ecodigester
The Sewage Treatment Company Limited

DATA SHEET
Percolation Test

Porosity or Percolation Tests

Prior to constructing a soakaway or sub-irrigation system for effluent dispersal, it is essential to conduct 'Porosity Tests' according to BSD6297:1983.

1. Determine the depth (Inlet Invert) of the soakaway pipe. This will be dependent upon the depth of the drainage system taking into account the falls required and the slope of the ground.

2. For single properties dig 3 holes to the proposed depth of the soakaway. Then construct a 'Test Sump' in each hole 250mm (10") deeper than the drain depth and hence each hole is the depth of the drain +300mm.

3. Place water into each of the 3 test sumps to a depth of 250mm (10") and let is drain away overnight.

4. The following day fill each 'Test Sump' again to a depth of 250mm. Record the time it takes for each sump to empty.

5. Repeat the test a further two times in each of the 3 holes. You will then have 3 emptying times for each of the 3 holes. The size of the soakaway required for treated sewage effluent is calculated as follows:-

   A. Calculate the emptying time for each hole in seconds and divide each of the nine values by 250mm in turn. You now have the soakaway value Vp in seconds for each of the nine tests.

   B. Add the nine Vp values together and divide by nine to obtain the mean Vp value in seconds.

   C. Use the following formula to calculate the base area of soakaway required in m^2 (this formula is for treated sewage effluent only):

   Vp seconds x Population (PE) x 0.2 = M^2 Soakaway base area

   Example: For a single house with 5 people and Vp value of 28 seconds:-

   Vp 28 x Population 5 x 0.2 = 28 m^2 base area

Soakaways or sub irrigation systems are most commonly constructed with a width of 600mm or 900mm. Hence in the example above, if using 600mm width, divide 28m^2 by 600mm (0.6m) and the length of trench required is 46.7m.

Notes & Tips

1. ***Water Table***
   Soakaways or sub-irrigation systems for treated sewage effluent should be constructed above the winter water table wherever possible. However sewage treatment and effluent pumping systems are important tools used to overcome difficulties at sites where the water table is high. Pumping treated effluent into a shallow soakaway in heavy ground works without nuisance in many cases.

2. ***Seasonal or Partial Soakaways***
   'Seasonal' or 'Partial' soakaways are commonly used on sites with poor soil porosity and an adjacent watercourse that may dry up. These consist of a soakaway for treated sewage effluent that overflows to a watercourse. Hence when the ground is dry the effluent soaks away and under wet conditions the soakaway overflows to the watercourse which then contains water to provide dilution.

3. ***Weather Conditions***
   The British Standard advises that Porosity Tests should not be undertaken under extreme weather conditions either wet or dry. Assessment of sites that may be wet in the winter require particular care if tested under dry conditions.

4. ***Maximum Fall***
   Effluent soakaways should have a fall no greater than 1 in 200.

5. ***Direction of Water Movement***
   In ground with poor drainage characteristics, it is important to construct soakaways in the same direction as the fall of the ground rather than against the fall. The natural direction of water movement is normally with the fall.

continued overleaf /...

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DATA SHEET

Percolation Test *continued*

Notes & Tips continued ...

6. Grid Systems

Soakaways are better constructed as grid systems rather than the traditional 'Herringbone'. The reason for this is that a grid allows alternative pathways and continued soakage in the event of a blockage.

7. Maximum Soakage Time / Poor Drainage

The official length of time for a porosity test to be a failure is 6 hours for the 250mm of water to disperse. However, in practice an emptying time such as this suggests that an alternative method of disposal may be required. If poor test results are obtained try a different area of ground. Local variations are very common. If necessary, test higher ground and consider using an effluent pumping system.

8. Size of Stone

Do not use 'Pea Gravel' for soakaway construction, the stones are too small and blockages are likely. Use 25mm clean stone or larger.

9. Type of Pipe

Do not use flexible drainage pipe with small holes for soakaway construction as these may become blocked. Use 110mm rigid plastic pipe with slots or holes.

10. Sloping Ground

If a soakaway is to be constructed on ground with a significant slope, it is essential to use a single run along one contour, or a 'Square Zig Zag' with each run along a contour overflowing to the next at a lower level.

11. Minimum Size

For a single house, if the porosity tests are very quick then the calculation may indicate only a small area of soakaway to be required. For a single house, a minimum size of a soakaway should be 20-30m of trench 600mm in width.

12. Underground Water Interests

Before constructing an effluent soakaway, it is essential to check for any underground water interests in the locality such as wells or boreholes. Some areas are especially sensitive due to major underground abstractions for drinking water. The Environment Agency or other regulatory authority holds details of the most important zones, Local Authorities have some records and a local search is always advisable.

13. More Than One House

When an effluent soakaway is required for more than one property, it may be necessary to undertake more than 3 porosity tests. In some areas a hole 3m deep is required to establish the 'Soil Profile' and check for the depth of the Water Table.

14. Water Interest Survey

In some areas it is necessary to provide a map showing a 'Water Interests Survey' such as wells, boreholes, streams, ponds and existing effluent soakaways. The Environment Agency or other regulatory authority will specify its requirements.

Example Soakaway Construction

Site	*Single House*
Population	*5*
Floor Area	*28m²*
Length	*46.7m*
Width	*600mm*
Invert	*600mm approx.*
Fall	*Max 1 in 200*
Pipe Size/Type	*110mm Rigid Plastic with slots or holes*
Stone Size/Type	*25mm Clean Stone or larger*
Depth of Stone	*400mm*
Volume of Stone	*11.2 m³*
Profile	*Layout*