😯 Onn Point	Project Upper Hou	se, Richards	Castle, Ludlow	ı, SY8 4ER	Job no. P	۲1232	
• ENGINEERING	Calcs for	Calcs for				Start page no./Revision	
		Soak	away 2			1	
	Calcs by C RJS	alcs date 11/05/2022	Checked by	Checked date	Approved by	Approved date	
In accordance with BRE Dige	st 365 - Soakaway	/ design					
Design rainfall intensity					Tedds calcul	ation version 2.0.04	
Location of catchment area		Other					
Impermeable area drained to th	e system	A = 354.0 I	m²				
Return period	obyetenn	Period = 1	00 vr				
Ratio 60 min to 2 day rainfall of	5 yr return period	r = <b>0.400</b>					
5-year return period rainfall of 6	0 minutes duration	M5 60min	= <b>20.0</b> mm				
Increase of rainfall intensity due	to global warming	p <sub>climate</sub> = 0 9	%				
Soakaway / infiltration trench	details						
Soakaway type		Rectangula	ar				
Minimum depth of pit (below inc	oming invert)	d = <b>1000</b> m	ım				
Width of pit		w = <b>1000</b> n	nm				
Length of pit		l = <b>19309</b> r	nm				
Percentage free volume		V <sub>free</sub> = <b>95</b> %	0				
Soil infiltration rate (BRE dige	est 365)						
Length of trial pit		I <sub>trial</sub> = <b>1000</b>	mm				
Width of trial pit		b <sub>trial</sub> = <b>400</b> I	mm				
Depth of trial pit (below invert)		d <sub>trial</sub> = <b>1000</b>	mm				
Free volume (if fill used)		V <sub>trial</sub> = <b>100</b>	%				
75% depth of pit		d <sub>75</sub> = (d <sub>trial</sub> >	< 0.75) <b>= 750.0</b>	<b>0</b> mm			
50% depth of pit		$d_{50} = (d_{trial})$	< 0.50) <b>= 500.0</b>	<b>0</b> mm			
25% depth of pit		$d_{25} = (d_{trial})$	< 0.25) <b>= 250.0</b>	<b>0</b> mm			
Test 1 - time to fall from 75% de	epth to 25% depth	T1 = <b>165</b> m	nin				
Test 2 - time to fall from 75% de	epth to 25% depth	T2 = <b>165</b> m	nin				
Test 3 - time to fall from 75% de	epth to 25% depth	T3 = <b>212</b> m	nin				
Longest time to fall from 75% d	epth to 25% depth	t <sub>ig</sub> = max(T	1, T2, T3) = <b>21</b>	2 min			
Storage volume from 75% to 25	% depth	$V_{p75_{25}} = (I_{tr})$	$ial \times b_{trial} \times (d_{75})$	$- d_{25}) \times V_{trial} = 0.2$	20 m³		
Internal surface area to 50% de	pth	$a_{p50} = ((I_{trial})$	$\times$ b <sub>trial</sub> ) + (I <sub>trial</sub> +	$b_{trial}$ ) × 2 × $d_{50}$ ) =	<b>1.80</b> m <sup>2</sup>		
Surface area of soakaway to 50	% storage depth	$A_{s50} = 2 \times ($	$I_{trial} + b_{trial} \times d_{tri}$	al / 2 = <b>1.400</b> m <sup>2</sup>			
Soil infiltration rate		$f = V_{p75_{25}} /$	$(a_{p50} \times t_{lg}) = 8.$	<b>74×10</b> ⁵ m/s			
Wetted area of pit 50% full		$a_{s50} = I \times d$	+ w × d = <b>2030</b>	<b>)8592</b> mm <sup>2</sup>			
Table equations							
Inflow (cl.3.3.1)		I = M100 ×	A				
Outflow (cl.3.3.2)		$O = a_{s50} \times f$	×D				
Storage (cl.3.3.3)		S = I - O					

Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	100 year rainfall, M100 (mm)	Inflow (m³)	Outflow (m³)	Storage required (m³)
5	0.37;	7.5;	1.85;	13.8;	4.89;	0.05;	4.83
10	0.52;	10.5;	1.92;	20.1;	7.10;	0.11;	7.00
15	0.63;	12.7;	1.95;	24.7;	8.76;	0.16;	8.60

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* ENGINEERING	Calcs for Soakaway 2				Start page no./Revision 2	
	Calcs by RJS	Calcs date 11/05/2022	Checked by	Checked date	Approved by	Approved date

Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	100 year rainfall, M100 (mm)	Inflow (m³)	Outflow (m³)	Storage required (m <sup>3</sup> )
30	0.80;	16.1;	2.00;	32.1;	11.37;	0.32;	11.05
60	1.00;	20.0;	2.03;	40.6;	14.37;	0.64;	13.73
120	1.21;	24.1;	2.01;	48.6;	17.20;	1.28;	15.92
240	1.45;	28.9;	1.98;	57.2;	20.26;	2.55;	17.71
360	1.60;	32.1;	1.95;	62.6;	22.17;	3.83;	18.34
600	1.79;	35.9;	1.92;	69.0;	24.42;	6.39;	18.03
1440	2.24;	44.8;	1.85;	83.0;	29.36;	15.33;	14.04
Required sto	brage volume	1	S <sub>req</sub> =	<b>18.34</b> m <sup>3</sup>		1	1

Required storage volume

Soakaway storage volume

## $S_{act}$ = I $\times$ d $\times$ w $\times$ V<sub>free</sub> = **18.34** m<sup>3</sup>

PASS - Soakaway storage volume

Time for emptying soakaway to half volume

 $t_{s50} = S_{req} \times 0.5 / (a_{s50} \times f) = 14hr \ 21min \ 32s$ PASS - Soakaway discharge time less than or equal to 24 hours