

Soakaway Calculator v 1.1 coopers chartered consulting engineers Calculation Sheet		Job No 5986		Sheet No SA1		Rev -					
Job Title Mytton Homes Burton Hall Road. Rossett, Wrexham Critical T Year Design Storm Duration for Soakaway Design based on CIRIA Report 156 - TRENCH		Member/Location 		Drg. Ref. 5986/01		Made by AJ		Date 03/10/2014		Chd. 	

This spreadsheet is set up to calculate the length of a trench soakaway for various durations of 1 in T year storms based on the guidance in CIRIA Report 156 'Infiltration drainage - Manual of good practice'.
 The inputted values in this calculation reflect the example given on page 83 of CIRIA Report 156.

Parameters	M5-60	17.00000000	mm	J0	1.64E-01	Wallingford
	r	0.34200000		J1	5.83E-03	Procedure
	T	100	years + 30% CC	J2	-1.34E-04	Variables

F.O.S	1.5										
Porosity of fill, n	0.95										
Impermeable Area, A _D	90.00	m ²									
Width of trench, W	2.00	m	Base Area, A _b		4.00	m ²					
Length of trench, L	2.00	m	Base Perimeter, P		8.00	m					
1 in 10 year rainfall intensity, I	See Table Below										

Depth of trench, h

Value to be calculated, see table below

	8.0E-05	m/s									
Infiltration coefficient		2.9E-01	m/h								
Infiltration coefficient, q		1.9E-01		[Allowing for factor of safety]							

	D	min	5	10	15	30	60	120	240	360	600	1440	2880
		hr	0.08	0.17	0.25	0.50	1	2	4	6	10	24	48
	I	m/hr	0.1657	0.1241	0.1016	0.0685	0.0445	0.0279	0.0170	0.0125	0.0084	0.0039	0.0019
	a		-9.211E+00	-6.771E+00	-5.456E+00	-3.517E+00	-2.105E+00	-1.132E+00	-4.951E-01	-2.339E-01	8.501E-03	2.704E-01	3.864E-01
	b		4.042E-01	4.042E-01	4.042E-01	4.042E-01	4.042E-01	4.042E-01	4.042E-01	4.042E-01	4.042E-01	4.042E-01	4.042E-01
	h	m	0.31	0.44	0.52	0.64	0.70	0.63	0.40	0.21	-0.01	-0.27	-0.39
	t _{1/2}	hr	0.52	0.66	0.73	0.82	0.85	0.81	0.62	0.40	-0.02	-1.15	-2.46
	Does soakway half-empty in 24 hrs?		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	q _{min}	m/hr	4.2E-03	5.3E-03	5.9E-03	6.5E-03	6.8E-03	6.5E-03	4.9E-03	3.2E-03	-1.7E-04	-9.2E-03	-2.0E-02

Soakaway Calculator v 1.1 coopers chartered consulting engineers Calculation Sheet		Job No 5986		Sheet No SA2		Rev -					
Job Title Mytton Homes Burton Hall Road. Rossett, Wrexham Critical T Year Design Storm Duration for Soakaway Design based on CIRIA Report 156 - TRENCH		Member/Location 		Drg. Ref. 5986/01		Made by AJ		Date 20/08/2013		Chd. 	

This spreadsheet is set up to calculate the length of a trench soakaway for various durations of 1 in T year storms based on the guidance in CIRIA Report 156 'Infiltration drainage - Manual of good practice'.
 The inputted values in this calculation reflect the example given on page 83 of CIRIA Report 156.

Parameters	M5-60	17.00000000	mm	J0	1.64E-01	Wallingford
	r	0.34200000		J1	5.83E-03	Procedure
	T	100	years + 30% CC	J2	-1.34E-04	Variables

F.O.S	1.5					
Porosity of fill, n	0.95					
Impermeable Area, A _D	210.00	m ²				
Width of trench, W	2.00	m	Base Area, A _b	6.00	m ²	
Length of trench, L	3.00	m	Base Perimeter, P	10.00	m	
1 in 10 year rainfall intensity, I	See Table Below					

Depth of trench, h

Value to be calculated, see table below

Infiltration coefficient	8.0E-05	m/s				
Infiltration coefficient, q	2.9E-01	m/h				
	1.9E-01		[Allowing for factor of safety]			

	5	10	15	30	60	120	240	360	600	1440	2880
D min hr	0.08	0.17	0.25	0.50	1	2	4	6	10	24	48
I m/hr	0.1657	0.1241	0.1016	0.0685	0.0445	0.0279	0.0170	0.0125	0.0084	0.0039	0.0019
a	-1.753E+01	-1.297E+01	-1.052E+01	-6.898E+00	-4.262E+00	-2.447E+00	-1.258E+00	-7.699E-01	-3.175E-01	1.715E-01	3.880E-01
b	3.368E-01	3.368E-01	3.368E-01	3.368E-01	3.368E-01	3.368E-01	3.368E-01	3.368E-01	3.368E-01	3.368E-01	3.368E-01
h m	0.49	0.71	0.85	1.07	1.22	1.20	0.93	0.67	0.31	-0.17	-0.39
t_{1/2} hr	0.75	0.94	1.03	1.15	1.21	1.20	1.08	0.91	0.55	-0.54	-1.93
Does soakway half-empty in 24 hrs?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
q_{min} m/hr	6.0E-03	7.5E-03	8.2E-03	9.2E-03	9.7E-03	9.6E-03	8.6E-03	7.3E-03	4.4E-03	-4.3E-03	-1.5E-02

Job Title	Mytton Homes Burton Hall Road. Rossett, Wrexham Critical T Year Design Storm Duration for Soakaway Design based on CIRIA Report 156 - TRENCH
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Drg. Ref.	5986/01		
Made by	A. J.	Date	20/08/2012
			Chd.

