



**Langford
Horsemere Green Lane
Climping**

***Micro Drainage Calculations
For
Discharge into Attenuation Ditch***

Prepared by:
Kazys Narbutas Consulting Limited

Unit 5B Tanners Court,
Tanners Lane, East Wellow,
Romsey. SO51 6DP



KNC1933/MDC-A

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsemere Green Lane Houses to Drainage Ditch	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Summary of Results for open ditch attenuation 100ys+40%.src

**Upstream
Structures**

Outflow To Overflow To

road 20.0-53.6 100ys+40%.src (None) (None)
road 53.6- 73.3 100ys+40%.src
road 73.3-90.845 100ys+40%.src
parking court a 100ys+40%.src

Storm Duration (mins)	Maximum Control (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
15 Summer	1.5	1.5	5.6577	0.3377	25.0	0 K
30 Summer	1.6	1.6	5.7322	0.4122	33.4	0 K
60 Summer	1.7	1.7	5.8017	0.4817	42.2	0 K
120 Summer	1.8	1.8	5.8637	0.5437	50.8	0 K
180 Summer	1.8	1.8	5.8938	0.5738	55.2	0 K
240 Summer	1.8	1.8	5.9113	0.5913	57.8	0 K
360 Summer	1.9	1.9	5.9308	0.6108	60.9	0 K
480 Summer	1.9	1.9	5.9413	0.6213	62.6	0 K
600 Summer	1.9	1.9	5.9463	0.6263	63.4	0 K
720 Summer	1.9	1.9	5.9478	0.6278	63.6	0 K
960 Summer	1.9	1.9	5.9408	0.6208	62.4	0 K
1440 Summer	1.9	1.9	5.9238	0.6038	59.8	0 K
2160 Summer	1.8	1.8	5.8943	0.5743	55.3	0 K
2880 Summer	1.8	1.8	5.8587	0.5387	50.1	0 K
4320 Summer	1.7	1.7	5.7837	0.4637	39.8	0 K
5760 Summer	1.5	1.5	5.7067	0.3867	30.4	0 K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	124.63	23
30 Summer	83.79	38
60 Summer	53.78	68
120 Summer	33.34	128
180 Summer	24.83	188
240 Summer	20.01	246
360 Summer	14.71	366
480 Summer	11.82	486
600 Summer	9.97	606
720 Summer	8.67	724
960 Summer	6.94	872
1440 Summer	5.07	1098
2160 Summer	3.70	1472
2880 Summer	2.95	1868
4320 Summer	2.14	2644
5760 Summer	1.70	3408

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsmere Green Lane Houses to Drainage Ditch	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Summary of Results for open ditch attenuation 100ys+40%.src

Storm Duration (mins)	Maximum Control (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
7200 Summer	1.5	1.5	5.6262	0.3062	21.8	O K
8640 Summer	1.5	1.5	5.5332	0.2132	13.3	O K
10080 Summer	1.5	1.5	5.4618	0.1418	7.9	O K
15 Winter	1.5	1.5	5.6862	0.3662	28.1	O K
30 Winter	1.6	1.6	5.7662	0.4462	37.6	O K
60 Winter	1.7	1.7	5.8412	0.5212	47.6	O K
120 Winter	1.8	1.8	5.9093	0.5893	57.5	O K
180 Winter	1.9	1.9	5.9433	0.6233	62.9	O K
240 Winter	1.9	1.9	5.9633	0.6433	66.1	O K
360 Winter	1.9	1.9	5.9873	0.6673	70.0	O K
480 Winter	2.0	2.0	6.0003	0.6803	72.2	O K
600 Winter	2.0	2.0	6.0073	0.6873	73.4	O K
720 Winter	2.0	2.0	6.0103	0.6903	73.9	O K
960 Winter	2.0	2.0	6.0083	0.6883	73.6	O K
1440 Winter	1.9	1.9	5.9858	0.6658	69.8	O K
2160 Winter	1.9	1.9	5.9423	0.6223	62.7	O K
2880 Winter	1.8	1.8	5.8893	0.5693	54.5	O K
4320 Winter	1.6	1.6	5.7752	0.4552	38.7	O K
5760 Winter	1.5	1.5	5.6512	0.3312	24.3	O K
7200 Winter	1.5	1.5	5.4908	0.1708	10.0	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
7200 Summer	1.43	4176
8640 Summer	1.24	4776
10080 Summer	1.09	5376
15 Winter	124.63	23
30 Winter	83.79	38
60 Winter	53.78	68
120 Winter	33.34	126
180 Winter	24.83	184
240 Winter	20.01	244
360 Winter	14.71	362
480 Winter	11.82	478
600 Winter	9.97	592
720 Winter	8.67	706
960 Winter	6.94	920
1440 Winter	5.07	1146
2160 Winter	3.70	1564
2880 Winter	2.95	1996
4320 Winter	2.14	2812
5760 Winter	1.70	3584
7200 Winter	1.43	4160

