.006	S36	960 Winter	30	+0%	1/15 Summer						
S8.007	S23	960 Winter	30	+0%	1/15 Summer						
S13.000	S64	15 Winter	30	+0%	100/15 Summer						
S13.001	S65	960 Winter	30	+0%	30/240 Winter						
S14.000	S49a	960 Winter	30	+0%	30/120 Summer						
S15.000	S42	15 Winter	30	+0%							
S16.000	S59	15 Winter	30	+0%	30/15 Summer						
S15.001	S43	15 Winter	30	+0%	30/15 Summer						
S15.002	S44	15 Winter	30	+0%							
S17.000	S46	360 Winter	30	+0%							
S17.001	S47	360 Winter	30	+0%	100/15 Summer						
S17.002	S45a	15 Winter	30	+0%	100/15 Summer						
S15.003	S45	15 Winter	30	+0%	100/15 Summer						
S15.004	S81	960 Winter	30	+0%	30/15 Winter						
S18.000	S55	360 Winter	30	+0%	100/120 Winter						
S15.005	S48	960 Winter	30	+0%	30/15 Summer						
S13.002	S49	960 Winter	30	+0%	1/120 Summer						
S13.003	S50	960 Winter	30	+0%	1/60 Winter						
S19.000	S56b	960 Winter	30	+0%	30/120 Summer						
S20.000	S56a	960 Winter	30	+0%	30/120 Winter						
S19.001	S56	960 Winter	30	+0%	30/30 Winter						
S13.004	S51	960 Winter	30	+0%	1/60 Summer						
S13.005	S52	960 Winter	30	+0%	1/60 Summer						
S13.006	S54	960 Winter	30	+0%	1/30 Winter						
S13.007	S62	960 Winter	30	+0%	1/15 Summer						
S1.009	S10	960 Winter	30	+0%	1/15 Summer						
S1.010	S11	960 Winter	30	+0%	1/15 Summer						
S1.011	S12	30 Winter	30	+0%							
S21.000	S66	15 Winter	30	+0%	100/15 Summer						
S21.001	S67	15 Winter	30	+0%	100/15 Summer						
S21.002	S68	15 Winter	30	+0%	100/15 Summer						
S22.000	S80	15 Winter	30	+0%	30/15 Summer						
S22.001	S80a	15 Winter	30	+0%	30/15 Summer						
S21.003	S69	15 Winter	30	+0%	1/15 Winter						
S21.004	S70	15 Winter	30	+0%	1/15 Winter						
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<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for SW1.SWS</u>								
		Water	Surcharged	Flooded			Pipe	
	US/MH	Level	Depth	Volume	Flow /	Overflow	Flow	Level
PN	Name	(m)	(m)	(m³)	Cap.	(l/s)	(l/s)	Exceeded
S21.004	S70	3.387	0.361	0.000	0.81		248.6	SURCHARGED

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

Simulation Criteria

Areal Reduction Factor 1.000

Hot Start (mins) 0

Hot Start Level (mm) 0

Manhole Headloss Coeff (Global) 0.500

Foul Sewage per hectare (l/s) 0.000

Additional Flow - % of Total Flow 10.000

MADD Factor * 10m³/ha Storage 2.000

Inlet Coeffiecient 0.800

Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0

Number of Online Controls 2

Number of Offline Controls 0

Number of Storage Structures 5

Number of Time/Area Diagrams 0

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 19.100 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status OFF

DVD Status ON

Inertia Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080

Return Period(s) (years) 1, 30, 100

Climate Change (%) 0, 0, 40

US/MH

PN

Name

Storm

Return Period

Climate Change

First (X) Surcharge

First (Y) Flood

First (Z) Overflow

Overflow Act.

