

Technical Note: 001

Date: 22nd January 2020

Site: Station Road Darton near Barnsley

Reference: 2019/2533

Site off Station Road, Darton – Residential Development
Surface Water Onsite Runoff

Existing Runoff from the Site

The total site area affected by this development has been estimated at approximately 2872m² (0.287 ha). The existing site is currently combination of unused area and existing roofed buildings. The roofed area has been estimated at 548m² (0.055 hectares). The unused area has been estimated at 2324m² as shown on the plan at Appendix A.

There are no open or culverted watercourses close to the development site.

Due to the presence of the railway adjacent to the site it is assumed that soakaways would not be acceptable due to the potential for horizontal flows to flood the railway.

There is a 225mm diameter combined sewer located within Station Road to the south west of the site. The sewer is approximately 1.5m deep.

The Yorkshire Water sewer plan is provided at Appendix B.

Discharge to Yorkshire Water combined sewer

The existing development site consists of 0.055 hectares of roofed and paved area. The site appears to drain to the Yorkshire Water combined sewer.

Table 1: Modified Rational flows from existing site 0.055 hectares

Return Period	Flow in litres per second (l/s)
1 in 1 year	7.76
1 in 30 year	19.86
1 in 100 year	32.99

The Modified Rational Method has been used to calculate the existing peak runoff from the site for various storms. The calculation sheet is provided at Appendix C of this report.

Generally, Yorkshire Water would stipulate the discharge is restricted to 1 year rate minus 30% which is approximately 5.4l/s.

There is a further 2324m² (0.233 hectares) of unused land which is assumed to be greenfield runoff rate. Qbar has been estimated at 0.9l/s using ICPSUDs method. The calculation is provided at Appendix C. Therefore, the total discharge from the site has been estimated at 6.3l/s (5.4 + 0.9).

Any discharge from the site into the sewer will require the consent of the appropriate water authority/riparian owner, as such, they will also need to be approached to agree the discharge restriction from the site.

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Therefore, for this assessment the peak discharge rate from the site has been restricted to 6.3l/s.

Attenuation requirements

The proposal will increase the impermeable area to 1309m² (0.131 hectares). The site is split into two areas. The smaller has an impermeable area of 461m² and the larger has an impermeable area of 848m².

The proposal is to have private driveways and access courts. Subsequently, an attenuation tank will be located in the parking area of each of the two areas. A control structure will also be provided in each area. The driveways will be constructed from under drained permeable paving to provide treatment to runoff.

Using WinDes Source Control software developed by Microdrainage the required attenuation has been calculated for the 1 in 100 year plus climate change (40%) event.

Reference should be made to Appendix E and Appendix F where the calculation sheets are provided. The attenuation size has been tabulated below in Table 2. It is estimated that during the 1 in 100 year plus climate change (40%) event that 54.2m³ of storage will be required. This will be provided within two 0.8m deep crate tank located in the parking areas prior to discharging into the Yorkshire Water sewer. The drainage strategy drawing provided at Appendix D shows the initial drainage strategy for the site.

Table 2: WinDes 1 in 100 year+CC40% Storage

Drainage Area	Area (m²)	Required Attenuation	Approx Volume (m³)
Smaller Site	461	21m ² x 800mm deep tank	18.9
Larger Site	848	40m ² x 800mm deep tank	35.3

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Attachment A – Existing Impermeable Areas



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Attachment C – Runoff Calculations

