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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Enq No | | sheet 1 |
| Client | | Mr & Mrs Shelbourne | | | | | | | | | | | | |
| Address | | 5 Frickley Bridge Lane, Brierley, Barnsley, South Yorks | | | | | | | | | | | | |
| Capacity calculations for traditional 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 | | | |
| | | front of dwelling plan 24/012 | | | | | | | | | | | 24hr | |
| T1 | 1 | | | | 300 x 300 x 300 | | 400 | 21/6/2024 | | 9:30 am | 1800 | | | |
| T1 | 2 | | | | 300 x 300 x 300 | | 400 | 22/6/2024 | | 9.30 AM | 82800 | | | |
| T1 | 3 | | | | 300 x 300 x 300 | | 400 | 23/6/2024 | | 9.30 AM | 86400 | | | |
| | | | | | | | | | | | 57000 | | Average | |
| Volume equation | | I - O = S | Where | I = | Inflow from the impermiable 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 x R | | A = | Impermiable area drained into the soakaway | | | | | | | | | |
| | | | | R = | Total rainfall from approved document H (building regulations) | | | | | | | | | |
| Outflow of soakaway | | O = a x s x 50 x f x 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 impermiable area to be drained | | | | r1 = | Roof area in sq metres | | | | | | | 89 | | sq metres |
| | | | | c1 = | roof constant | @ 1.15 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 | | 57000 | sec | average |
| | | | | | | | | | | run off in mm | | 150 | mm | half depth |
| Water dispersion vp required therefore | | | | | | | | | | | | 380 | vp | |
| Filtration rate | | f = 0.01/2vp | | | 0.01 | 2 | I37 | | | | | 760 | f | |
| | | | | | | | | | | | | 0.00001315789 | | outflow vol |
| Outflow Volume | | O = a x s x 50 x f x D | | | 2 | 0.0000131578947 | 5 | | | | | 0.00013157894 | | 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 | 0.0000131578947 | | | | | | 1.023486842 | | 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 | | | | 1.023486842 | Therefore designed soakaway is ok | | | | | | cubic metres |
| Therfore 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. | | | | | | | | | | | | | | |
| | | | | | | | | | | | | Sheet | | 1 |