Parc Cenedlaethol Bannau Brycheiniog
Brecon Beacons National Park

PLANNING ADVICE NOTE 15 (October 2008)

SEPTIC TANKS

A GUIDE TO PERCOLATION TESTS AND SOAKAWAY DRAIN CALCULATION

Introduction

This leaflet provides advice on the criteria which should be used in the design and installation of soakaway drainage for septic tank installations. It is not intended to give full details of the design and installation of such systems; reference for detailed appraisal should be made to BS 6297:198 (Design and Installation of Small Sewage Treatment Works and Cesspools).

What size tank do I need?

Each person in a dwelling will produce approximately 180 litres of effluent a day. A figure of 2000 litres ($2m^2$) should be added to the result of multiplying 180 by the maximum persons who could utilise the facility (the number and size of bedrooms is a good guide). For example, a new house which could accommodate 6 persons should have a tank size of 3080 litres (i.e. 2,000 + (180 x 6). Bear in mind that if a waste disposal unit is proposed then one extra person should be allowed for in the calculation. If using a proprietary tank, please provide details with your Planning Application and ensure you follow the manufacturer's instructions. If a "traditional" septic tank construction is proposed please ensure that the details have been approved by the Planning and Building Regulation authorities before you start work on it.

How do I calculate the length of the soakaway drains?

This is calculated via a percolation test of the area where it is proposed to install the system. A percolation test should be carried out in accordance with BS6297.
The area of discharge or soakaway trenches required is derived from the formula:

Number of persons x Percolation Value x 0.25

How do I obtain the percolation value?

This value is obtained by carrying out a percolation test in the area where the soakaway drainage is proposed. Three percolation test pits should be excavated along the length of the pipe at the start, middle and end of the pipe. Each pit should be 300mm square and be 250mm below the proposed invert level of the soakaway drain. The hole may be bigger at the top but the bottom 250-300mm must be the 300mm square dimension. Once excavated, fill the pit with water to a depth of at least 250mm and allow it to seep away overnight. The next day, refill the test pit with water to a depth of at least 250mm. Then time, in seconds, how long it takes for the water to drain away completely. **This test should be carried out at each pit (with the average figure taken).**

The percolation value is the average time taken for the water to drop 1mm. Therefore, if you divide the total time it takes for the water to drain away by the total depth of the water in the hole, the percolation value will be obtained (e.g. 250mm of water takes 60 minutes to drain away - 3,600 seconds/250 = 14.4).

When testing, avoid abnormal weather conditions (e.g. heavy rain or drought) as this will distort the result.

If you find that the water will not drain away or the percolation value exceeds 140, then the subsoil is not suitable for soakaway drains. If the value is between 100 and 140 soakaway drains are unlikely to function. In this case an alternative method should be considered or a secondary under drainage system considered.

Calculating the Area of Soakaway Trench

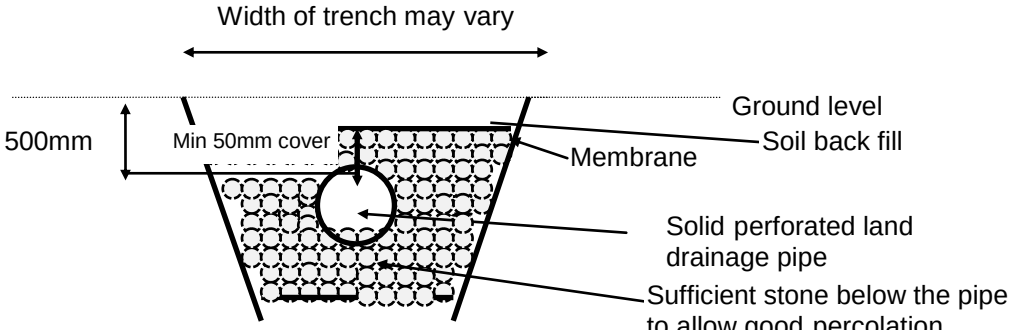
The percolation value can now be inserted into the above formula. For example, with the 6 persons used before and a percolation value of 14.4 the result would be:

Area of Soakaway (m²)	=	No. of persons x percolation value x 0.25
Area (m²)	=	6 x 14.4 x 0.25
Area (m²)	=	21.6

To calculate the length of drainage, divide the area above by the trench width which is to be used. If a 450mm width trench is to be used, the length required will be 21.6/045 = 48m.
If you require clarification on this procedure, please contact the Environment Agency (for address and telephone number see footnote).

Soakaway construction

BS 6279 gives guidance on the design of soakaway trenches. Generally a system of solid perforated land drainage pipes should be laid at least 500mm below ground level at a gradient not exceeding 1:200. Pipes should be bedded and surrounded with stone which is between 20 and 50mm grade. There must be sufficient stone below the pipe to allow good percolation. The stone should cover the pipe by at least 50mm. A layer of plastic membrane should cover the stone before generally backfilling the trench to prevent the migration of silt.



Illustrative Soakaway Trench

Important notes

1. If it is likely that the winter water table will be within 1m of the proposed soakaway drainage system then an alternative method should be considered as the system may not function correctly.
2. The Environment Agency is informed of any proposed septic tank and drainage system when you submit your planning application. If the drainage system is near a stream or watercourse, it may be necessary to obtain a licence to discharge from the Environment Agency.
3. For soakaway drains to function correctly, care must be taken in the test procedure. Ground conditions vary and it is often the case that a system may cause problems if all environmental factors are not taken into account. General advice can be obtained from the Environment Agency (see below). Similarly, the construction of soakaway drainage must be carried out accurately, as the 1:200 falls are shallow.
4. Please ensure that your Building Control Officer is notified when work commences with the septic tank installation/construction. They will also need to inspect the primary drainage system before it is covered.
5. Advice on drainage matters can be sought from the Building Control Officer at your local authority office (not the National Park Authority) dealing with your project.

(Environment Agency, Rivers House, St Mellons Business Park, St Mellons, Cardiff CF3 0EY
Tel: 02920 770088 www.environment-agency.gov.uk/regions/wales)

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