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsemere Green Lane Houses to Drainage Ditch	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Summary of Results for open ditch attenuation 100ys+40%.src

Storm Duration (mins)	Maximum Control (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
8640 Winter	1.5	1.5	5.3993	0.0793	3.9	0 K
10080 Winter	1.3	1.3	5.3888	0.0688	3.3	0 K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
8640 Winter	1.24	4496
10080 Winter	1.09	5240

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsemere Green Lane Houses to Drainage Ditch	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Rainfall Details for open ditch attenuation 100ys+40%.src

Region	ENG+WAL	Shortest Storm (mins)	15
Return Period (years)	100	Longest Storm (mins)	10080
M5-60 (mm)	19.000	Summer Storms	Yes
Ratio-R	0.350	Winter Storms	Yes
Cv (Summer)	0.750	Climate Change %	+40
Cv (Winter)	0.840		

Time / Area Diagram

Total Area (ha) = 0.110

Time from:	(mins) to:	Area (ha)	Time from:	(mins) to:	Area (ha)
0	4	0.000	4	8	0.110

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsemere Green Lane Houses to Drainage Ditch	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Storage Controls for open ditch attenuation 100ys+40%.src

Tank/Pond Details

Invert Level (m) 5.320 Ground Level (m) 6.100

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.00	42.3	0.20	79.9	0.40	117.5	0.60	155.0	0.80	188.0

Hydro-Brake Outflow Control

Design Head (m) 0.750 Hydro-Brake Type MD6 Invert Level (m) 5.300
Design Flow (l/s) 2.0 Diameter (mm) 64

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.10	1.5	0.80	2.1	2.00	3.3	4.00	4.7	7.00	6.2
0.20	1.5	1.00	2.3	2.20	3.5	4.50	5.0	7.50	6.4
0.30	1.4	1.20	2.6	2.40	3.6	5.00	5.2	8.00	6.6
0.40	1.5	1.40	2.8	2.60	3.8	5.50	5.5	8.50	6.8
0.50	1.7	1.60	3.0	3.00	4.1	6.00	5.7	9.00	7.0
0.60	1.8	1.80	3.1	3.50	4.4	6.50	6.0	9.50	7.2

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Unit 5B Tanners Court	Langford	
Tanners Lane, East Wellow	Horsmere Green Lane	
Romsey SO51 6DP	Road 20.0- 53.7	
Date August 2020	Designed By KN	
File Langford Discharges to Ditch.C...	Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Summary of Results for road 20.0-53.6 100yrs+40%.src

**Upstream
Structures**

Outflow To

Overflow To

(None) open ditch attenuation 100ys+40%.src

(None)

Half Drain Time : 467 minutes

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
15 Summer	0.3	0.0	0.3	5.5143	0.1243	7.0	0 K
30 Summer	0.3	0.0	0.3	5.5543	0.1642	9.5	0 K
60 Summer	0.3	0.0	0.3	5.5947	0.2047	12.2	0 K
120 Summer	0.3	0.0	0.3	5.6327	0.2427	14.6	0 K
180 Summer	0.4	0.0	0.4	5.6502	0.2602	15.8	0 K
240 Summer	0.4	0.0	0.4	5.6587	0.2687	16.3	0 K
360 Summer	0.4	0.0	0.4	5.6637	0.2737	16.6	0 K
480 Summer	0.4	0.0	0.4	5.6657	0.2757	16.7	0 K
600 Summer	0.4	0.0	0.4	5.6657	0.2757	16.8	0 K
720 Summer	0.4	0.0	0.4	5.6647	0.2747	16.7	0 K
960 Summer	0.4	0.0	0.4	5.6607	0.2707	16.4	0 K
1440 Summer	0.4	0.0	0.4	5.6472	0.2572	15.6	0 K
2160 Summer	0.3	0.0	0.3	5.6247	0.2347	14.1	0 K
2880 Summer	0.3	0.0	0.3	5.6032	0.2132	12.7	0 K
4320 Summer	0.3	0.0	0.3	5.5652	0.1752	10.2	0 K
5760 Summer	0.3	0.0	0.3	5.5353	0.1453	8.3	0 K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	124.63	23
30 Summer	83.79	37
60 Summer	53.78	66
120 Summer	33.34	126
180 Summer	24.83	186
240 Summer	20.01	244
360 Summer	14.71	340
480 Summer	11.82	396
600 Summer	9.97	456
720 Summer	8.67	522
960 Summer	6.94	658
1440 Summer	5.07	930
2160 Summer	3.70	1344
2880 Summer	2.95	1736
4320 Summer	2.14	2512
5760 Summer	1.70	3232