S1.000

S1

360 Winter

100

+40%

S1.001

S2

15 Winter

100

+40%

S1.002

S3

15 Winter

100

+40%

100/15

Summer

S2.000

S38

15 Summer

100

+40%

100/15

Summer

S3.000

S39a

360 Winter

100

+40%

S2.001

S39

15 Summer

100

+40%

30/30

Summer

S2.002

S40

180 Winter

100

+40%

30/30

Winter

S1.003

S4

180 Winter

100

+40%

30/30

Winter

S1.004

S5

180 Winter

100

+40%

30/30

Summer

S1.005

S6

360 Winter

100

+40%

1/240

Winter

S4.000

S34

360 Winter

100

+40%

30/15

Summer

S5.000

S37

30 Summer

100

+40%

30/15

Summer

100/30

Summer

S1.006

S7

360 Winter

100

+40%

1/60

Winter

S6.000

S8a

360 Winter

100

+40%

30/30

Winter

S1.007

S8

360 Winter

100

+40%

1/60

Summer

S7.000

S9a

360 Winter

100

+40%

30/30

Summer

S1.008

S9

360 Winter

100

+40%

1/30

Winter

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	8.450	-0.225	0.000	0.00	0.0	OK	
S1.001	S2	6.673	-0.104	0.000	0.56	59.7	OK	
S1.002	S3	5.924	0.234	0.000	1.11	115.0	SURCHARGED	
S2.000	S38	4.894	0.854	0.000	0.41	55.6	SURCHARGED	
S3.000	S39a	4.955	-0.225	0.000	0.00	0.0	OK	
S2.001	S39	4.694	0.862	0.000	1.78	157.1	SURCHARGED	
S2.002	S40	4.436	0.625	0.000	0.27	63.3	SURCHARGED	
S1.003	S4	4.428	0.664	0.000	0.21	91.7	SURCHARGED	
S1.004	S5	4.421	0.726	0.000	0.10	101.9	SURCHARGED	
S1.005	S6	4.308	1.080	0.000	0.10	60.8	SURCHARGED	
S4.000	S34	4.318	0.928	0.000	0.20	15.0	FLOOD RISK	
S5.000	S37	4.565	1.195	0.091	1.58	129.1	FLOOD	1
S1.006	S7	4.306	1.181	0.000	0.27	129.8	SURCHARGED	
S6.000	S8a	4.295	0.695	0.000	0.01	0.3	SURCHARGED	
S1.007	S8	4.295	1.297	0.000	0.45	143.0	SURCHARGED	
S7.000	S9a	4.295	0.795	0.000	0.10	14.3	FLOOD RISK	
S1.008	S9	4.287	1.324	0.000	0.11	156.8	FLOOD RISK	

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<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS</u>								
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S8.000	S17	1440 Winter	100	+40%	100/600 Winter			
S8.001	S18	1440 Winter	100	+40%	1/120 Winter			
S9.000	S32	1440 Winter	100	+40%	30/180 Winter			
S8.002	S19	1440 Winter	100	+40%	1/60 Summer			
S10.000	S24	15 Winter	100	+40%	1/60 Summer			
S10.001	S25	1440 Winter	100	+40%	1/30 Winter			
S10.002	S26	1440 Winter	100	+40%	1/30 Summer			
S8.003	S20	1440 Winter	100	+40%	1/15 Summer			
S11.000	S27	15 Winter	100	+40%	100/15 Summer			
S12.000	S31	15 Winter	100	+40%	30/15 Summer	100/15 Summer		
S11.001	S28	15 Winter	100	+40%	30/15 Summer			
S8.004	S29	1440 Winter	100	+40%	1/15 Summer			
S8.005	S22	1440 Winter	100	+40%	1/15 Summer			
S8.006	S36	1440 Winter	100	+40%	1/15 Summer			
S8.007	S23	1440 Winter	100	+40%	1/15 Summer			
S13.000	S64	15 Winter	100	+40%	100/15 Summer			
S13.001	S65	1440 Winter	100	+40%	30/240 Winter			
S14.000	S49a	1440 Winter	100	+40%	30/120 Summer			
S15.000	S42	15 Winter	100	+40%				
S16.000	S59	15 Winter	100	+40%	30/15 Summer			
S15.001	S43	15 Winter	100	+40%	30/15 Summer			
S15.002	S44	15 Winter	100	+40%				
S17.000	S46	360 Winter	100	+40%				
S17.001	S47	15 Winter	100	+40%	100/15 Summer			
S17.002	S45a	15 Winter	100	+40%	100/15 Summer			
S15.003	S45	15 Winter	100	+40%	100/15 Summer			
S15.004	S81	15 Winter	100	+40%	30/15 Winter			
S18.000	S55	1440 Winter	100	+40%	100/120 Winter			
S15.005	S48	1440 Winter	100	+40%	30/15 Summer			
S13.002	S49	1440 Winter	100	+40%	1/120 Summer			
S13.003	S50	1440 Winter	100	+40%	1/60 Winter			
S19.000	S56b	1440 Winter	100	+40%	30/120 Summer			
S20.000	S56a	1440 Winter	100	+40%	30/120 Winter			
S19.001	S56	1440 Winter	100	+40%	30/30 Winter			
S13.004	S51	1440 Winter	100	+40%	1/60 Summer			
S13.005	S52	1440 Winter	100	+40%	1/60 Summer			
S13.006	S54	1440 Winter	100	+40%	1/30 Winter			
S13.007	S62	1440 Winter	100	+40%	1/15 Summer			
S1.009	S10	1440 Winter	100	+40%	1/15 Summer			
S1.010	S11	1440 Winter	100	+40%	1/15 Summer			
S1.011	S12	60 Summer	100	+40%				
S21.000	S66	15 Winter	100	+40%	100/15 Summer			
S21.001	S67	15 Winter	100	+40%	100/15 Summer			
S21.002	S68	15 Winter	100	+40%	100/15 Summer			
S22.000	S80	15 Winter	100	+40%	30/15 Summer			
S22.001	S80a	15 Winter	100	+40%	30/15 Summer			
S21.003	S69	15 Winter	100	+40%	1/15 Winter			
S21.004	S70	15 Winter	100	+40%	1/15 Winter			
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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S21.004	S70	3.806	0.780	0.000	1.52		464.0	SURCHARGED	

