

SURFACE PENETROMETERS

The penetration resistance of a soil is a measure for the determination of the bearing capacity and the root development possibilities.

The penetrometers described here are used to measure the penetration resistance of the top layer. Specifically in the green area planning (maintenance of sports fields, parks, etc.) there is an increasing need to combine quantitative measurements in the soil profile with all kinds of aspects of the use of the soil (for instance the resistance of the turf against treading in respect to whether or not the field is playable).

In case of these penetrometers for top layers a cone or a measuring rod is pushed into the soil at a constant speed and the highest penetration resistance experienced here is indicated.

06.06 Hand penetrometer for top layers, standard set

The hand penetrometer for top layers is a device that is used to determine the penetration resistance of top layers (measurement over a distance of

about 10 cm). Measuring range 6 MPa. Because of the limited overall length of the device, the hand penetrometer can also be used for horizontal measurement, for instance in the walls of profile pits.

The principle of the hand penetrometer is based on measuring the highest penetration resistance of a cone over a distance of about 10 cm.

The penetration resistance is measured by means of a compression spring.

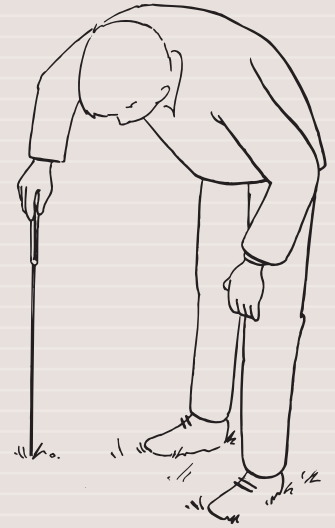
A number of cones and compression springs are available. A certain combination of a cone and a compression spring is selected based on the expected penetration resistance. If the expected penetration resistance is high, a cone with a small surface is selected and a compression spring with a large maximum force and visa versa.

Compression springs, extension- and sounding rods and cones can be exchanged easily and quickly. The spring within the penetrometer is compressed when the cone encounters a resistance as it is driven into the ground.

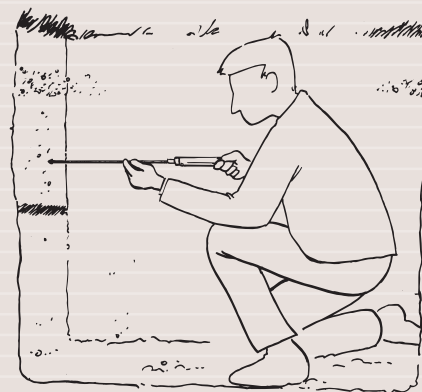


P1.53
Parts List
Pg 328-329

The hand penetrometer for top layers is used to measure the penetration resistance.



The (horizontal) measurement of the penetration resistance in the wall of a profile pit.



Hand penetrometer for top layers, complete set

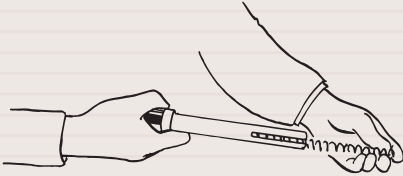


P1.53
Parts List
Pg 328



SURFACE PENETROMETERS

A heavier compression spring is placed.



At this point the spring takes a slip ring along. This slip ring indicates on the scale the maximum compression measured up to that time.

Compared to the pocket penetrometer (art. no. 06.03) the measurements executed using the hand penetrometer are a lot more accurate.

An other aspect distinguishing the hand penetrometer from the pocket penetrometer is that it has a wider measuring range.

The set packed in a plastic case consists of: the measuring device, extension rods, sounding rods, various cones, compression springs and tools.

Applications

The hand penetrometer for top layers is, as its name already indicates, specifically used for:

- ❑ To determine the density in top layers, i.e. whether a sports field is playable (resistance of the turf against treading).

- ❑ It can also be used for horizontal measurements, e.g. in profile pits, thanks to its limited length.

06.03 Pocket penetrometer

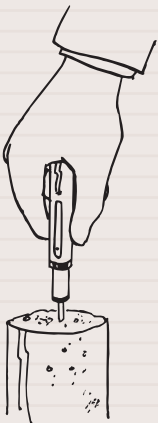
The pocket penetrometer is specifically used to determine the penetration resistance of top layers (measuring depth 5 mm) and of samples in the field or in the laboratory. Measuring range 0.5 MPa.

The pocket penetrometer is composed of a housing, a spring, a flat-tipped measuring pin, a slip ring and a scale.

When pushing the instrument into the ground, the pin encounters a force of the ground. The spring is compressed by this force. A slip ring is taken along during this operation, which shows on the scale the maximum force that has been encountered.

The scale has been calibrated in such a way that the penetration resistance that has been encountered can be read on it immediately.

The pocket penetrometer is used to determine the penetration resistance of an undisturbed sample.



Hand penetrometer for top layers



Pocket penetrometer