Modified Rational Method			Return Period		Flood		1		years		
			Post Development		Rainfall		2		years		
Length (m)	34	m	Rainfall Duration (hours)	Rainfall Duration (days)	Rainfall Depth (mm)	Effective Depth (mm)	Rainfall Intensity (mm/hr)	FLOW (l/s)	FLOW (l/s)	FLOW (l/s)	FLOW (l/s)
Area (ha)	0.055	ha	0.15	0.006	7.5	1.6	50.0	7.8	141.0		
Max Height	63.0	m	0.25	0.010	8.22	8.3	32.9	5.1	92.7		
Min Height	62.0	m	0.5	0.021	10.52	10.7	21.0	3.3	59.3		
Delta H	1.0	m	0.75	0.031	12.13	12.3	16.2	2.5	45.6		
Slope (1/k)	2.94	m	1	0.042	13.42	13.6	13.4	2.1	37.9		
Te (mins)	8.95	mins	1.25	0.052	14.51	14.7	11.6	1.6	32.7		
ARF	0.999		1.5	0.063	15.46	15.7	10.3	1.6	29.1		
SAAR	779.000	mm	1.75	0.073	16.31	16.5	9.3	1.4	25.3		
UCWI	75	mm	2	0.083	17.09	17.3	8.5	1.3	24.1		
PMP	100.0	%	2.25	0.094	17.8	18.1	7.9	1.2	22.3		
SOIL	0.40		2.5	0.104	18.46	18.7	7.4	1.1	20.8		
Percentage Runoff PR	78.05		2.75	0.115	19.08	19.4	6.9	1.1	19.6		
DEEPSTOR	0.42		3	0.125	19.67	20.0	6.6	1.0	18.5		
Cv	0.7805		3.25	0.135	20.22	20.5	6.2	1.0	17.5		
Cr	1.3		3.5	0.146	20.74	21.0	5.9	0.9	16.7		
10 year	7.75	l/s	3.75	0.156	21.24	21.6	5.7	0.9	16.0		
15 year	19.35	l/s	4	0.167	21.72	22.0	5.4	0.8	15.3		
			4.25	0.177	22.18	22.5	5.2	0.8	14.7		
Modified Rational Method			Return Period		Flood		30		years		
			Post Development		Rainfall		60		years		
Length (m)	34	m	Rainfall Duration (hours)	Rainfall Duration (days)	Rainfall Depth (mm)	Effective Depth (mm)	Rainfall Intensity (mm/hr)	FLOW (l/s)	FLOW (l/s)	FLOW (l/s)	FLOW (l/s)
Area (ha)	0.055	ha	0.15	0.006	19.2	21.2	126.0	10.0	261.1		
Max Height	63.0	m	0.25	0.010	25.8	27.2	107.2	15.6	322.4		
Min Height	62.0	m	0.5	0.021	32.34	32.8	64.7	10.0	182.4		
Delta H	1.0	m	0.75	0.031	36.04	36.6	48.1	7.5	135.5		
Slope (1/k)	2.94	m	1	0.042	38.9	39.5	38.9	6.0	109.7		
Te (mins)	8.95	mins	1.25	0.052	41.27	41.9	33.0	5.1	93.1		
