APPENDIX G

GREENFIELD RUNOFF CALCULATIONS

ICP SUDS Mean Annual Flood

Input

Return Period (years) 100 SAAR (mm) 659 Urban 0.000
Area (ha) 1.000 Soil 0.470 Region Number Region 5

Results l/s

QBAR Rural 4.5
QBAR Urban 4.5

Q100 years 16.0

Q1 year 3.9
Q30 years 10.8
Q100 years 16.0

Rainfall Details

Rainfall Model	FSR	Ratio R	0.412	Cv (Winter)	0.840
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	England and Wales	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	20.000	Cv (Summer)	0.750	Climate Change %	+40

Time Area Diagram

Total Area (ha) 31.686

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.852	28	32	0.852	56	60	0.852	84	88	0.852	112	116	0.852	140	144	0.852
4	8	0.852	32	36	0.852	60	64	0.852	88	92	0.852	116	120	0.852	144	148	0.852
8	12	0.852	36	40	0.852	64	68	0.852	92	96	0.852	120	124	0.852	148	152	0.162
12	16	0.852	40	44	0.852	68	72	0.852	96	100	0.852	124	128	0.852			
16	20	0.852	44	48	0.852	72	76	0.852	100	104	0.852	128	132	0.852			
20	24	0.852	48	52	0.852	76	80	0.852	104	108	0.852	132	136	0.852			
24	28	0.852	52	56	0.852	80	84	0.852	108	112	0.852	136	140	0.852			

Model Details

Storage is Online Cover Level (m) 114.650

Complex Structure

Infiltration Basin

Invert Level (m) 111.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.02959 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.02959

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	8.0	3.450	860.0

Infiltration Basin

Invert Level (m) 111.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.02959 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.02959

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2813.0	3.450	6745.0

Infiltration Basin

Invert Level (m) 112.850 Infiltration Coefficient Side (m/hr) 0.02959
Infiltration Coefficient Base (m/hr) 0.02959 Safety Factor 2.0

Infiltration Basin

Porosity 1.00

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	17.0	1.800	577.0

Infiltration Basin

Invert Level (m) 113.075 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.02959 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.02959

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	0.1	1.575	372.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0451-1426-1500-1426
Design Head (m)	1.500
Design Flow (l/s)	142.6
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	451
Invert Level (m)	113.150
Minimum Outlet Pipe Diameter (mm)	500
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)

Hydro-Brake® Optimum Outflow Control

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	142.5	Kick-Flo®	1.177	126.6
Flush-Flo™	0.680	142.2	Mean Flow over Head Range	-	114.1

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)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	11.8	0.600	141.7	1.600	147.0	2.600	186.3	5.000	256.6	7.500	313.2
0.200	43.0	0.800	141.3	1.800	155.7	3.000	199.8	5.500	268.9	8.000	323.3
0.300	85.6	1.000	136.4	2.000	163.9	3.500	215.5	6.000	280.7	8.500	333.1
0.400	128.0	1.200	127.8	2.200	171.7	4.000	230.1	6.500	291.9	9.000	342.6
0.500	139.4	1.400	137.8	2.400	179.2	4.500	243.7	7.000	302.7	9.500	351.8

Summary of Results for 1 year Return Period

Half Drain Time : 2127 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	111.758	0.558	17.1	0.0	17.1	1727.6	O K
30 min Summer	111.913	0.713	18.7	0.0	18.7	2266.4	O K
60 min Summer	112.077	0.877	20.5	0.0	20.5	2863.8	O K
120 min Summer	112.247	1.047	22.3	0.0	22.3	3515.9	O K
180 min Summer	112.348	1.148	23.4	0.0	23.4	3923.9	O K
240 min Summer	112.421	1.221	24.2	0.0	24.2	4223.5	O K
360 min Summer	112.518	1.318	25.2	0.0	25.2	4631.4	O K
480 min Summer	112.580	1.380	25.9	0.0	25.9	4899.1	O K
600 min Summer	112.624	1.424	26.4	0.0	26.4	5095.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	31.296	0.0	1301.1	161
30 min Summer	20.325	0.0	1420.0	173
60 min Summer	12.800	0.0	2787.3	198
120 min Summer	7.895	0.0	3051.6	252
180 min Summer	5.922	0.0	3214.7	304
240 min Summer	4.823	0.0	3333.2	356
360 min Summer	3.593	0.0	3492.2	464
480 min Summer	2.905	0.0	3593.8	572
600 min Summer	2.464	0.0	3665.4	680

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
720 min Summer	112.658	1.458	26.8	0.0	26.8	5243.7	O K
960 min Summer	112.703	1.503	27.3	0.0	27.3	5445.3	O K
1440 min Summer	112.742	1.542	27.8	0.0	27.8	5625.4	O K
2160 min Summer	112.754	1.554	27.9	0.0	27.9	5679.4	O K
2880 min Summer	112.751	1.551	27.9	0.0	27.9	5666.9	O K
4320 min Summer	112.723	1.523	27.5	0.0	27.5	5536.5	O K
5760 min Summer	112.683	1.483	27.1	0.0	27.1	5355.1	O K
7200 min Summer	112.642	1.442	26.6	0.0	26.6	5173.9	O K
8640 min Summer	112.603	1.403	26.2	0.0	26.2	4998.8	O K
10080 min Summer	112.564	1.364	25.8	0.0	25.8	4829.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
720 min Summer	2.153	0.0	3716.4	788
960 min Summer	1.741	0.0	3775.9	1006
1440 min Summer	1.291	0.0	3786.3	1448
2160 min Summer	0.957	0.0	7077.0	1836
2880 min Summer	0.774	0.0	7150.1	2216
4320 min Summer	0.574	0.0	6967.3	3036
5760 min Summer	0.464	0.0	10583.0	3872
7200 min Summer	0.394	0.0	11222.3	4696
8640 min Summer	0.344	0.0	11689.4	5528
10080 min Summer	0.307	0.0	11463.6	6352

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Winter	111.822	0.622	17.8	0.0	17.8	1946.7	O K
30 min Winter	111.992	0.792	19.6	0.0	19.6	2551.3	O K
60 min Winter	112.171	0.971	21.5	0.0	21.5	3222.1	O K
120 min Winter	112.357	1.157	23.5	0.0	23.5	3957.0	O K
180 min Winter	112.468	1.268	24.7	0.0	24.7	4419.7	O K
240 min Winter	112.548	1.348	25.6	0.0	25.6	4761.2	O K
360 min Winter	112.655	1.455	26.8	0.0	26.8	5230.6	O K
480 min Winter	112.724	1.524	27.6	0.0	27.6	5543.4	O K
600 min Winter	112.775	1.575	28.1	0.0	28.1	5776.3	O K
720 min Winter	112.814	1.614	28.6	0.0	28.6	5955.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Winter	31.296	0.0	1351.7	161
30 min Winter	20.325	0.0	1483.5	174
60 min Winter	12.800	0.0	2933.6	200
120 min Winter	7.895	0.0	3225.7	252
180 min Winter	5.922	0.0	3405.4	304
240 min Winter	4.823	0.0	3535.5	356
360 min Winter	3.593	0.0	3709.5	464
480 min Winter	2.905	0.0	3820.1	570
600 min Winter	2.464	0.0	3897.6	678
720 min Winter	2.153	0.0	3952.3	786

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
960 min Winter	112.867	1.667	29.2	0.1	29.2	6208.4	O K
1440 min Winter	112.920	1.720	30.0	0.0	30.0	6460.5	O K
2160 min Winter	112.934	1.734	30.2	0.0	30.2	6529.5	O K
2880 min Winter	112.930	1.730	30.1	0.1	30.1	6510.0	O K
4320 min Winter	112.894	1.694	29.6	0.0	29.6	6336.2	O K
5760 min Winter	112.838	1.638	28.8	0.0	28.8	6067.7	O K
7200 min Winter	112.773	1.573	28.1	0.1	28.1	5768.4	O K
8640 min Winter	112.711	1.511	27.4	0.0	27.4	5481.7	O K
10080 min Winter	112.652	1.452	26.7	0.0	26.7	5215.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
960 min Winter	1.741	0.0	4015.1	1002
1440 min Winter	1.291	0.0	4024.4	1436
2160 min Winter	0.957	0.0	7592.4	2036
2880 min Winter	0.774	0.0	7666.5	2324
4320 min Winter	0.574	0.0	7451.8	3252
5760 min Winter	0.464	0.0	11853.0	4168
7200 min Winter	0.394	0.0	12557.5	5064
8640 min Winter	0.344	0.0	12704.0	5944
10080 min Winter	0.307	0.0	12440.9	6800

Summary of Results for 30 year Return Period

Half Drain Time : 895 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	112.461	1.261	24.6	0.0	24.6	4388.4	O K
30 min Summer	112.760	1.560	28.0	0.0	28.0	5706.9	O K
60 min Summer	113.042	1.842	31.6	0.0	31.6	7066.1	O K
120 min Summer	113.296	2.096	35.4	24.3	59.7	8394.5	O K
180 min Summer	113.409	2.209	37.1	67.3	104.4	9019.9	O K
240 min Summer	113.472	2.272	38.1	95.5	133.7	9383.0	O K
360 min Summer	113.542	2.342	39.2	124.9	164.1	9787.6	O K
480 min Summer	113.572	2.372	39.7	135.9	175.6	9967.9	O K
600 min Summer	113.586	2.386	39.9	136.6	176.6	10050.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	76.797	0.0	1878.1	162
30 min Summer	49.754	0.0	2132.7	175
60 min Summer	30.811	0.0	4393.6	202
120 min Summer	18.522	0.0	5024.5	248
180 min Summer	13.611	0.0	5674.0	286
240 min Summer	10.893	0.0	6183.7	322
360 min Summer	7.936	0.0	6936.4	400
480 min Summer	6.337	0.0	7491.7	484
600 min Summer	5.319	0.0	7919.6	548

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
720 min Summer	113.597	2.397	40.1	137.1	177.3	10114.9	O K
960 min Summer	113.610	2.410	40.3	137.8	178.1	10192.5	O K
1440 min Summer	113.613	2.413	40.4	137.9	178.3	10212.8	O K
2160 min Summer	113.591	2.391	40.0	136.8	176.9	10078.5	O K
2880 min Summer	113.561	2.361	39.5	132.1	171.6	9901.8	O K
4320 min Summer	113.508	2.308	38.7	111.3	150.0	9586.8	O K
5760 min Summer	113.464	2.264	38.0	92.0	130.0	9335.4	O K
7200 min Summer	113.429	2.229	37.4	76.1	113.5	9132.3	O K
8640 min Summer	113.399	2.199	37.0	63.0	99.9	8963.9	O K
10080 min Summer	113.373	2.173	36.6	52.3	88.8	8819.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
720 min Summer	4.609	0.0	8262.0	614
960 min Summer	3.673	0.0	8772.9	744
1440 min Summer	2.665	0.0	9356.9	1012
2160 min Summer	1.932	0.0	13932.3	1404
2880 min Summer	1.536	0.0	14150.1	1792
4320 min Summer	1.112	0.0	13833.6	2564
5760 min Summer	0.883	0.0	20067.6	3344
7200 min Summer	0.738	0.0	20118.7	4128
8640 min Summer	0.638	0.0	19836.8	4920
10080 min Summer	0.564	0.0	19258.0	5720

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Winter	112.586	1.386	26.0	0.0	26.0	4928.2	O K
30 min Winter	112.909	1.709	29.8	0.0	29.8	6406.4	O K
60 min Winter	113.209	2.009	34.0	4.3	38.3	7926.6	O K
120 min Winter	113.451	2.251	37.8	86.2	123.9	9261.8	O K
180 min Winter	113.561	2.361	39.5	131.9	171.4	9900.0	O K
240 min Winter	113.630	2.430	40.7	138.6	179.3	10313.4	O K
360 min Winter	113.714	2.514	42.0	141.1	183.1	10831.9	O K
480 min Winter	113.757	2.557	42.8	141.8	184.5	11102.1	O K
600 min Winter	113.775	2.575	43.1	141.9	185.0	11219.8	O K
720 min Winter	113.782	2.582	43.2	142.0	185.2	11266.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Winter	76.797	0.0	1986.8	162
30 min Winter	49.754	0.0	2266.3	175
60 min Winter	30.811	0.0	4719.7	202
120 min Winter	18.522	0.0	5858.1	238
180 min Winter	13.611	0.0	6697.4	274
240 min Winter	10.893	0.0	7297.7	318
360 min Winter	7.936	0.0	8153.4	406
480 min Winter	6.337	0.0	8781.2	496
600 min Winter	5.319	0.0	9269.8	584
720 min Winter	4.609	0.0	9666.7	654

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control Σ Outflow (l/s)	Max Volume (m³)	Status
960 min Winter	113.787	2.587	43.3	142.0	185.3	11297.0	O K
1440 min Winter	113.765	2.565	42.9	141.9	184.8	11154.0	O K
2160 min Winter	113.696	2.496	41.7	140.7	182.4	10720.2	O K
2880 min Winter	113.622	2.422	40.5	138.3	178.8	10269.0	O K
4320 min Winter	113.529	2.329	39.0	119.9	158.9	9710.0	O K
5760 min Winter	113.474	2.274	38.1	96.2	134.4	9389.6	O K
7200 min Winter	113.433	2.233	37.5	78.1	115.6	9157.5	O K
8640 min Winter	113.401	2.201	37.0	64.1	101.1	8977.2	O K
10080 min Winter	113.375	2.175	36.6	53.1	89.7	8829.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
960 min Winter	3.673	0.0	10279.7	794
1440 min Winter	2.665	0.0	11064.2	1082
2160 min Winter	1.932	0.0	15880.7	1496
2880 min Winter	1.536	0.0	16230.7	1876
4320 min Winter	1.112	0.0	16060.7	2620
5760 min Winter	0.883	0.0	22426.7	3392
7200 min Winter	0.738	0.0	22487.0	4176
8640 min Winter	0.638	0.0	22197.2	4968
10080 min Winter	0.564	0.0	21568.6	5776