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<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for SW1.SWS</u>								
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S21.005	S71	15 Winter	100	+40%	1/15 Winter			
S21.006	S72	15 Winter	100	+40%	1/15 Winter			
S21.007	S73	720 Winter	100	+40%	1/15 Summer			
S23.000	S82	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
S23.001	S83	15 Winter	100	+40%	30/15 Summer			
S21.008	S74	720 Winter	100	+40%	1/15 Summer			
S24.000	S84a	720 Winter	100	+40%	30/120 Winter			
S25.000	S84	720 Winter	100	+40%	100/120 Summer			
S21.009	S76	720 Winter	100	+40%	1/15 Summer			
S21.010	S77	720 Winter	100	+40%	1/15 Summer			
S21.011	S78	10080 Winter	100	+40%				
S21.012	S79	10080 Winter	100	+40%				
S1.012	S13	60 Summer	100	+40%				

**HARBOUR PLACE, FORTY ACRE FARM,
BEDHAMPTON**

OWNERS MANUAL

Relating to Surface Water Drainage Maintenance

The site has been designed in accordance with Sustainable Drainage Systems (SUDS) techniques.

The SUDS Manual (CIRIA C753) states that “Sedimentation is one of the primary removal mechanisms in SUDS. Most pollution in runoff is attached to sediment particles and therefore removal of sediment results in a significant reduction in pollutant loads”.

In order to remove sedimentation the surface water drainage design utilises deep seal trapped gullies throughout, catchpit manholes upstream of the surface water storage/infiltration devices and distribution tanks within the permeable paved areas.

Drawings are attached for the permeable paving, soakaway and filter drains

CONTENTS

- 1) Explanation of the Surface Water Drainage System
- 2) Operating and Maintenance Responsibility
- 3) Maintenance Schedule for solid wall pipes
- 4) Maintenance schedule for filter drains
- 5) Maintenance schedule for swales
- 6) Maintenance schedule for infiltration basins
- 7) Maintenance schedule for grilles
- 8) Reasons for Maintenance

1) Explanation of the Surface Water Drainage System

The Principle of SUDs has been adopted for the whole of the site, calculations have been carried out using MicroDrainage with a storm return period of 100 years, an allowance of 40% for climate change and an allowance of 10% for urban creep.

2) Operating and Maintenance Responsibility

Barratt David Wilson Homes are responsible for maintaining the surface water drainage systems on this site during the construction period. A management company will be set up by Barratt David Wilson (BDW) in the name of 'Harbour Place Management Company Ltd' or similar which during the construction period BDW will act as sole directors. Upon handover and occupation, the maintenance company will be handed over to residents who will take over as Directors. The Management Company will appoint a managing agent who will ensure that the SuDS are operated and maintained as set out in this document. The maintenance and operation will be funded through contributions from the Residents to the maintenance company.

3) Maintenance Schedule for solid wall pipes

Maintenance Schedule	Required Action	Recommended Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance)	Monthly
	Inspect chambers and manholes for evidence of pipes operating correctly and take remedial action if necessary, to include jetting of pipework.	Monthly for 3 months, then annually

4) Maintenance Schedule for Filter drains

Maintenance Schedule	Required Action	Recommended Frequency
Regular maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices	Monthly (or as required).
	Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre-treatment devices	Six monthly or as required
Occasional maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (eg NJUG, 2007 or BS 3998:2010)	As required.
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly, or as required
	Clear perforated pipework of blockages	As required.

5) Maintenance Schedule for swales

Maintenance Schedule	Required Action	Recommended Frequency
Regular maintenance	Remove litter and debris	Monthly (or as required).
	Cut grass – to retain grass height within specified design range	Monthly (during growth season) or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale treatment area
Remedial actions	Repair erosion or other damage by re-turfing or reseedling	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream	As required

	gravel trench, flow spreader or at top of filter strip	
	Remove and dispose of oils or petrol residues using safe standard practices	As required

6) Maintenance Schedule for infiltration Basins

Maintenance Schedule	Required Action	Recommended Frequency
Regular maintenance	Remove litter, debris and trash	Monthly
	Cut grass – for landscaped areas and access routes	Monthly (during growing season) or as required
	Cut grass – meadow grass in and around basin	Half yearly: spring (before nesting season) and autumn
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
Occasional maintenance	Reseed areas of poor vegetation growth	As required or if bare soil is exposed over 10% or more of the swale treatment area
	Prune and trim trees and remove cuttings	As required
	Remove sediment from pre-treatment system when 50% full	As required
Remedial actions	Repair erosion or other damage by re-turfing or reseeding	As required
	Realign the rip-rap	As required
	Repair or rehabilitate inlets, outlets and overflows	As required
	Rehabilitate infiltration surface using scarifying and spiking techniques if performance deteriorates	As required
	Relevel uneven surfaces and reinstate design levels	As required

Monitoring	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and pre-treatment systems for silt accumulation; establish appropriate silt removal frequencies	Half yearly
	Inspect infiltration surfaces for compaction and ponding	Monthly