ARF	0.999		1.5	0.063	43.3	43.9	28.9	4.5	87.4		
SAAR	779.000	mm	1.75	0.073	45.09	45.8	25.8	4.0	72.7		
UCWI	75	mm	2	0.083	46.7	47.4	23.4	3.6	65.9		
PMP	100.0	%	2.25	0.094	48.17	48.9	21.4	3.3	60.4		
SOIL	0.40		2.5	0.104	49.51	50.2	19.8	3.1	55.9		
Percentage Runoff PR	78.05		2.75	0.115	50.76	51.5	18.5	2.9	52.1		
DEEPSTOR	0.42		3	0.125	51.93	52.7	17.3	2.7	48.6		
Cv	0.7805		3.25	0.135	53.03	53.8	16.3	2.5	46.0		
Cr	1.3		3.5	0.146	54.06	54.9	15.4	2.4	43.6		
10 year	19.35	l/s	3.75	0.156	55.04	55.8	14.7	2.3	41.4		
15 year	32.29	l/s	4	0.167	55.97	56.8	14.0	2.2	39.5		
			4.25	0.177	56.86	57.7	13.4	2.1	37.7		
Modified Rational Method			Return Period		Flood		100		years		
			Post Development		Rainfall		140		years		
Length (m)	34	m	Rainfall Duration (hours)	Rainfall Duration (days)	Rainfall Depth (mm)	Effective Depth (mm)	Rainfall Intensity (mm/hr)	FLOW (l/s)	FLOW (l/s)	FLOW (l/s)	FLOW (l/s)
Area (ha)	0.055	ha	0.15	0.006	31.9	32.4	212.7	33.0	569.9		
Max Height	63.0	m	0.25	0.010	37.9	38.5	151.6	23.5	427.6		
Min Height	62.0	m	0.5	0.021	44.94	45.6	89.9	13.9	252.5		
Delta H	1.0	m	0.75	0.031	48.58	49.3	66.1	10.3	189.5		
Slope (1/k)	2.94	m	1	0.042	53.14	53.9	53.1	8.2	149.9		
Te (mins)	8.95	mins	1.25	0.052	56.06	56.9	44.8	7.0	126.5		
ARF	0.999		1.5	0.063	58.55	59.4	38.0	6.1	110.1		
SAAR	779.000	mm	1.75	0.073	60.74	61.6	34.7	5.4	97.9		
UCWI	75	mm	2	0.083	62.7	63.6	31.4	4.9	88.4		
PMP	100.0	%	2.25	0.094	64.48	65.4	28.7	4.4	80.8		
SOIL	0.40		2.5	0.104	66.11	67.1	26.4	4.1	74.6		
Percentage Runoff PR	78.05		2.75	0.115	67.62	68.6	24.6	3.8	69.4		
DEEPSTOR	0.42		3	0.125	69.02	70.0	23.0	3.6	64.9		
Cv	0.7805		3.25	0.135	70.34	71.4	21.6	3.4	61.0		
Cr	1.3		3.5	0.146	71.58	72.6	20.5	3.2	57.7		
10 year	32.29	l/s	3.75	0.156	72.75	73.8	19.4	3.0	54.7		
15 year	54.7	l/s	4	0.167	73.87	75.0	18.5	2.9	52.1		
			4.25	0.177	74.93	76.0	17.6	2.7	49.7		