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

Half Drain Time : 895 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	113.235	2.035	34.4	8.6	43.0	8063.3	O K
30 min Summer	113.628	2.428	40.6	138.6	179.2	10306.6	O K
60 min Summer	113.979	2.779	46.6	142.2	187.4	12569.5	O K
120 min Summer	114.296	3.096	52.3	142.2	187.4	14851.7	O K
180 min Summer	114.454	3.254	55.3	142.2	188.4	16088.4	Flood Risk
240 min Summer	114.547	3.347	57.1	142.2	194.8	16846.4	Flood Risk
360 min Summer	114.655	3.455	59.1	142.7	201.8	17756.1	FLOOD
480 min Summer	114.710	3.510	59.1	145.2	204.4	18278.7	FLOOD
600 min Summer	114.738	3.538	59.1	146.5	205.6	18554.0	FLOOD

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	139.587	0.0	2632.1	162
30 min Summer	91.185	0.0	4489.4	169
60 min Summer	56.713	0.0	9095.6	192
120 min Summer	34.079	0.0	11426.3	238
180 min Summer	24.967	0.0	12771.0	286
240 min Summer	19.906	0.0	13704.3	332
360 min Summer	14.417	47.1	15040.6	428
480 min Summer	11.468	569.8	16035.6	524
600 min Summer	9.596	845.1	16815.1	622

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
720 min Summer	114.750	3.550	59.1	147.0	206.2	18666.0	FLOOD
960 min Summer	114.756	3.556	59.1	147.3	206.4	18724.0	FLOOD
1440 min Summer	114.749	3.549	59.1	147.0	206.1	18651.0	FLOOD
2160 min Summer	114.704	3.504	59.1	145.0	204.1	18225.3	FLOOD
2880 min Summer	114.639	3.439	58.9	142.2	200.9	17615.2	Flood Risk
4320 min Summer	114.473	3.273	55.7	142.2	189.7	16235.4	Flood Risk
5760 min Summer	114.280	3.080	52.0	142.2	187.4	14731.4	O K
7200 min Summer	114.084	2.884	48.5	142.2	187.4	13297.7	O K
8640 min Summer	113.919	2.719	45.5	142.2	187.2	12163.7	O K
10080 min Summer	113.787	2.587	43.3	142.0	185.3	11293.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
720 min Summer	8.292	957.0	17453.2	720
960 min Summer	6.581	1015.0	18450.8	836
1440 min Summer	4.744	942.1	19795.0	1094
2160 min Summer	3.415	516.3	25784.0	1500
2880 min Summer	2.702	0.0	26770.9	1900
4320 min Summer	1.940	0.0	27540.9	2700
5760 min Summer	1.532	0.0	34583.7	3472
7200 min Summer	1.275	0.0	34850.5	4168
8640 min Summer	1.097	0.0	34654.6	4840
10080 min Summer	0.966	0.0	34052.4	5496

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Winter	113.404	2.204	37.0	65.4	102.4	8993.0	O K
30 min Winter	113.813	2.613	43.7	142.1	185.9	11465.2	O K
60 min Winter	114.192	2.992	50.4	142.2	187.4	14072.4	O K
120 min Winter	114.528	3.328	56.7	142.2	193.4	16682.7	Flood Risk
180 min Winter	114.689	3.489	59.1	144.3	203.4	18078.1	FLOOD
240 min Winter	114.780	3.580	59.1	148.4	207.5	18953.0	FLOOD
360 min Winter	114.893	3.693	59.1	153.3	212.4	20028.0	FLOOD
480 min Winter	114.959	3.759	59.1	156.1	215.2	20656.9	FLOOD
600 min Winter	114.995	3.795	59.1	157.6	216.7	21003.4	FLOOD
720 min Winter	115.012	3.812	59.1	158.3	217.4	21164.0	FLOOD

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Winter	139.587	0.0	3225.6	161
30 min Winter	91.185	0.0	5599.8	170
60 min Winter	56.713	0.0	10511.8	194
120 min Winter	34.079	0.0	13114.6	240
180 min Winter	24.967	369.2	14638.6	288
240 min Winter	19.906	1244.1	15693.5	334
360 min Winter	14.417	2319.0	17203.3	432
480 min Winter	11.468	2948.0	18331.5	530
600 min Winter	9.596	3294.4	19218.3	628
720 min Winter	8.292	3455.1	19946.2	728

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
960 min Winter	115.010	3.810	59.1	158.2	217.4	21144.5	FLOOD
1440 min Winter	114.975	3.775	59.1	156.8	215.9	20810.7	FLOOD
2160 min Winter	114.880	3.680	59.1	152.7	211.9	19909.3	FLOOD
2880 min Winter	114.764	3.564	59.1	147.6	206.8	18794.1	FLOOD
4320 min Winter	114.508	3.308	56.4	142.2	192.1	16521.9	Flood Risk
5760 min Winter	114.195	2.995	50.5	142.2	187.4	14096.2	O K
7200 min Winter	113.904	2.704	45.3	142.2	187.1	12063.4	O K
8640 min Winter	113.694	2.494	41.7	140.7	182.4	10707.1	O K
10080 min Winter	113.572	2.372	39.7	135.8	175.5	9963.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
960 min Winter	6.581	3435.6	21091.2	902
1440 min Winter	4.744	3101.8	22655.7	1168
2160 min Winter	3.415	2200.4	29034.1	1616
2880 min Winter	2.702	1085.2	30184.5	2048
4320 min Winter	1.940	0.0	31447.5	2884
5760 min Winter	1.532	0.0	38798.7	3640
7200 min Winter	1.275	0.0	39226.7	4280
8640 min Winter	1.097	0.0	39091.8	4864
10080 min Winter	0.966	0.0	38464.4	5344

Rainfall Details

Rainfall Model	FSR	Ratio R	0.412	Cv (Winter)	0.840
Return Period (years)	1	Summer Storms	Yes	Shortest Storm (mins)	15
Region	England and Wales	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	20.000	Cv (Summer)	0.750	Climate Change %	+0

Time Area Diagram

Total Area (ha) 26.500

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.883	24	28	0.883	48	52	0.883	72	76	0.883	96	100	0.883	120	124	0.010
4	8	0.883	28	32	0.883	52	56	0.883	76	80	0.883	100	104	0.883			
8	12	0.883	32	36	0.883	56	60	0.883	80	84	0.883	104	108	0.883			
12	16	0.883	36	40	0.883	60	64	0.883	84	88	0.883	108	112	0.883			
16	20	0.883	40	44	0.883	64	68	0.883	88	92	0.883	112	116	0.883			
20	24	0.883	44	48	0.883	68	72	0.883	92	96	0.883	116	120	0.883			

Model Details

Storage is Online Cover Level (m) 113.300

Complex Structure

Tank or Pond

Invert Level (m) 111.050

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	5686.0	2.250	8765.0	2.251	0.0

Tank or Pond

Invert Level (m) 112.050

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	5428.0	1.250	6725.0	1.251	0.0

Tank or Pond

Invert Level (m) 112.050

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1540.0	1.250	2399.0	1.251	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0361-9000-2300-9000
Design Head (m)	2.300
Design Flow (l/s)	90.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	361
Invert Level (m)	111.000
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.300	89.9	Kick-Flo®	1.559	74.5
Flush-Flo™	0.714	89.9	Mean Flow over Head Range	-	77.0

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)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	10.3	0.600	89.5	1.600	75.5	2.600	95.5	5.000	131.2	7.500	160.0
0.200	36.3	0.800	89.7	1.800	79.9	3.000	102.3	5.500	137.5	8.000	165.1
0.300	67.7	1.000	88.4	2.000	84.1	3.500	110.3	6.000	143.5	8.500	170.1
0.400	85.0	1.200	86.1	2.200	88.0	4.000	117.7	6.500	149.2	9.000	174.9
0.500	88.0	1.400	81.7	2.400	91.8	4.500	124.7	7.000	154.7	9.500	179.6

Summary of Results for 1 year Return Period

Half Drain Time : 354 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	111.278	0.228	0.0	61.0	61.0	1325.5	O K
30 min Summer	111.339	0.289	0.0	78.1	78.1	1696.3	O K
60 min Summer	111.406	0.356	0.0	85.3	85.3	2103.8	O K
120 min Summer	111.476	0.426	0.0	87.4	87.4	2537.5	O K
180 min Summer	111.515	0.465	0.0	88.3	88.3	2780.6	O K
240 min Summer	111.540	0.490	0.0	88.7	88.7	2933.2	O K
360 min Summer	111.562	0.512	0.0	89.0	89.0	3075.5	O K
480 min Summer	111.569	0.519	0.0	89.1	89.1	3118.6	O K
600 min Summer	111.571	0.521	0.0	89.1	89.1	3133.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	31.296	0.0	1511.2	129
30 min Summer	20.325	0.0	1953.0	137
60 min Summer	12.800	0.0	2541.2	156
120 min Summer	7.895	0.0	3135.7	194
180 min Summer	5.922	0.0	3528.1	234
240 min Summer	4.823	0.0	3831.6	276
360 min Summer	3.593	0.0	4281.3	362
480 min Summer	2.905	0.0	4616.6	428
600 min Summer	2.464	0.0	4893.5	496

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
720 min Summer	111.571	0.521	0.0	89.1	89.1	3129.4	O K
960 min Summer	111.564	0.514	0.0	89.1	89.1	3085.3	O K
1440 min Summer	111.538	0.488	0.0	88.7	88.7	2924.6	O K
2160 min Summer	111.492	0.442	0.0	87.8	87.8	2634.3	O K
2880 min Summer	111.447	0.397	0.0	86.6	86.6	2355.9	O K
4320 min Summer	111.376	0.326	0.0	84.0	84.0	1920.3	O K
5760 min Summer	111.335	0.285	0.0	77.1	77.1	1671.1	O K
7200 min Summer	111.307	0.257	0.0	69.6	69.6	1500.8	O K
8640 min Summer	111.286	0.236	0.0	63.5	63.5	1373.6	O K
10080 min Summer	111.269	0.219	0.0	58.1	58.1	1274.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
720 min Summer	2.153	0.0	5132.4	562
960 min Summer	1.741	0.0	5533.3	696
1440 min Summer	1.291	0.0	6121.8	964
2160 min Summer	0.957	0.0	6847.7	1352
2880 min Summer	0.774	0.0	7384.6	1724
4320 min Summer	0.574	0.0	8205.8	2432
5760 min Summer	0.464	0.0	8847.4	3144
7200 min Summer	0.394	0.0	9384.1	3856
8640 min Summer	0.344	0.0	9847.7	4584
10080 min Summer	0.307	0.0	10258.7	5304

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Winter	111.303	0.253	0.0	68.6	68.6	1479.8	O K
30 min Winter	111.372	0.322	0.0	83.8	83.8	1897.8	O K
60 min Winter	111.450	0.400	0.0	86.7	86.7	2370.5	O K
120 min Winter	111.530	0.480	0.0	88.6	88.6	2872.5	O K
180 min Winter	111.575	0.525	0.0	89.2	89.2	3156.1	O K
240 min Winter	111.603	0.553	0.0	89.5	89.5	3336.2	O K
360 min Winter	111.631	0.581	0.0	89.7	89.7	3510.8	O K
480 min Winter	111.636	0.586	0.0	89.7	89.7	3549.1	O K
600 min Winter	111.635	0.585	0.0	89.7	89.7	3538.5	O K
720 min Winter	111.630	0.580	0.0	89.7	89.7	3507.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Winter	31.296	0.0	1689.0	129
30 min Winter	20.325	0.0	2184.9	138
60 min Winter	12.800	0.0	2846.4	158
120 min Winter	7.895	0.0	3512.1	200
180 min Winter	5.922	0.0	3952.0	242
240 min Winter	4.823	0.0	4291.9	286
360 min Winter	3.593	0.0	4795.6	374
480 min Winter	2.905	0.0	5170.8	460
600 min Winter	2.464	0.0	5481.3	532
720 min Winter	2.153	0.0	5748.7	604

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
960 min Winter	111.614	0.564	0.0	89.6	89.6	3402.8	O K
1440 min Winter	111.567	0.517	0.0	89.1	89.1	3103.9	O K
2160 min Winter	111.490	0.440	0.0	87.8	87.8	2621.7	O K
2880 min Winter	111.422	0.372	0.0	85.8	85.8	2200.6	O K
4320 min Winter	111.338	0.288	0.0	77.9	77.9	1691.5	O K
5760 min Winter	111.296	0.246	0.0	66.6	66.6	1436.2	O K
7200 min Winter	111.268	0.218	0.0	57.9	57.9	1270.3	O K
8640 min Winter	111.248	0.198	0.0	51.4	51.4	1148.3	O K
10080 min Winter	111.232	0.182	0.0	46.3	46.3	1054.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
960 min Winter	1.741	0.0	6197.6	750
1440 min Winter	1.291	0.0	6842.4	1034
2160 min Winter	0.957	0.0	7669.9	1432
2880 min Winter	0.774	0.0	8273.4	1800
4320 min Winter	0.574	0.0	9191.2	2480
5760 min Winter	0.464	0.0	9909.8	3192
7200 min Winter	0.394	0.0	10510.4	3920
8640 min Winter	0.344	0.0	11029.3	4640
10080 min Winter	0.307	0.0	11489.2	5368

Summary of Results for 30 year Return Period

Half Drain Time : 875 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	111.603	0.553	0.0	89.5	89.5	3333.1	O K
30 min Summer	111.765	0.715	0.0	89.9	89.9	4384.8	O K
60 min Summer	111.927	0.877	0.0	89.9	89.9	5467.8	O K
120 min Summer	112.065	1.015	0.0	89.9	89.9	6533.7	O K
180 min Summer	112.106	1.056	0.0	89.9	89.9	7105.7	O K
240 min Summer	112.131	1.081	0.0	89.9	89.9	7458.6	O K
360 min Summer	112.159	1.109	0.0	89.9	89.9	7858.9	O K
480 min Summer	112.173	1.123	0.0	89.9	89.9	8052.7	O K
600 min Summer	112.178	1.128	0.0	89.9	89.9	8123.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	76.797	0.0	3654.7	130
30 min Summer	49.754	0.0	4685.4	141
60 min Summer	30.811	0.0	6120.7	164
120 min Summer	18.522	0.0	7359.8	214
180 min Summer	13.611	0.0	8106.6	264
240 min Summer	10.893	0.0	8628.0	314
360 min Summer	7.936	0.0	9389.2	416
480 min Summer	6.337	0.0	9959.1	518
600 min Summer	5.319	0.0	10410.9	622