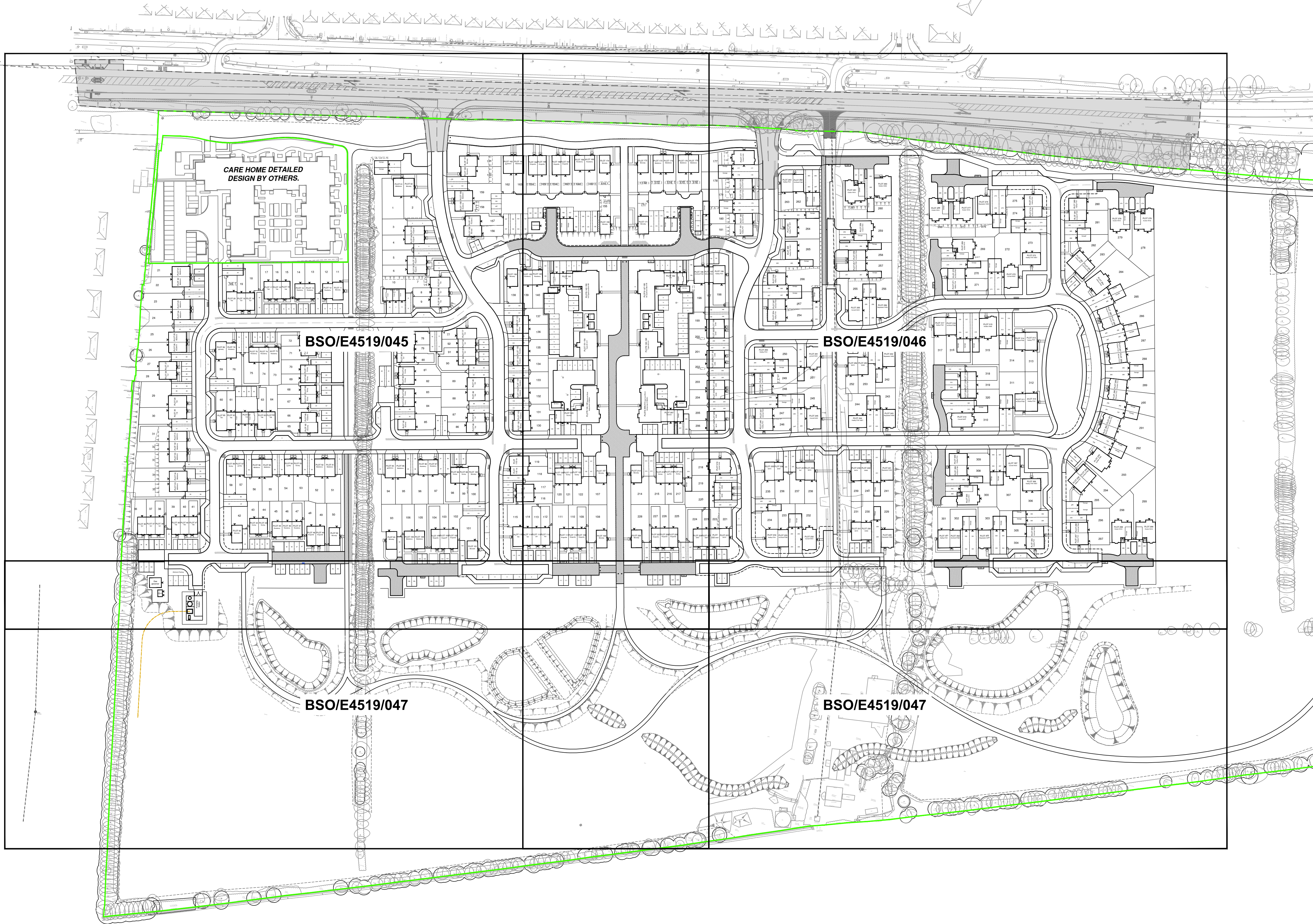
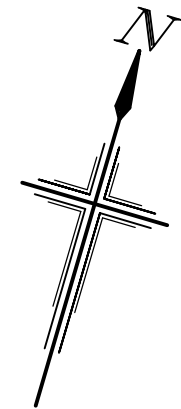
7) Maintenance Schedule for grilles

Maintenance Schedule	Required Action	Recommended Frequency
Regular maintenance	Litter and debris removal	Monthly (or as required).
Occasional maintenance	Check moving parts and locks. Oil and ensure free moving. Replace when necessary.	Six monthly
Remedial actions	Remove build-up of sediment.	As required.
Monitoring	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	

8) Reasons for Maintenance

Surface water contains variable amounts of sediment which settles out at certain locations and could cause blockages if left.

Road gullies also trap oil and prevent it entering the surface water sewer system.



