OPERATING INSTRUCTIONS

Falling Head Apparatus

25-0605, 25-0607, 25-0609, 25-0611, 25-0613

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1 Introduction

Clays and silts are tested using the 'falling head' technique. A specimen is confined within a cylinder and connected to a glass tube of fixed diameter filled with de-aired water. Flow of water through the specimen is observed by monitoring the rate of fall of water in the tube. It is essential that soils of very low permeability are sealed inside the cylinder to prevent seepage along the sides of the specimen, giving false high values of water flow. Before testing, the specimen must be completely saturated as presence of air will restrict the flow of water and give false low values of permeability.

25-0605 Falling Head Permeability Cell
With sample core cutter 29-5300. The cell comprises a porous base plate, three tie rods and a top plate machined to accept small diameter tubes. Flexible tubing and a glass T-piece are supplied to connect a vacuum to the cell so that the sample can be saturated before testing.

25-0607 Compaction Permeameter (falling head)
This cell is basically a $^{1}/_{30}$ ft³ Proctor Mould clamped between a base and top cap so that a falling head permeability test may be carried out on a compacted sample.

25-0609 Standpipe Panel
Complete with three glass tubes of 1.5, 3 and 4.5 mm diameter bore, approximately 1.4 metres long. Supplied complete with metre scale and thick walled flexible tubing. The glass tubes are fitted to a panel for wall mounting and connected to a 3-way outlet valve.

25-0611 De-airing Tank
Manufactured from transparent plastic with de-airing jet inlet and a flow outlet connection with flexible tubing. The tank is manufactured to withstand a reduced pressure and is suitable for direct wall mounting.

25-0613 Soaking Tank
With fixed overflow. Used for containing permeability cell during test.

2 Calibration of Standpipe Tubes

When the apparatus is first installed, it is necessary to calibrate the standpipe tubes in the following manner.
Completely install the apparatus as shown in figure 1. Make a mark near each end of the tube. Measure the height of each mark from the soaking tank overflow weir. If the height to the upper mark is H_1 cm and to the lower mark is H_2 cm then the third graduation mark is made at a distance from the upper mark of

$\left(H_1 - \sqrt{H_1 \times H_2}\right)$ cm

that is the height of the middle mark will be

$\sqrt{H_1 \times H_2}$ above the weir.

If the calibration mark is made at this height, the time for the water to fall from H_1 to $\sqrt{H_1 - H_2}$ will be the same as the time for the water to fall from $\sqrt{H_1 - H_2}$ to H_2.

Measure the lengths between each mark on the tube, measure the bore diameter and calculate the volumes. Fill the tube with water and collect the water emitted between each mark and check that they agree with the calculated volumes.

Note: when the calibration of the tubes has been made in the way described, then the time taken for the water to fall from the upper mark to the middle mark should be within 2 to 3 percent of the time taken for the water to fall from the middle mark to the lower mark.

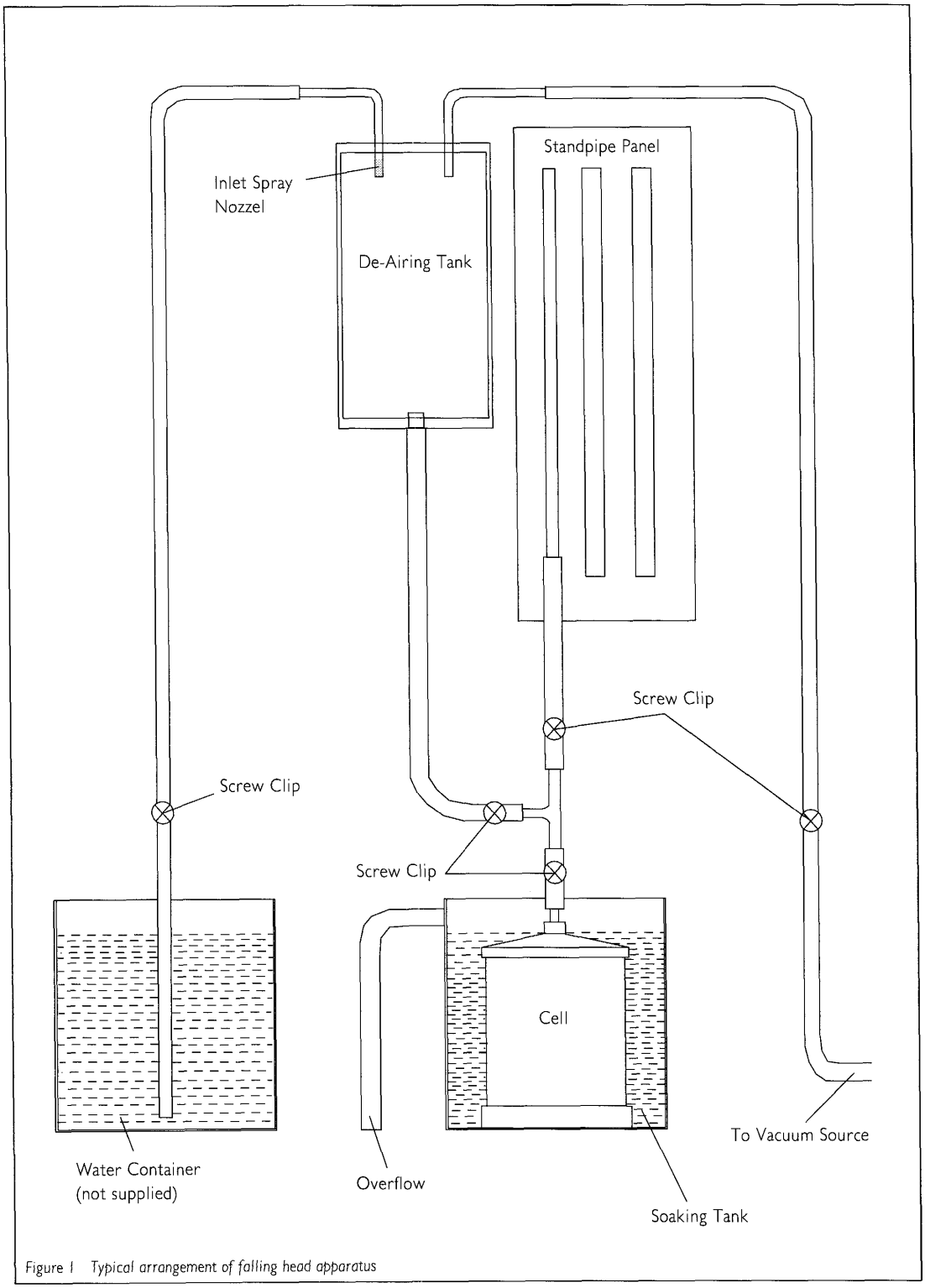

Figure 1 Typical arrangement of falling head apparatus