

Client Mr & Mrs Shelbourne  
 Address 5 Frickley Bridge Lane, Brierley, Barnsley, South Yorks

Capacity calculations for traditional rubble filled soakaways  
 Design criteria Design to the Building Regulations 2002 Approved Document H part H2

Trial pit	Day	Recorded position	Samle pit size in mm	Invert depth	Date	Time	Time in secs	
		rear of dwelling plan 24/012						24hr
T4	1		300 x 300 x 300	400	24/6/2024	9:30 am	64800	
T4	2		300 x 300 x 300	400	25/6/2024	9.30 AM	28800	
T4	3		300 x 300 x 300	400	26/6/2024	9.30 AM	43200	
							45600	Average

Volume equation  $I - O = S$  Where  
 I = Inflow from the impermeable area drained to the soakaway  
 O = The outflow infiltrating into the soil during rainfall  
 S = The required storage in the soakaway to balance a temporalry outflow

Inflow to soakaway  $I = A \times R$   
 A = Impermeable area drained into the soakaway  
 R = Total rainfall from approved document H (building regulations)

Outflow of soakaw  $O = a \times s \times 50 \times f \times D$   
 O = The outflow infiltrating into the soil during rainfall  
 as50 = The internal surface of the soakaway to 50% effective depth excluding base  
 f = Soil infiltration rate  
 D = Storm duration

Total impermeable area to be drained  
 r1 = Roof area in sq metres 89 sq metres  
 c1 = roof constant 1.15 for 30 degree pitch 1.15 c1  
 Effective roof area drained 102.35 sq metres

Total time taken for water dispersal through ground from average recorded times taken in field test (Trial pit T1) where the dispersal rate is calculated based on an dispersion of 75% to 25% of the water within test pit. IE 150mm run off

Dispersion rate 45600 sec average  
 run off in mm 150 mm half depth  
 vp 304 vp

Water dispersion vp required therefore  
 Filtration rate  $f = 0.01/2vp$  0.01 2 l37 608 f  
 0.0000164473684 outflow vol

Outflow Volume  $O = a \times s \times 50 \times f \times D$  2 0.0000164473684 5 0.000164473684 O=outflow vol

Area drained x rainfall of 10mm 102.35 10 1023.5 /1000 storage capacity 1.0235 cubic metres

Therefore storage capacity minus the outflow volume = 1.0235 0.0000164473684 1.023483553 storage volume 1

Soakaway dimensions in metres taken below invert  
 2.5 metres Length  
 1 metres Width  
 1.2 metres Depth  
 Soakaway volume 3 cubic metres

Therefore consider fill material containing 75% voids therefore soakaway volume x 75% 3 75 100 2.25 storage volume 2

Therefore using a reserve factor of 1.5 : 1 storage volume 2 to be increased 2.25 1.5 3.375 cubic metres

Therefore storage volume 2 3.375 is greater than storage volume 1 1.023483553 Therefore designed soakaway is ok cubic metres

Therefore by calculation 1 No soakaway 2.5 metres long by 1 metre wide by 1.2 metre deep is ok for the area drained

Note under the building regulations the maximum area drained should be no more than 25square metres . Per soakaway pit however by calculation the designed enlarged pit dimensions demonstrates the capacity of the soakaway to meet the current building regulations.

Typical 1m3 ploypipe interlocking crate system will drain an approximate area of 50m2. Individual crates 1000 Long 500 Wide x 400 Deep.