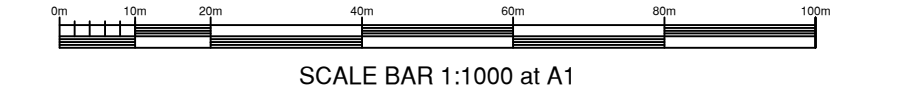
- NOTES**
1. All dimensions are in metres unless stated otherwise.
 2. Do not scale from this drawing. Only written dimensions are to be used.
 3. This drawing should be read in conjunction with the Architect's and Structural Engineer's design drawings and specification.
 4. All adoptable drainage works to be in accordance with Sewers for Adoption 6th Edition and interim addendum and specific requirements of Icoso Water.
 5. Site layout shown in this drawing is based on ID Partnership Proposed Site Layout Plan, drawing number PL-06 revision U, issued to RCP in .dwg format on 19/09/2019. Substations based on SSE Standard Substation Enclosures, drawing number MP/32/1644 revision A, as provided by Client on 10/01/2019.
 6. Architectural blocks based on RCP Block Foundation Layouts, drawing numbers 4519/A/FOUND/01 to 31 as current on the 27th September 2019. Substations based on SSE Standard Substation Enclosures, drawing number MP/32/1644 revision A, as provided by Client on 10/01/2019.
 7. Topographical Survey as per Siteline Site Survey, drawing number 36FA01, dated August 2016.
 8. Public Open Space areas as per TCL group drawing received 05/02/2020.
 9. This drawing should be read in conjunction with Section 104 Keyplan (DSM-E4593-400), Section 104 Drainage Construction Details (DSM-E4593-471 & 472).
 10. **ANY VARIANCE OR DISCREPANCY MUST BE REPORTED BACK TO RCP ENGINEERING BEFORE WORK BEGINS.**

Section 104 Key
Approximate Site Boundary

Any proposed works within Root Protection Areas are subject to supervision and approval by the Arboriculturist.
Any proposed works within Badger Exclusion zones are subject to supervision and approval by the Ecologist.

CDM NOTES

1. **EXISTING SERVICES.** Depth of existing services must be determined prior to works commencing. The contractor is responsible for establishing underground services in accordance with HSE Guidance note HS (G) 47. Any services which would be within the proposed construction layers must be lowered to below the sub-base.



Rev.	Date	Details	By	Chkd	Appd
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Client:-

BARRATT HOMES

DAVID WILSON HOMES
WHERE QUALITY LIVES

Site:- Harbour Place, Forty Acre Farm, Bedhampton	Drawing Title:- Drainage Management Plan KEYPLAN: SHEET 1 OF 4
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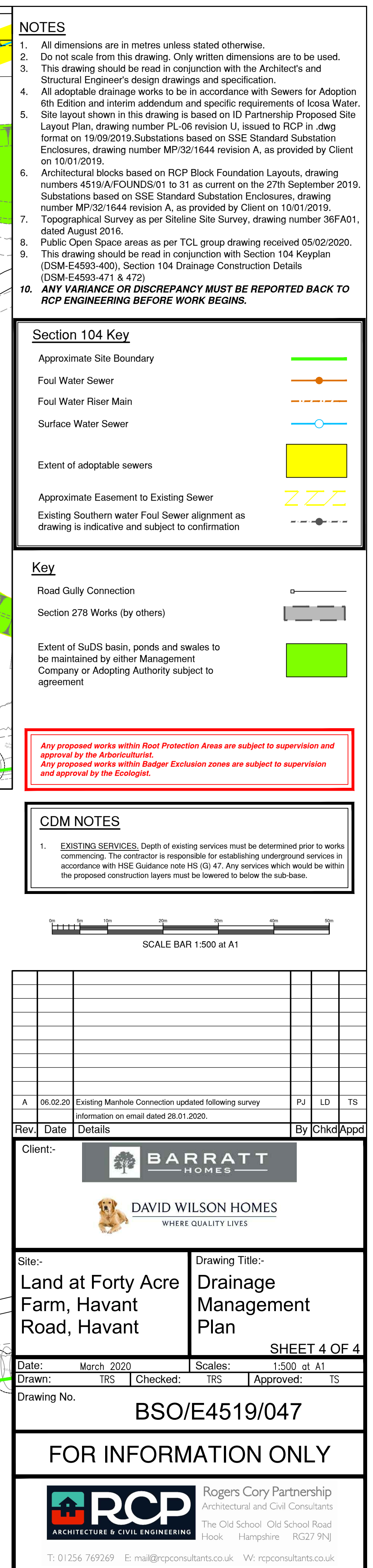
Date:	March 2020	Scales:	1:1000 at A1
Drawn:	TRS	Checked:	TRS
Approved:	TRS		