This spreadsheet is set up to calculate the length of a trench soakaway for various durations of 1 in T year storms based on the guidance in CIRIA Report 156 'Infiltration drainage - Manual of good practice'.
The inputted values in this calculation reflect the example given on page 83 of CIRIA Report 156.

Parameters	M5-60	17.00000000	mm	J0	1.64E-01	Wallingford
	r	0.34200000		J1	5.83E-03	Procedure
	T	100	years + 30% CC	J2	-1.34E-04	Variables

F.O.S	1.5		
Porosity of fill, n	0.95		
Impermeable Area, A _D	300.00	m2	
Width of trench, W	2.00	m	Base Area, A _b 9.00 m2
Length of trench, L	4.50	m	Base Perimeter, P 13.00 m
1 in 10 year rainfall intensity, I	See Table Below		

Depth of trench, h Value to be calculated, see table below

Infiltration coefficient	8.0E-05 m/s	
Infiltration coefficient, q	2.9E-01 m/h	
	1.9E-01	[Allowing for factor of safety]

D	min	5	10	15	30	60	120	240	360	600	1440	2880
	hr	0.08	0.17	0.25	0.50	1	2	4	6	10	24	48
I	m/hr	0.1657	0.1241	0.1016	0.0685	0.0445	0.0279	0.0170	0.0125	0.0084	0.0039	0.0019
a b		-1.923E+01	-1.422E+01	-1.152E+01	-7.547E+00	-4.651E+00	-2.656E+00	-1.349E+00	-8.131E-01	-3.159E-01	2.214E-01	4.593E-01
		2.919E-01	2.919E-01	2.919E-01	2.919E-01	2.919E-01	2.919E-01	2.919E-01	2.919E-01	2.919E-01	2.919E-01	2.919E-01
h	m	0.46	0.68	0.81	1.02	1.18	1.17	0.93	0.67	0.30	-0.22	-0.46
t_{1/2}	hr	0.77	0.97	1.08	1.21	1.30	1.29	1.16	0.97	0.56	-0.72	-2.35
Does soakway half-empty in 24 hrs?		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
q_{min}	m/hr	6.1E-03	7.8E-03	8.6E-03	9.7E-03	1.0E-02	1.0E-02	9.3E-03	7.7E-03	4.5E-03	-5.8E-03	-1.9E-02

Soakaway Calculator v 1.1 coopers chartered consulting engineers Calculation Sheet		Job No 5986		Sheet No SA4		Rev -					
Job Title Mytton Homes Burton Hall Road. Rossett, Wrexham Critical T Year Design Storm Duration for Soakaway Design based on CIRIA Report 156 - TRENCH		Member/Location 		Drg. Ref. 5986/01		Made by AJ		Date 20/08/2013		Chd. 	

This spreadsheet is set up to calculate the length of a trench soakaway for various durations of 1 in T year storms based on the guidance in CIRIA Report 156 'Infiltration drainage - Manual of good practice'.
 The inputted values in this calculation reflect the example given on page 83 of CIRIA Report 156.

Parameters	M5-60	17.00000000	mm	J0	1.64E-01	Wallingford
	r	0.34200000		J1	5.83E-03	Procedure
	T	100	years + 30% CC	J2	-1.34E-04	Variables

F.O.S	1.5						
Porosity of fill, n	0.95						
Impermeable Area, A _D	180.00	m ²					
Width of trench, W	1.00	m	Base Area, A _b		5.00	m ²	
Length of trench, L	5.00	m	Base Perimeter, P		12.00	m	
1 in 10 year rainfall intensity, I	See Table Below						

Depth of trench, h

Value to be calculated, see table below

Infiltration coefficient	8.0E-05	m/s					
Infiltration coefficient, q		2.9E-01	m/h				
		1.9E-01		[Allowing for factor of safety]			

D	min hr	5	10	15	30	60	120	240	360	600	1440	2880
		0.08	0.17	0.25	0.50	1	2	4	6	10	24	48
I	m/hr	0.1657	0.1241	0.1016	0.0685	0.0445	0.0279	0.0170	0.0125	0.0084	0.0039	0.0019
a		-1.253E+01	-9.278E+00	-7.524E+00	-4.939E+00	-3.056E+00	-1.760E+00	-9.101E-01	-5.618E-01	-2.387E-01	1.106E-01	2.652E-01
b		4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01
h	m	0.50	0.72	0.86	1.06	1.17	1.09	0.78	0.53	0.24	-0.11	-0.27
t _{1/2}	hr	0.65	0.79	0.85	0.92	0.95	0.93	0.81	0.68	0.41	-0.34	-1.30
Does soakway half-empty in 24 hrs?		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
q _{min}	m/hr	5.2E-03	6.3E-03	6.8E-03	7.3E-03	7.6E-03	7.4E-03	6.5E-03	5.4E-03	3.3E-03	-2.7E-03	-1.0E-02

Soakaway Calculator v 1.1 coopers chartered consulting engineers Calculation Sheet		Job No 5986		Sheet No SA5		Rev -					
Job Title Mytton Homes Burton Hall Road. Rossett, Wrexham Critical T Year Design Storm Duration for Soakaway Design based on CIRIA Report 156 - TRENCH		Member/Location 		Drg. Ref. 5986/01		Made by AJ		Date 20/08/2013		Chd. 	

This spreadsheet is set up to calculate the length of a trench soakaway for various durations of 1 in T year storms based on the guidance in CIRIA Report 156 'Infiltration drainage - Manual of good practice'.
 The inputted values in this calculation reflect the example given on page 83 of CIRIA Report 156.

