= 1.4 x 0.3 x 0.4
= 0.168m^3

Exposed area = (Length x Half the effective height x 2) + (Width x Half the effective height x 2) + Base area

= (1.4 x 0.4 x 2) + (0.3 x 0.4 x 2) + (1.4 x 0.3)
= 1.78m2

Time = 257min

Infiltration rate (f) = 0.168/1.78/257 = $3.67E^{-04}$ m/min; f = $6.11E^{-06}$ m/sec

Based on the Infiltration rate and storage calculations, a Soakaway of 1.2x1.2x1.5m dp was completed 5m from the building to disperse 50% of the extension roof water.

An 8m x 0.4m Raingarden is to be provided to disperse the second 50% of roof rain water.

If we can be of any further assistance or you require clarification on the above, please do not hesitate to contact the undersigned.

Yours sincerely,

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Soakaway design

Soakaway location		-	Dublin
Area draining to soakaway	A	=	50 m^2
Invert to soakaway		=	0.4 m
Soakaway type		-	Pit
Effective storage depth	D_e	=	1.1 m
Soil infiltration rate	f	=	0.00055 m/s
Rainfall ratio	r	=	0.25
Permeability of fill	P_{er}	=	30 %
Rainfall return period		=	1 in 100 year
Length increment		=	0.1 m (computed length will be rounded to this value)

Design calculations to BRE Digest 365 (February 2016)

Assuming square pit,

Length of soakaway	L	=	0.9 m
Breadth of soakaway	B	=	0.9 m
Effective outflow area	a_{s50}	=	$0.5*((2*B*D_e)+(2*L*D_e))$
		=	$0.5*((2*0.9*1.1)+(2*0.9*1.1))$
		=	1.98 m^2
Storage volume	V_s	=	$L*B*D_e*P_{er}/100$
		=	$0.9*0.9*1.1*30/100$
		=	0.27 m^3
Time of emptying half storage volume			
	t_{s50}	=	$V_s*0.5/(a_{s50}*f*60*60)$
		=	$0.27*0.5/(1.98*0.00055*60*60)$
		=	0.0 hrs.

D	R	I	O	S	A_{max}
min.	**m**	**m^3**	**m^3**	**m^3**	**m^2**
10	0.018	0.89	0.65	0.24	52
20	0.024	1.22	1.31	-	-
30	0.029	1.46	1.96	-	-
40	0.033	1.65	2.61	-	-
60	0.04	2	3.92	-	-
120	0.052	2.61	7.84	-	-
240	0.067	3.37	15.68	-	-
360	0.077	3.87	23.52	-	-
600	0.092	4.58	39.2	-	-
1440	0.13	6.26	94.09	-	-