Drawing No. **BSO/E4519/044**

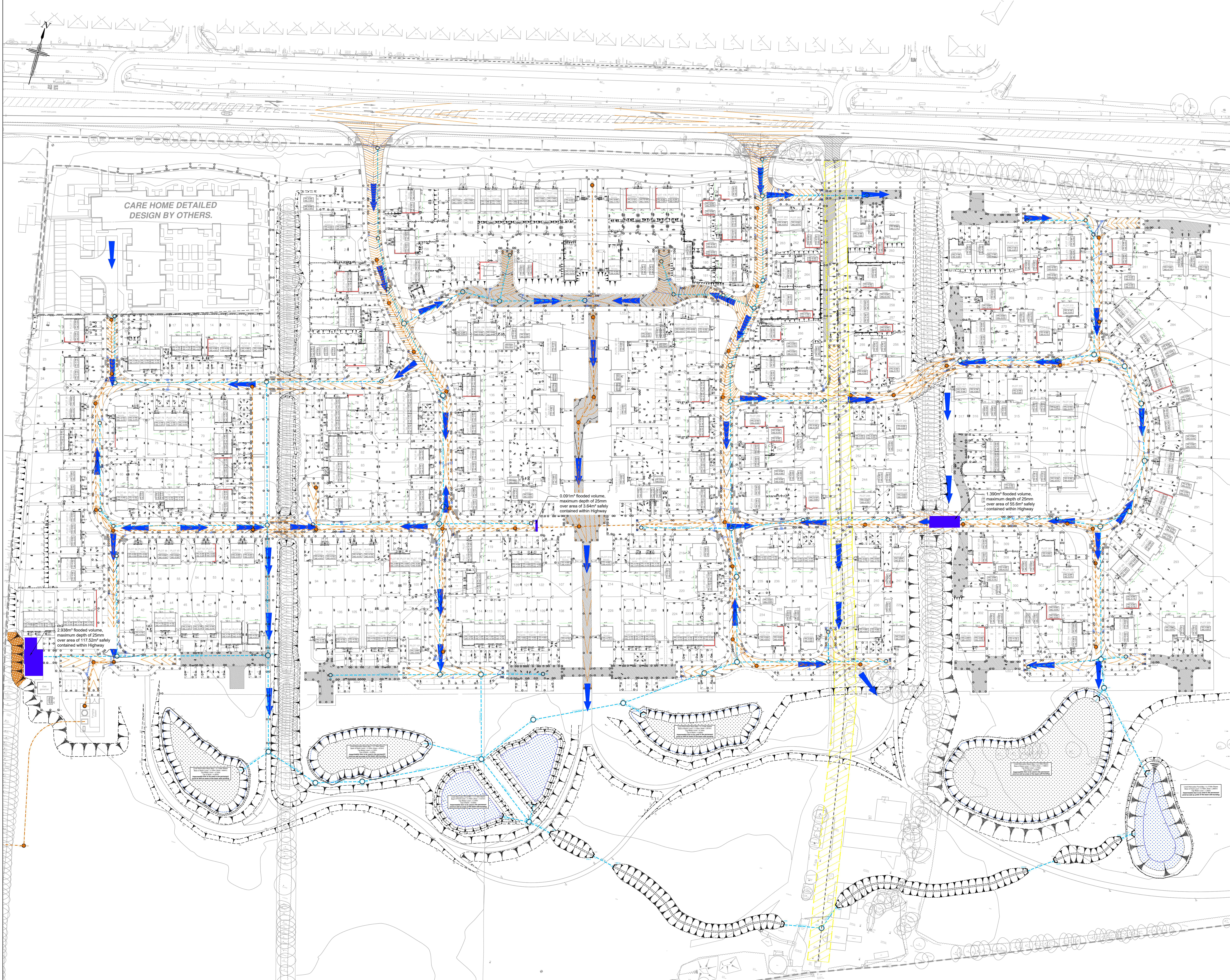
FOR INFORMATION ONLY

RCP
ARCHITECTURE & CIVIL ENGINEERING

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<u>NOTES</u>							
1. All dimensions are in metres unless stated otherwise. 2. Do not scale from this drawing. Only written dimensions are to be used. 3. This drawing should be read in conjunction with the Architect's and Structural Engineer's design drawings and specification. 4. All adoptable drainage works to be in accordance with Sewers for Adoption 6th Edition and interim addendum and specific requirements of Icosa Water. 5. Site layout shown in this drawing is based on ID Partnership Proposed Site Layout Plan, drawing number PL-06 revision U, issued to RCP in .dwg format on 19/09/2019.Substations based on SSE Standard Substation Enclosures, drawing number MP/32/1644 revision A, as provided by Client on 10/01/2019. 6. Architectural blocks based on RCP Block Foundation Layouts, drawing numbers 4519/A/FOUND/01 to 31 as current on the 27th September 2019. Substations based on SSE Standard Substation Enclosures, drawing number MP/32/1644 revision A, as provided by Client on 10/01/2019. 7. Topographical Survey as per Siteline Site Survey, drawing number 36FA01, dated August 2016. 8. Public Open Space areas as per TCL group drawing received 05/02/2020. 9. This drawing should be read in conjunction with Section 104 Keyplan (DSM-E4593-400), Section 104 Drainage Construction Details (DSM-E4593-471 & 472) 10. ANY VARIANCE OR DISCREPANCY MUST BE REPORTED BACK TO RCP ENGINEERING BEFORE WORK BEGINS.							
<u>Section 104 Key</u>							
Approximate Site Boundary							
Foul Water Sewer							
Foul Water Riser Main							
Surface Water Sewer							
Extent of adoptable sewers							
Approximate Easement to Existing Sewer							
Existing Southern water Foul Sewer alignment as drawing is indicative and subject to confirmation							
<u>Key</u>							
Road Gully Connection							
Section 278 Works (by others)							
Extent of SuDs basin, ponds and swales to be maintained by either Management Company or Adopting Authority subject to agreement							
Any proposed works within Root Protection Areas are subject to supervision and approval by the Arboriculturist. Any proposed works within Badger Exclusion zones are subject to supervision and approval by the Ecologist.							
<u>CDM NOTES</u>							