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsmere Green Lane Road 20.0- 53.7	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Summary of Results for road 20.0-53.6 100yrs+40%.src

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
7200 Summer	0.3	0.0	0.3	5.5123	0.1223	6.8	0 K
8640 Summer	0.3	0.0	0.3	5.4958	0.1058	5.8	0 K
10080 Summer	0.2	0.0	0.2	5.4853	0.0953	5.1	0 K
15 Winter	0.3	0.0	0.3	5.5293	0.1393	7.9	0 K
30 Winter	0.3	0.0	0.3	5.5737	0.1837	10.8	0 K
60 Winter	0.3	0.0	0.3	5.6197	0.2297	13.8	0 K
120 Winter	0.4	0.0	0.4	5.6632	0.2732	16.6	0 K
180 Winter	0.4	0.0	0.4	5.6837	0.2937	17.9	0 K
240 Winter	0.4	0.0	0.4	5.6937	0.3037	18.6	0 K
360 Winter	0.4	0.0	0.4	5.7017	0.3117	19.1	0 K
480 Winter	0.4	0.0	0.4	5.7022	0.3122	19.1	0 K
600 Winter	0.4	0.0	0.4	5.7012	0.3112	19.1	0 K
720 Winter	0.4	0.0	0.4	5.6992	0.3092	18.9	0 K
960 Winter	0.4	0.0	0.4	5.6922	0.3022	18.5	0 K
1440 Winter	0.4	0.0	0.4	5.6712	0.2812	17.1	0 K
2160 Winter	0.3	0.0	0.3	5.6377	0.2477	14.9	0 K
2880 Winter	0.3	0.0	0.3	5.6057	0.2157	12.9	0 K
4320 Winter	0.3	0.0	0.3	5.5523	0.1623	9.4	0 K
5760 Winter	0.3	0.0	0.3	5.5128	0.1228	6.9	0 K
7200 Winter	0.3	0.0	0.3	5.4888	0.0988	5.3	0 K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
7200 Summer	1.43	3896
8640 Summer	1.24	4584
10080 Summer	1.09	5336
15 Winter	124.63	23
30 Winter	83.79	37
60 Winter	53.78	66
120 Winter	33.34	124
180 Winter	24.83	182
240 Winter	20.01	238
360 Winter	14.71	348
480 Winter	11.82	448
600 Winter	9.97	480
720 Winter	8.67	554
960 Winter	6.94	708
1440 Winter	5.07	1014
2160 Winter	3.70	1448
2880 Winter	2.95	1852
4320 Winter	2.14	2640
5760 Winter	1.70	3336
7200 Winter	1.43	3960

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsemere Green Lane Road 20.0- 53.7	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Summary of Results for road 20.0-53.6 100yrs+40%.src

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
8640 Winter	0.2	0.0	0.2	5.4768	0.0868	4.5	0 K
10080 Winter	0.2	0.0	0.2	5.4678	0.0778	3.9	0 K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
8640 Winter	1.24	4672
10080 Winter	1.09	5352

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsemere Green Lane Road 20.0- 53.7	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Rainfall Details for road 20.0-53.6 100yrs+40%.src

Region	ENG+WAL	Shortest Storm (mins)	15
Return Period (years)	100	Longest Storm (mins)	10080
M5-60 (mm)	19.000	Summer Storms	Yes
Ratio-R	0.350	Winter Storms	Yes
Cv (Summer)	0.750	Climate Change %	+40
Cv (Winter)	0.840		

Time / Area Diagram

Total Area (ha) = 0.034

Time from:	(mins) to:	Area (ha)	Time from:	(mins) to:	Area (ha)
0	4	0.000	4	8	0.034

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsemere Green Lane Road 20.0- 53.7	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Storage Controls for road 20.0-53.6 100yrs+40%.src

Porous Car Park Details

Infil Coef - Base (m/hr)	0.000000	Cover Level (m)	5.790
Membrane Percolation (mm/hr)	1000	Slope (1:x)	200.0
Safety Factor	10.0	Max Percolation (l/s)	44.9
Porosity	0.40	Depression Storage (mm)	5
Length (m)	33.7	Evaporation (mm/day)	3
Width (m)	4.8	Cap Volume (m)	5.790
Invert Level (m)	5.390		