Parameters	M5-60	17.00000000	mm	J0	1.64E-01	Wallingford
	r	0.34200000		J1	5.83E-03	Procedure
	T	100	years + 30% CC	J2	-1.34E-04	Variables

F.O.S	1.5					
Porosity of fill, n	0.95					
Impermeable Area, A _D	220.00	m ²				
Width of trench, W	2.50	m	Base Area, A _b	6.25	m ²	
Length of trench, L	2.50	m	Base Perimeter, P	10.00	m	
1 in 10 year rainfall intensity, I	See Table Below					

Depth of trench, h

Value to be calculated, see table below

Infiltration coefficient	8.0E-05	m/s				
Infiltration coefficient, q	2.9E-01	m/h				
	1.9E-01		[Allowing for factor of safety]			

	5	10	15	30	60	120	240	360	600	1440	2880
D min hr	0.08	0.17	0.25	0.50	1	2	4	6	10	24	48
I m/hr	0.1657	0.1241	0.1016	0.0685	0.0445	0.0279	0.0170	0.0125	0.0084	0.0039	0.0019
a	-1.837E+01	-1.359E+01	-1.102E+01	-7.230E+00	-4.469E+00	-2.567E+00	-1.321E+00	-8.101E-01	-3.362E-01	1.761E-01	4.029E-01
b	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01	3.234E-01
h m	0.49	0.71	0.86	1.08	1.23	1.22	0.96	0.69	0.32	-0.18	-0.40
t_{1/2} hr	0.77	0.96	1.05	1.18	1.25	1.24	1.11	0.94	0.58	-0.55	-2.00
Does soakway half-empty in 24 hrs?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
q_{min} m/hr	6.1E-03	7.7E-03	8.4E-03	9.4E-03	1.0E-02	9.9E-03	8.9E-03	7.6E-03	4.6E-03	-4.4E-03	-1.6E-02

Soakaway Calculator v 1.1 coopers chartered consulting engineers Calculation Sheet		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Job No</td> <td style="width: 40%;">Sheet No</td> <td style="width: 30%;">Rev</td> </tr> <tr> <td style="text-align: center; height: 40px;">5986</td> <td style="text-align: center;">SA6</td> <td style="text-align: center;">-</td> </tr> <tr> <td colspan="3">Member/Location</td> </tr> <tr> <td colspan="3">Drg. Ref. 5986/01</td> </tr> <tr> <td>Made by</td> <td>AJ</td> <td>Date 20/08/2013</td> </tr> <tr> <td colspan="2"></td> <td>Chd.</td> </tr> </table>			Job No	Sheet No	Rev	5986	SA6	-	Member/Location			Drg. Ref. 5986/01			Made by	AJ	Date 20/08/2013			Chd.
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Job Title Mytton Homes Burton Hall Road. Rossett, Wrexham Critical T Year Design Storm Duration for Soakaway Design based on CIRIA Report 156 - TRENCH																						

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Parameters	M5-60	17.00000000	mm	J0	1.64E-01	Wallingford
	r	0.34200000		J1	5.83E-03	Procedure
	T	100	years + 30% CC	J2	-1.34E-04	Variables

F.O.S	1.5				
Porosity of fill, n	0.95				
Impermeable Area, A _D	170.00	m2			
Width of trench, W	1.00	m	Base Area, A _b	5.00	m2
Length of trench, L	5.00	m	Base Perimeter, P	12.00	m
1 in 10 year rainfall intensity, I	See Table Below				

Depth of trench, h

Value to be calculated, see table below

Infiltration coefficient	8.0E-05	m/s			
Infiltration coefficient, q	2.9E-01	m/h			
	1.9E-01				

[Allowing for factor of safety]

	5	10	15	30	60	120	240	360	600	1440	2880
D min hr	0.08	0.17	0.25	0.50	1	2	4	6	10	24	48
I m/hr	0.1657	0.1241	0.1016	0.0685	0.0445	0.0279	0.0170	0.0125	0.0084	0.0039	0.0019
a	-1.181E+01	-8.739E+00	-7.083E+00	-4.641E+00	-2.863E+00	-1.639E+00	-8.364E-01	-5.075E-01	-2.023E-01	1.276E-01	2.736E-01
b	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01
h m	0.47	0.68	0.81	1.00	1.10	1.02	0.72	0.48	0.20	-0.13	-0.27
t_{1/2} hr	0.63	0.76	0.83	0.90	0.93	0.90	0.78	0.64	0.37	-0.41	-1.38
Does soakway half-empty in 24 hrs?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
q_{min} m/hr	5.1E-03	6.1E-03	6.6E-03	7.2E-03	7.4E-03	7.2E-03	6.3E-03	5.1E-03	2.9E-03	-3.3E-03	-1.1E-02

Soakaway Calculator v 1.1 coopers chartered consulting engineers Calculation Sheet		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Job No</td> <td style="width: 40%;">Sheet No</td> <td style="width: 30%;">Rev</td> </tr> <tr> <td style="text-align: center; height: 40px;">5986</td> <td style="text-align: center;">SA7</td> <td style="text-align: center;">-</td> </tr> <tr> <td colspan="3">Member/Location</td> </tr> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Drg. Ref.</td> <td colspan="3">5986/01</td> </tr> <tr> <td>Made by</td> <td>AJ</td> <td>Date</td> <td>20/08/2013</td> </tr> <tr> <td></td> <td></td> <td>Chd.</td> <td></td> </tr> </table>		Job No	Sheet No	Rev	5986	SA7	-	Member/Location			Drg. Ref.	5986/01			Made by	AJ	Date	20/08/2013			Chd.	
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	r	0.34200000		J1	5.83E-03	Procedure
	T	100	years + 30% CC	J2	-1.34E-04	Variables

F.O.S	1.5	
Porosity of fill, n	0.95	
Impermeable Area, A _D	170.00	m2
Width of trench, W	1.00	m
Length of trench, L	5.00	m
1 in 10 year rainfall intensity, I	See Table Below	
Base Area, A _b	5.00 m2	
Base Perimeter, P	12.00 m	