1. EXISTING SERVICES. Depth of existing services must be determined prior to works commencing. The contractor is responsible for establishing underground services in accordance with HSE Guidance note HS (G) 47. Any services which would be within the proposed construction layers must be lowered to below the sub-base.							
SCALE BAR 1:500 at A1							
A	06.02.20	Existing Manhole Connection updated following survey information on email dated 28.01.2020.			PJ	LD	TS
Rev./	Date	Details			By	Chkd	Appd
Client:-							
 DAVID WILSON HOMES WHERE QUALITY LIVES							
Site:-				Drawing Title:-			
Land at Forty Acre Farm, Havant Road, Havant				Drainage Management Plan			
SHEET 4 OF 4							
Date: March 2020				Scales: 1:500 at A1			
Drawn: TRS		Checked: TRS		Approved: TS			
Drawing No. BSO/E4519/047							
FOR INFORMATION ONLY							
				Rogers Cory Partnership Architectural and Civil Consultants The Old School / Old School Road Hook Hampshire RG27 9NJ			
T: 01256 767269 E: mail@rcpcconsultants.co.uk W: rcpcconsultants.co.uk							



NOTES

1. All dimensions are in metres unless stated otherwise.
2. Do not scale from this drawing. Only written dimensions are to be used.
3. Site layout based on ID Partnership Proposed Site Layout Plan, drawing number PL04 Revision U issued to RCP in .dwg format on 19/09/2019.
4. Topographic Survey as per Stiline survey drawing number 36FA01 dated August 2016.

KEY

Exceedance Flow Route

Primary Road Contour

Secondary Road Contour

Flooded Volumes

70.000

69.950

Any proposed works within Flood Protection Areas are subject to supervision and approval by the Arboriculturalist.

SCALE BAR 1:500 at A0

H	11.03.20	Updated with flood volumes and depths	TRS	TRS	TRS
G	10.01.20	Revised to latest site layout.	FJ	LD	TRS
F	10.05.19	Revised to latest site layout.	RM	TRS	TRS
E	08.05.19	Revised to latest site layout.	NW	AC	TRS
D	13.02.19	Revised to latest site layout.	TRS	TRS	TRS
C	09.01.19	Revised to latest site layout.	NW	AC	TRS
B	17.10.18	Revised to suit latest site layout.	NW	AC	TRS
A	00.04.18	Planning head removed from opposite Photo 278 & 279.	AC	AC	TRS
Rev	Date	Details	By	Chkd	Appd

Client:-

BARRATT HOMES

DAVID WILSON HOMES
WHERE QUALITY LIVES

Site:-

Land at Forty Acre Farm, Havant Road, Havant

Drawing Title:-

EXCEEDANCE FLOW LAYOUT

Date:-

April 2018

Drawn:-

WJ

Checked:-

AC

Approved:-

TRS

Scales:-

1:500 at A0

Drawing No.

