7. Check the total infiltration flow rate. Ensure that the conducting surface area of the infiltration structure in contact with the soil is sufficient to drain away the stored volume within a 24-hour period. Use the following formula to find the total infiltration flow rate:

$$Q1 = \frac{(Pa_{50})}{(24)}$$

EquationA-4.5: Total infiltration flow rate

Where:

Q_1 = total infiltration flow rate for Soakaway (m^3/hour)

D = Storm Duration per hours

P = soil permeability (m/day) found from site testing based on average of at least three permeability tests performed at same excavated soil level as for the proposed Soakaway structure installation depth.

a_{50}= Internal surface area of Soakaway to 50% effective depth. This excludes the base area which is assumed to clog with fine particles and become ineffective in the long term.

D= Storm duration per hours.

Check time of emptying using the following formula:

$$T_D = \frac{V_{soakaway}}{Q_1}$$

Equation A-4.6: Formula for finding time for water to drain away

Where:

T_D = time to empty the Soakaway volume (hour)

If T_D is greater than 24 hours, reconfigure the Soakaway to reduce the catchment area, increase the size or adjust the internal configuration to increase the soil contact surface, then recalculate T_D.

8. Size of the Soakaway storage volume can usually be reduced by routing the runoff inflow and outflow rates to find the required maximum storage volume. This can be done using a simple spreadsheet procedure, as discussed in Volume II, Section 3.4.1. This procedure cumulates the runoff volume calculated for short periods using the NRCS curve numbers and the design storm distributions (refer to Section 3.4.6 or additional information). Infiltrated outflow rate volumes for each period is subtracted from the cumulated volume. Required storage is that shown for the time period with the highest cumulated volume.

Infiltration rates can be improved in many cases by ripping hardpan, loosening the soil, or installing distributor pipes to infiltration trenches down in more pervious layers.

A4.4.1   Soakaways trenches:

Soakaway trenches are a modification of the Soakaway chamber. Soakaway trenches are placed on flat horizontal profiles consisting of trenches backfilled with permeable coarse aggregate, with a perforated longitudinal pipe, and wrapped in Geotextile filter fabric.

Perforated pipe improves the distribution of runoff flow along the Soakaway trench and helps to collect fine sediments before they enter the backfill and clog the infiltration