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
720 min Summer	112.177	1.127	0.0	89.9	89.9	8115.9	O K
960 min Summer	112.168	1.118	0.0	89.9	89.9	7991.0	O K
1440 min Summer	112.146	1.096	0.0	89.9	89.9	7669.4	O K
2160 min Summer	112.107	1.057	0.0	89.9	89.9	7114.0	O K
2880 min Summer	112.066	1.016	0.0	89.9	89.9	6541.3	O K
4320 min Summer	111.925	0.875	0.0	89.9	89.9	5456.3	O K
5760 min Summer	111.784	0.734	0.0	89.9	89.9	4514.2	O K
7200 min Summer	111.665	0.615	0.0	89.8	89.8	3734.4	O K
8640 min Summer	111.568	0.518	0.0	89.1	89.1	3113.7	O K
10080 min Summer	111.491	0.441	0.0	87.8	87.8	2628.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
720 min Summer	4.609	0.0	10783.3	726
960 min Summer	3.673	0.0	11363.5	858
1440 min Summer	2.665	0.0	12063.7	1106
2160 min Summer	1.932	0.0	13822.1	1508
2880 min Summer	1.536	0.0	14657.7	1912
4320 min Summer	1.112	0.0	15905.7	2696
5760 min Summer	0.883	0.0	16846.8	3440
7200 min Summer	0.738	0.0	17610.1	4152
8640 min Summer	0.638	0.0	18257.6	4848
10080 min Summer	0.564	0.0	18818.4	5528

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Winter	111.670	0.620	0.0	89.9	89.9	3767.9	O K
30 min Winter	111.851	0.801	0.0	89.9	89.9	4960.4	O K
60 min Winter	112.031	0.981	0.0	89.9	89.9	6188.7	O K
120 min Winter	112.127	1.077	0.0	89.9	89.9	7402.9	O K
180 min Winter	112.173	1.123	0.0	89.9	89.9	8061.2	O K
240 min Winter	112.202	1.152	0.0	89.9	89.9	8474.4	O K
360 min Winter	112.236	1.186	0.0	89.9	89.9	8960.3	O K
480 min Winter	112.254	1.204	0.0	89.9	89.9	9217.3	O K
600 min Winter	112.262	1.212	0.0	89.9	89.9	9337.4	O K
720 min Winter	112.264	1.214	0.0	89.9	89.9	9368.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Winter	76.797	0.0	4078.8	130
30 min Winter	49.754	0.0	5210.9	142
60 min Winter	30.811	0.0	6855.5	166
120 min Winter	18.522	0.0	8236.8	216
180 min Winter	13.611	0.0	9045.0	266
240 min Winter	10.893	0.0	9622.5	318
360 min Winter	7.936	0.0	10461.0	422
480 min Winter	6.337	0.0	11082.1	526
600 min Winter	5.319	0.0	11567.2	630
720 min Winter	4.609	0.0	11958.1	736

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
960 min Winter	112.257	1.207	0.0	89.9	89.9	9260.6	O K
1440 min Winter	112.224	1.174	0.0	89.9	89.9	8795.3	O K
2160 min Winter	112.169	1.119	0.0	89.9	89.9	8004.5	O K
2880 min Winter	112.109	1.059	0.0	89.9	89.9	7144.5	O K
4320 min Winter	111.929	0.879	0.0	89.9	89.9	5481.3	O K
5760 min Winter	111.719	0.669	0.0	89.9	89.9	4082.7	O K
7200 min Winter	111.554	0.504	0.0	88.9	88.9	3025.3	O K
8640 min Winter	111.436	0.386	0.0	86.3	86.3	2289.5	O K
10080 min Winter	111.363	0.313	0.0	83.4	83.4	1842.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
960 min Winter	3.673	0.0	12534.2	946
1440 min Winter	2.665	0.0	12999.8	1194
2160 min Winter	1.932	0.0	15480.8	1640
2880 min Winter	1.536	0.0	16416.7	2076
4320 min Winter	1.112	0.0	17797.5	2888
5760 min Winter	0.883	0.0	18871.5	3624
7200 min Winter	0.738	0.0	19726.2	4288
8640 min Winter	0.638	0.0	20448.5	4912
10080 min Winter	0.564	0.0	21076.5	5448

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

Half Drain Time : 1851 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	112.053	1.003	0.0	89.9	89.9	6360.6	O K
30 min Summer	112.199	1.149	0.0	89.9	89.9	8431.2	O K
60 min Summer	112.345	1.295	0.0	89.9	89.9	10555.6	O K
120 min Summer	112.485	1.435	0.0	89.9	89.9	12660.1	O K
180 min Summer	112.560	1.510	0.0	89.9	89.9	13818.2	O K
240 min Summer	112.607	1.557	0.0	89.9	89.9	14551.0	O K
360 min Summer	112.665	1.615	0.0	89.9	89.9	15466.6	O K
480 min Summer	112.701	1.651	0.0	89.9	89.9	16038.4	O K
600 min Summer	112.724	1.674	0.0	89.9	89.9	16398.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	139.587	0.0	6368.3	132
30 min Summer	91.185	0.0	7441.4	145
60 min Summer	56.713	0.0	11117.4	172
120 min Summer	34.079	0.0	13086.8	226
180 min Summer	24.967	0.0	13931.3	282
240 min Summer	19.906	0.0	14088.9	336
360 min Summer	14.417	0.0	13812.8	446
480 min Summer	11.468	0.0	13569.7	556
600 min Summer	9.596	0.0	13376.8	668

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
720 min Summer	112.738	1.688	0.0	89.9	89.9	16623.4	O K
960 min Summer	112.750	1.700	0.0	89.9	89.9	16813.5	O K
1440 min Summer	112.738	1.688	0.0	89.9	89.9	16623.6	O K
2160 min Summer	112.688	1.638	0.0	89.9	89.9	15824.9	O K
2880 min Summer	112.639	1.589	0.0	89.9	89.9	15045.5	O K
4320 min Summer	112.542	1.492	0.0	89.9	89.9	13546.3	O K
5760 min Summer	112.447	1.397	0.0	89.9	89.9	12092.8	O K
7200 min Summer	112.359	1.309	0.0	89.9	89.9	10767.4	O K
8640 min Summer	112.276	1.226	0.0	89.9	89.9	9545.8	O K
10080 min Summer	112.199	1.149	0.0	89.9	89.9	8423.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
720 min Summer	8.292	0.0	13217.4	780
960 min Summer	6.581	0.0	12945.2	1004
1440 min Summer	4.744	0.0	12474.5	1454
2160 min Summer	3.415	0.0	24162.0	1884
2880 min Summer	2.702	0.0	25058.9	2256
4320 min Summer	1.940	0.0	23944.6	3036
5760 min Summer	1.532	0.0	29225.3	3808
7200 min Summer	1.275	0.0	30403.0	4584
8640 min Summer	1.097	0.0	31390.1	5360
10080 min Summer	0.966	0.0	32241.5	6104

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Winter	112.112	1.062	0.0	89.9	89.9	7183.2	O K
30 min Winter	112.274	1.224	0.0	89.9	89.9	9513.7	O K
60 min Winter	112.435	1.385	0.0	89.9	89.9	11909.5	O K
120 min Winter	112.591	1.541	0.0	89.9	89.9	14294.5	O K
180 min Winter	112.674	1.624	0.0	89.9	89.9	15598.1	O K
240 min Winter	112.726	1.676	0.0	89.9	89.9	16435.5	O K
360 min Winter	112.793	1.743	0.0	89.9	89.9	17511.2	O K
480 min Winter	112.835	1.785	0.0	89.9	89.9	18204.0	O K
600 min Winter	112.863	1.813	0.0	89.9	89.9	18660.3	O K
720 min Winter	112.882	1.832	0.0	89.9	89.9	18963.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Winter	139.587	0.0	6944.9	132
30 min Winter	91.185	0.0	7458.2	145
60 min Winter	56.713	0.0	12336.1	172
120 min Winter	34.079	0.0	14091.0	226
180 min Winter	24.967	0.0	14072.0	280
240 min Winter	19.906	0.0	13860.6	336
360 min Winter	14.417	0.0	13564.4	444
480 min Winter	11.468	0.0	13373.7	554
600 min Winter	9.596	0.0	13230.6	664
720 min Winter	8.292	0.0	13113.3	774

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
960 min Winter	112.901	1.851	0.0	89.9	89.9	19277.9	O K
1440 min Winter	112.899	1.849	0.0	89.9	89.9	19250.3	O K
2160 min Winter	112.851	1.801	0.0	89.9	89.9	18459.7	O K
2880 min Winter	112.788	1.738	0.0	89.9	89.9	17435.4	O K
4320 min Winter	112.670	1.620	0.0	89.9	89.9	15542.4	O K
5760 min Winter	112.539	1.489	0.0	89.9	89.9	13497.7	O K
7200 min Winter	112.401	1.351	0.0	89.9	89.9	11393.0	O K
8640 min Winter	112.273	1.223	0.0	89.9	89.9	9495.7	O K
10080 min Winter	112.155	1.105	0.0	89.9	89.9	7794.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
960 min Winter	6.581	0.0	12923.1	994
1440 min Winter	4.744	0.0	12636.8	1438
2160 min Winter	3.415	0.0	26433.8	2080
2880 min Winter	2.702	0.0	26055.0	2376
4320 min Winter	1.940	0.0	24146.9	3288
5760 min Winter	1.532	0.0	32732.8	4192
7200 min Winter	1.275	0.0	34051.7	4992
8640 min Winter	1.097	0.0	35156.9	5760
10080 min Winter	0.966	0.0	36111.6	6488

Rainfall Details

Rainfall Model	FSR	Ratio R	0.412	Cv (Winter)	0.840
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	England and Wales	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	20.000	Cv (Summer)	0.750	Climate Change %	+40

Time Area Diagram

Total Area (ha) 8.410

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.841	8	12	0.841	16	20	0.841	24	28	0.841	32	36	0.841
4	8	0.841	12	16	0.841	20	24	0.841	28	32	0.841	36	40	0.841

Model Details

Storage is Online Cover Level (m) 108.200

Infiltration Basin Structure

Invert Level (m) 106.500 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.11268 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.11268

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2702.0	1.700	4128.0	1.701	0.0

Summary of Results for 1 year Return Period

Half Drain Time : 148 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
15 min Summer	106.642	0.142	45.9	391.2	O K
30 min Summer	106.686	0.186	47.0	516.3	O K
60 min Summer	106.728	0.228	48.1	635.5	O K
120 min Summer	106.756	0.256	48.8	717.5	O K
180 min Summer	106.761	0.261	48.9	732.1	O K
240 min Summer	106.761	0.261	48.9	731.2	O K
360 min Summer	106.753	0.253	48.7	708.1	O K
480 min Summer	106.741	0.241	48.4	674.0	O K
600 min Summer	106.729	0.229	48.1	638.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m^3)	Time-Peak (mins)
15 min Summer	31.296	0.0	49
30 min Summer	20.325	0.0	59
60 min Summer	12.800	0.0	80
120 min Summer	7.895	0.0	126
180 min Summer	5.922	0.0	164
240 min Summer	4.823	0.0	198
360 min Summer	3.593	0.0	266
480 min Summer	2.905	0.0	334
600 min Summer	2.464	0.0	402

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
720 min Summer	106.716	0.216	47.8	602.1	O K
960 min Summer	106.692	0.192	47.2	532.4	O K
1440 min Summer	106.648	0.148	46.0	408.1	O K
2160 min Summer	106.598	0.098	44.8	267.0	O K
2880 min Summer	106.565	0.065	43.9	176.8	O K
4320 min Summer	106.544	0.044	38.0	118.9	O K
5760 min Summer	106.536	0.036	31.4	97.8	O K
7200 min Summer	106.531	0.031	26.6	83.9	O K
8640 min Summer	106.527	0.027	23.6	73.4	O K
10080 min Summer	106.524	0.024	21.0	65.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
720 min Summer	2.153	0.0	468
960 min Summer	1.741	0.0	600
1440 min Summer	1.291	0.0	852
2160 min Summer	0.957	0.0	1204
2880 min Summer	0.774	0.0	1536
4320 min Summer	0.574	0.0	2220
5760 min Summer	0.464	0.0	2944
7200 min Summer	0.394	0.0	3680
8640 min Summer	0.344	0.0	4408
10080 min Summer	0.307	0.0	5144

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	106.662	0.162	46.4	447.0	O K
30 min Winter	106.712	0.212	47.7	588.8	O K
60 min Winter	106.759	0.259	48.9	725.1	O K
120 min Winter	106.793	0.293	49.8	824.6	O K
180 min Winter	106.800	0.300	49.9	846.3	O K
240 min Winter	106.799	0.299	49.9	841.0	O K
360 min Winter	106.786	0.286	49.6	804.4	O K
480 min Winter	106.768	0.268	49.1	751.1	O K
600 min Winter	106.748	0.248	48.6	693.9	O K
720 min Winter	106.728	0.228	48.1	636.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	31.296	0.0	50
30 min Winter	20.325	0.0	60
60 min Winter	12.800	0.0	82
120 min Winter	7.895	0.0	130
180 min Winter	5.922	0.0	176
240 min Winter	4.823	0.0	212
360 min Winter	3.593	0.0	286
480 min Winter	2.905	0.0	360
600 min Winter	2.464	0.0	434
720 min Winter	2.153	0.0	504