BSO/E4519/017 G

INITIAL TENDER ISSUE

SUBJECT TO ADOPTING AUTHORITY APPROVAL

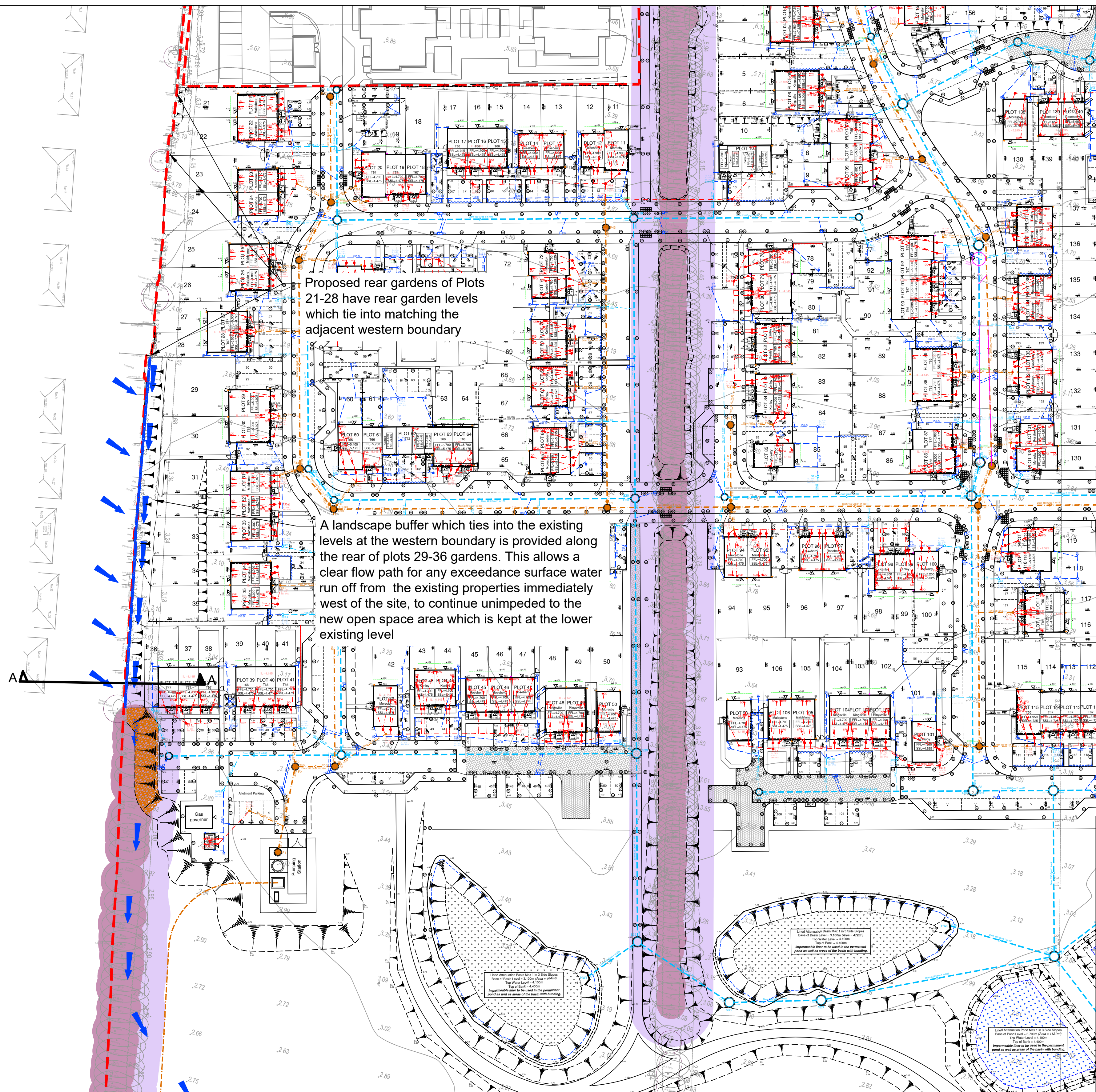
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A landscape buffer which ties into the existing levels at the western boundary is provided along the rear of plots 29-36 gardens. This allows a clear flow path for any exceedance surface water run off from the existing properties immediately west of the site, to continue unimpeded to the new open space area which is kept at the lower existing level

1. All dimensions are in metres unless stated otherwise.
2. Do not scale from this drawing. Only written dimensions are to be used.
3. This drawing should be read in conjunction with the Architect's and Structural Engineer's design drawings and specification and External Works Layouts.
4. Site layout based on ID Partnership Proposed Site Layout Plan, drawing number PL04 Revision Q, issued to RCP in .dwg format on 02/05/2019.
5. Topographic Survey as per Stiteline survey drawing number 36FA01 dated August 2016.
6. The proposed finished levels are indicative only and subject to further design development. The finished floor levels may vary by 300mm from what is currently proposed.
7. Retaining walls and CGB's are subject to further design development.

Primary Road Contour	70.000
Secondary Road Contour	69.950
Proposed Finished Floor Level and Structural Slab Level	PLCS 001 SLCS 001
Existing Levels	3.30
Indicative Retaining Wall	
Indicative Concrete Gravel Board	
Approximate Potential Surface Water Flood Risk Area	
Root Protection Area	
Exceedance Flow Route	
Granular French Drain	

[illegible]

Rev.	Date	Details	By	Chkd	Appo
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The logo for Barratt Homes is displayed. It consists of a square icon containing a stylized tree, followed by the text 'BARRATT' in a large, bold, sans-serif font, and 'HOMES' in a smaller, all-caps, sans-serif font below it, separated by horizontal lines.

Site:- Land at Forty Acre Farm, Havant Road, Havant	Drawing Title:- Western Edge Flow Routes
--	--

Date: August		Scales: 1:500@A1	
Drawn: TRS	Checked: TRS	Approved: TRS	

Drawing No. _____

Drawing No. **BSO/E4519/041D**

PRELIMINARY



T: 01256 769269 E: mail@rcpcconsultants.co.uk W: rcpcconsultants.co.uk

Section A-A

Existing House

24.181

4.163

Landscape buffer Zone

2.895

Pot 36 Garden

Pot 36 Path

Pot 36 Building

Pot Garden Fence

4.40m AOD

4.55m AOD

4.55m AOD

Site Boundary

Greater French Drain

Existing GL 3.13m AOD