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Technical Note: 001
Date: 30th April 2021
Site: Mortimer Street Batley Residential
Reference:2020/2706

Surface Water Drainage Design

Existing Runoff

The existing site is generally vegetation and covers a total area of 780m². There are areas of compact stone which form a driveway from Mortimer Street into the site. The site slopes severely (approx. 5m) from Mortimer Street north east. The area proposed for the development doesn't include any roofed or paved areas with formalised drainage.

There are no open or culverted watercourses which are close or accessible from the site. Abbeydale BEC Ltd prepared a site investigation report dated June 2019 which concluded that due to the steep slopes the site is not considered to be suitable for infiltration drainage.

The Yorkshire Water sewer plan shows that there is a combined sewer located at the head of Mortimer Street in line with the site entrance. The Yorkshire Water sewer plan is provided at Appendix A.

Adopting a rate of 5l/s/ha estimates a restricted discharge of 0.39l/s. It is considered impractical to reduce to less than 1l/s. As such, the peak discharge from the site into the sewer is restricted to 1l/s.

Proposed Drainage Strategy

The drainage strategy incorporates a single crate tank discharging via a new pumped rising main into the existing combined sewer which terminates adjacent to the site entrance.

A tank with an area of 20m² and depth of 800mm has been recommended for the development.

The proposed drainage layout is provided at Appendix B.

An assessment of the required balance volume for a paved area has been made using the estimated post development impermeable area of 400m² (0.04 hectares). Using WinDes Source Control software developed by Microdrainage the required soakaway sizing has been calculated for the 1 in 100 year plus climate change (40%) event.

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Reference should be made to Appendix C where the calculation sheets are provided. It is estimated that a crate tank 5m wide by 4m long and 0.8m deep will be required. The drainage strategy drawing provided at Appendix B shows the location of the crate tank.

Adoption & Maintenance

The piped drainage and crate tank system within the site will be the responsibility of the owner of the site. This will also include the pipes and manholes.

Foul Water Drainage Design

Existing Runoff

The Yorkshire Water sewer plan shows that there is a combined sewer located at the head of Mortimer Street in line with the site entrance. The Yorkshire Water sewer plan is provided at Appendix A.