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
960 min Winter	106.690	0.190	47.1	526.5	O K
1440 min Winter	106.623	0.123	45.4	339.0	O K
2160 min Winter	106.558	0.058	43.7	157.8	O K
2880 min Winter	106.544	0.044	38.0	118.3	O K
4320 min Winter	106.533	0.033	28.4	88.3	O K
5760 min Winter	106.527	0.027	23.1	71.9	O K
7200 min Winter	106.523	0.023	19.7	61.1	O K
8640 min Winter	106.520	0.020	17.0	53.2	O K
10080 min Winter	106.518	0.018	15.3	47.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
960 min Winter	1.741	0.0	640
1440 min Winter	1.291	0.0	888
2160 min Winter	0.957	0.0	1196
2880 min Winter	0.774	0.0	1496
4320 min Winter	0.574	0.0	2212
5760 min Winter	0.464	0.0	2944
7200 min Winter	0.394	0.0	3640
8640 min Winter	0.344	0.0	4416
10080 min Winter	0.307	0.0	5144

Summary of Results for 30 year Return Period

Half Drain Time : 350 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m^3)	Status
15 min Summer	106.881	0.381	52.0	1084.2	O K
30 min Summer	106.988	0.488	54.8	1409.9	O K
60 min Summer	107.086	0.586	57.3	1714.3	O K
120 min Summer	107.161	0.661	59.3	1954.6	O K
180 min Summer	107.186	0.686	60.0	2035.1	O K
240 min Summer	107.190	0.690	60.1	2048.9	O K
360 min Summer	107.176	0.676	59.7	2004.6	O K
480 min Summer	107.159	0.659	59.3	1948.1	O K
600 min Summer	107.140	0.640	58.8	1889.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m^3)	Time-Peak (mins)
15 min Summer	76.797	0.0	51
30 min Summer	49.754	0.0	63
60 min Summer	30.811	0.0	88
120 min Summer	18.522	0.0	140
180 min Summer	13.611	0.0	192
240 min Summer	10.893	0.0	244
360 min Summer	7.936	0.0	318
480 min Summer	6.337	0.0	380
600 min Summer	5.319	0.0	446

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
720 min Summer	107.122	0.622	58.3	1831.1	O K
960 min Summer	107.087	0.587	57.4	1719.7	O K
1440 min Summer	107.021	0.521	55.7	1512.7	O K
2160 min Summer	106.931	0.431	53.3	1235.4	O K
2880 min Summer	106.851	0.351	51.2	996.4	O K
4320 min Summer	106.724	0.224	48.0	623.1	O K
5760 min Summer	106.634	0.134	45.7	368.1	O K
7200 min Summer	106.577	0.077	44.2	209.4	O K
8640 min Summer	106.550	0.050	43.6	136.2	O K
10080 min Summer	106.544	0.044	38.5	120.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
720 min Summer	4.609	0.0	514
960 min Summer	3.673	0.0	652
1440 min Summer	2.665	0.0	924
2160 min Summer	1.932	0.0	1320
2880 min Summer	1.536	0.0	1704
4320 min Summer	1.112	0.0	2424
5760 min Summer	0.883	0.0	3120
7200 min Summer	0.738	0.0	3768
8640 min Summer	0.638	0.0	4408
10080 min Summer	0.564	0.0	5144

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	106.928	0.428	53.2	1226.4	O K
30 min Winter	107.047	0.547	56.3	1593.6	O K
60 min Winter	107.157	0.657	59.2	1940.5	O K
120 min Winter	107.244	0.744	61.5	2226.4	O K
180 min Winter	107.277	0.777	62.4	2333.8	O K
240 min Winter	107.287	0.787	62.6	2366.2	O K
360 min Winter	107.276	0.776	62.4	2332.2	O K
480 min Winter	107.255	0.755	61.8	2260.1	O K
600 min Winter	107.232	0.732	61.2	2186.2	O K
720 min Winter	107.208	0.708	60.6	2107.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	76.797	0.0	51
30 min Winter	49.754	0.0	64
60 min Winter	30.811	0.0	90
120 min Winter	18.522	0.0	140
180 min Winter	13.611	0.0	194
240 min Winter	10.893	0.0	246
360 min Winter	7.936	0.0	350
480 min Winter	6.337	0.0	402
600 min Winter	5.319	0.0	478
720 min Winter	4.609	0.0	554

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
960 min Winter	107.158	0.658	59.3	1946.0	O K
1440 min Winter	107.061	0.561	56.7	1636.2	O K
2160 min Winter	106.928	0.428	53.2	1225.8	O K
2880 min Winter	106.813	0.313	50.3	884.1	O K
4320 min Winter	106.640	0.140	45.8	385.5	O K
5760 min Winter	106.550	0.050	43.6	136.6	O K
7200 min Winter	106.542	0.042	36.7	114.2	O K
8640 min Winter	106.537	0.037	31.9	99.1	O K
10080 min Winter	106.532	0.032	27.9	87.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
960 min Winter	3.673	0.0	706
1440 min Winter	2.665	0.0	998
2160 min Winter	1.932	0.0	1408
2880 min Winter	1.536	0.0	1792
4320 min Winter	1.112	0.0	2488
5760 min Winter	0.883	0.0	2952
7200 min Winter	0.738	0.0	3656
8640 min Winter	0.638	0.0	4368
10080 min Winter	0.564	0.0	5144

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

Half Drain Time : 571 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	107.192	0.692	60.1	2055.0	O K
30 min Summer	107.382	0.882	65.2	2685.5	O K
60 min Summer	107.557	1.057	69.9	3294.2	O K
120 min Summer	107.702	1.202	73.8	3821.0	O K
180 min Summer	107.763	1.263	75.5	4046.7	O K
240 min Summer	107.789	1.289	76.2	4143.8	O K
360 min Summer	107.798	1.298	76.4	4176.3	O K
480 min Summer	107.782	1.282	76.0	4117.1	O K
600 min Summer	107.762	1.262	75.4	4041.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	139.587	0.0	52
30 min Summer	91.185	0.0	65
60 min Summer	56.713	0.0	92
120 min Summer	34.079	0.0	146
180 min Summer	24.967	0.0	200
240 min Summer	19.906	0.0	254
360 min Summer	14.417	0.0	364
480 min Summer	11.468	0.0	446
600 min Summer	9.596	0.0	506

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
720 min Summer	107.740	1.240	74.8	3960.4	O K
960 min Summer	107.695	1.195	73.6	3792.5	O K
1440 min Summer	107.610	1.110	71.3	3483.7	O K
2160 min Summer	107.499	0.999	68.3	3090.5	O K
2880 min Summer	107.398	0.898	65.6	2743.0	O K
4320 min Summer	107.222	0.722	60.9	2151.6	O K
5760 min Summer	107.072	0.572	57.0	1672.8	O K
7200 min Summer	106.947	0.447	53.7	1285.4	O K
8640 min Summer	106.843	0.343	51.0	971.2	O K
10080 min Summer	106.756	0.256	48.8	717.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
720 min Summer	8.292	0.0	568
960 min Summer	6.581	0.0	698
1440 min Summer	4.744	0.0	974
2160 min Summer	3.415	0.0	1384
2880 min Summer	2.702	0.0	1788
4320 min Summer	1.940	0.0	2568
5760 min Summer	1.532	0.0	3312
7200 min Summer	1.275	0.0	4048
8640 min Summer	1.097	0.0	4768
10080 min Summer	0.966	0.0	5464

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	107.271	0.771	62.2	2314.9	O K
30 min Winter	107.480	0.980	67.8	3024.6	O K
60 min Winter	107.674	1.174	73.0	3715.6	O K
120 min Winter	107.838	1.338	77.5	4326.8	O K
180 min Winter	107.909	1.409	79.5	4601.4	Flood Risk
240 min Winter	107.943	1.443	80.4	4732.2	Flood Risk
360 min Winter	107.963	1.463	81.0	4811.5	Flood Risk
480 min Winter	107.955	1.455	80.7	4778.6	Flood Risk
600 min Winter	107.931	1.431	80.1	4685.7	Flood Risk
720 min Winter	107.906	1.406	79.4	4589.4	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	139.587	0.0	52
30 min Winter	91.185	0.0	66
60 min Winter	56.713	0.0	92
120 min Winter	34.079	0.0	146
180 min Winter	24.967	0.0	200
240 min Winter	19.906	0.0	254
360 min Winter	14.417	0.0	362
480 min Winter	11.468	0.0	470
600 min Winter	9.596	0.0	566
720 min Winter	8.292	0.0	594

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
960 min Winter	107.855	1.355	78.0	4391.4	O K
1440 min Winter	107.740	1.240	74.9	3961.3	O K
2160 min Winter	107.584	1.084	70.6	3392.3	O K
2880 min Winter	107.441	0.941	66.8	2888.2	O K
4320 min Winter	107.192	0.692	60.1	2054.0	O K
5760 min Winter	106.988	0.488	54.8	1410.2	O K
7200 min Winter	106.823	0.323	50.5	912.3	O K
8640 min Winter	106.692	0.192	47.2	531.9	O K
10080 min Winter	106.595	0.095	44.7	258.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
960 min Winter	6.581	0.0	746
1440 min Winter	4.744	0.0	1052
2160 min Winter	3.415	0.0	1496
2880 min Winter	2.702	0.0	1916
4320 min Winter	1.940	0.0	2720
5760 min Winter	1.532	0.0	3480
7200 min Winter	1.275	0.0	4200
8640 min Winter	1.097	0.0	4864
10080 min Winter	0.966	0.0	5464

APPENDIX H

ASSESSMENT OF FOUL WATER FLOWS

Assessment of Foul Flows

Domestic type foul sewage is to discharge via gravity into a new pumping station compound to be built to Anglian Water adoptable Standards.
The foul flow will be collected from all units north of B4100. Also, to be included within the pumping station design will be foul flows from a new private pumping station serving unit south of B4100.

Proposed peak foul flows from the developed site based on the design and construction guidelines (DCG). Note the DCG method includes for domestic flows from the developed site and a small allowance for trade effluent assuming a proportion of the site is allocated to wet industry.

All foul flows based on Design and Construction Guidance Part B 3.1 Foul Sewers and Lateral Drains part 2. Extract from guidelines below;

2. Design flows for industrial and commercial developments can contain two elements: domestic flows (flows from toilets and kitchens, etc.) and trade effluent flow (wastewater from industrial processes). The total peak design flow is the sum of the domestic design flow and the trade effluent design flow.
a) The domestic design flow should be calculated in accordance with BS EN 12056-2System II (see also BS EN 16933-2) or, in the absence of appropriate information, 0.6 litres per second per hectare of developable land;
b) The trade effluent design flow should be based on a metered discharge from premises similar to that proposed, or assumed as 0.5 litres per second per hectare for normal industry and 1 litre per second per hectare for wet industry. Where the proportion of wet industry is unknown, an average flow of 0.7 litres per second per hectare should be used.

For this exercise it is deemed appropriate to use the proposed development area in hectares x 0.6 litres per second to account for domestic flow and 0.7 litres per second to account for wet industry.

Total Area	= 28,0000m^2 | 28 Ha
Domestic Type Flow	= Area x 0.6 l/s
Commercial / Industrial Trade Effluent Allowance	= Area x 0.7 l/s
Total Design Flow	**= 28 x 1.3 = 36.4 l/s**

Proposed Pump Rate:

Pump rate = Maximum 18 litres per second (TBC by pump specialist)

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Assessment of Emergency Storage

Foul emergency storage volumes based on the following:

Emergency storage volume for the new units based on Design and Construction Guidance Part D 5.5 Storage part 3. Extract from guidelines below;

3. For foul pumping stations serving less than 500 dwellings, as a minimum, the storage should equate to 160 litres per dwelling, and ***for commercial or industrial developments one hour of peak design flow rate****. For pumping stations serving 500 dwellings or more, the sewerage company should be consulted to determine the storage requirements.*

For this exercise it is deemed appropriate to use one hour of the design flow rate.

All units total design flow	= 36.4 l/sec
All units 1 hour design flow total	= 131,040 litres

Total Emergency Storage Volume:

Final volume	**= 131,040 litres | 131.04m^3**

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APPENDIX I

EXPLORATORY HOLE LOGS

Unit 01
1,117,000 sq.ft.

Unit 02
814,000 sq.ft.

Unit 03
212,000
sq.ft.

Unit 04
242,000
sq.ft.

Unit 05
299,000
sq.ft.

Unit 06
119,000
sq.ft.

Unit 07
382,000 sq.ft.

SA1
SA2
SA3
SA4
SA5
SA6
SA7

80235
Min. 30m
46423
70995
206100
138300

A43
B4100
M40
(J10)

Rev	Date	By	Description

Gross Site Area
197.66Ac

Total GIA
3,184,890sq.ft/295,850sq.m

TRITAX SYMMETRY
A TRITAX BIG BOX COMPANY

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Architects + Masterplanners

Waterfront House
2a Smith Way
Grove Park
Enderby
Leicester LE19 1SX

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www.stephengeorge.co.uk

Symmetry Park,
M40 Junction 10

Drawing Name:
Illustrative Masterplan - Option 2

Drawing Stage:	FEASIBILITY
Suitability:	S0 - Work in Progress

SGP File Ref: 14-019-SGP-XX-XX-DR-A-001004.dwg

SGP Project No	Date	Drawn	Team	Scale	Rev
14-019	10/2021	LVA	MMS	1:2000 @ A1	A

Drawing Number:
14-019 -SGP-XX-XX-DR-A- 001004
Project Code Originator Volume Level Type Role Number

Trial Pit Log

Trialpit No **SA01**

Sheet 1 of 1

Project Name: Ardley	Project No. TE1628	Co-ords: - Level:	Date 15/03/2022
Location: Symmetry Park		Dimensions (m): 3.1 × 0.6, Depth 1.50	Scale 1:25
Client: Tritax Symmetry			Logged ST

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			TOPSOIL: Grass over soft, dark brown slightly gravelly CLAY. Gravel is angular, medium to coarse of limestone. TOPSOIL
				0.90			Firm to stiff, yellowish brown, slightly sandy, slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded, fine to medium of limestone. WHITE LIMESTONE FORMATION
				1.50			Weathered LIMESTONE recovered as firm, yellow brown and white mottled, slightly gravely CLAY with a medium cobble content of angular, white limestone. WHITE LIMESTONE FORMATION
							End of pit at 1.50 m

Remarks: 1) Machine excavated pit for soakaway testing. 2) No groundwater ingress encountered. 3) Terminated due to hard strata encountered.

