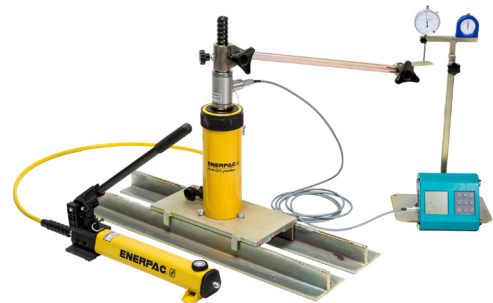


## Phicometer

The Phicometer is a device for in situ measurement of mechanical characteristics  $\phi$  and C of the ground by linear shearing test. Its advantages are, first, the possibility of performing test on ground which cannot be sampled or which is difficult to sample. The low cost of this test method and the rapid execution. It conforms to French standard NF P 94-120 and EN ISO 22476-16

### Test description



The test consist in placing metal shells provided with horizontal annular teeth in a 63mm diameter borehole, then applying radial pressure  $\sigma$  to these shells, so that the teeth penetrate the surrounding soil.

The stress  $\sigma$ , therefore, works on the circumscribes surface S, such that S :

- $S = \pi d.L$ , where : - d = outside diameter of the teeth
- L = the shell length

Pull-up is then applied at a controlled rate from the ground surface. The mobilizable limit force T under stress  $\sigma$  produces the corresponding shearing stress  $\tau = T/S$ .

Thus, a certain number of data are measured in order to determine the internal friction angle and the cohesion of the soil which are designated by the symbol  $\phi$  and c.

### Implementation

The test is performed in a previously drilled borehole with diameter between 62 to 65mm. The borehole has to be drilled with minimum disturbance of the soil using the same methods as those recommended for Pressuremeter tests.

The probe is inserted into the borehole to the test depth using rods which serve to apply the pulling force.



# Phicometer

A borehole shear tester to assess  $\phi$  and  $c$  In

The equipment includes three main parts :

1

The Phicometer probe is equipped with 230 mm long metal shells with an initial outside diameter of 58 mm. The shearing surface is variable during the test but remains at around 500 cm<sup>2</sup>. The retain system consists of steel blades as slotted tube. Within the shells, stays the monocellular inflatable probe.

2

The interconnection equipment includes :

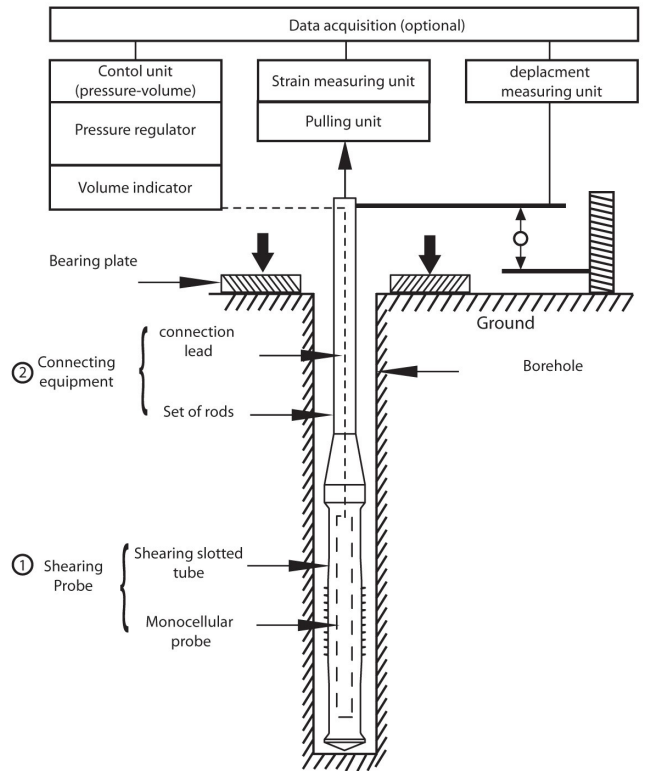
- 32 mm diameter drilling rods (provided separately)
- A tubing, connecting the inflatable probe to the surface equipment.

3

The surface equipment includes :

- A bearing plate
- A hollow jack applying the pulling force
- A dynamometric gauge for measuring the pulling force T
- A locking system
- Wagon drill rods set with various lengths
- A displacement measuring unit including a dial gauge and a timer
- A Control Unit (Pressuremeter), provided separately, measuring the volume of the probe and the pressure applied

③ Surface equipment



Dynamometric gauge



Phicometer in position