Depth of trench, h

Value to be calculated, see table below

Infiltration coefficient	8.0E-05	m/s
Infiltration coefficient, q	2.9E-01	m/h
	1.9E-01	

[Allowing for factor of safety]

D	min hr	5	10	15	30	60	120	240	360	600	1440	2880
		0.08	0.17	0.25	0.50	1	2	4	6	10	24	48
I	m/hr	0.1657	0.1241	0.1016	0.0685	0.0445	0.0279	0.0170	0.0125	0.0084	0.0039	0.0019
a		-1.181E+01	-8.739E+00	-7.083E+00	-4.641E+00	-2.863E+00	-1.639E+00	-8.364E-01	-5.075E-01	-2.023E-01	1.276E-01	2.736E-01
b		4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01	4.851E-01
h	m	0.47	0.68	0.81	1.00	1.10	1.02	0.72	0.48	0.20	-0.13	-0.27
t _{1/2}	hr	0.63	0.76	0.83	0.90	0.93	0.90	0.78	0.64	0.37	-0.41	-1.38
Does soakway half-empty in 24 hrs?		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
q _{min}	m/hr	5.1E-03	6.1E-03	6.6E-03	7.2E-03	7.4E-03	7.2E-03	6.3E-03	5.1E-03	2.9E-03	-3.3E-03	-1.1E-02

Soakaway Calculator v 1.1 coopers chartered consulting engineers Calculation Sheet		Job No 5986 Sheet No SA8 Rev -	
Job Title Mytton Homes Burton Hall Road. Rossett, Wrexham Critical T Year Design Storm Duration for Soakaway Design based on CIRIA Report 156 - TRENCH		Member/Location Drg. Ref. 5986/01 Made by AJ Date 20/08/2013 Chd.	

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	r	0.34200000		J1	5.83E-03	Procedure
	T	100	years + 30% CC	J2	-1.34E-04	Variables

F.O.S	1.5						
Porosity of fill, n	0.95						
Impermeable Area, A _D	145.00	m ²					
Width of trench, W	1.00	m	Base Area, A _b		4.00	m ²	
Length of trench, L	4.00	m	Base Perimeter, P		10.00	m	
1 in 10 year rainfall intensity, I	See Table Below						

Depth of trench, h Value to be calculated, see table below

	8.0E-05	m/s					
Infiltration coefficient		2.9E-01	m/h				
Infiltration coefficient, q		1.9E-01		[Allowing for factor of safety]			

	D	min hr	5	10	15	30	60	120	240	360	600	1440	2880
			0.08	0.17	0.25	0.50	1	2	4	6	10	24	48
	I	m/hr	0.1657	0.1241	0.1016	0.0685	0.0445	0.0279	0.0170	0.0125	0.0084	0.0039	0.0019
	a		-1.212E+01	-8.972E+00	-7.276E+00	-4.777E+00	-2.957E+00	-1.704E+00	-8.826E-01	-5.459E-01	-2.335E-01	1.041E-01	2.536E-01
	b		5.053E-01	5.053E-01	5.053E-01	5.053E-01	5.053E-01	5.053E-01	5.053E-01	5.053E-01	5.053E-01	5.053E-01	5.053E-01
	h	m	0.50	0.72	0.86	1.07	1.17	1.08	0.77	0.52	0.23	-0.10	-0.25
	t _{1/2}	hr	0.64	0.77	0.83	0.89	0.92	0.90	0.79	0.66	0.40	-0.32	-1.23
	Does soakway half-empty in 24 hrs?		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	q _{min}	m/hr	5.2E-03	6.2E-03	6.6E-03	7.2E-03	7.4E-03	7.2E-03	6.3E-03	5.3E-03	3.2E-03	-2.6E-03	-9.9E-03

Soakaway Calculator v 1.1 coopers chartered consulting engineers Calculation Sheet		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Job No</td> <td style="width: 40%;">Sheet No</td> <td style="width: 30%;">Rev</td> </tr> <tr> <td style="text-align: center; height: 40px;">5986</td> <td style="text-align: center;">SA9</td> <td style="text-align: center;">-</td> </tr> <tr> <td colspan="3">Member/Location</td> </tr> </table>		Job No	Sheet No	Rev	5986	SA9	-	Member/Location					
Job No	Sheet No	Rev													
5986	SA9	-													
Member/Location															
Job Title Mytton Homes Burton Hall Road. Rossett, Wrexham Critical T Year Design Storm Duration for Soakaway Design based on CIRIA Report 156 - TRENCH		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Drg. Ref.</td> <td colspan="3">5986/01</td> </tr> <tr> <td>Made by</td> <td>AJ</td> <td>Date</td> <td>20/08/2013</td> </tr> <tr> <td></td> <td></td> <td>Chd.</td> <td></td> </tr> </table>		Drg. Ref.	5986/01			Made by	AJ	Date	20/08/2013			Chd.	
Drg. Ref.	5986/01														
Made by	AJ	Date	20/08/2013												
		Chd.													

This spreadsheet is set up to calculate the length of a trench soakaway for various durations of 1 in T year storms based on the guidance in CIRIA Report 156 'Infiltration drainage - Manual of good practice'.
 The inputted values in this calculation reflect the example given on page 83 of CIRIA Report 156.