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EWE Associates Ltd		Page 1
Windy Ridge Barn Thealby Lane Winterton DN15 9TG		
Date 22/01/2020 10:44 File	Designed By Windows7 Checked By	
Micro Drainage	Source Control W.12.4	

<u>ICP SUDS Mean Annual Flood</u>			
Input			
Return Period (years)	1	Soil	0.400
Area (ha)	0.232	Urban	0.000
SAAR (mm)	779	Region Number	Region 3
Results 1/s			
QBAR Rural	0.9		
QBAR Urban	0.9		
Q1 year	0.8		
Q1 year	0.8		
Q30 years	1.6		
Q100 years	1.9		

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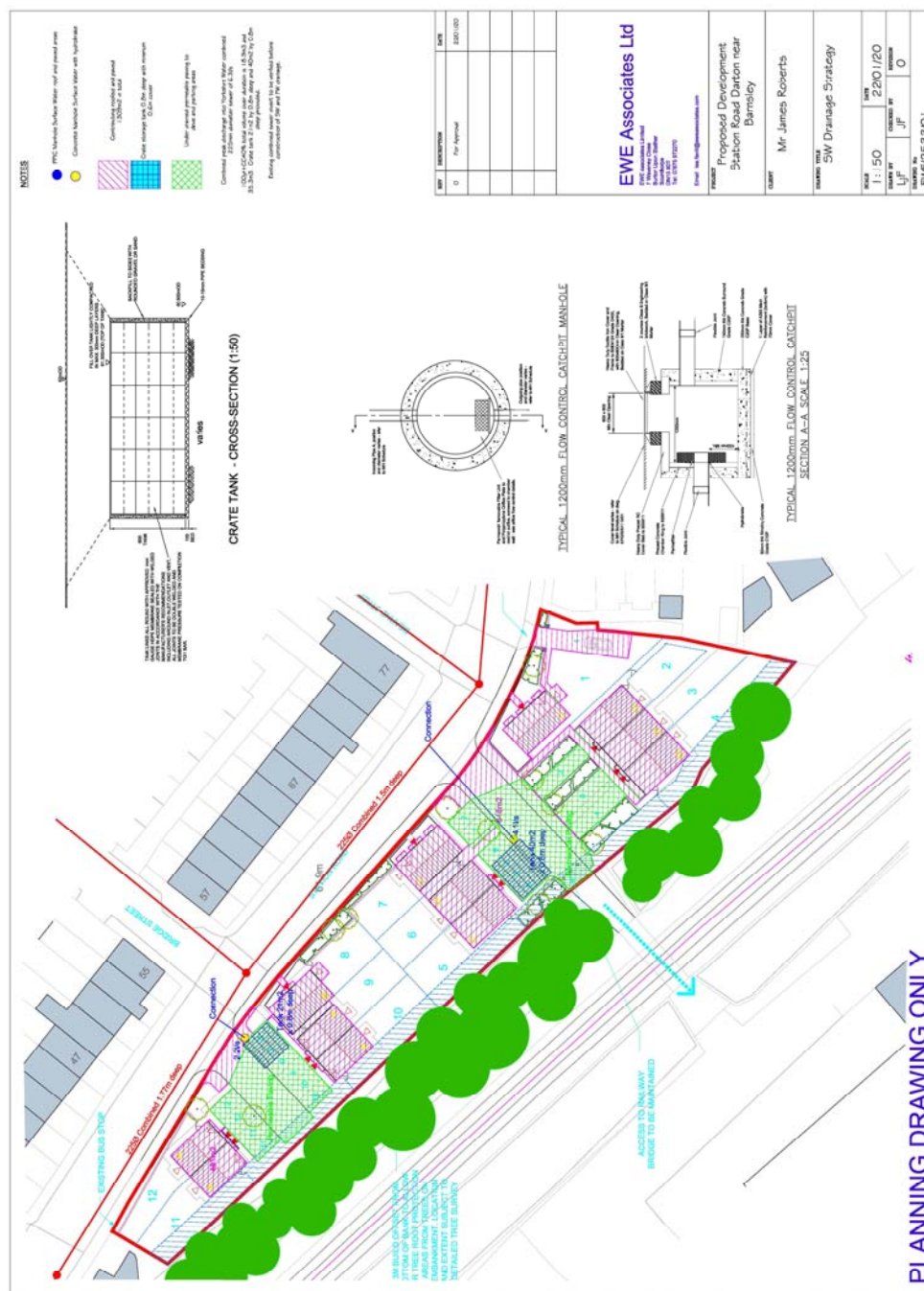
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Attachment D – Drainage Strategy Drawing



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Attachment E – WinDes Calculations smaller site