Proposed Foul Drainage

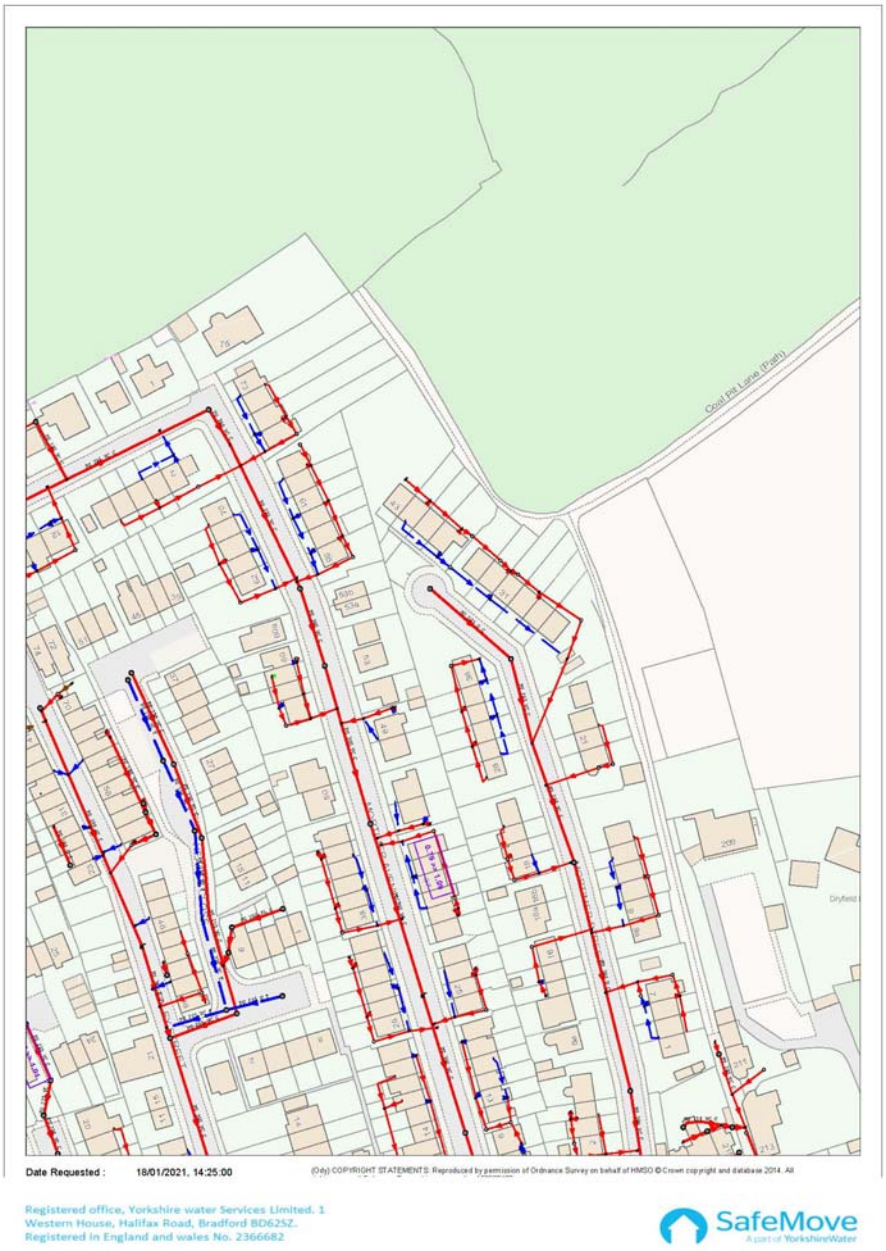
It is proposed that a private foul pumping station discharging via a new pumped rising main into the existing combined sewer which terminates adjacent to the site entrance is provided as shown on the drainage drawing at Appendix B.

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APPENDIX A – Sewer Plan and Information