Parameters	M5-60	17.00000000	mm	J0	1.64E-01	Wallingford
	r	0.34200000		J1	5.83E-03	Procedure
	T	100	years + 30% CC	J2	-1.34E-04	Variables

F.O.S	1.5	
Porosity of fill, n	0.95	
Impermeable Area, A _D	60.00	m ²
Width of trench, W	1.00	m
Length of trench, L	1.50	m
1 in 10 year rainfall intensity, I	See Table Below	

Depth of trench, h

Value to be calculated, see table below

Infiltration coefficient	8.0E-05	m/s
Infiltration coefficient, q	2.9E-01	m/h
	1.9E-01	

[Allowing for factor of safety]

D	min hr	5	10	15	30	60	120	240	360	600	1440	2880
		0.08	0.17	0.25	0.50	1	2	4	6	10	24	48
I	m/hr	0.1657	0.1241	0.1016	0.0685	0.0445	0.0279	0.0170	0.0125	0.0084	0.0039	0.0019
a		-1.006E+01	-7.456E+00	-6.053E+00	-3.984E+00	-2.478E+00	-1.441E+00	-7.615E-01	-4.828E-01	-2.243E-01	5.514E-02	1.788E-01
b		6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01
h	m	0.55	0.79	0.94	1.14	1.21	1.07	0.71	0.47	0.22	-0.06	-0.18
t _{1/2}	hr	0.58	0.67	0.71	0.75	0.76	0.73	0.64	0.54	0.36	-0.16	-0.82
Does soakway half-empty in 24 hrs?		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
q _{min}	m/hr	4.6E-03	5.3E-03	5.7E-03	6.0E-03	6.1E-03	5.9E-03	5.1E-03	4.3E-03	2.9E-03	-1.3E-03	-6.6E-03

Soakaway Calculator v 1.1 coopers chartered consulting engineers Calculation Sheet				Job No 5986			Sheet No SA10			Rev -		
Job Title Mytton Homes Burton Hall Road. Rossett, Wrexham Critical T Year Design Storm Duration for Soakaway Design based on CIRIA Report 156 - TRENCH				Member/Location 			Drg. Ref. 5986/01					
				Made by AJ			Date 20/08/2013			Chd. 		

This spreadsheet is set up to calculate the length of a trench soakaway for various durations of 1 in T year storms based on the guidance in CIRIA Report 156 'Infiltration drainage - Manual of good practice'.
 The inputted values in this calculation reflect the example given on page 83 of CIRIA Report 156.

Parameters	M5-60	17.00000000	mm	J0	1.64E-01	Wallingford
	r	0.34200000		J1	5.83E-03	Procedure
	T	100	years + 30% CC	J2	-1.34E-04	Variables

F.O.S	1.5						
Porosity of fill, n	0.95						
Impermeable Area, A _D	60.00	m ²					
Width of trench, W	1.00	m	Base Area, A _b		1.50	m ²	
Length of trench, L	1.50	m	Base Perimeter, P		5.00	m	
1 in 10 year rainfall intensity, I	See Table Below						

Depth of trench, h

Value to be calculated, see table below

	8.0E-05	m/s					
Infiltration coefficient		2.9E-01	m/h				
Infiltration coefficient, q		1.9E-01					

[Allowing for factor of safety]

	D	min	5	10	15	30	60	120	240	360	600	1440	2880
		hr	0.08	0.17	0.25	0.50	1	2	4	6	10	24	48
	I	m/hr	0.1657	0.1241	0.1016	0.0685	0.0445	0.0279	0.0170	0.0125	0.0084	0.0039	0.0019
	a		-1.006E+01	-7.456E+00	-6.053E+00	-3.984E+00	-2.478E+00	-1.441E+00	-7.615E-01	-4.828E-01	-2.243E-01	5.514E-02	1.788E-01
	b		6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01
	h	m	0.55	0.79	0.94	1.14	1.21	1.07	0.71	0.47	0.22	-0.06	-0.18
	t _{1/2}	hr	0.58	0.67	0.71	0.75	0.76	0.73	0.64	0.54	0.36	-0.16	-0.82
	Does soakway half-empty in 24 hrs?		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	q _{min}	m/hr	4.6E-03	5.3E-03	5.7E-03	6.0E-03	6.1E-03	5.9E-03	5.1E-03	4.3E-03	2.9E-03	-1.3E-03	-6.6E-03

Soakaway Calculator v 1.1 coopers chartered consulting engineers Calculation Sheet		Job No 5986 Sheet No SA11 Rev -	
Job Title Mytton Homes Burton Hall Road. Rossett, Wrexham Critical T Year Design Storm Duration for Soakaway Design based on CIRIA Report 156 - TRENCH		Member/Location Drg. Ref. 5986/01 Made by AJ Date 20/08/2013 Chd.	

This spreadsheet is set up to calculate the length of a trench soakaway for various durations of 1 in T year storms based on the guidance in CIRIA Report 156 'Infiltration drainage - Manual of good practice'.
 The inputted values in this calculation reflect the example given on page 83 of CIRIA Report 156.

Parameters	M5-60	17.00000000	mm	J0	1.64E-01	Wallingford
	r	0.34200000		J1	5.83E-03	Procedure
	T	100	years + 30% CC	J2	-1.34E-04	Variables

F.O.S	1.5					
Porosity of fill, n	0.95					
Impermeable Area, A _D	60.00	m ²				
Width of trench, W	1.00	m	Base Area, A _b	1.50	m ²	
Length of trench, L	1.50	m	Base Perimeter, P	5.00	m	
1 in 10 year rainfall intensity, I	See Table Below					