Stability: Stable.

Trial Pit Log

Trialpit No **SA02**

Sheet 1 of 1

Project Name: Ardley	Project No. TE1628	Co-ords: - Level:	Date 15/03/2022
Location: Symmetry Park		Dimensions (m): 2.3 × 0.6, Depth 0.95	Scale 1:25
Client: Tritax Symmetry			Logged ST

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							TOPSOIL: Grass over soft, dark brown slightly gravelly CLAY. Gravel is angular, medium to coarse of limestone. TOPSOIL
				0.30			Stiff, greyish brown, slightly sandy CLAY. Sand is fine to coarse. WHITE LIMESTONE FORMATION
				0.50			Stiff, greyish brown, gravelly CLAY with a high cobble content. Gravel is angular, white limestone. Cobbles are angular of limestone. WHITE LIMESTONE FORMATION
▼				0.90			Weathered LIMESTONE recovered as cobbles of medium, strong limestone. WHITE LIMESTONE FORMATION
				0.95			End of pit at 0.95 m

1 2 3 4 5

Remarks: 1) Machine excavated pit for soakaway testing. 2) Groundwater ingress encountered as slow seepage at the bottom of the pit. 3) Terminated due to hard strata encountered.

Stability: Stable.

Trial Pit Log

Trialpit No **SA02A**

Sheet 1 of 1

Project Name: Ardley	Project No. TE1628	Co-ords: - Level:	Date 15/03/2022
Location: Symmetry Park		Dimensions (m): 2.3 × 0.6, Depth 1.20	Scale 1:25
Client: Tritax Symmetry			Logged ST

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			TOPSOIL: Grass over dark brown, slightly gravelly CLAY with a high cobble content. Gravel is angular, medium to coarse of limestone. Cobbles are angular of limestone. TOPSOIL
				0.80			Firm, brown slightly gravelly CLAY. Gravel is angular medium to coarse of mudstone. WHITE LIMESTONE FORMATION
▼				1.20			Weathered limestone recovered as gravelly, slightly clayey cobbles of limestone. Gravel is subangular, fine to medium of limestone. WHITE LIMESTONE FORMATION End of pit at 1.20 m

Remarks: 1) Machine excavated pit for soakaway testing. 2) groundwater ingress encountered as medium seepage at the bottom of the pit. 3) Terminated due to hard strata encountered.

Stability: Stable.

Trial Pit Log

Trialpit No **SA03**

Sheet 1 of 1

Project Name: Ardley	Project No. TE1628	Co-ords: - Level:	Date 15/03/2022
Location: Symmetry Park		Dimensions (m): 3.9 x 1.4 Depth 1.40	Scale 1:25
Client: Tritax Symmetry			Logged ST

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			TOPSOIL: Grass over dark brown, slightly gravelly CLAY with a high cobble content. Gravel is angular, medium to coarse of limestone. Cobbles are angular of limestone. TOPSOIL
				0.90			Weathered LIMESTONE recovered as gravelly, angular COBBLES of medium, strong, cream limestone. Gravel is angular of medium strong limestone. WHITE LIMESTONE FORMATION
				1.40			Weathered bedrock recovered as greyish brown, slightly clayey, gravelly, angular COBBLES of limestone. Gravel is angular, medium to coarse of limestone. WHITE LIMESTONE FORMATION
							End of pit at 1.40 m

Remarks: 1) Machine excavated pit for soakaway testing. 2) No groundwater ingress encountered. 3) Terminated due to hard strata encountered.

Stability: Stable.

Trial Pit Log

Trialpit No **SA04**

Sheet 1 of 1

Project Name: Ardley	Project No. TE1628	Co-ords: - Level:	Date 16/03/2022
Location: Symmetry Park		Dimensions (m): 2.8 × 0.6, Depth 1.30	Scale 1:25
Client: Tritax Symmetry			Logged ST

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			TOPSOIL: Grass over dark brown, slightly gravelly CLAY with a high cobble content. Gravel is angular to subrounded, fine to coarse of limestone. Cobbles are angular of limestone. TOPSOIL
				0.80			Weathered, white LIMESTONE recovered as brown, slightly clayey, angular COBBLES of limestone. WHITE LIMESTONE FORMATION
				1.30			Weathered white LIMSTONE, recovered as grey slightly gravelly slightly clayey angular COBBLES of limestone. Gravel is angular medium to coarse of limestone. WHITE LIMESTONE FORMATION
							End of pit at 1.30 m

Remarks: 1) Machine excavated pit for soakaway testing. 2) No groundwater ingress encountered. 3) Terminated due to hard strata encountered.

Stability: Stable.

Trial Pit Log

Trialpit No **SA05**

Sheet 1 of 1

Project Name: Ardley	Project No. TE1628	Co-ords: - Level:	Date 16/03/2022
Location: Symmetry Park		Dimensions (m): 3.1 × 0.6, Depth 1.40	Scale 1:25
Client: Tritax Symmetry			Logged ST

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			TOPSOIL: Grass over dark brown, slightly gravelly CLAY with a high cobble content. Gravel is angular to subrounded, fine to coarse of limestone. Cobbles are angular of limestone. TOPSOIL
							Weathered, white LIMESTONE recovered as brown, slightly clayey, angular COBBLES of limestone. WHITE LIMESTONE FORMATION
				1.40			End of pit at 1.40 m

Remarks: 1) Machine excavated pit for soakaway testing. 2) No groundwater ingress encountered. 3) Terminated due to hard strata encountered.

Stability: Stable.

Trial Pit Log

Trialpit No **SA06**

Sheet 1 of 1

Project Name: Ardley	Project No. TE1628	Co-ords: - Level:	Date 15/03/2022
Location: Symmetry Park		Dimensions (m): 3.3 × 0.6, Depth 1.60	Scale 1:25
Client: Tritax Symmetry			Logged ST

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			TOPSOIL: Grass over soft, dark brown slightly gravelly CLAY. Gravel is angular, medium to coarse of limestone. TOPSOIL
							Medium strong, white LIMESTONE recovered as angular cobbles of limestone. WHITE LIMESTONE FORMATION
				1.60			End of pit at 1.60 m

Remarks: 1) Machine excavated pit for soakaway testing. 2) No groundwater ingress encountered. 3) Terminated due to hard strata encountered.

Stability: Stable.

Trial Pit Log

Trialpit No **SA07**

Sheet 1 of 1

Project Name: Ardley	Project No. TE1628	Co-ords: - Level:	Date 15/03/2022
Location: Symmetry Park		Dimensions (m): 3.5 × 1.4, Depth 1.40	Scale 1:25
Client: Tritax Symmetry			Logged ST

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			TOPSOIL: Grass over soft, dark brown, slightly gravelly CLAY. TOPSOIL
				0.80			Soft, greyish brown, slightly gravelly, slightly sandy CLAY. Gravel is angular, fine to medium of limestone. Sand is fine to coarse. WHITE LIMESTONE FORMATION
				1.40			Weathered bedrock recovered as greyish brown, clayey, angular, coarse GRAVEL of limestone. WHITE LIMESTONE FORMATION
							End of pit at 1.40 m

Remarks: 1) Machine excavated pit for soakaway testing. 2) No groundwater ingress encountered. 3) Terminated due to hard strata encountered.

Stability: Stable.

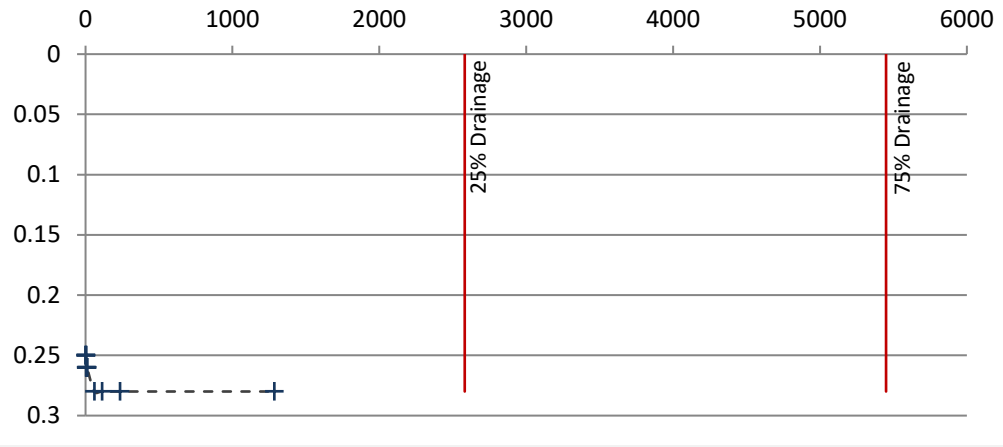
APPENDIX J

SOAKAWAY TEST RESULTS

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA01.1
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	16.03.2022 to 17.03.2022
Client:	Symmetry Park	**Test Number:**	1 of 20
Site:	Ardley	**Comments:**	

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	3.1
Soakage Pit Depth [m]	1.5
Depth to water at start of test bgl [m]	0.25
Effective Storage Depth [m]	1.25
Free Volume [%]	100

Effective Depth at 25% Drainage	0.5625
Effective Depth at 75% Drainage	1.1875
Time to Drain From 25% to 75% [s]	N/A
Internal Surface Area [m^2]	6.485
Effective Storage Volume [m^3]	1.1625
Test Completion [%]	2%



Soil infiltration rate(m/s)	Test failed. Estimated to take at least 24 hours for drainage.

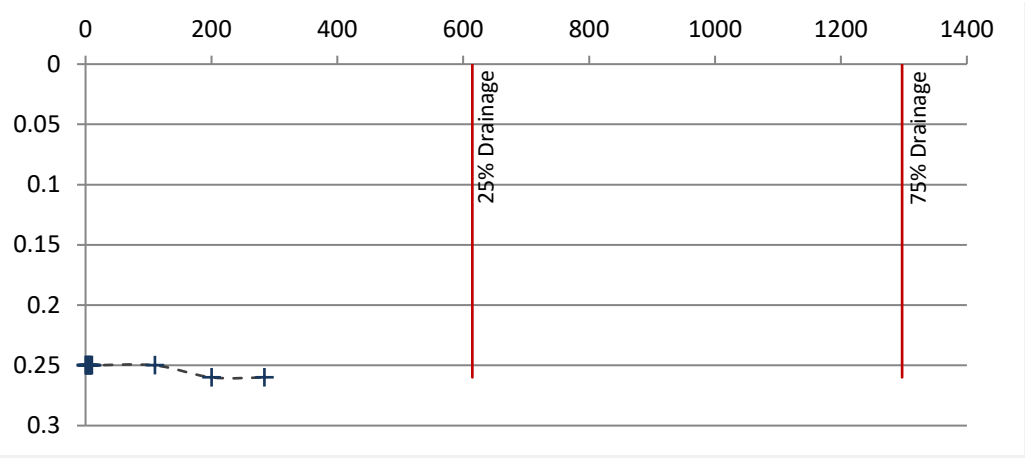
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Time [min]	0	1	2	3	4	5	6	7	8	9	10	59	112	235	1285					
Depth to water [m]	0.25	0.25	0.25	0.25	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.28	0.28	0.28	0.28					

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA01.2
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	17.03.2022
Client:	Symmetry Park	**Test Number:**	2 of 20
Site:	Ardley	**Comments:**	

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	3.1
Soakage Pit Depth [m]	1.5
Depth to water at start of test bgl [m]	0.25
Effective Storage Depth [m]	1.25
Free Volume [%]	100

Effective Depth at 25% Drainage	0.5625
Effective Depth at 75% Drainage	1.1875
Time to Drain From 25% to 75% [s]	N/A
Internal Surface Area [m^2]	6.485
Effective Storage Volume [m^3]	1.1625
Test Completion [%]	1%



Soil infiltration rate(m/s)	Test failed. Estimated to take at least 24 hours for drainage.