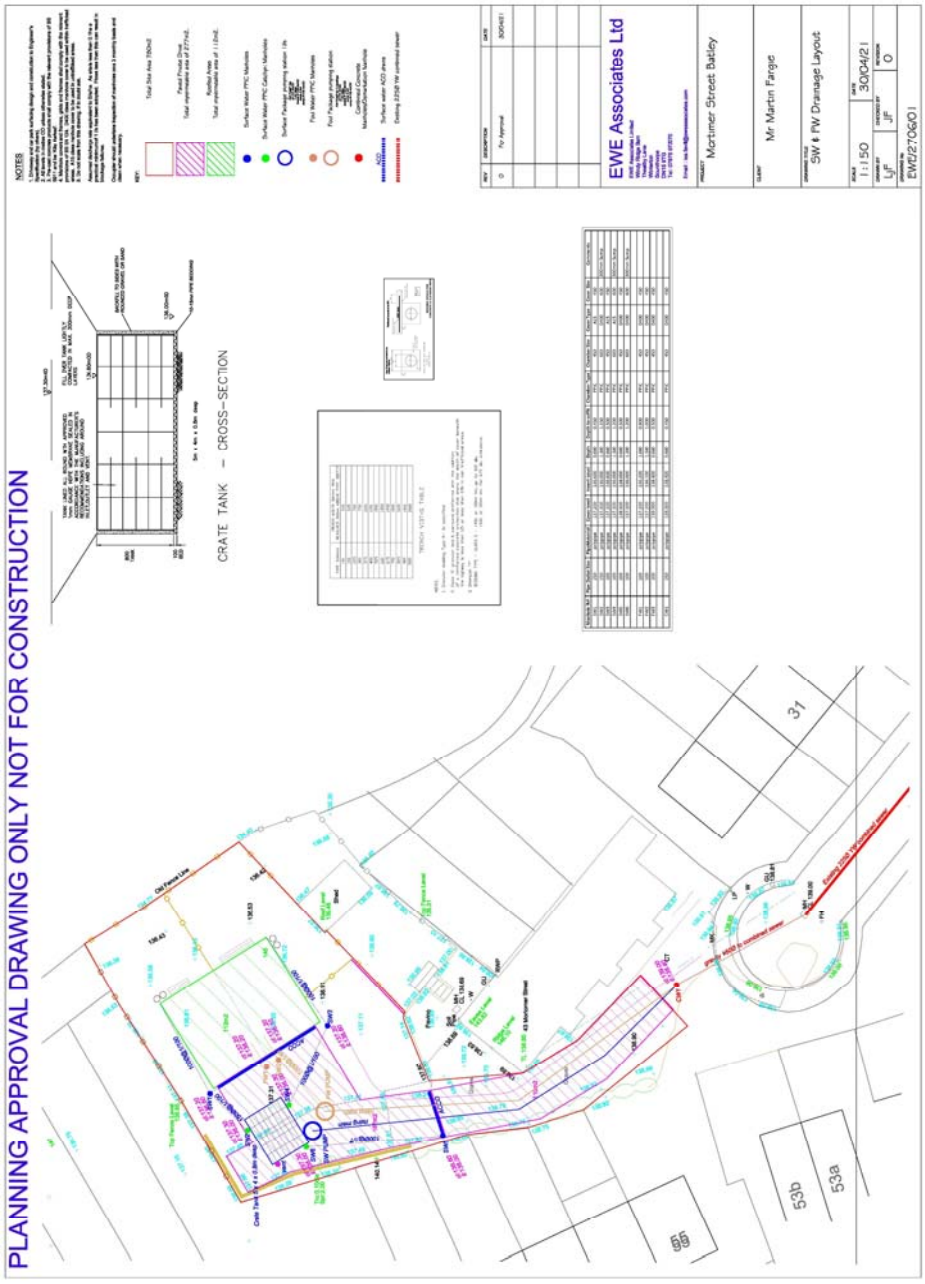


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APPENDIX B – Drainage Drawing



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APPENDIX C – WINDES 100yr+CC40% Calculations

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Windy Ridge Barn Thealby Lane Winterton DN15 9TG		Micro Drainage
Date 05/02/2021 11:03	Designed By Windows7	
File 100yr+CC40% tank ...	Checked By	
Micro Drainage	Source Control W.12.4	

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	136.515	0.615	1.0	12.3	O K
30 min Summer	136.590	0.690	1.0	13.8	O K
60 min Summer	136.648	0.748	1.0	15.0	O K
120 min Summer	136.661	0.761	1.0	15.2	O K
180 min Summer	136.646	0.746	1.0	14.9	O K
240 min Summer	136.626	0.726	1.0	14.5	O K
360 min Summer	136.580	0.680	1.0	13.6	O K
480 min Summer	136.532	0.632	1.0	12.6	O K
600 min Summer	136.483	0.583	1.0	11.7	O K
720 min Summer	136.438	0.538	1.0	10.8	O K
960 min Summer	136.379	0.479	1.0	9.6	O K
1440 min Summer	136.273	0.373	1.0	7.5	O K
2160 min Summer	136.157	0.257	1.0	5.1	O K
2880 min Summer	136.098	0.198	1.0	4.0	O K
4320 min Summer	136.048	0.148	0.7	3.0	O K
5760 min Summer	136.019	0.119	0.6	2.4	O K
7200 min Summer	136.001	0.101	0.5	2.0	O K
8640 min Summer	135.987	0.087	0.4	1.7	O K
10080 min Summer	135.977	0.077	0.4	1.5	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	173.889	18
30 min Summer	101.197	33
60 min Summer	58.893	62
120 min Summer	34.273	114
180 min Summer	24.971	142
240 min Summer	19.946	174
360 min Summer	14.532	242
480 min Summer	11.608	310
600 min Summer	9.751	376
720 min Summer	8.457	442
960 min Summer	6.964	570
1440 min Summer	5.297	820
2160 min Summer	4.029	1164
2880 min Summer	3.318	1496
4320 min Summer	2.378	2204
5760 min Summer	1.878	2936
7200 min Summer	1.564	3672
8640 min Summer	1.346	4400
10080 min Summer	1.186	5136