EWE Associates Ltd			Page 1		
Windy Ridge Barn Thealby Lane Winterton DN15 9TG					
Date 22/01/2020 10:51		Designed By Windows7			
File Area 1 461m2 tank...		Checked By			
Micro Drainage		Source Control W.12.4			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	61.148	0.648	1.5	13.6	O K
30 min Summer	61.229	0.729	1.6	15.3	O K
60 min Summer	61.283	0.783	1.7	16.4	O K
120 min Summer	61.289	0.789	1.7	16.6	O K
180 min Summer	61.275	0.775	1.6	16.3	O K
240 min Summer	61.253	0.753	1.6	15.8	O K
360 min Summer	61.207	0.707	1.6	14.8	O K
480 min Summer	61.162	0.662	1.5	13.9	O K
600 min Summer	61.119	0.619	1.5	13.0	O K
720 min Summer	61.079	0.579	1.4	12.2	O K
960 min Summer	61.026	0.526	1.4	11.0	O K
1440 min Summer	60.933	0.433	1.2	9.1	O K
2160 min Summer	60.824	0.324	1.1	6.8	O K
2880 min Summer	60.735	0.235	1.1	4.9	O K
4320 min Summer	60.579	0.079	1.0	1.7	O K
5760 min Summer	60.564	0.064	0.8	1.3	O K
7200 min Summer	60.556	0.056	0.6	1.2	O K
8640 min Summer	60.551	0.051	0.5	1.1	O K
10080 min Summer	60.547	0.047	0.5	1.0	O K
Storm Event	Rain (mm/hr)		Time-Peak (mins)		
15 min Summer	169.834		18		
30 min Summer	100.662		32		
60 min Summer	59.663		60		
120 min Summer	35.363		96		
180 min Summer	26.042		128		
240 min Summer	20.960		162		
360 min Summer	15.435		232		
480 min Summer	12.423		300		
600 min Summer	10.498		368		
720 min Summer	9.149		434		
960 min Summer	7.546		566		
1440 min Summer	5.752		822		
2160 min Summer	4.384		1192		
2880 min Summer	3.616		1584		
4320 min Summer	2.561		2200		
5760 min Summer	2.005		2936		
7200 min Summer	1.659		3656		
8640 min Summer	1.420		4400		
10080 min Summer	1.246		5096		
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EWE Associates Ltd			Page 2			
Windy Ridge Barn Thealby Lane Winterton DN15 9TG						
Date 22/01/2020 10:51		Designed By Windows7				
File Area 1 461m2 tank...		Checked By				
Micro Drainage		Source Control W.12.4				
<u>Summary of Results for 100 year Return Period (+40%)</u>						
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status	
15 min Winter	61.229	0.729	1.6	15.3	O K	
30 min Winter	61.327	0.827	1.7	17.3	O K	
60 min Winter	61.450	0.950	1.8	18.8	O K	
120 min Winter	61.584	1.084	1.9	18.9	O K	
180 min Winter	61.419	0.919	1.8	18.6	O K	
240 min Winter	61.363	0.863	1.7	17.9	O K	
360 min Winter	61.281	0.781	1.7	16.4	O K	
480 min Winter	61.211	0.711	1.6	14.9	O K	
600 min Winter	61.147	0.647	1.5	13.6	O K	
720 min Winter	61.088	0.588	1.4	12.4	O K	
960 min Winter	61.009	0.509	1.3	10.7	O K	
1440 min Winter	60.879	0.379	1.2	8.0	O K	
2160 min Winter	60.708	0.208	1.1	4.4	O K	
2880 min Winter	60.582	0.082	1.0	1.7	O K	
4320 min Winter	60.560	0.060	0.7	1.3	O K	
5760 min Winter	60.552	0.052	0.6	1.1	O K	
7200 min Winter	60.546	0.046	0.5	1.0	O K	
8640 min Winter	60.542	0.042	0.4	0.9	O K	
10080 min Winter	60.539	0.039	0.3	0.8	O K	
Storm Event	Rain (mm/hr)		Time-Peak (mins)			
15 min Winter	169.834		18			
30 min Winter	100.662		32			
60 min Winter	59.663		60			
120 min Winter	35.363		96			
180 min Winter	26.042		136			
240 min Winter	20.960		176			
360 min Winter	15.435		250			
480 min Winter	12.423		322			
600 min Winter	10.498		392			
720 min Winter	9.149		462			
960 min Winter	7.546		596			
1440 min Winter	5.752		864			
2160 min Winter	4.384		1280			
2880 min Winter	3.616		1472			
4320 min Winter	2.561		2168			
5760 min Winter	2.005		2920			
7200 min Winter	1.659		3592			
8640 min Winter	1.420		4384			
10080 min Winter	1.246		5136			
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EWE Associates Ltd		Page 3
Windy Ridge Barn		
Thealby Lane		
Winterton DN15 9TG		
Date 22/01/2020 10:51	Designed By Windows7	
File Area 1 461m2 tank...	Checked By	
Micro Drainage	Source Control W.12.4	

<u>Rainfall Details</u>	
Rainfall Model	FEH
Return Period (years)	100
Site Location	431200 410100 SE 31200 10100
C (1km)	-0.026
D1 (1km)	0.365
D2 (1km)	0.450
D3 (1km)	0.269
E (1km)	0.302
F (1km)	2.363
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

<u>Time / Area Diagram</u>	
Total Area (ha) 0.046	
Time	Area
(mins)	(ha)
0-4	0.046

