

Soakaway

DETERMINATION OF MAXIMUM DEPTH OF WATER FOR 10 MINUTES, 1,4,6,12 and 18 HOUR 100 YEAR EVENTS (3D infiltration system)

No.	Abbreviation	Calculations	Value
1	AD		54.60 m ²
2	Ab		2 m ²
3	n		0.95
4	i		0.036 m/h
5	D		0.166 h
6	q		0.00005 m/h
7	R		27.30
	P		6.00 m
	a	$Ab/P - (iAD)/Pq$	-6551.67
	b	Pq/nAb	0.00
	hmax	$a(e^{-bD}) - 1$	0.17 m
		$((nAb)/(9*P)) * \log(e^{hmax + (Ab/P)/((hmax/2) + (Ab/P))})$	
Time for half emptying 3D infiltration system	t1/2	$x/2 + (Ab/P)) * 100$	-0.12 hr
Acceptable infiltration coefficient		$((n/24) * (Ab/P)) * \log(e^{hmax + (Ab/P)/((hmax/2) + (Ab/P))})$	0.000 m/h
No.	Abbreviation	Calculations	Value
1	AD		54.60 m ²
2	Ab		2 m ²
3	n		0.95
4	i		0.041 m/h
5	D		1 h
6	q		0.00005 m/h
7	R		27.30
	P		6.00 m
	a	$Ab/P - (iAD)/Pq$	-7460.21
	b	Pq/nAb	0.00
	hmax	$a(e^{-bD}) - 1$	1.18 m
		$((nAb)/(9*P)) * \log(e^{hmax + (Ab/P)/((hmax/2) + (Ab/P))})$	
Time for half emptying 3D infiltration system	t1/2	$x/2 + (Ab/P)) * 100$	1.52 hr
Acceptable infiltration coefficient		$((n/24) * (Ab/P)) * \log(e^{hmax + (Ab/P)/((hmax/2) + (Ab/P))})$	0.006 m/h
No.	Abbreviation	Calculations	Value

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1	Area to be drained	AD		54.6 m2
2	Base area of infiltration system	Ab		2 m2
3	Porosity of fill material	n		0.95
4	Intensity of rainfall events	i		0.015 m/h
5	Duration of rainfall events	D		4 h
6	Infiltration coefficient from percolation test adjusted by the appropriate factor of safety	q		0.00005 m/h
7	Ratio of drained area to infiltration area	R		27.30
	Perimeter	P		6.00 m
		a	$Ab/P-(iAD)/Pq$	-2711.10
		b	Pq/nAb	0.00
		hmax	$a(e^{(-bD)}-1)$	1.71 m
	Time for half emptying 3D infiltration system	t1/2	$((nAb)/(9*P))*\log_e(hmax+(Ab/P)/((hmax/2)+(Ab/P)))*100$	2.42 hr
	Acceptable infiltration coefficient		$((n/24)*(Ab/P))*\log_e(hmax+(Ab/P)/((hmax/2)+(Ab/P)))*100$	0.009 m/h
No.		Abbreviation	Calculations	Value
1	Area to be drained	AD		54.6 m2
2	Base area of infiltration system	Ab		2 m2
3	Porosity of fill material	n		0.95
4	Intensity of rainfall events	i		0.011 m/h
5	Duration of rainfall events	D		6 h
6	Infiltration coefficient from percolation test adjusted by the appropriate factor of safety	q		0.00005 m/h
7	Ratio of drained area to infiltration area	R		27.30
	Perimeter	P		6.00 m
		a	$Ab/P-(iAD)/Pq$	-2001.67
		b	Pq/nAb	0.00
		hmax	$a(e^{(-bD)}-1)$	1.90 m
	Time for half emptying 3D infiltration system	t1/2	$((nAb)/(9*P))*\log_e(hmax+(Ab/P)/((hmax/2)+(Ab/P)))*100$	2.70 hr
	Acceptable infiltration coefficient		$((n/24)*(Ab/P))*\log_e(hmax+(Ab/P)/((hmax/2)+(Ab/P)))*100$	0.010 m/h
No.		Abbreviation	Calculations	Value
1	Area to be drained	AD		54.6 m2
2	Base area of infiltration system	Ab		2 m2
3	Porosity of fill material	n		0.95

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4	Intensity of rainfall events	i	0.006	m/h
5	Duration of rainfall events	D	12	h
6	Infiltration coefficient from percolation test adjusted by the appropriate factor of safety	q	0.00005	m/h
7	Ratio of drained area to infiltration area	R	27.30	
	Perimeter	P	6.00	m
		a	Ab/P-(iAD)/Pq	-1144.63
		b	Pq/nAb	0.00
		hmax	a(e(-bD)-1)	2.17 m
	Time for half emptying 3D infiltration system	t1/2	$\frac{((nAb)/(9*P))*\log(hmax+(Ab/P)/((hmax/2)+(Ab/P)))}{((n/24)*(Ab/P))*\log(e(hmax+(Ab/P)/((hmax/2)+(Ab/P))))}$	3.08 hr
	Acceptable infiltration coefficient			0.012 m/h
No.		Abbreviation	Calculations	Value
1	Area to be drained	AD		54.6 m2
2	Base area of infiltration system	Ab		2 m2
3	Porosity of fill material	n		0.95
4	Intensity of rainfall events	i		0.005 m/h
5	Duration of rainfall events	D		18 h
6	Infiltration coefficient from percolation test adjusted by the appropriate factor of safety	q		0.00005 m/h
7	Ratio of drained area to infiltration area	R		27.30
	Perimeter	P		6.00 m
		a	Ab/P-(iAD)/Pq	-829.83
		b	Pq/nAb	0.00
		hmax	a(e(-bD)-1)	2.36 m
	Time for half emptying 3D infiltration system	t1/2	$\frac{((nAb)/(9*P))*\log(hmax+(Ab/P)/((hmax/2)+(Ab/P)))}{((n/24)*(Ab/P))*\log(e(hmax+(Ab/P)/((hmax/2)+(Ab/P))))}$	3.33 hr
	Acceptable infiltration coefficient		$\frac{((n/24)*(Ab/P))*\log(e(hmax+(Ab/P)/((hmax/2)+(Ab/P))))}{((nAb)/(9*P))*\log(hmax+(Ab/P)/((hmax/2)+(Ab/P)))}$	0.012 m/h