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Micro Drainage	Source Control W.12.4	

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Winter	136.592	0.692	1.0	13.8	O K
30 min Winter	136.680	0.780	1.0	15.6	O K
60 min Winter	136.761	0.861	1.0	17.0	O K
120 min Winter	136.811	0.911	1.0	17.6	O K
180 min Winter	136.770	0.870	1.0	17.2	O K
240 min Winter	136.733	0.833	1.0	16.6	O K
360 min Winter	136.664	0.764	1.0	15.3	O K
480 min Winter	136.590	0.690	1.0	13.8	O K
600 min Winter	136.515	0.615	1.0	12.3	O K
720 min Winter	136.444	0.544	1.0	10.9	O K
960 min Winter	136.347	0.447	1.0	8.9	O K
1440 min Winter	136.184	0.284	1.0	5.7	O K
2160 min Winter	136.084	0.184	0.9	3.7	O K
2880 min Winter	136.053	0.153	0.8	3.1	O K
4320 min Winter	136.011	0.111	0.6	2.2	O K
5760 min Winter	135.988	0.088	0.4	1.8	O K
7200 min Winter	135.974	0.074	0.4	1.5	O K
8640 min Winter	135.963	0.063	0.3	1.3	O K
10080 min Winter	135.956	0.056	0.3	1.1	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Winter	173.889	18
30 min Winter	101.197	32
60 min Winter	58.893	60
120 min Winter	34.273	116
180 min Winter	24.971	166
240 min Winter	19.946	188
360 min Winter	14.532	264
480 min Winter	11.608	338
600 min Winter	9.751	408
720 min Winter	8.457	476
960 min Winter	6.964	606
1440 min Winter	5.297	838
2160 min Winter	4.029	1144
2880 min Winter	3.318	1500
4320 min Winter	2.378	2208
5760 min Winter	1.878	2936
7200 min Winter	1.564	3672
8640 min Winter	1.346	4408
10080 min Winter	1.186	5144

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
Site Location	423250 424850 SE 23250 24850
C (1km)	-0.025
D1 (1km)	0.334
D2 (1km)	0.440
D3 (1km)	0.294
E (1km)	0.302
F (1km)	2.350
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time / Area Diagram

Total Area (ha) 0.040

Time (mins)	Area (ha)
0-4	0.040

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Date 05/02/2021 11:03 File 100yr+CC40% tank ...	Designed By Windows7 Checked By	
Micro Drainage	Source Control W.12.4	

Model Details

Storage is Online Cover Level (m) 137.300

Tank or Pond Structure

Invert Level (m) 135.900

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	20.0	1.400	0.0	2.800	0.0	4.200	0.0
0.200	20.0	1.600	0.0	3.000	0.0	4.400	0.0
0.400	20.0	1.800	0.0	3.200	0.0	4.600	0.0
0.600	20.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	20.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	0.0	2.400	0.0	3.800	0.0		
1.200	0.0	2.600	0.0	4.000	0.0		

Pump Outflow Control

Invert Level (m) 135.900

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.200	1.0000	1.800	1.0000	3.400	1.0000	5.000	1.0000
0.400	1.0000	2.000	1.0000	3.600	1.0000	5.200	1.0000
0.600	1.0000	2.200	1.0000	3.800	1.0000	5.400	1.0000
0.800	1.0000	2.400	1.0000	4.000	1.0000	5.600	1.0000
1.000	1.0000	2.600	1.0000	4.200	1.0000	5.800	1.0000
1.200	1.0000	2.800	1.0000	4.400	1.0000	6.000	1.0000
1.400	1.0000	3.000	1.0000	4.600	1.0000		
1.600	1.0000	3.200	1.0000	4.800	1.0000		

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