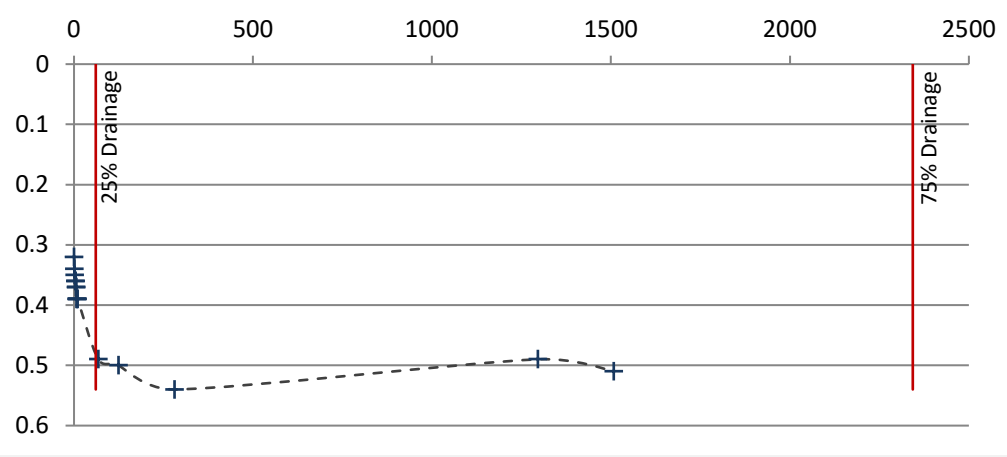
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Time [min]	0	1	2	3	4	5	6	7	8	9	10	110	200	284						
Depth to water [m]	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.26	0.26						

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA02.1
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	16.03.2022 to 17.03.2022
Client:	Symmetry Park	**Test Number:**	3 of 20
Site:	Ardley	**Comments:**	Water level risen over night

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	2.3
Soakage Pit Depth [m]	0.95
Depth to water at start of test bgl [m]	0.32
Effective Storage Depth [m]	0.63
Free Volume [%]	100

Effective Depth at 25% Drainage	0.4775
Effective Depth at 75% Drainage	0.7925
Time to Drain From 25% to 75% [s]	N/A
Internal Surface Area [m^2]	3.207
Effective Storage Volume [m^3]	0.4347
Test Completion [%]	35%



Soil infiltration rate(m/s)	Soakaway failed. Estimated to take at least 47.44 hours to drain 75%

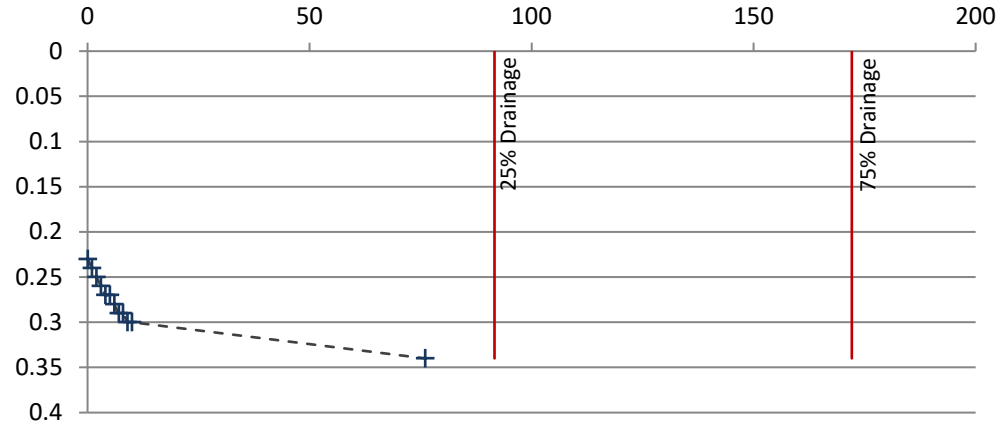
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Time [min]	0	1	2	3	4	5	6	7	8	9	10	68	124	281	1296	1508				
Depth to water [m]	0.32	0.34	0.35	0.36	0.36	0.37	0.37	0.39	0.39	0.39	0.39	0.49	0.5	0.54	0.49	0.51				

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA02.2
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	17.03.2022
Client:	Symmetry Park	**Test Number:**	4 of 20
Site:	Ardley	**Comments:**	

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	2.3
Soakage Pit Depth [m]	0.95
Depth to water at start of test bgl [m]	0.23
Effective Storage Depth [m]	0.72
Free Volume [%]	100

Effective Depth at 25% Drainage	0.41
Effective Depth at 75% Drainage	0.77
Time to Drain From 25% to 75% [s]	N/A
Internal Surface Area [m^2]	3.468
Effective Storage Volume [m^3]	0.4968
Test Completion [%]	15%



Soil infiltration rate(m/s)	Soakaway failed. Estimated to take at least 13.09 hours to drain 75%

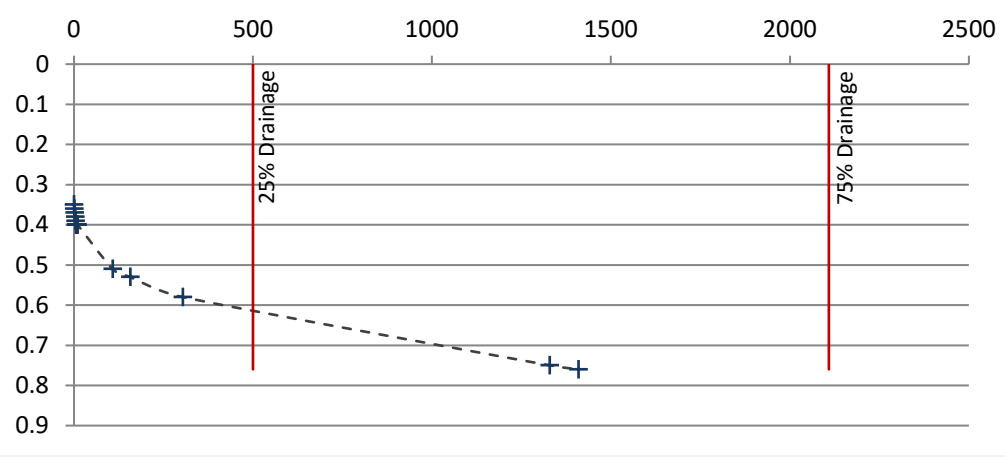
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Time [min]	0	1	2	3	4	5	6	7	8	9	10	76								
Depth to water [m]	0.23	0.24	0.25	0.26	0.27	0.27	0.28	0.29	0.29	0.3	0.3	0.34								

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA03.1
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	16.03.2022 to 17.03.2022
Client:	Symmetry Park	**Test Number:**	5 of 20
Site:	Ardley	**Comments:**	

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	3.9
Soakage Pit Depth [m]	1.4
Depth to water at start of test bgl [m]	0.35
Effective Storage Depth [m]	1.05
Free Volume [%]	100

Effective Depth at 25% Drainage	0.6125
Effective Depth at 75% Drainage	1.1375
Time to Drain From 25% to 75% [s]	N/A
Internal Surface Area [m^2]	7.065
Effective Storage Volume [m^3]	1.2285
Test Completion [%]	39%



Soil infiltration rate(m/s)	Soakaway failed. Estimated to take at least 73.82 hours to drain 75%

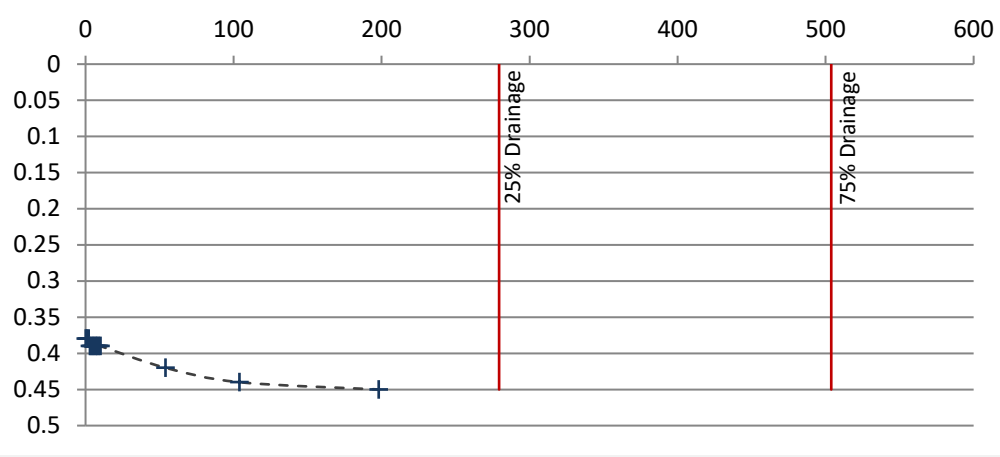
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Time [min]	0	1	2	3	4	5	6	7	8	9	10	108	157	304	1329	1409				
Depth to water [m]	0.35	0.36	0.37	0.38	0.39	0.4	0.4	0.4	0.4	0.4	0.4	0.51	0.53	0.58	0.75	0.76				

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA03.2
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	17.03.2022
Client:	Symmetry Park	**Test Number:**	6 of 20
Site:	Ardley	**Comments:**	

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	3.9
Soakage Pit Depth [m]	1.4
Depth to water at start of test bgl [m]	0.38
Effective Storage Depth [m]	1.02
Free Volume [%]	100

Effective Depth at 25% Drainage	0.635
Effective Depth at 75% Drainage	1.145
Time to Drain From 25% to 75% [s]	N/A
Internal Surface Area [m^2]	6.93
Effective Storage Volume [m^3]	1.1934
Test Completion [%]	7%



Soil infiltration rate(m/s)	Soakaway failed. Estimated to take at least 112.18 hours to drain 75%

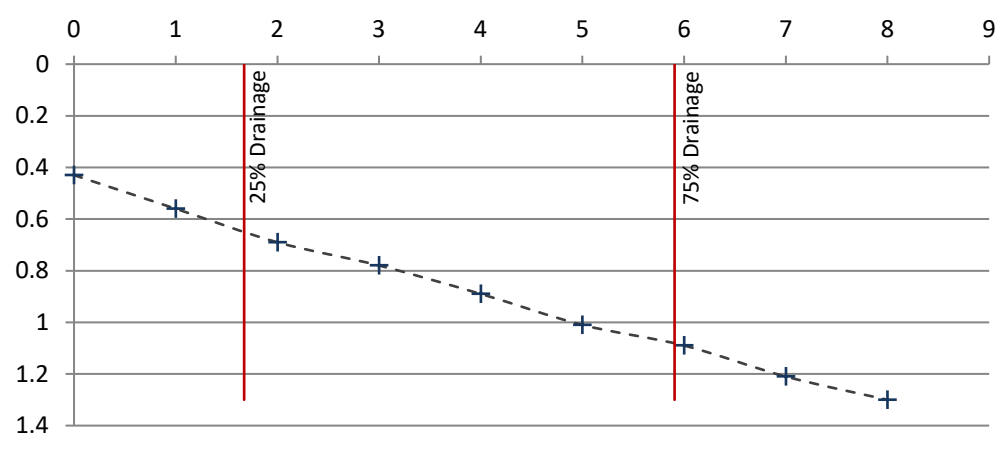
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Time [min]	0	1	2	3	4	5	6	7	8	9	10	54	104	198						
Depth to water [m]	0.38	0.38	0.38	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.42	0.44	0.45						

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA04.1
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	16.03.2022
Client:	Symmetry Park	**Test Number:**	7 of 20
Site:	Ardley	**Comments:**	

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	2.8
Soakage Pit Depth [m]	1.3
Depth to water at start of test bgl [m]	0.43
Effective Storage Depth [m]	0.87
Free Volume [%]	100

Effective Depth at 25% Drainage	0.6475
Effective Depth at 75% Drainage	1.0825
Time to Drain From 25% to 75% [s]	254
Internal Surface Area [m^2]	4.638
Effective Storage Volume [m^3]	0.7308
Test Completion [%]	100%



Soil infiltration rate(m/s)	6.20E-04

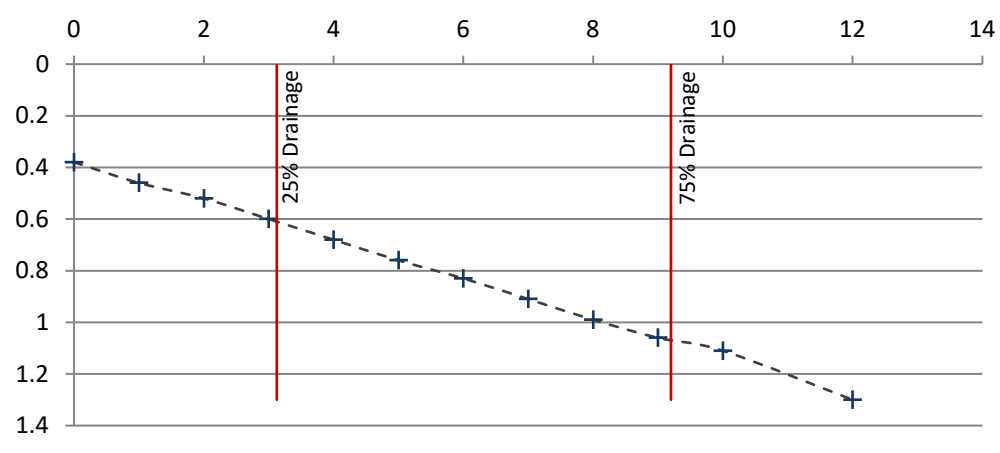
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Time [min]	0	1	2	3	4	5	6	7	8											
Depth to water [m]	0.43	0.56	0.69	0.78	0.89	1.01	1.09	1.21	1.3											

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA04.2
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	16.03.2022
Client:	Symmetry Park	**Test Number:**	8 of 20
Site:	Ardley	**Comments:**	

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	2.8
Soakage Pit Depth [m]	1.3
Depth to water at start of test bgl [m]	0.38
Effective Storage Depth [m]	0.92
Free Volume [%]	100

Effective Depth at 25% Drainage	0.61
Effective Depth at 75% Drainage	1.07
Time to Drain From 25% to 75% [s]	365
Internal Surface Area [m^2]	4.808
Effective Storage Volume [m^3]	0.7728
Test Completion [%]	100%



Soil infiltration rate(m/s)	4.41E-04

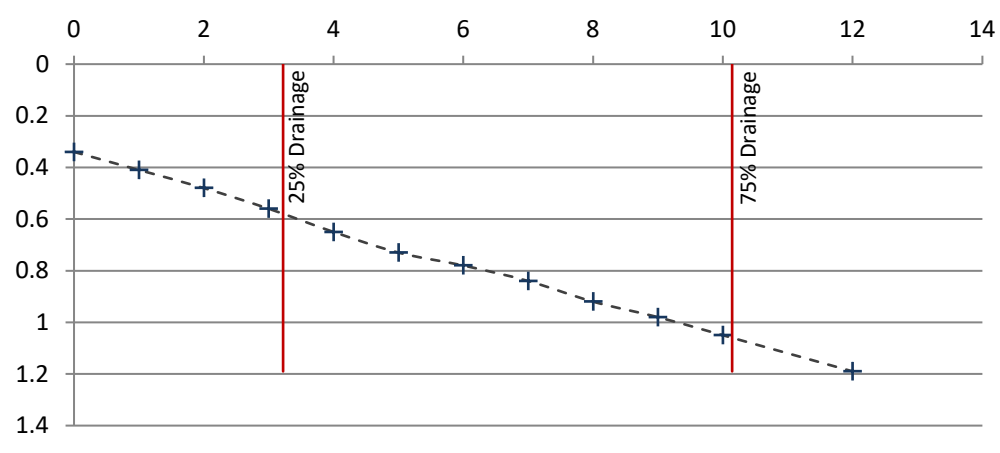
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Time [min]	0	1	2	3	4	5	6	7	8	9	10	12								
Depth to water [m]	0.38	0.46	0.52	0.6	0.68	0.76	0.83	0.91	0.99	1.06	1.11	1.3								