Hydro-Brake Outflow Control

Design Head (m)	0.350	Hydro-Brake Type	MD4	Invert Level (m)	5.390
Design Flow (l/s)	0.4	Diameter (mm)	30		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.10	0.3	0.80	0.6	2.00	1.0	4.00	1.4	7.00	1.9
0.20	0.3	1.00	0.7	2.20	1.0	4.50	1.5	7.50	1.9
0.30	0.4	1.20	0.8	2.40	1.1	5.00	1.6	8.00	2.0
0.40	0.4	1.40	0.8	2.60	1.1	5.50	1.6	8.50	2.0
0.50	0.5	1.60	0.9	3.00	1.2	6.00	1.7	9.00	2.1
0.60	0.5	1.80	0.9	3.50	1.3	6.50	1.8	9.50	2.2

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsmere Green Lane Road 53.6-73.3	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Summary of Results for road 53.6- 73.3 100yrs+40%.src

**Upstream
Structures**

Outflow To

Overflow To

(None) open ditch attenuation 100ys+40%.src

(None)

Half Drain Time : 183 minutes

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
15 Summer	0.3	0.0	0.3	5.6673	0.0983	3.3	0 K
30 Summer	0.3	0.0	0.3	5.6983	0.1293	4.5	0 K
60 Summer	0.4	0.0	0.4	5.7277	0.1587	5.6	0 K
120 Summer	0.4	0.0	0.4	5.7492	0.1802	6.4	0 K
180 Summer	0.4	0.0	0.4	5.7552	0.1862	6.6	0 K
240 Summer	0.4	0.0	0.4	5.7572	0.1882	6.7	0 K
360 Summer	0.4	0.0	0.4	5.7562	0.1872	6.7	0 K
480 Summer	0.4	0.0	0.4	5.7522	0.1832	6.5	0 K
600 Summer	0.4	0.0	0.4	5.7473	0.1782	6.3	0 K
720 Summer	0.4	0.0	0.4	5.7407	0.1717	6.1	0 K
960 Summer	0.4	0.0	0.4	5.7283	0.1592	5.6	0 K
1440 Summer	0.3	0.0	0.3	5.7038	0.1348	4.7	0 K
2160 Summer	0.3	0.0	0.3	5.6763	0.1073	3.7	0 K
2880 Summer	0.3	0.0	0.3	5.6613	0.0923	3.1	0 K
4320 Summer	0.2	0.0	0.2	5.6423	0.0733	2.4	0 K
5760 Summer	0.2	0.0	0.2	5.6303	0.0613	1.9	0 K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	124.63	22
30 Summer	83.79	37
60 Summer	53.78	66
120 Summer	33.34	124
180 Summer	24.83	156
240 Summer	20.01	188
360 Summer	14.71	254
480 Summer	11.82	322
600 Summer	9.97	390
720 Summer	8.67	460
960 Summer	6.94	592
1440 Summer	5.07	842
2160 Summer	3.70	1196
2880 Summer	2.95	1560
4320 Summer	2.14	2292
5760 Summer	1.70	3000

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Unit 5B Tanners Court	Langford	
Tanners Lane, East Wellow	Horsmere Green Lane	
Romsey SO51 6DP	Road 53.6-73.3	
Date August 2020	Designed By KN	
File Langford Discharges to Ditch.C...	Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Summary of Results for road 53.6- 73.3 100yrs+40%.src

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
7200 Summer	0.2	0.0	0.2	5.6223	0.0532	1.6	0 K
8640 Summer	0.2	0.0	0.2	5.6158	0.0467	1.4	0 K
10080 Summer	0.1	0.0	0.1	5.6113	0.0422	1.2	0 K
15 Winter	0.3	0.0	0.3	5.6798	0.1108	3.8	0 K
30 Winter	0.3	0.0	0.3	5.7153	0.1462	5.1	0 K
60 Winter	0.4	0.0	0.4	5.7487	0.1797	6.4	0 K
120 Winter	0.4	0.0	0.4	5.7752	0.2062	7.4	0 K
180 Winter	0.4	0.0	0.4	5.7817	0.2127	7.6	0 K
240 Winter	0.4	0.0	0.4	5.7817	0.2127	7.6	0 K
360 Winter	0.4	0.0	0.4	5.7787	0.2097	7.5	0 K
480 Winter	0.4	0.0	0.4	5.7717	0.2027	7.3	0 K
600 Winter	0.4	0.0	0.4	5.7627	0.1937	6.9	0 K
720 Winter	0.4	0.0	0.4	5.7527	0.1837	6.5	0 K
960 Winter	0.4	0.0	0.4	5.7328	0.1638	5.8	0 K
1440 Winter	0.3	0.0	0.3	5.6968	0.1278	4.4	0 K
2160 Winter	0.3	0.0	0.3	5.6643	0.0953	3.2	0 K
2880 Winter	0.3	0.0	0.3	5.6488	0.0798	2.6	0 K
4320 Winter	0.2	0.0	0.2	5.6293	0.0603	1.9	0 K
5760 Winter	0.2	0.0	0.2	5.6178	0.0487	1.5	0 K
7200 Winter	0.1	0.0	0.1	5.6103	0.0412	1.2	0 K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
7200 Summer	1.43	3744
8640 Summer	1.24	4416
10080 Summer	1.09	5152
15 Winter	124.63	22
30 Winter	83.79	36
60 Winter	53.78	64
120 Winter	33.34	122
180 Winter	24.83	174
240 Winter	20.01	198
360 Winter	14.71	274
480 Winter	11.82	350
600 Winter	9.97	424
720 Winter	8.67	496
960 Winter	6.94	632
1440 Winter	5.07	886
2160 Winter	3.70	1220
2880 Winter	2.95	1592
4320 Winter	2.14	2336
5760 Winter	1.70	3056
7200 Winter	1.43	3752

