

Ref: 22/5859

2nd October 2023

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Re: Drainage Report 13 Wainsfort Avenue, Dublin 6.

ONCE Consultant Engineers monitored a BRE Digest365 infiltration test during construction for the design of a Surface Water Soakaway design.

The property is 13 Wainsfort Avenue, Dublin 6

A trial pit was excavated to 1.5m below ground level by the Building Contractor on 13th October 2022. The pit was inspected by Thomas O Neill C.Eng of ONCE Consultant Engineers on 17th October 2022.

The ground comprised 200mm topsoil
200mm to 800mm the subsoil is a Clay with cobbles. From 800mm to 1500mm the content of cobbles is higher.

No Water was present in the pit.

A trial hole was excavated

Length 1.4m

Width 0.3m

Depth 1.5m

The base of the pit was filled with water to a depth of 800mm and the drop in the water level was followed over time

The time required for the level to fall from 75% full to 25% full (ie 50% drop) – from a water depth of 0.6m to a water depth of 0.2m is estimated to be 257min.

Table 1 – Time taken for water level to fall
Elapsed Time (Mins) Depth of Water (mm)

0	800
8	720
13	660
30	550
110	380
145	320
151	310
204	250
278	200

Infiltration rate (f) = Volume of water used/unit exposed area /unit time
Volume = pit length (m) x Width (m) x Drop in water level (m)

$$= 1.4 \times 0.3 \times 0.6$$
$$= 0.252\text{m}^3$$

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

$$= (1.4 \times 0.4 \times 2) + (0.3 \times 0.4 \times 2) + (1.4 \times 0.3)$$
$$= 1.78\text{m}^2$$

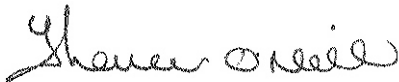
Time = 257min

Infiltration rate (f) = $0.252/1.78/257 = 3.7\text{E-}04$ m/min; f = $5.5\text{E-}04$ m/sec

Based on the Infiltration rate and storage calculations, a Soakaway of 1.2x1.2x1.5m dp was instructed to be completed 5m from the building.

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,



THOMAS O'NEILL
Chartered Engineer
for ONCE Consultant Engineers Limited.



Trial Pit 1.5m deep no water table



Trial Pit 1.5m deep during test

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Proj: 5859
Ref : soakaw

Date: 17/10/22

Soakaway design

Soakaway location - Dublin
 Area draining to soakaway A = 50 m²
 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 m²
 Storage volume V_s = L*B*D_e*P_{er}/100
 = 0.9*0.9*1.1*30/100
 = 0.27 m³
 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	m³	m³	m³	m²
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	-	-