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA04.3
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	16.03.2022
Client:	Symmetry Park	**Test Number:**	9 of 20
Site:	Ardley	**Comments:**	

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	2.8
Soakage Pit Depth [m]	1.3
Depth to water at start of test bgl [m]	0.34
Effective Storage Depth [m]	0.96
Free Volume [%]	100

Effective Depth at 25% Drainage	0.58
Effective Depth at 75% Drainage	1.06
Time to Drain From 25% to 75% [s]	415
Internal Surface Area [m^2]	4.944
Effective Storage Volume [m^3]	0.8064
Test Completion [%]	100%



Soil infiltration rate(m/s)	3.93E-04

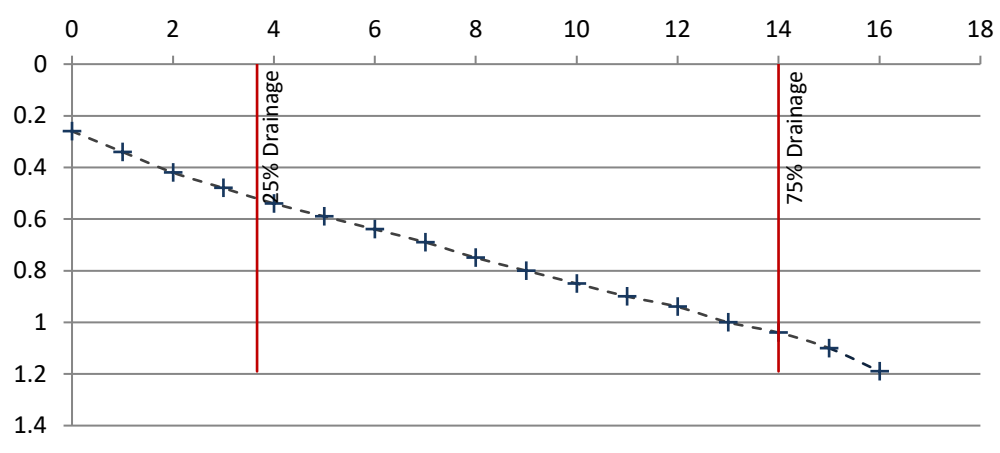
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Time [min]	0	1	2	3	4	5	6	7	8	9	10	12								
Depth to water [m]	0.34	0.41	0.48	0.56	0.65	0.73	0.78	0.84	0.92	0.98	1.05	1.19								

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA04.4
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	18.03.2022
Client:	Symmetry Park	**Test Number:**	10 of 20
Site:	Ardley	**Comments:**	

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	2.8
Soakage Pit Depth [m]	1.3
Depth to water at start of test bgl [m]	0.26
Effective Storage Depth [m]	1.04
Free Volume [%]	100

Effective Depth at 25% Drainage	0.52
Effective Depth at 75% Drainage	1.04
Time to Drain From 25% to 75% [s]	620
Internal Surface Area [m^2]	5.216
Effective Storage Volume [m^3]	0.8736
Test Completion [%]	100%



Soil infiltration rate(m/s)	2.70E-04

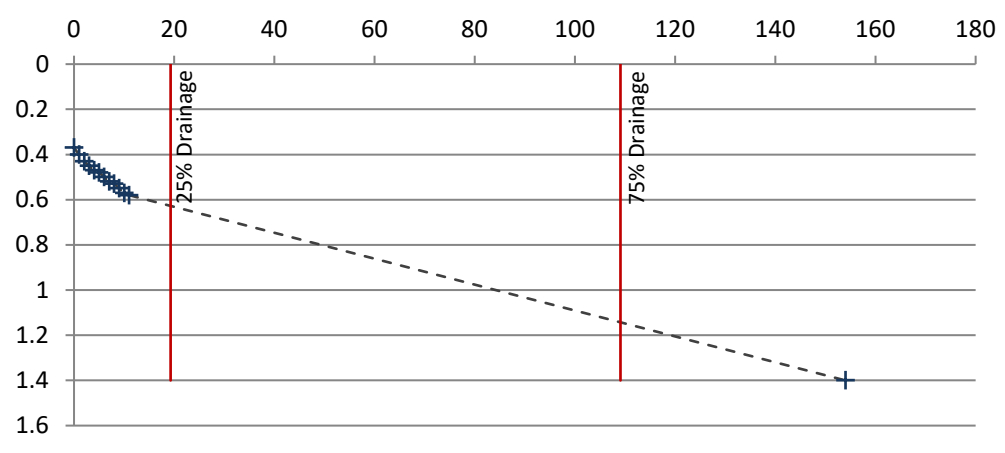
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Time [min]	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			
Depth to water [m]	0.26	0.34	0.42	0.48	0.54	0.59	0.64	0.69	0.75	0.8	0.85	0.9	0.94	1	1.04	1.1	1.19			

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA05.1
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	16.03.2022
Client:	Symmetry Park	**Test Number:**	11 of 20
Site:	Ardley	**Comments:**	Soakway found dry at 16:10

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	3.1
Soakage Pit Depth [m]	1.4
Depth to water at start of test bgl [m]	0.37
Effective Storage Depth [m]	1.03
Free Volume [%]	100

Effective Depth at 25% Drainage	0.6275
Effective Depth at 75% Drainage	1.1425
Time to Drain From 25% to 75% [s]	5389
Internal Surface Area [m^2]	5.671
Effective Storage Volume [m^3]	0.9579
Test Completion [%]	100%



Soil infiltration rate(m/s)	3.13E-05

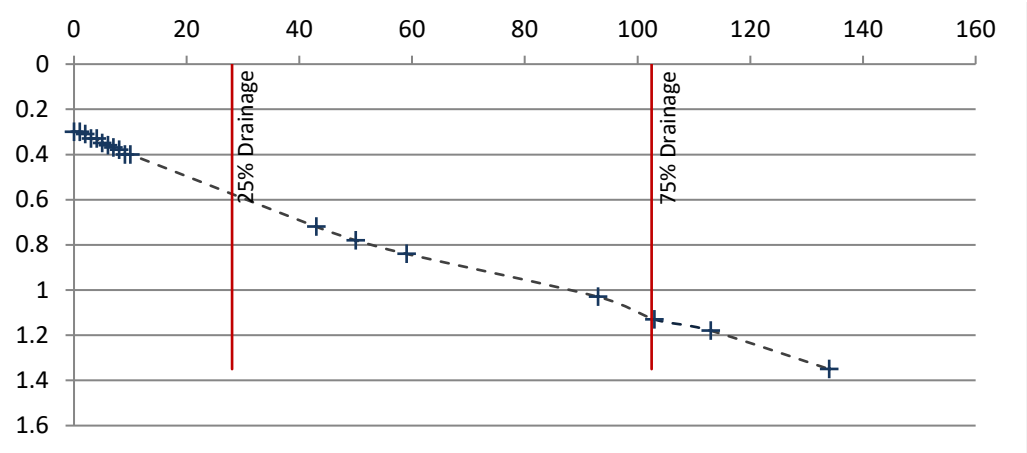
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Time [min]	0	1	2	3	4	5	6	7	8	9	10	11	154							
Depth to water [m]	0.37	0.4	0.43	0.45	0.47	0.48	0.5	0.52	0.53	0.55	0.57	0.58	1.4							

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA05.2
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	17.03.2022
Client:	Symmetry Park	**Test Number:**	12 of 20
Site:	Ardley	**Comments:**	

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	3.1
Soakage Pit Depth [m]	1.4
Depth to water at start of test bgl [m]	0.3
Effective Storage Depth [m]	1.10
Free Volume [%]	100

Effective Depth at 25% Drainage	0.575
Effective Depth at 75% Drainage	1.125
Time to Drain From 25% to 75% [s]	4467
Internal Surface Area [m^2]	5.93
Effective Storage Volume [m^3]	1.023
Test Completion [%]	100%



Soil infiltration rate(m/s)	3.86E-05

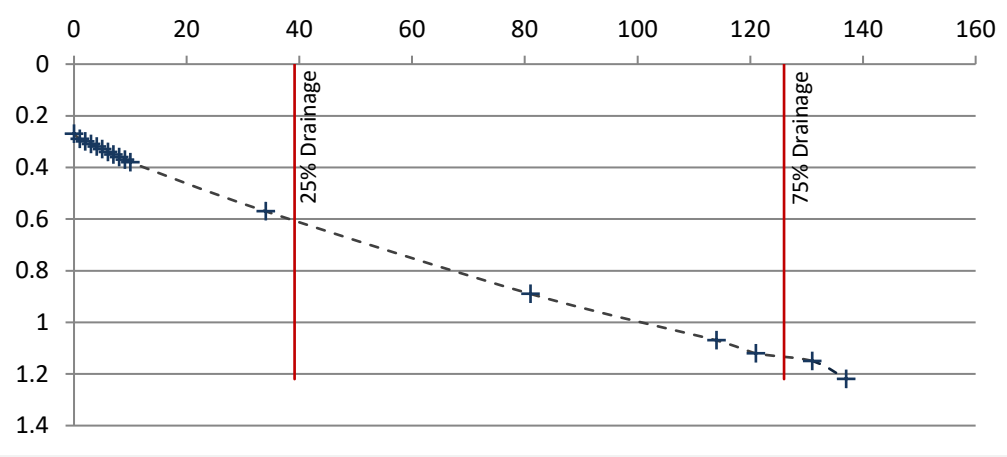
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Time [min]	0	1	2	3	4	5	6	7	8	9	10	43	50	59	93	103	113	134		
Depth to water [m]	0.3	0.3	0.31	0.33	0.33	0.35	0.36	0.37	0.38	0.4	0.4	0.72	0.78	0.84	1.03	1.13	1.18	1.35		

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA05.3
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	18.03.2022
Client:	Symmetry Park	**Test Number:**	13 of 20
Site:	Ardley	**Comments:**	

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	3.1
Soakage Pit Depth [m]	1.4
Depth to water at start of test bgl [m]	0.34
Effective Storage Depth [m]	1.06
Free Volume [%]	100

Effective Depth at 25% Drainage	0.605
Effective Depth at 75% Drainage	1.135
Time to Drain From 25% to 75% [s]	5212
Internal Surface Area [m^2]	5.782
Effective Storage Volume [m^3]	0.9858
Test Completion [%]	100%



Soil infiltration rate(m/s)	3.27E-05

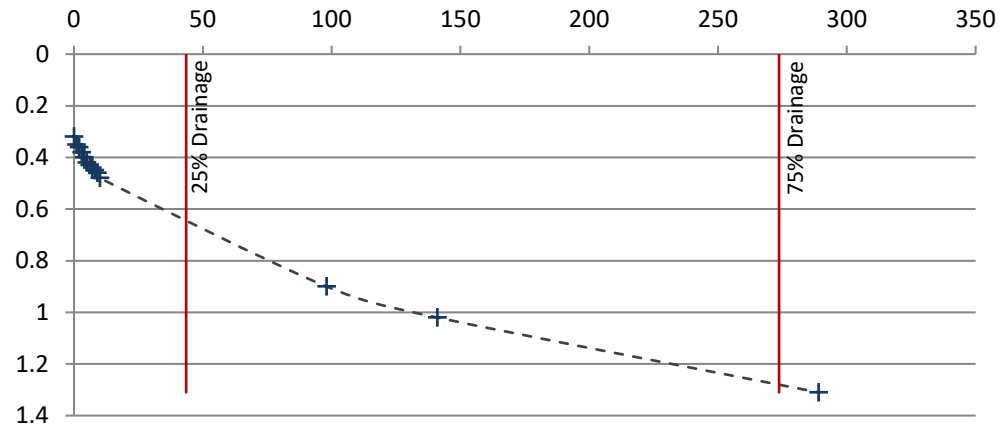
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Time [min]	0	1	2	3	4	5	6	7	8	9	10	34	81	114	121	131	137			
Depth to water [m]	0.27	0.29	0.3	0.31	0.32	0.33	0.34	0.35	0.36	0.37	0.38	0.57	0.89	1.07	1.12	1.15	1.22			

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA06.1
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	16.03.2022
Client:	Symmetry Park	**Test Number:**	14 of 20
Site:	Ardley	**Comments:**	

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	3.3
Soakage Pit Depth [m]	1.6
Depth to water at start of test bgl [m]	0.32
Effective Storage Depth [m]	1.28
Free Volume [%]	100

Effective Depth at 25% Drainage	0.64
Effective Depth at 75% Drainage	1.28
Time to Drain From 25% to 75% [s]	13810
Internal Surface Area [m^2]	6.972
Effective Storage Volume [m^3]	1.2672
Test Completion [%]	100%



Soil infiltration rate(m/s)	1.32E-05

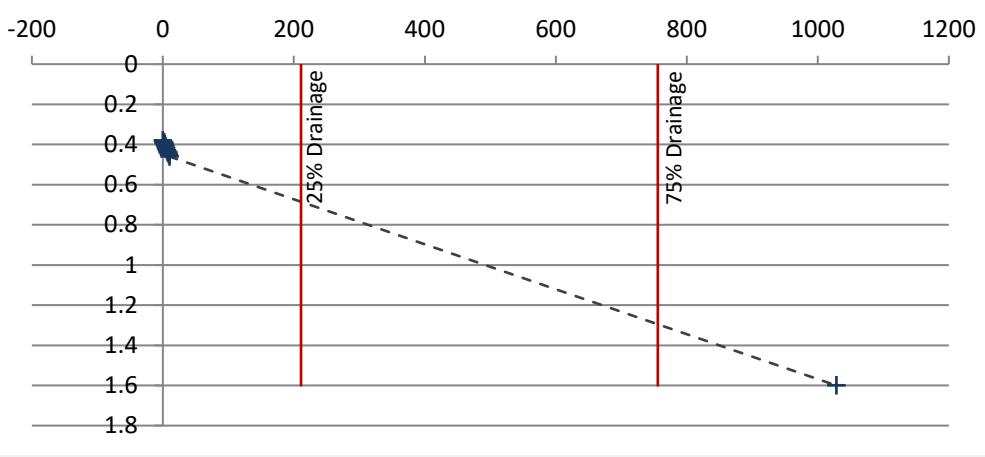
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Time [min]	0	1	2	3	4	5	6	7	8	9	10	98	141	289						
Depth to water [m]	0.32	0.35	0.36	0.38	0.4	0.42	0.43	0.44	0.45	0.46	0.48	0.9	1.02	1.31						