Kazys Narbutas Consulting Limited		Page 3
Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsemere Green Lane Road 53.6-73.3	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Summary of Results for road 53.6- 73.3 100yrs+40%.src

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
8640 Winter	0.1	0.0	0.1	5.6048	0.0357	1.0	0 K
10080 Winter	0.1	0.0	0.1	5.6007	0.0317	0.8	0 K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
8640 Winter	1.24	4496
10080 Winter	1.09	5240

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsemere Green Lane Road 53.6-73.3	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Rainfall Details for road 53.6- 73.3 100yrs+40%.src

Region	ENG+WAL	Shortest Storm (mins)	15
Return Period (years)	100	Longest Storm (mins)	10080
M5-60 (mm)	19.000	Summer Storms	Yes
Ratio-R	0.350	Winter Storms	Yes
Cv (Summer)	0.750	Climate Change %	+40
Cv (Winter)	0.840		

Time / Area Diagram

Total Area (ha) = 0.017

Time from:	(mins) to:	Area (ha)	Time from:	(mins) to:	Area (ha)
0	4	0.000	4	8	0.017

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsmere Green Lane Road 53.6-73.3	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Storage Controls for road 53.6- 73.3 100yrs+40%.src

Porous Car Park Details

Infil Coef - Base (m/hr)	0.000000	Cover Level (m)	5.969
Membrane Percolation (mm/hr)	1000	Slope (1:x)	200.0
Safety Factor	10.0	Max Percolation (l/s)	26.1
Porosity	0.40	Depression Storage (mm)	5
Length (m)	19.6	Evaporation (mm/day)	3
Width (m)	4.8	Cap Volume (m)	5.969
Invert Level (m)	5.569		

Hydro-Brake Outflow Control

Design Head (m)	0.250	Hydro-Brake Type	MD4	Invert Level (m)	5.569
Design Flow (l/s)	0.4	Diameter (mm)	33		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.10	0.3	0.80	0.7	2.00	1.2	4.00	1.7	7.00	2.2
0.20	0.4	1.00	0.8	2.20	1.2	4.50	1.8	7.50	2.3
0.30	0.5	1.20	0.9	2.40	1.3	5.00	1.8	8.00	2.3
0.40	0.5	1.40	1.0	2.60	1.3	5.50	1.9	8.50	2.4
0.50	0.6	1.60	1.0	3.00	1.4	6.00	2.0	9.00	2.5
0.60	0.6	1.80	1.1	3.50	1.5	6.50	2.1	9.50	2.5

Kazys Narbutas Consulting Limited		Page 1
Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsemere Green Lane Road 73.3-90.845	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Summary of Results for road 73.3-90.845 100yrs+40%.src

**Upstream
Structures**

Outflow To

Overflow To

(None) open ditch attenuation 100yrs+40%.src

(None)

