

# Howard J Wroot

## Chartered Surveyor

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Date: 9 March 2017

Your ref  
Our ref

**Proposal:** Discharge of Conditions application to construct houses and garages on Plots 1 to 9 inclusive at  
**Site Location:** 0.64 ha of land at 7 Lakes Industrial Estate, Ealand, Scunthorpe, DN17 4JS  
**Application ref:** PA/2015/0481 **Appeal Ref APP/Y2003/W/16/3145930**  
**Applicant:** Colin Muscroft.

## APPENDIX 5 Design of Soakaways

The following design has been submitted and approved in respect of the adjacent site, a similar if not better percolation test has been carried out on the subject site 40m away.

It is therefore considered appropriate to adopt the below results being on the conservative side in respect of the surface water discharge.

A percolation test was performed at site on during December 2016. A single trial holes was excavated and the test was performed to the BRE365 specification. The trial hole was located within the centre of the site. There was no water encountered during the excavation and no water inflow during the test. The trial hole was dug to depth of 2.5m and no ground water was encountered.

The following test results were observed as shown below in Table 3-1. The infiltration rate of 0.022m/hr has been estimated.



Table 3-1: Percolation Test		
Time (mins)	Depth (mm)	Percolation Time (m/hr)
0	195	0.022m/hr
90	147	
270	49	
360	0	

#### Calculation for Soil Infiltration Rate for Percolation Test

Length of pit = 1180mm

Width of Pit = 610mm

Depth of Pit = 1000mm

Filled Depth of Pit = 195mm

Volume Out flowing between 25% and 75% effective depth:

$$= 1.18\text{m} \times 0.610\text{m} \times (0.147 - 0.049 = 0.098\text{m})$$

$$= 0.071\text{m}^3$$

The mean surface area through which the outflow occurs, taken to be the pit sides to 50% filled depth and including the base of the pit:  $A_{p50}$

$$= (1.18\text{m} \times 0.098\text{m} \times 2) + (0.61\text{m} \times 0.098\text{m} \times 2) + (1.18\text{m} \times 0.61\text{m})$$

$$= 1.071\text{m}^2$$

From the table showing time for the outflow between 25% and 75% effective depth:  
 $T_{p25-75}$

$$= 180\text{mins}$$

$$\text{Soil infiltration rate, } f = 0.071 / 1.071 \times 180 \times 60 = 6.1 \times 10^{-6}\text{m/s (0.022m/hr)}$$

#### Calculation for Roof Soakaways

Based on a percolation rate of 0.022m/hr calculated previously the roof soakaway structures have been sized to accommodate the 1 in 100 year plus climate change (30%) rainfall event. The soakaways are designed to accommodate the full rainfall runoff with no surface water flooding. The volume within the pipe network has not been included and therefore additional storage is available within the plot drainage system during events that exceed the 1 in 100 year plus climate change event. The soakaway design has been undertaken using MicroDrainage Source control software. The WinDes calculations sheets are provided at Appendix D. The location of the soakaways are shown on the plan at Appendix B.

The roofed areas draining to the soakaway vary from 37m<sup>2</sup> up to 70m<sup>2</sup>. Therefore, the soakaway has been conservatively designed on an area of 70m<sup>2</sup>. It was found that a lined soakaway 1.2m deep with a 1.25m diameter ring would be required.

The above soakaway design to drain 70m<sup>2</sup> of roofed area to a 1.25m diameter soakaway has been applied to the application site. Whereby two number soakaways per plot is proposed to cater for a roof plan area of 140m<sup>2</sup> per unit max.