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA06.2
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	16.03.2022 to 17.03.2022
Client:	Symmetry Park	**Test Number:**	15 of 20
Site:	Ardley	**Comments:**	Found dry on 17.03.2022 at 08:25

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	3.3
Soakage Pit Depth [m]	1.6
Depth to water at start of test bgl [m]	0.38
Effective Storage Depth [m]	1.22
Free Volume [%]	100

Effective Depth at 25% Drainage	0.685
Effective Depth at 75% Drainage	1.295
Time to Drain From 25% to 75% [s]	32683
Internal Surface Area [m^2]	6.738
Effective Storage Volume [m^3]	1.2078
Test Completion [%]	100%



Soil infiltration rate(m/s)	5.48E-06

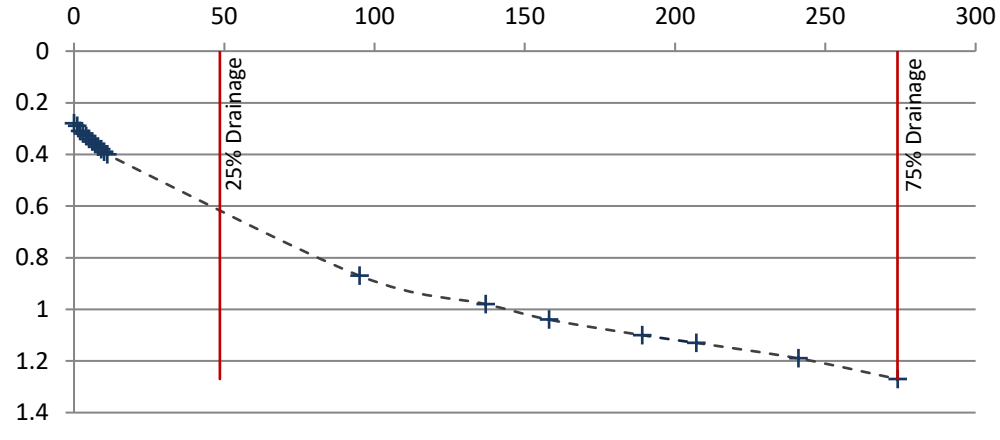
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Time [min]	0	1	2	3	4	5	6	7	8	9	10	1028								
Depth to water [m]	0.38	0.39	0.39	0.4	0.41	0.42	0.43	0.44	0.44	0.45	0.46	1.6								

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA06.3
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	17.03.2022
Client:	Symmetry Park	**Test Number:**	16 of 20
Site:	Ardley	**Comments:**	

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	3.3
Soakage Pit Depth [m]	1.6
Depth to water at start of test bgl [m]	0.28
Effective Storage Depth [m]	1.32
Free Volume [%]	100

Effective Depth at 25% Drainage	0.61
Effective Depth at 75% Drainage	1.27
Time to Drain From 25% to 75% [s]	13528
Internal Surface Area [m^2]	7.128
Effective Storage Volume [m^3]	1.3068
Test Completion [%]	100%



Soil infiltration rate(m/s)	1.36E-05

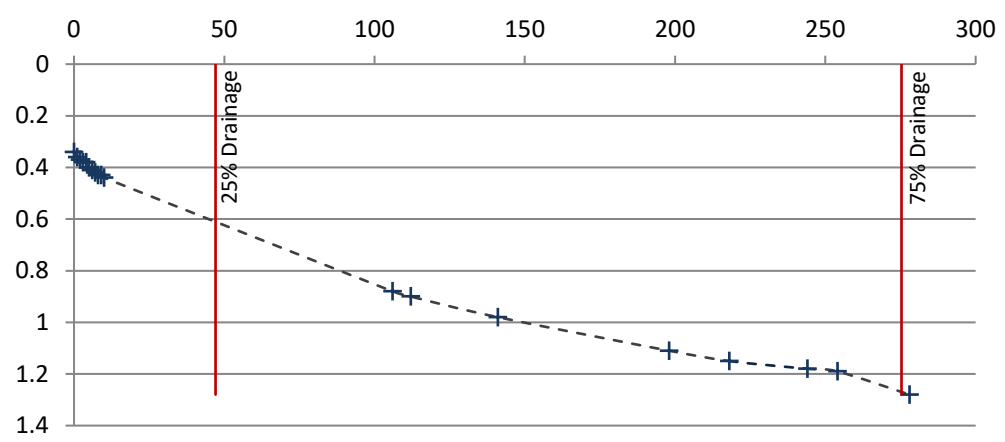
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Time [min]	0	1	2	3	4	5	6	7	8	9	10	11	95	137	158	189	207	241	274	
Depth to water [m]	0.28	0.29	0.31	0.32	0.33	0.34	0.35	0.36	0.37	0.38	0.39	0.4	0.87	0.98	1.04	1.1	1.13	1.19	1.27	

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA06.4
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	18.03.2022
Client:	Symmetry Park	**Test Number:**	17 of 20
Site:	Ardley	**Comments:**	

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	3.3
Soakage Pit Depth [m]	1.6
Depth to water at start of test bgl [m]	0.28
Effective Storage Depth [m]	1.32
Free Volume [%]	100

Effective Depth at 25% Drainage	0.61
Effective Depth at 75% Drainage	1.27
Time to Drain From 25% to 75% [s]	13695
Internal Surface Area [m^2]	7.128
Effective Storage Volume [m^3]	1.3068
Test Completion [%]	100%



Soil infiltration rate(m/s)	1.34E-05

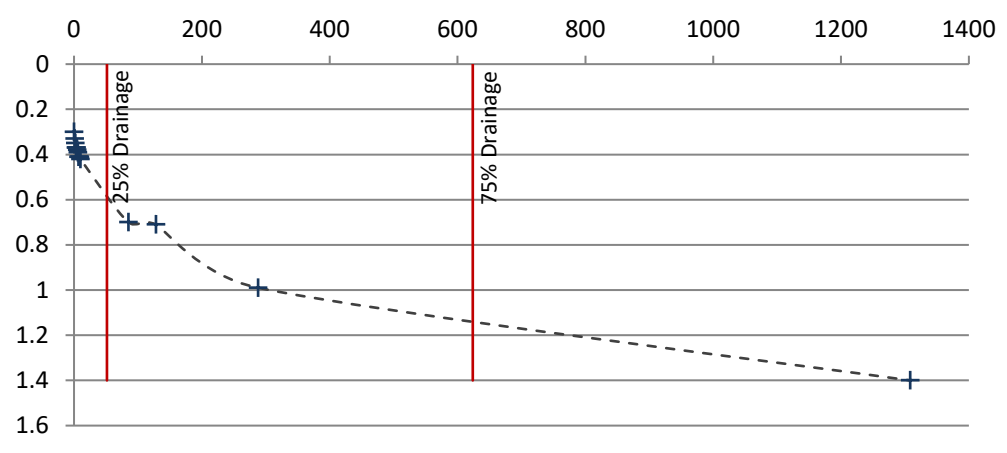
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Time [min]	0	1	2	3	4	5	6	7	8	9	10	106	112	141	198	218	244	254	278	
Depth to water [m]	0.34	0.36	0.37	0.38	0.38	0.4	0.41	0.42	0.43	0.43	0.44	0.88	0.9	0.98	1.11	1.15	1.18	1.19	1.28	

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA07.1
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	16.03.2022 to 17.03.2022
Client:	Symmetry Park	**Test Number:**	18 of 20
Site:	Ardley	**Comments:**	Found dry on 17.03.2022 at 8:30

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	3.5
Soakage Pit Depth [m]	1.4
Depth to water at start of test bgl [m]	0.3
Effective Storage Depth [m]	1.10
Free Volume [%]	100

Effective Depth at 25% Drainage	0.575
Effective Depth at 75% Drainage	1.125
Time to Drain From 25% to 75% [s]	34340
Internal Surface Area [m^2]	6.61
Effective Storage Volume [m^3]	1.155
Test Completion [%]	100%



Soil infiltration rate(m/s)	5.09E-06

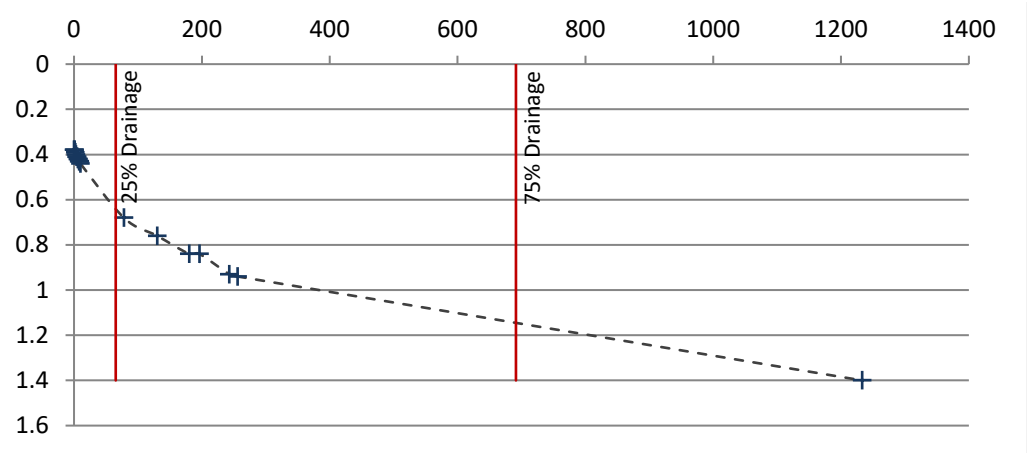
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Time [min]	0	1	2	3	4	5	6	7	8	9	10	85	128	288	1308					
Depth to water [m]	0.3	0.33	0.35	0.37	0.37	0.38	0.39	0.41	0.41	0.41	0.42	0.7	0.71	0.99	1.4					

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA07.2
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	17.03.2022 to 18.03.2022
Client:	Symmetry Park	**Test Number:**	19 of 20
Site:	Ardley	**Comments:**	Found dry on 18.03.2022 at 8:25

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	3.5
Soakage Pit Depth [m]	1.4
Depth to water at start of test bgl [m]	0.38
Effective Storage Depth [m]	1.02
Free Volume [%]	100

Effective Depth at 25% Drainage	0.635
Effective Depth at 75% Drainage	1.145
Time to Drain From 25% to 75% [s]	37569
Internal Surface Area [m^2]	6.282
Effective Storage Volume [m^3]	1.071
Test Completion [%]	100%



Soil infiltration rate(m/s)	4.54E-06

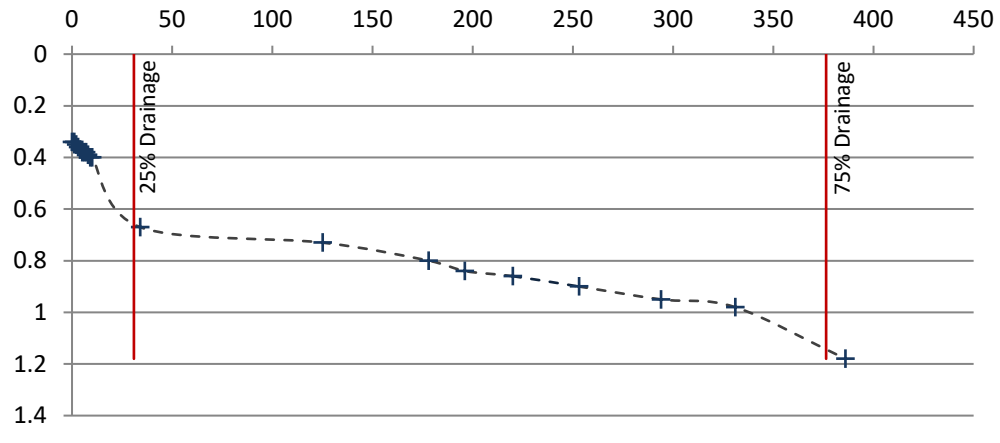
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Time [min]	0	1	2	3	4	5	6	7	8	9	10	78	130	180	196	243	256	1233		
Depth to water [m]	0.38	0.38	0.39	0.4	0.41	0.41	0.42	0.42	0.43	0.43	0.44	0.68	0.76	0.84	0.84	0.93	0.94	1.4		

	Tier Environmental Chadwick House Birchwood Park Warrington Rd WA3 6AE	**Test ID:**	SA07.3
		Job Number:	TE1628
		Technician:	Spyridon Theodoridis
		Test Date:	18.03.2022
Client:	Symmetry Park	**Test Number:**	20 of 20
Site:	Ardley	**Comments:**	

Soakage Pit Width [m]	0.6
Soakage Pit Length [m]	3.5
Soakage Pit Depth [m]	1.4
Depth to water at start of test bgl [m]	0.38
Effective Storage Depth [m]	1.02
Free Volume [%]	100

Effective Depth at 25% Drainage	0.635
Effective Depth at 75% Drainage	1.145
Time to Drain From 25% to 75% [s]	20729
Internal Surface Area [m^2]	6.282
Effective Storage Volume [m^3]	1.071
Test Completion [%]	100%



Soil infiltration rate(m/s)	8.22E-06

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS

Measurement N°	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Time [min]	0	1	2	3	4	5	6	7	8	9	10	34	125	178	196	220	253	294	331	386
Depth to water [m]	0.34	0.34	0.35	0.36	0.37	0.38	0.38	0.38	0.39	0.4	0.4	0.67	0.73	0.8	0.84	0.86	0.9	0.95	0.98	1.18