Half Drain Time : 231 minutes

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
15 Summer	0.3	0.0	0.3	5.7448	0.0838	4.2	0 K
30 Summer	0.4	0.0	0.4	5.7693	0.1083	5.7	0 K
60 Summer	0.4	0.0	0.4	5.7938	0.1328	7.2	0 K
120 Summer	0.4	0.0	0.4	5.8133	0.1522	8.4	0 K
180 Summer	0.4	0.0	0.4	5.8193	0.1582	8.8	0 K
240 Summer	0.4	0.0	0.4	5.8212	0.1602	8.9	0 K
360 Summer	0.4	0.0	0.4	5.8218	0.1607	9.0	0 K
480 Summer	0.4	0.0	0.4	5.8203	0.1592	8.9	0 K
600 Summer	0.4	0.0	0.4	5.8168	0.1557	8.7	0 K
720 Summer	0.4	0.0	0.4	5.8133	0.1523	8.4	0 K
960 Summer	0.4	0.0	0.4	5.8043	0.1433	7.9	0 K
1440 Summer	0.4	0.0	0.4	5.7868	0.1258	6.8	0 K
2160 Summer	0.4	0.0	0.4	5.7653	0.1043	5.5	0 K
2880 Summer	0.4	0.0	0.4	5.7523	0.0913	4.7	0 K
4320 Summer	0.3	0.0	0.3	5.7353	0.0743	3.6	0 K
5760 Summer	0.2	0.0	0.2	5.7243	0.0633	2.9	0 K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	124.63	22
30 Summer	83.79	37
60 Summer	53.78	66
120 Summer	33.34	124
180 Summer	24.83	172
240 Summer	20.01	200
360 Summer	14.71	264
480 Summer	11.82	332
600 Summer	9.97	402
720 Summer	8.67	468
960 Summer	6.94	602
1440 Summer	5.07	858
2160 Summer	3.70	1216
2880 Summer	2.95	1588
4320 Summer	2.14	2336
5760 Summer	1.70	3056

Kazys Narbutas Consulting Limited		Page 2
Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsmere Green Lane Road 73.3-90.845	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Summary of Results for road 73.3-90.845 100yrs+40%.src

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
7200 Summer	0.2	0.0	0.2	5.7163	0.0552	2.4	0 K
8640 Summer	0.2	0.0	0.2	5.7103	0.0492	2.0	0 K
10080 Summer	0.2	0.0	0.2	5.7053	0.0442	1.7	0 K
15 Winter	0.4	0.0	0.4	5.7543	0.0933	4.8	0 K
30 Winter	0.4	0.0	0.4	5.7828	0.1218	6.5	0 K
60 Winter	0.4	0.0	0.4	5.8103	0.1492	8.3	0 K
120 Winter	0.4	0.0	0.4	5.8337	0.1727	9.7	0 K
180 Winter	0.4	0.0	0.4	5.8417	0.1807	10.2	0 K
240 Winter	0.4	0.0	0.4	5.8427	0.1817	10.3	0 K
360 Winter	0.4	0.0	0.4	5.8417	0.1807	10.2	0 K
480 Winter	0.4	0.0	0.4	5.8383	0.1772	10.0	0 K
600 Winter	0.4	0.0	0.4	5.8327	0.1717	9.6	0 K
720 Winter	0.4	0.0	0.4	5.8263	0.1652	9.3	0 K
960 Winter	0.4	0.0	0.4	5.8123	0.1513	8.4	0 K
1440 Winter	0.4	0.0	0.4	5.7858	0.1248	6.7	0 K
2160 Winter	0.4	0.0	0.4	5.7578	0.0968	5.0	0 K
2880 Winter	0.3	0.0	0.3	5.7433	0.0823	4.1	0 K
4320 Winter	0.2	0.0	0.2	5.7248	0.0638	2.9	0 K
5760 Winter	0.2	0.0	0.2	5.7133	0.0522	2.2	0 K
7200 Winter	0.2	0.0	0.2	5.7053	0.0442	1.7	0 K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
7200 Summer	1.43	3752
8640 Summer	1.24	4496
10080 Summer	1.09	5240
15 Winter	124.63	22
30 Winter	83.79	36
60 Winter	53.78	66
120 Winter	33.34	122
180 Winter	24.83	178
240 Winter	20.01	230
360 Winter	14.71	284
480 Winter	11.82	360
600 Winter	9.97	436
720 Winter	8.67	510
960 Winter	6.94	650
1440 Winter	5.07	914
2160 Winter	3.70	1260
2880 Winter	2.95	1644
4320 Winter	2.14	2380
5760 Winter	1.70	3112
7200 Winter	1.43	3824

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsemere Green Lane Road 73.3-90.845	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Summary of Results for road 73.3-90.845 100yrs+40%.src

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
8640 Winter	0.2	0.0	0.2	5.6997	0.0387	1.4	0 K
10080 Winter	0.1	0.0	0.1	5.6953	0.0342	1.1	0 K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
8640 Winter	1.24	4504
10080 Winter	1.09	5248

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsemere Green Lane Road 73.3-90.845	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Rainfall Details for road 73.3-90.845 100yrs+40%.src

Region	ENG+WAL	Shortest Storm (mins)	15
Return Period (years)	100	Longest Storm (mins)	10080
M5-60 (mm)	19.000	Summer Storms	Yes
Ratio-R	0.350	Winter Storms	Yes
Cv (Summer)	0.750	Climate Change %	+40
Cv (Winter)	0.840		

