| G.R Merchant Ltd | Plot 1 Soakaway 2 (2 No) | | | |
|---|---|---|---|---|
| | | | Revision | |
| | Job No: | | Page: | C/01 |
| Section: Belmont - Sutton St James | Prepared By: | SLB | Date: | 28/01/2026 |

| ALTERNATIVE SOAKAWAY SIZES | | | |
|---|---|---|---|
| | trench soakaways | | |
| width of trench *[mm]*: | 450 | 600 | 900 |
| required trench length *[m]*: | 11.76 | 9.37 | 6.64 |
| | ring soakaways | | |
| diameter of ring *[mm]*: | 1050 | 1350 | 1500 |
| required pit diameter *[m]*: | 2.10 | 2.09 | 2.08 |

** Based on effective depth and number of pits as in Soakaway Data table*

| SUMMARY OF CALCULATIONS | | |
|---|---|---|
| critical design rainfall duration '$t_{crit}$' = | 240 | *min* |
| required storage volume '$V_{req}$' = | 6.96 | $m^3$ |
| provided storage volume '$V_{prov}$' = | 7.16 | $m^3$ |
| utilisation factor = | **0.97** | ***.OK*** |
| required time to discharge 50% '$t_{50}$' = | 6.18 | *hours* |
| utilisation factor = | **0.26** | ***.OK*** |

| GENERAL DATA | |
|---|---|
| site location: | **England and Wales** |
| soakaway type: | **geocellular units** |
| impermeable area drained to soakaway 'A' *[$m^2$]* = | **130** |
| 60 min rainfall depth of 5 year return period 'R' *[mm]* = | **20** |
| M5-60 to M5-2d rainfall ratio 'r' = | **0.50** |
| allowance for climate change: | **30%** |

| SOAKAWAY DATA | |
|---|---|
| soakaway width 'W' [m] = | **1.80** |
| soakaway length 'L' [m] = | **3.60** |
| total depth from ground level '$D_b$' *[m]* = | **1.80** |
| depth to drain invert level '$D_d$' *[m]* = | **0.50** |
| soakaway effective depth '$D_{eff}$' *[m]* = | 1.30 |
| free volume in infill aggregate *[%]* = | **85** |

| SOIL INFILTRATION DATA | |
|---|---|
| allowance for infiltration through soakaway base: | **30%** |
| available on-site infiltration test results: | (●) Yes ( ) No |
| use soakage trial pit table below | |
| internal surface area of trial pit '$a_{p50}$' [$m^2$] = | 1.80 |
| storage volume between 75-25% '$V_p$' [$m^3$] = | 0.22 |
| time for water to fall from 75-25% '$t_p$' [min] = | 111.39 |
| soil infiltration rate 'f' [m/s] = | 1.80E-05 |

| SOAKAGE TRIAL PIT DATA | |
|---|---|
| soakage trial pit width '$W_t$' *[m]* = | **0.60** |
| soakage trial pit length '$L_t$' *[m]* = | **1.20** |
| total depth from ground level '$D_{tb}$' *[m]* = | **1.00** |
| depth to pipe invert level '$D_{tp}$' *[m]* = | **0.40** |
| soakage trial pit effective depth '$D_{teff}$' *[m]* = | 0.60 |
| free volume in infill aggregate *[%]* = | **100** |
| *NOTE: faces of excavation assumed to be vertical* | |

**REQUIRED STORAGE CAPACITY PER RAINFALL DURATION**

| rainfall duration *[min]* | rainfall factor Z1 | M5-D rainfalls *[mm]* | M10-D Z2 | M10-D rainfalls *[mm]* | M10-D inflow *[$m^3$]* | M50-D Z2 | M50-D rainfalls *[mm]* | M50-D inflow *[$m^3$]* | M100-D Z2 | M100-D rainfalls *[mm]* | M100-D inflow *[$m^3$]* | outflow from soakaway *[$m^3$]* | required storage *[$m^3$]* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0.39 | 7.80 | 1.21 | 12.24 | 1.59 | 1.61 | 16.33 | 2.12 | 1.86 | 18.83 | 2.45 | 0.05 | 2.40 |
| 10 | 0.54 | 10.80 | 1.22 | 17.17 | 2.23 | 1.66 | 23.28 | 3.03 | 1.92 | 27.00 | 3.51 | 0.10 | 3.41 |
| 15 | 0.65 | 13.00 | 1.23 | 20.82 | 2.71 | 1.68 | 28.39 | 3.69 | 1.96 | 33.09 | 4.30 | 0.14 | 4.16 |
| 30 | 0.82 | 16.40 | 1.24 | 26.44 | 3.44 | 1.71 | 36.42 | 4.74 | 2.00 | 42.67 | 5.55 | 0.29 | 5.26 |
| 60 | 1.00 | 20.00 | 1.24 | 32.24 | 4.19 | 1.73 | 44.98 | 5.85 | 2.03 | 52.78 | 6.86 | 0.58 | 6.28 |
| 120 | 1.19 | 23.80 | 1.24 | 38.37 | 4.99 | 1.72 | 53.29 | 6.93 | 2.01 | 62.34 | 8.10 | 1.16 | 6.95 |
| **240** | 1.38 | 27.60 | 1.23 | 44.12 | 5.74 | 1.71 | 61.34 | 7.97 | 1.99 | 71.37 | 9.28 | 2.32 | **6.96** |
| 360 | 1.51 | 30.20 | 1.22 | 47.87 | 6.22 | 1.70 | 66.69 | 8.67 | 1.97 | 77.28 | 10.05 | 3.48 | 6.57 |
| 600 | 1.68 | 33.60 | 1.21 | 52.82 | 6.87 | 1.68 | 73.31 | 9.53 | 1.94 | 84.79 | 11.02 | 5.79 | 5.23 |
| 1440 | 2.03 | 40.60 | 1.19 | 62.74 | 8.16 | 1.64 | 86.37 | 11.23 | 1.89 | 99.50 | 12.94 | 13.91 | 0.00 |

** Z2 is growth factor from M5 rainfalls*

**SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS**

| water level measurement N°: | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Soakage Trial 1** | time *[min]* = | 0 | 15 | 30 | 45 | 60 | 90 | 120 | 150 | 180 | 210 | | | | | | | | | |
| | depth to water *[m]* = | 0.00 | 0.40 | 0.57 | 0.71 | 0.79 | 0.85 | 0.89 | 0.93 | 0.97 | 1.00 | | | | | | | | | |
| **Soakage Trial 2** | time *[min]* = | 0 | 15 | 30 | 45 | 60 | 90 | 120 | 150 | 180 | 210 | | | | | | | | | |
| | depth to water *[m]* = | 0.00 | 0.38 | 0.56 | 0.69 | 0.78 | 0.83 | 0.87 | 0.91 | 0.95 | 0.98 | | | | | | | | | |
| **Soakage Trial 3** | time *[min]* = | 0 | 15 | 30 | 45 | 60 | 90 | 120 | 150 | 180 | 210 | | | | | | | | | |
| | depth to water *[m]* = | 0.00 | 0.35 | 0.54 | 0.68 | 0.73 | 0.79 | 0.82 | 0.86 | 0.90 | 0.94 | | | | | | | | | |