Depth of trench, h Value to be calculated, see table below

	8.0E-05	m/s				
Infiltration coefficient	2.9E-01	m/h				
Infiltration coefficient, q	1.9E-01		[Allowing for factor of safety]			

	min	5	10	15	30	60	120	240	360	600	1440	2880
D	hr	0.08	0.17	0.25	0.50	1	2	4	6	10	24	48
I	m/hr	0.1657	0.1241	0.1016	0.0685	0.0445	0.0279	0.0170	0.0125	0.0084	0.0039	0.0019
a		-1.006E+01	-7.456E+00	-6.053E+00	-3.984E+00	-2.478E+00	-1.441E+00	-7.615E-01	-4.828E-01	-2.243E-01	5.514E-02	1.788E-01
b		6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01
h	m	0.55	0.79	0.94	1.14	1.21	1.07	0.71	0.47	0.22	-0.06	-0.18
t_{1/2}	hr	0.58	0.67	0.71	0.75	0.76	0.73	0.64	0.54	0.36	-0.16	-0.82
Does soakway half-empty in 24 hrs?		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
q_{min}	m/hr	4.6E-03	5.3E-03	5.7E-03	6.0E-03	6.1E-03	5.9E-03	5.1E-03	4.3E-03	2.9E-03	-1.3E-03	-6.6E-03

Job Title	Mytton Homes Burton Hall Road, Rossett, Wrexham Critical T Year Design Storm Duration for Soakaway Design based on CIRIA Report 156 - TRENCH
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Drg. Ref.	5986/01		
Made by	A. J.	Date	20/08/2012
			Chd.

This spreadsheet is set up to calculate the length of a trench soakaway for various durations of 1 in T year storms based on the guidance in CIRIA Report 156 'Infiltration drainage - Manual of good practice'.
The inputted values in this calculation reflect the example given on page 83 of CIRIA Report 156.

Parameters	M5-60	17.00000000 mm	J0	1.64E-01	Wallingford
	r	0.34200000	J1	5.83E-03	Procedure
	T	100 years + 30% CC	J2	-1.34E-04	Variables

F.O.S	1.5		
Porosity of fill, n	0.95		
Impermeable Area, A _D	60.00 m2		
Width of trench, W	1.00 m	Base Area, A _b	1.50 m2
Length of trench, L	1.50 m	Base Perimeter, P	5.00 m
1 in 10 year rainfall intensity, I	See Table Below		

Depth of trench, h Value to be calculated, see table below

Infiltration coefficient	8.0E-05 m/s	
Infiltration coefficient, q	2.9E-01 m/h	
	1.9E-01	[Allowing for factor of safety]

D	min	5	10	15	30	60	120	240	360	600	1440	2880
	hr	0.08	0.17	0.25	0.50	1	2	4	6	10	24	48
I	m/hr	0.1657	0.1241	0.1016	0.0685	0.0445	0.0279	0.0170	0.0125	0.0084	0.0039	0.0019
a		-1.006E+01	-7.456E+00	-6.053E+00	-3.984E+00	-2.478E+00	-1.441E+00	-7.615E-01	-4.828E-01	-2.243E-01	5.514E-02	1.788E-01
b		6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01
h	m	0.55	0.79	0.94	1.14	1.21	1.07	0.71	0.47	0.22	-0.06	-0.18
t_{1/2}	hr	0.58	0.67	0.71	0.75	0.76	0.73	0.64	0.54	0.36	-0.16	-0.82
Does soakway half-empty in 24 hrs?		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
q_{min}	m/hr	4.6E-03	5.3E-03	5.7E-03	6.0E-03	6.1E-03	5.9E-03	5.1E-03	4.3E-03	2.9E-03	-1.3E-03	-6.6E-03

Soakaway Calculator v 1.1 coopers chartered consulting engineers Calculation Sheet		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Job No</td> <td style="width: 33%;">Sheet No</td> <td style="width: 34%;">Rev</td> </tr> <tr> <td style="text-align: center; height: 40px;">5986</td> <td style="text-align: center; height: 40px;">SA13</td> <td style="text-align: center; height: 40px;">-</td> </tr> <tr> <td colspan="3" style="padding: 2px;">Member/Location</td> </tr> <tr> <td colspan="3" style="padding: 2px;">Drg. Ref. 5986/01</td> </tr> <tr> <td style="padding: 2px;">Made by</td> <td style="padding: 2px;">AJ</td> <td style="padding: 2px;">Date</td> </tr> <tr> <td></td> <td></td> <td style="padding: 2px;">20/08/2013</td> </tr> <tr> <td></td> <td></td> <td style="padding: 2px;">Chd.</td> </tr> </table>			Job No	Sheet No	Rev	5986	SA13	-	Member/Location			Drg. Ref. 5986/01			Made by	AJ	Date			20/08/2013			Chd.
Job No	Sheet No	Rev																							
5986	SA13	-																							
Member/Location																									
Drg. Ref. 5986/01																									
Made by	AJ	Date																							
		20/08/2013																							
		Chd.																							
Job Title Mytton Homes Burton Hall Road. Rossett, Wrexham Critical T Year Design Storm Duration for Soakaway Design based on CIRIA Report 156 - TRENCH																									

This spreadsheet is set up to calculate the length of a trench soakaway for various durations of 1 in T year storms based on the guidance in CIRIA Report 156 'Infiltration drainage - Manual of good practice'.
 The inputted values in this calculation reflect the example given on page 83 of CIRIA Report 156.

Parameters	M5-60	17.00000000 mm	J0	1.64E-01	Wallingford
	r	0.34200000	J1	5.83E-03	Procedure
	T	100 years + 30% CC	J2	-1.34E-04	Variables

F.O.S	1.5				
Porosity of fill, n	0.95				
Impermeable Area, A _D	60.00 m ²				
Width of trench, W	1.00 m	Base Area, A _b	1.50 m ²		
Length of trench, L	1.50 m	Base Perimeter, P	5.00 m		
1 in 10 year rainfall intensity, I	See Table Below				

Depth of trench, h Value to be calculated, see table below

	8.0E-05 m/s				
Infiltration coefficient	2.9E-01 m/h				
Infiltration coefficient, q	1.9E-01				

[Allowing for factor of safety]