Time / Area Diagram

Total Area (ha) = 0.022

Time from:	(mins) to:	Area (ha)	Time from:	(mins) to:	Area (ha)
0	4	0.000	4	8	0.022

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsemere Green Lane Road 73.3-90.845	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Storage Controls for road 73.3-90.845 100yrs+40%.src

Porous Car Park Details

Infil Coef - Base (m/hr)	0.000000	Cover Level (m)	6.061
Membrane Percolation (mm/hr)	1000	Slope (1:x)	200.0
Safety Factor	10.0	Max Percolation (l/s)	43.1
Porosity	0.40	Depression Storage (mm)	5
Length (m)	32.3	Evaporation (mm/day)	3
Width (m)	4.8	Cap Volume (m)	6.061
Invert Level (m)	5.661		

Hydro-Brake Outflow Control

Design Head (m)	0.200	Hydro-Brake Type	MD4	Invert Level (m)	5.661
Design Flow (l/s)	0.4	Diameter (mm)	34		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.10	0.4	0.80	0.8	2.00	1.3	4.00	1.8	7.00	2.4
0.20	0.4	1.00	0.9	2.20	1.4	4.50	2.0	7.50	2.5
0.30	0.5	1.20	1.0	2.40	1.4	5.00	2.1	8.00	2.6
0.40	0.6	1.40	1.1	2.60	1.5	5.50	2.2	8.50	2.7
0.50	0.7	1.60	1.2	3.00	1.6	6.00	2.3	9.00	2.8
0.60	0.7	1.80	1.2	3.50	1.7	6.50	2.3	9.50	2.8

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Unit 5B Tanners Court	Langford	
Tanners Lane, East Wellow	Horsmere Green Lane	
Romsey SO51 6DP	Parking Court A	
Date August 2020	Designed By KN	
File Langford Discharges to Ditch.C...	Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Summary of Results for parking court a 100yrs+40%.src

Upstream Structures

Outflow To

Overflow To

(None) open ditch attenuation 100ys+40%.src

(None)

Half Drain Time : 440 minutes

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
15 Summer	0.2	0.0	0.2	5.9463	0.0633	5.7	0 K
30 Summer	0.3	0.0	0.3	5.9663	0.0833	8.0	0 K
60 Summer	0.3	0.0	0.3	5.9868	0.1038	10.4	0 K
120 Summer	0.3	0.0	0.3	6.0063	0.1233	12.6	0 K
180 Summer	0.3	0.0	0.3	6.0153	0.1323	13.6	0 K
240 Summer	0.3	0.0	0.3	6.0193	0.1363	14.1	0 K
360 Summer	0.3	0.0	0.3	6.0223	0.1393	14.5	0 K
480 Summer	0.3	0.0	0.3	6.0243	0.1413	14.7	0 K
600 Summer	0.3	0.0	0.3	6.0248	0.1418	14.7	0 K
720 Summer	0.3	0.0	0.3	6.0243	0.1413	14.7	0 K
960 Summer	0.3	0.0	0.3	6.0228	0.1398	14.5	0 K
1440 Summer	0.3	0.0	0.3	6.0168	0.1338	13.8	0 K
2160 Summer	0.3	0.0	0.3	6.0048	0.1218	12.5	0 K
2880 Summer	0.3	0.0	0.3	5.9938	0.1108	11.2	0 K
4320 Summer	0.3	0.0	0.3	5.9773	0.0943	9.3	0 K
5760 Summer	0.3	0.0	0.3	5.9663	0.0833	8.0	0 K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	124.63	23
30 Summer	83.79	37
60 Summer	53.78	66
120 Summer	33.34	126
180 Summer	24.83	186
240 Summer	20.01	244
360 Summer	14.71	326
480 Summer	11.82	386
600 Summer	9.97	450
720 Summer	8.67	516
960 Summer	6.94	650
1440 Summer	5.07	926
2160 Summer	3.70	1324
2880 Summer	2.95	1704
4320 Summer	2.14	2428
5760 Summer	1.70	3176

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsmere Green Lane Parking Court A	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Summary of Results for parking court a 100yrs+40%.src