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Date 22/01/2020 10:51		Designed By Windows7					
File Area 1 461m2 tank...		Checked By					
Micro Drainage		Source Control W.12.4					
<u>Model Details</u>							
Storage is Online Cover Level (m) 62.000							
<u>Tank or Pond Structure</u>							
Invert Level (m) 60.500							
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	21.0	1.400	0.0	2.800	0.0	4.200	0.0
0.200	21.0	1.600	0.0	3.000	0.0	4.400	0.0
0.400	21.0	1.800	0.0	3.200	0.0	4.600	0.0
0.600	21.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	21.0	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		
<u>Hydro-Brake® Outflow Control</u>							
Design Head (m) 1.500		Hydro-Brake® Type Md4		Invert Level (m) 60.500			
Design Flow (l/s) 2.2		Diameter (mm) 49					
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.0	1.200	2.0	3.000	3.2	7.000	4.9
0.200	0.9	1.400	2.2	3.500	3.4	7.500	5.0
0.300	1.0	1.600	2.3	4.000	3.7	8.000	5.2
0.400	1.2	1.800	2.5	4.500	3.9	8.500	5.3
0.500	1.3	2.000	2.6	5.000	4.1	9.000	5.5
0.600	1.4	2.200	2.7	5.500	4.3	9.500	5.7
0.800	1.6	2.400	2.8	6.000	4.5		
1.000	1.8	2.600	3.0	6.500	4.7		
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Attachment F – WinDes Calculations smaller site

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Windy Ridge Barn

Thealby Lane

Winterton DN15 9TG

Date 22/01/2020 10:59

File Area 2 848m2 tank...

Micro Drainage

Designed By Windows7

Checked By

Source Control W.12.4

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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	61.130	0.630	2.7	25.2	O K
30 min Summer	61.210	0.710	2.9	28.4	O K
60 min Summer	61.265	0.765	3.0	30.6	O K
120 min Summer	61.272	0.772	3.0	30.9	O K
180 min Summer	61.259	0.759	3.0	30.4	O K
240 min Summer	61.239	0.739	2.9	29.6	O K
360 min Summer	61.194	0.694	2.8	27.8	O K
480 min Summer	61.148	0.648	2.7	25.9	O K
600 min Summer	61.105	0.605	2.6	24.2	O K
720 min Summer	61.064	0.564	2.5	22.6	O K
960 min Summer	61.010	0.510	2.4	20.4	O K
1440 min Summer	60.912	0.412	2.2	16.5	O K
2160 min Summer	60.783	0.283	2.2	11.3	O K
2880 min Summer	60.644	0.144	2.2	5.8	O K
4320 min Summer	60.594	0.094	1.8	3.8	O K
5760 min Summer	60.578	0.078	1.4	3.1	O K
7200 min Summer	60.569	0.069	1.1	2.8	O K
8640 min Summer	60.563	0.063	1.0	2.5	O K
10080 min Summer	60.559	0.059	0.9	2.3	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	169.834	18
30 min Summer	100.662	32
60 min Summer	59.663	60
120 min Summer	35.363	96
180 min Summer	26.042	128
240 min Summer	20.960	164
360 min Summer	15.435	232
480 min Summer	12.423	302
600 min Summer	10.498	368
720 min Summer	9.149	434
960 min Summer	7.546	568
1440 min Summer	5.752	824
2160 min Summer	4.384	1212
2880 min Summer	3.616	1500
4320 min Summer	2.561	2200
5760 min Summer	2.005	2936
7200 min Summer	1.659	3672
8640 min Summer	1.420	4400
10080 min Summer	1.246	5136

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Technical Note: 001

Date: 22nd January 2020

Site: Station Road Darton near Barnsley

Reference: 2019/2533

EWE Associates Ltd

Windy Ridge Barn

Thealby Lane

Winterton DN15 9TG

Date 22/01/2020 10:59

Designed By Windows7

File Area 2 848m2 tank...

