

Soakaway design

Digest 365

BRE Construction Division

Soakaways have been the traditional way to dispose of stormwater from buildings and paved areas remote from a public sewer or watercourse. In recent years, soakaways have been used within urban, fully-sewered areas to limit the impact on discharge of new upstream building works and to avoid costs of sewer upgrading outside a development. Soakaways are seen increasingly as a more widely applicable option alongside other means of stormwater control and disposal.

Soakaways must store the immediate stormwater run-off and allow for its efficient infiltration into the adjacent soil. They must discharge their stored water sufficiently quickly to provide the necessary capacity to receive runoff from a subsequent storm. The time taken for discharge depends upon the soakaway shape and size, and the surrounding soil's infiltration characteristics. They can be constructed in many different forms and from a range of materials.

This Digest describes design and construction procedures for soakaways, explains how to calculate rainfall design values and soil infiltration rates, and gives design examples.

Digest 365 is being reissued with minor typographical amendments to coincide with the publication of BRESOAK Soakaway design software (Ref. AP241).



Courtesy of Hughes Concrete Ltd

Precast concrete soakaway rings being installed for drainage of a supermarket car park

BRESOAK Soakaway design software (ref. AP241)

BRESOAK software helps designers to plan soakaways in line with the advice in Digest 365. The software will save time in designing soakaways, and give confidence that the results will be fully in line with Digest 365 and acceptable for building control purposes. Full details are available on www.ihsbrepress.com.

Shape and size

Soakaways for areas less than 100 m² have traditionally been built as square or circular pits, either filled with rubble or lined with dry-jointed brickwork or precast perforated concrete ring units surrounded by suitable granular backfill. BS 8301 suggests that soakaways may take the form of trenches that follow convenient contours: compared with square or circular shapes, they have larger internal surface areas for infiltration of stormwater for a given stored volume. The designer must consider the merits of the more compact square or circular forms against the better rate of discharge from the trench in the particular conditions of soil type, available space, site layout and topography.

For drained areas above 100 m², soakaways can be precast ring or of trench type and not substantially deeper than soakaways that serve small areas: 3 to 4 m is adequate if ground conditions allow. Although limiting the depth does mean the length must be increased, trench

soakaways are cheaper to dig with readily available excavating equipment.

Soil infiltration characteristics

The method of determination must give representative results for the proposed site of the soakaway. This is achieved by:

- Excavating a trial pit of sufficient size to represent a section of the design soakaway.
- Filling the pit several times in quick succession whilst monitoring the rate of seepage, to represent soil moisture conditions typical of the site when the soakaway becomes operative.
- Examining site data to ensure that variations in soil conditions, areas of filled land, preferential underground seepage routes, variations in the level of groundwater, and any geotechnical and geological factors likely to affect the long-term percolation and stability of the area surrounding the soakaway have been assessed. Groundwater should not rise to



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