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
7200 Summer	0.2	0.0	0.2	5.9578	0.0748	7.0	0 K
8640 Summer	0.2	0.0	0.2	5.9508	0.0678	6.2	0 K
10080 Summer	0.2	0.0	0.2	5.9453	0.0622	5.5	0 K
15 Winter	0.2	0.0	0.2	5.9538	0.0708	6.5	0 K
30 Winter	0.3	0.0	0.3	5.9763	0.0933	9.1	0 K
60 Winter	0.3	0.0	0.3	5.9998	0.1168	11.8	0 K
120 Winter	0.3	0.0	0.3	6.0218	0.1388	14.4	0 K
180 Winter	0.3	0.0	0.3	6.0323	0.1493	15.6	0 K
240 Winter	0.4	0.0	0.4	6.0378	0.1547	16.3	0 K
360 Winter	0.4	0.0	0.4	6.0423	0.1592	16.8	0 K
480 Winter	0.4	0.0	0.4	6.0428	0.1597	16.9	0 K
600 Winter	0.4	0.0	0.4	6.0428	0.1598	16.8	0 K
720 Winter	0.4	0.0	0.4	6.0418	0.1588	16.8	0 K
960 Winter	0.4	0.0	0.4	6.0383	0.1553	16.3	0 K
1440 Winter	0.3	0.0	0.3	6.0273	0.1443	15.1	0 K
2160 Winter	0.3	0.0	0.3	6.0093	0.1263	13.0	0 K
2880 Winter	0.3	0.0	0.3	5.9928	0.1098	11.1	0 K
4320 Winter	0.3	0.0	0.3	5.9723	0.0893	8.7	0 K
5760 Winter	0.2	0.0	0.2	5.9588	0.0758	7.1	0 K
7200 Winter	0.2	0.0	0.2	5.9488	0.0658	6.0	0 K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
7200 Summer	1.43	3896
8640 Summer	1.24	4664
10080 Summer	1.09	5352
15 Winter	124.63	23
30 Winter	83.79	37
60 Winter	53.78	66
120 Winter	33.34	124
180 Winter	24.83	182
240 Winter	20.01	238
360 Winter	14.71	348
480 Winter	11.82	446
600 Winter	9.97	478
720 Winter	8.67	554
960 Winter	6.94	708
1440 Winter	5.07	1000
2160 Winter	3.70	1412
2880 Winter	2.95	1792
4320 Winter	2.14	2552
5760 Winter	1.70	3288
7200 Winter	1.43	4040

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsemere Green Lane Parking Court A	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Summary of Results for parking court a 100yrs+40%.src

Storm Duration (mins)	Maximum Control (l/s)	Maximum Filtration (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m³)	Status
8640 Winter	0.2	0.0	0.2	5.9413	0.0582	5.1	0 K
10080 Winter	0.2	0.0	0.2	5.9358	0.0527	4.4	0 K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
8640 Winter	1.24	4760
10080 Winter	1.09	5456

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsemere Green Lane Parking Court A	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Rainfall Details for parking court a 100yrs+40%.src

Region	ENG+WAL	Shortest Storm (mins)	15
Return Period (years)	100	Longest Storm (mins)	10080
M5-60 (mm)	19.000	Summer Storms	Yes
Ratio-R	0.350	Winter Storms	Yes
Cv (Summer)	0.750	Climate Change %	+40
Cv (Winter)	0.840		

Time / Area Diagram

Total Area (ha) = 0.031

Time from:	(mins) to:	Area (ha)	Time from:	(mins) to:	Area (ha)
0	4	0.000	4	8	0.031

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Unit 5B Tanners Court Tanners Lane, East Wellow Romsey SO51 6DP	Langford Horsmere Green Lane Parking Court A	
Date August 2020 File Langford Discharges to Ditch.C...	Designed By KN Checked By	
Micro Drainage	Source Control W.11.2	

Cascade Storage Controls for parking court a 100yrs+40%.src

Porous Car Park Details

Infil Coef - Base (m/hr)	0.000000	Cover Level (m)	6.183
Membrane Percolation (mm/hr)	1000	Slope (1:x)	1000.0
Safety Factor	10.0	Max Percolation (l/s)	80.6
Porosity	0.40	Depression Storage (mm)	5
Length (m)	29.0	Evaporation (mm/day)	3
Width (m)	10.0	Cap Volume (m)	6.183
Invert Level (m)	5.883		

Hydro-Brake Outflow Control

Design Head (m)	0.250	Hydro-Brake Type	MD4	Invert Level (m)	5.883
Design Flow (l/s)	0.4	Diameter (mm)	33		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.10	0.3	0.80	0.7	2.00	1.2	4.00	1.7	7.00	2.2
0.20	0.4	1.00	0.8	2.20	1.2	4.50	1.8	7.50	2.3
0.30	0.5	1.20	0.9	2.40	1.3	5.00	1.8	8.00	2.3
0.40	0.5	1.40	1.0	2.60	1.3	5.50	1.9	8.50	2.4
0.50	0.6	1.60	1.0	3.00	1.4	6.00	2.0	9.00	2.5
0.60	0.6	1.80	1.1	3.50	1.5	6.50	2.1	9.50	2.5