Checked By

Micro Drainage

Source Control W.12.4

Page 2



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	61.209	0.709	2.9	28.3	O K
30 min Winter	61.303	0.803	3.0	32.1	O K
60 min Winter	61.396	0.896	3.2	34.9	O K
120 min Winter	61.414	0.914	3.2	35.3	O K
180 min Winter	61.383	0.883	3.2	34.6	O K
240 min Winter	61.341	0.841	3.1	33.5	O K
360 min Winter	61.267	0.767	3.0	30.7	O K
480 min Winter	61.197	0.697	2.8	27.9	O K
600 min Winter	61.132	0.632	2.7	25.3	O K
720 min Winter	61.072	0.572	2.6	22.9	O K
960 min Winter	60.988	0.488	2.4	19.5	O K
1440 min Winter	60.839	0.339	2.2	13.6	O K
2160 min Winter	60.618	0.118	2.1	4.7	O K
2880 min Winter	60.596	0.096	1.8	3.8	O K
4320 min Winter	60.574	0.074	1.3	3.0	O K
5760 min Winter	60.564	0.064	1.0	2.6	O K
7200 min Winter	60.558	0.058	0.8	2.3	O K
8640 min Winter	60.553	0.053	0.7	2.1	O K
10080 min Winter	60.550	0.050	0.6	2.0	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Winter	169.834	18
30 min Winter	100.662	32
60 min Winter	59.663	60
120 min Winter	35.363	100
180 min Winter	26.042	138
240 min Winter	20.960	176
360 min Winter	15.435	252
480 min Winter	12.423	324
600 min Winter	10.498	394
720 min Winter	9.149	464
960 min Winter	7.546	600
1440 min Winter	5.752	880
2160 min Winter	4.384	1124
2880 min Winter	3.616	1468
4320 min Winter	2.561	2200
5760 min Winter	2.005	2912
7200 min Winter	1.659	3616
8640 min Winter	1.420	4360
10080 min Winter	1.246	5040

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Technical Note: 001

Date: 22nd January 2020

Site: Station Road Darton near Barnsley

Reference: 2019/2533

EWE Associates Ltd		Page 3				
Windy Ridge Barn Thealby Lane Winterton DN15 9TG						
Date 22/01/2020 10:59	Designed By Windows7					
File Area 2 848m2 tank...	Checked By					
Micro Drainage	Source Control W.12.4					
<u>Rainfall Details</u>						
Rainfall Model FEH						
Return Period (years) 100						
Site Location 431200 410100 SE 31200 10100						
C (1km) -0.026						
D1 (1km) 0.365						
D2 (1km) 0.450						
D3 (1km) 0.269						
E (1km) 0.302						
F (1km) 2.363						
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						
<u>Time / Area Diagram</u>						
Total Area (ha) 0.085						
<table><thead><tr><th>Time (mins)</th><th>Area (ha)</th></tr></thead><tbody><tr><td>0-4</td><td>0.085</td></tr></tbody></table>			Time (mins)	Area (ha)	0-4	0.085
Time (mins)	Area (ha)					
0-4	0.085					
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Technical Note: 001

Date: 22nd January 2020

Site: Station Road Darton near Barnsley

Reference: 2019/2533

EWE Associates Ltd		Page 4					
Windy Ridge Barn Thealby Lane Winterton DN15 9TG							
Date 22/01/2020 10:59							
File Area 2 848m2 tank...							
Designed By Windows7		Checked By					
Micro Drainage		Source Control W.12.4					
<u>Model Details</u>							
Storage is Online Cover Level (m) 62.000							
<u>Tank or Pond Structure</u>							
Invert Level (m) 60.500							
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	40.0	1.400	0.0	2.800	0.0	4.200	0.0
0.200	40.0	1.600	0.0	3.000	0.0	4.400	0.0
0.400	40.0	1.800	0.0	3.200	0.0	4.600	0.0
0.600	40.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	40.0	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		
<u>Hydro-Brake® Outflow Control</u>							
Design Head (m) 1.500		Hydro-Brake® Type M44		Invert Level (m) 60.500			
Design Flow (l/s) 4.1		Diameter (mm) 66					
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.9	1.200	3.7	3.000	5.9	7.000	9.0
0.200	1.9	1.400	4.0	3.500	6.4	7.500	9.3
0.300	1.9	1.600	4.3	4.000	6.8	8.000	9.6
0.400	2.2	1.800	4.6	4.500	7.2	8.500	9.9
0.500	2.4	2.000	4.8	5.000	7.6	9.000	10.2
0.600	2.6	2.200	5.0	5.500	8.0	9.500	10.5
0.800	3.0	2.400	5.3	6.000	8.3		
1.000	3.4	2.600	5.5	6.500	8.7		
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