keystone**architecture**
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Proposed Play Barn, Shepherds Place Farm, Graizelound			Revision		
	Job No:	**500GRZL**	Page:	**01**	
Section:		Prepared By:	**JCB**	Date:	**21/11/2018**

SUMMARY OF CALCULATIONS		
critical design rainfall duration 't_{crit}' =	30	*min*
required storage volume 'V_{req}' =	9.37	m^3
provided storage volume 'V_{prov}' =	9.98	m^3
utilisation factor =	**0.94**	***.OK***
required time to discharge 50% 't_{50}' =	0.60	*hours*
utilisation factor =	**0.02**	***.OK***

GENERAL DATA	
site location:	**England and Wales**
soakaway type:	**infilled pit or trench**
impermeable area drained to soakaway 'A' *[m^2]* =	**670.14**
60 min rainfall depth of 5 year return period 'R' *[mm]* =	**20**
M5-60 to M5-2d rainfall ratio 'r' =	**0.40**
allowance for climate change:	**1%**

SOAKAWAY DATA	
soakaway width 'W' [m] =	**9.50**
soakaway length 'L' [m] =	**3.50**
total depth from ground level 'D_b' *[m]* =	**1.60**
depth to drain invert level 'D_d' *[m]* =	**0.60**
soakaway effective depth 'D_{eff}' *[m]* =	1.00
free volume in infill aggregate *[%]* =	**30**

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	**100%**
available on-site infiltration test results:	○ Yes ● No
soil infiltration rate 'f' *[m/s]* =	**5.00E-05**

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

rainfall duration *[min]*	rainfall factor Z1	**M5-D** rainfalls *[mm]*	**M10-D** Z2	**M10-D** rainfalls *[mm]*	**M10-D** inflow *[m^3]*	**ignore** Z2	**ignore** rainfalls *[mm]*	**ignore** inflow *[m^3]*	**ignore** Z2	**ignore** rainfalls *[mm]*	**ignore** inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.37	7.47	1.20	9.12	6.11							0.69	5.42
10	0.52	10.47	1.22	12.96	8.69							1.39	7.30
15	0.63	12.67	1.23	15.80	10.59							2.08	8.51
30	0.80	16.07	1.24	20.19	13.53							4.16	**9.37**
60	1.00	20.00	1.24	25.13	16.84							8.33	8.52
120	1.21	24.13	1.24	30.33	20.32							16.65	3.67
240	1.45	28.93	1.22	35.90	24.06							33.30	0.00
360	1.60	32.07	1.21	39.45	26.44							49.95	0.00
600	1.79	35.87	1.20	43.71	29.29							83.25	0.00
1440	2.24	44.80	1.18	53.60	35.92							199.80	0.00

** Z2 is a growth factor from M5 rainfalls*