Australian Standard™

Methods of testing soils for engineering purposes

Method 6.5.1: Soil strength and consolidation tests—Determination of the static cone penetration resistance of a soil—Field test using a mechanical and electrical cone or friction-cone penetrometer

1 SCOPE This method applies to the determination of the static cone penetration resistance of a soil in the field, using a cone penetrometer, and additionally the sleeve skin friction and friction ratio of a soil in the field, using a friction-cone penetrometer (see Note 1).

2 APPARATUS The following apparatus shall be used:

(a) *Penetrometer* A penetrometer, similar in general features to the type illustrated in Figures 1 or 2. The penetrometer point shall be a cone of 60 ±2 degrees point angle, and a base diameter of 35.7, +0, −0.4 mm, resulting in a projected area of 1000 mm^2.

The cone shall be made from steel of a type and hardness to resist wear due to abrasion by soil, and shall have a surface finish equivalent to a ground-machined surface. Periodically check the dimensions of the cone and replace it when the dimensions no longer meet the specifications above.

As the method permits a variety of penetrometers to be used, the main features of each type are as follows:

(i) *Simplified cone penetrometer—mechanical* Figure 1 shows the design of a typical simplified static cone penetrometer. The push rod is connected directly to the cone with the diameter of the push rod being about 8 mm less than that of the cone.

(ii) *Cone penetrometer—mechanical* Figure 2 shows the design and action of a typical static cone penetrometer. A mantle of reduced diameter is attached above the cone, to minimize soil contamination of the sliding mechanism. This mechanism shall permit a downward movement of the cone, in relation to the outer sleeve, of a least 40 mm.

(iii) *Friction-cone penetrometer—mechanical* Figure 3 shows the design and action of a typical mechanical friction-cone penetrometer.

The lower part of the tip, including a mantle attached to the cone point, advances first until the friction sleeve and then both advance. This mechanism shall permit a downward movement of the cone in relation to the outer sleeve of at least 40 mm in each phase.