

# **APPENDIX C**

**Simplified falling head permeameter test for  
determining hydraulic conductivity of sand fill**

### **SIMPLIFIED FALLING-HEAD PERMEAMETER TEST FOR SAND FILL**

The permeameter consists of a clear plexiglass tube with one end covered by a fine mesh screen such as 60x60 mesh size or filter fabric with similar permeability. The cylinder is stood in a low plastic container with a layer of filter fabric or fine screen at bottom to allow free exit of permeating water. The details and general arrangement of the apparatus are shown in Figure C2.

The sand to be tested shall be 100% saturated with water. Care should be taken not to wash out fines from the sand. Approximately 60 mm of the sand to be tested is placed in the cleaned cylinder and compacted by allowing the cylinder to fall 200 mm five times onto a piece of wood or a firm surface. (The piece of wood may be placed in a shallow box to contain splashes). More sand is added to the 105 mm mark and again compacted. The cylinder is then placed in the container and the sand flooded from the bottom up to drive out any air. After allowing the sand to drain excess water, the sample is again compacted by dropping 200 mm five times. At this time the top of the sample should be at the 100 mm mark. If the top is above or below this level by any more than 5 mm, repeat the test procedure with a new sample.

The cylinder is now returned to the container and flooded from the bottom up, then water is carefully poured into the top of the cylinder above the upper reference mark. The water level is now allowed to fall, noting the time in minutes that it takes to pass over the 50 mm gauge length. Measure the temperature of the water at the time of the test. Now refer to the **Figure C3** to determine the sand suitability for a septic system.

The test done on the sample taken from a stockpile or pit does not guarantee that all sand from that source is suitable for septic system. It must be confirmed by tests done on sand supplied to the site.

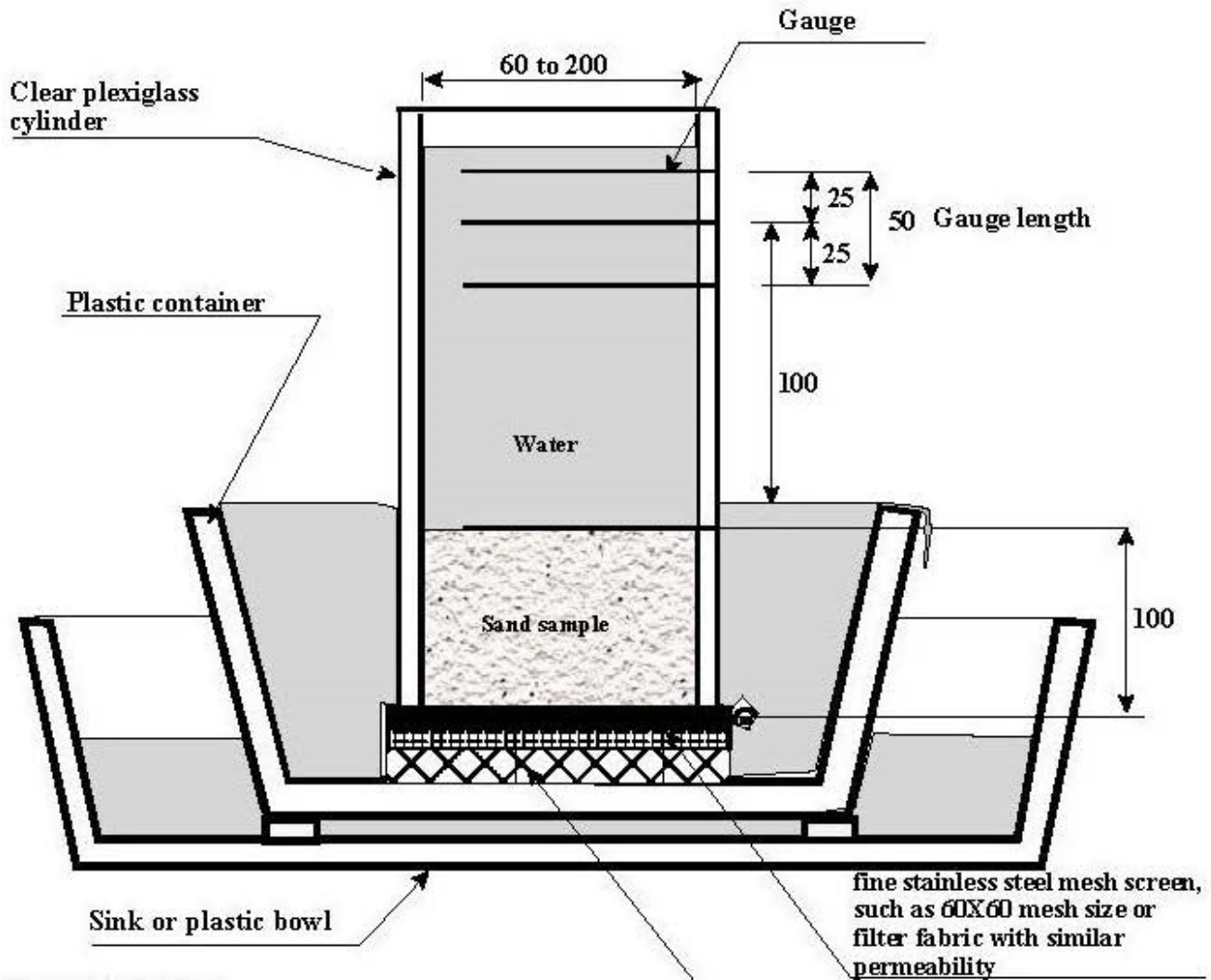
#### **TEST:**

- 1) Saturate the sand with water, avoiding ponding of the water on the top of the sample.
- 2) Add 60 mm (3 1/3") of the sand to cylinder and drop cylinder five times 200 mm onto a wooden block.
- 3) Add more sand to 105 mm (4 3/16") and drop again five times 200 mm.
- 4) Place cylinder into container with water. When the water surfaces over the sand, remove cylinder and allow water to drain. This will ensure saturation.
- 5) Compact sand again by dropping cylinder five times 200 mm. At this time the top of the sample should be at the 100 mm mark. If the top is above or below this level by any more than 5 mm, repeat the test procedure with a new sample.
- 6) Return cylinder to container with water. After the water surfaces, carefully pour water into the top of the cylinder to a level above the upper reference mark.
- 7) Allow the water level to fall noting the time in minutes that it takes to pass over the 50 mm (2") gauge length.
- 8) Refer to Figure C3 to determine the suitability of the sand for a septic system.

Figure C2

### FALLING HEAD PERMEAMETER APPARATUS

All dimensions in millimetres (mm)



#### TESTING PROCEDURE

1. Saturate the sand to be tested with water avoiding ponding of the water on the top of the sample.
2. Add 60 mm of the sand to cylinder and drop cylinder five times 200 mm.
3. Add more sand to 105 mm and drop again five times 200 mm.
4. Place cylinder into container with water. When water surfaces remove cylinder and allow water to drain.
5. Compact sand again by dropping cylinder five times 200 mm. At this time the top of the sample should be at the 100 mm mark. If the top is above or below this level by more than 5 mm, repeat the test procedure with a new sample.
6. Return cylinder to container with water. After the water surfaces, carefully pour water into the top of the cylinder to a level above upper reference mark.
7. Allow the water level to fall noting the time in minutes that it takes to pass over the 50 mm gauge length.
8. Refer to FIGURE C3 to determine sand suitability for septic system.
9. Clean cylinder and backwash filter fabric cover.

Figure C3

FALLING HEAD PERMEAMETER CHART