	5	10	15	30	60	120	240	360	600	1440	2880
D min hr	0.08	0.17	0.25	0.50	1	2	4	6	10	24	48
I m/hr	0.1657	0.1241	0.1016	0.0685	0.0445	0.0279	0.0170	0.0125	0.0084	0.0039	0.0019
a	-1.006E+01	-7.456E+00	-6.053E+00	-3.984E+00	-2.478E+00	-1.441E+00	-7.615E-01	-4.828E-01	-2.243E-01	5.514E-02	1.788E-01
b	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01
h m	0.55	0.79	0.94	1.14	1.21	1.07	0.71	0.47	0.22	-0.06	-0.18
t_{1/2} hr	0.58	0.67	0.71	0.75	0.76	0.73	0.64	0.54	0.36	-0.16	-0.82
Does soakway half-empty in 24 hrs?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
q_{min} m/hr	4.6E-03	5.3E-03	5.7E-03	6.0E-03	6.1E-03	5.9E-03	5.1E-03	4.3E-03	2.9E-03	-1.3E-03	-6.6E-03

Soakaway Calculator v 1.1 coopers chartered consulting engineers Calculation Sheet		Job No 5986		Sheet No SA14		Rev -					
Job Title Mytton Homes Burton Hall Road. Rossett, Wrexham Critical T Year Design Storm Duration for Soakaway Design based on CIRIA Report 156 - TRENCH		Member/Location 		Drg. Ref. 5986/01		Made by AJ		Date 20/08/2013		Chd. 	

This spreadsheet is set up to calculate the length of a trench soakaway for various durations of 1 in T year storms based on the guidance in CIRIA Report 156 'Infiltration drainage - Manual of good practice'.
 The inputted values in this calculation reflect the example given on page 83 of CIRIA Report 156.

Parameters	M5-60	17.00000000	mm	J0	1.64E-01	Wallingford
	r	0.34200000		J1	5.83E-03	Procedure
	T	100	years + 30% CC	J2	-1.34E-04	Variables

F.O.S	1.5						
Porosity of fill, n	0.95						
Impermeable Area, A _D	60.00	m ²					
Width of trench, W	1.00	m	Base Area, A _b		1.50	m ²	
Length of trench, L	1.50	m	Base Perimeter, P		5.00	m	
1 in 10 year rainfall intensity, I	See Table Below						

Depth of trench, h

Value to be calculated, see table below

Infiltration coefficient	8.0E-05	m/s					
Infiltration coefficient, q		2.9E-01	m/h				
		1.9E-01		[Allowing for factor of safety]			

	D	min	5	10	15	30	60	120	240	360	600	1440	2880
		hr	0.08	0.17	0.25	0.50	1	2	4	6	10	24	48
	I	m/hr	0.1657	0.1241	0.1016	0.0685	0.0445	0.0279	0.0170	0.0125	0.0084	0.0039	0.0019
	a		-1.006E+01	-7.456E+00	-6.053E+00	-3.984E+00	-2.478E+00	-1.441E+00	-7.615E-01	-4.828E-01	-2.243E-01	5.514E-02	1.788E-01
	b		6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01	6.737E-01
	h	m	0.55	0.79	0.94	1.14	1.21	1.07	0.71	0.47	0.22	-0.06	-0.18
	t _{1/2}	hr	0.58	0.67	0.71	0.75	0.76	0.73	0.64	0.54	0.36	-0.16	-0.82
	Does soakway half-empty in 24 hrs?		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	q _{min}	m/hr	4.6E-03	5.3E-03	5.7E-03	6.0E-03	6.1E-03	5.9E-03	5.1E-03	4.3E-03	2.9E-03	-1.3E-03	-6.6E-03

Soakaway Calculator v 1.1 coopers chartered consulting engineers Calculation Sheet		Job No 5986		Sheet No SA15		Rev -					
Job Title Mytton Homes Burton Hall Road. Rossett, Wrexham Critical T Year Design Storm Duration for Soakaway Design based on CIRIA Report 156 - TRENCH		Member/Location 		Drg. Ref. 5986/01		Made by AJ		Date 20/08/2013		Chd. 	

This spreadsheet is set up to calculate the length of a trench soakaway for various durations of 1 in T year storms based on the guidance in CIRIA Report 156 'Infiltration drainage - Manual of good practice'.
 The inputted values in this calculation reflect the example given on page 83 of CIRIA Report 156.

Parameters	M5-60	17.00000000	mm	J0	1.64E-01	Wallingford
	r	0.34200000		J1	5.83E-03	Procedure
	T	100	years + 30% CC	J2	-1.34E-04	Variables

F.O.S	1.5						
Porosity of fill, n	0.95						
Impermeable Area, A _D	245.00	m ²					
Width of trench, W	1.00	m	Base Area, A _b	7.00	m ²		
Length of trench, L	7.00	m	Base Perimeter, P	16.00	m		
1 in 10 year rainfall intensity, I	See Table Below						

Depth of trench, h

Value to be calculated, see table below

Infiltration coefficient	8.0E-05	m/s					
Infiltration coefficient, q	2.9E-01	m/h					
	1.9E-01		[Allowing for factor of safety]				

	5	10	15	30	60	120	240	360	600	1440	2880
D min hr	0.08	0.17	0.25	0.50	1	2	4	6	10	24	48
I m/hr	0.1657	0.1241	0.1016	0.0685	0.0445	0.0279	0.0170	0.0125	0.0084	0.0039	0.0019
a	-1.278E+01	-9.459E+00	-7.669E+00	-5.029E+00	-3.108E+00	-1.784E+00	-9.170E-01	-5.614E-01	-2.315E-01	1.250E-01	2.829E-01
b	4.620E-01	4.620E-01	4.620E-01	4.620E-01	4.620E-01	4.620E-01	4.620E-01	4.620E-01	4.620E-01	4.620E-01	4.620E-01
h m	0.48	0.70	0.84	1.04	1.15	1.08	0.77	0.53	0.23	-0.13	-0.28
t_{1/2} hr	0.66	0.80	0.86	0.94	0.97	0.95	0.83	0.69	0.41	-0.39	-1.41
Does soakway half-empty in 24 hrs?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
q_{min} m/hr	5.3E-03	6.4E-03	6.9E-03	7.5E-03	7.8E-03	7.6E-03	6.7E-03	5.5E-03	3.3E-03	-3.2E-03	-1.1E-02

Job Title	Mytton Homes Burton Hall Road. Rossett, Wrexham Critical T Year Design Storm Duration for Soakaway Design based on CIRIA Report 156 - TRENCH
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Drg. Ref.	5986/01		
Made by	A. J.	Date	20/08/2012
			Chd.

