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Proposed soakaway design
G & R Leigh, Buxton

Infiltration rate

The excavated hole measured 1.5m deep and 2.5x0.9m on plan.

Outflowing water volume = $1.5 \times 2.5 \times 0.9 = 3.3\text{m}^3$.

Surface area through which out flow occurs = $1.5 \times 6.8 = 10.2\text{m}^2$

The time of out flow (slowest) of the 3 tests = All 3 test proved that the water out flow was immediate through the gravel and cobble strata, however, to be conservative say 30 seconds.

Soil infiltration rate = $3.3/10.2 \times 0.5 \times 60 = 10.8 \times 10^{-3}$

Car park area

Impermeable drained area = 850m^2

Inflow to soakaway $I = A \times R = 850 \times 0.0248 = 21\text{m}^3$ for a 60 min storm (worst case).

Assume a 150mm thk layer of type 3 MOT subbase to store the water with a 30% void for storage:

$O = A \times s \times f \times D = 425 \times 10.8 \times 10^{-3} \times 60 = 275\text{m}^3$, thus no storage volume is required.

Storage volume provide with 150mm type 3 MOT over the area of the car park with 30% void = $0.3 \times 850 \times 0.15 = 38\text{m}^3$, therefore, more than satisfactory storage.

Therefore, provide 150mm thk type 1 MOT with 30%void storage below car park area.

Roof and Yard area

Impermeable drained area = 1840m^2

Inflow to soakaway $I = A \times R = 1840 \times 0.0248 = 45\text{m}^3$ for a 60 min storm (worst case).

Provide say 2no. soakaway trenches 25m long x 1.0m deep x 1.0m wide

With total combined surface area of 100m^2

$O = A \times s \times f \times D = 50 \times 10.8 \times 10^{-3} \times 60 = 32\text{m}^3$, thus storage volume required = $45 - 32 = 13\text{m}^3$

Storage volume provide soakaway trenches with 30% void = $0.3 \times 50 = 15\text{m}^3$, therefore, storage volume satisfactory.

Therefore, provide 2no. soakaway trenches 1.0m wide x 1.0m deep and minimum 25m long.