This spreadsheet is set up to calculate the length of a trench soakaway for various durations of 1 in T year storms based on the guidance in CIRIA Report 156 'Infiltration drainage - Manual of good practice'.
The inputted values in this calculation reflect the example given on page 83 of CIRIA Report 156.

Parameters	M5-60	17.00000000 mm	J0	1.64E-01	Wallingford
	r	0.34200000	J1	5.83E-03	Procedure
	T	100 years + 30% CC	J2	-1.34E-04	Variables

F.O.S	1.5		
Porosity of fill, n	0.95		
Impermeable Area, A _D	300.00	m2	
Width of trench, W	1.00	m	Base Area, A _b 8.50 m2
Length of trench, L	8.50	m	Base Perimeter, P 19.00 m
1 in 10 year rainfall intensity, I	See Table Below		

Depth of trench, h Value to be calculated, see table below

	8.0E-05 m/s
Infiltration coefficient	2.9E-01 m/h
Infiltration coefficient, q	1.9E-01

[Allowing for factor of safety]

D	min	5	10	15	30	60	120	240	360	600	1440	2880
	hr	0.08	0.17	0.25	0.50	1	2	4	6	10	24	48
I	m/hr	0.1657	0.1241	0.1016	0.0685	0.0445	0.0279	0.0170	0.0125	0.0084	0.0039	0.0019
a		-1.318E+01	-9.758E+00	-7.912E+00	-5.190E+00	-3.208E+00	-1.844E+00	-9.493E-01	-5.826E-01	-2.425E-01	1.252E-01	2.880E-01
b		4.518E-01	4.518E-01	4.518E-01	4.518E-01	4.518E-01	4.518E-01	4.518E-01	4.518E-01	4.518E-01	4.518E-01	4.518E-01
h	m	0.49	0.71	0.84	1.05	1.17	1.10	0.79	0.54	0.24	-0.13	-0.29
t_{1/2}	hr	0.67	0.81	0.88	0.96	0.99	0.97	0.85	0.71	0.42	-0.39	-1.42
Does soakway half-empty in 24 hrs?		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
q_{min}	m/hr	5.3E-03	6.5E-03	7.0E-03	7.6E-03	7.9E-03	7.8E-03	6.8E-03	5.7E-03	3.4E-03	-3.1E-03	-1.1E-02

Soakaway Calculator v 1.1 coopers chartered consulting engineers Calculation Sheet		Job No 5986		Sheet No SA17		Rev -	
Job Title Mytton Homes Burton Hall Road. Rossett, Wrexham Critical T Year Design Storm Duration for Soakaway Design based on CIRIA Report 156 - TRENCH		Member/Location Drg. Ref. 5986/01 Made by AJ Date 20/08/2013 Chd.					

This spreadsheet is set up to calculate the length of a trench soakaway for various durations of 1 in T year storms based on the guidance in CIRIA Report 156 'Infiltration drainage - Manual of good practice'.
 The inputted values in this calculation reflect the example given on page 83 of CIRIA Report 156.

Parameters	M5-60	17.00000000	mm	J0	1.64E-01	Wallingford
	r	0.34200000		J1	5.83E-03	Procedure
	T	100	years + 30% CC	J2	-1.34E-04	Variables

F.O.S	1.5						
Porosity of fill, n	0.95						
Impermeable Area, A _D	580.00	m ²					
Width of trench, W	2.00	m	Base Area, A _b	25.00	m ²		
Length of trench, L	12.50	m	Base Perimeter, P	29.00	m		
1 in 10 year rainfall intensity, I	See Table Below						

Depth of trench, h

Value to be calculated, see table below

Infiltration coefficient	8.0E-05	m/s				
Infiltration coefficient, q	2.9E-01	m/h				
	1.9E-01		[Allowing for factor of safety]			

	D	min hr	5	10	15	30	60	120	240	360	600	1440	2880
			0.08	0.17	0.25	0.50	1	2	4	6	10	24	48
	I	m/hr	0.1657	0.1241	0.1016	0.0685	0.0445	0.0279	0.0170	0.0125	0.0084	0.0039	0.0019
	a		-1.640E+01	-1.206E+01	-9.726E+00	-6.278E+00	-3.769E+00	-2.040E+00	-9.070E-01	-4.426E-01	-1.171E-02	4.540E-01	6.601E-01
	b		2.344E-01	2.344E-01	2.344E-01	2.344E-01	2.344E-01	2.344E-01	2.344E-01	2.344E-01	2.344E-01	2.344E-01	2.344E-01
	h	m	0.32	0.46	0.55	0.69	0.79	0.76	0.55	0.33	0.01	-0.45	-0.66
	t _{1/2}	hr	0.62	0.82	0.93	1.08	1.16	1.14	0.93	0.64	0.03	-1.87	-4.13
	Does soakway half-empty in 24 hrs?		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	q _{min}	m/hr	4.9E-03	6.5E-03	7.4E-03	8.6E-03	9.3E-03	9.1E-03	7.4E-03	5.1E-03	2.1E-04	-1.5E-02	-3.3E-02