Static plate load test of soils

ASTM D1196/D1196M - 12(2016) Standard Test Method for Nonrepetitive Static Plate Load Tests of Soils and Flexible Pavement Components, for Use in Evaluation and Design of Airport and Highway Pavements
(The Static Plate Load Tester supports the following standards: ASTM D1194, ASTM D1195, ASTM D1196; DIN1834; BS1377)
ADAM, Christoph et al., 2009. Computational validation of static and dynamic plate load testing. Acta Geotechnica. 4(1), 35-55. DOI: 10.1007/s11440-008-0081-0. ISSN 1861-1125.

A circular load plate made of steel with a radius *r* is placed on the planar subsoil to be tested. If required, a thin layer of sand can be used to smoothen the surface of the subgrade in order to ensure proper force transmission across the entire plate. The plate is loaded vertically in well-defined load steps, and the vertical displacements are recorded simultaneously. Subsequently, the load is stepwise reduced until the applied force is nearly zero. This procedure is repeated consecutively. The displacement of the load plate, which corresponds to the settlement of the subsoil, is recorded by means of a dial gauge relative to a frame, which is positioned in a prescribed distance to the plate.

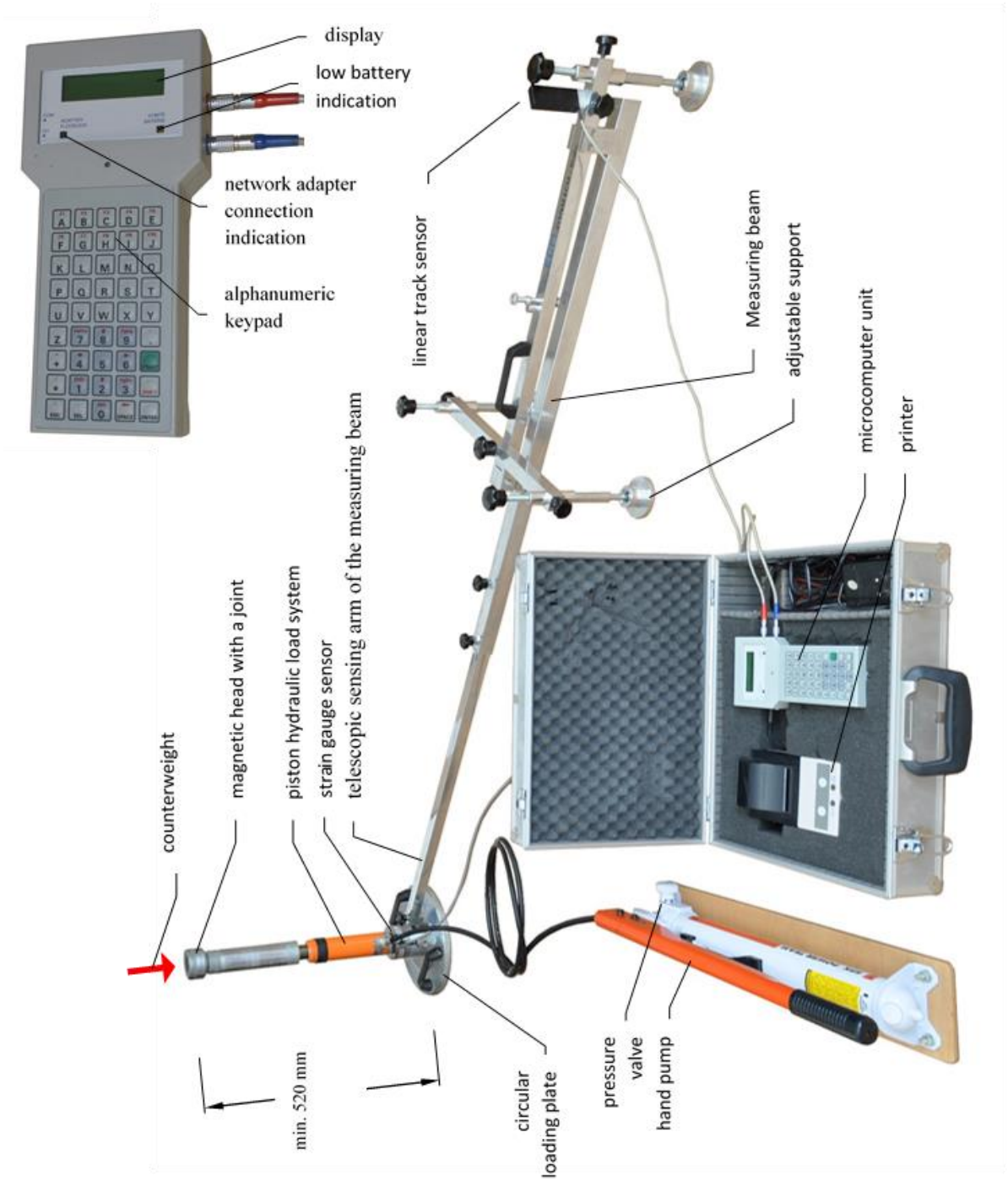
The static load plate test is evaluated by assuming that the assessed subsoil can be characterized by a linear elastic, homogeneous, isotropic half space. From the settlement s of the rigid circular plate, which is loaded by a concentrated force P the Young's modulus E can be determined according to the theory of elasticity $E = \frac{1-\nu^2}{2}\frac{P}{rs}$, where v is Poisson's ratio of the subsoil, and r denotes the radius of the plate

Used equipment:

ECM-Static (ECM Electronic Control & Measurement) - a device for semi-automatic measurement of deformation parameters and control of the static load capacity of compacted soil. Selection of technical parameters:

- Minimum height of the supper surface: 520 mm,
- Maximum allowed force: 50 kN,
- Maximum load pressure: 0,530 MPa,
- Maximum settlement: 24 mm,
- Pressure measurement error: +/- (1 % + 1kPa),
- Settlement measurement error: +/- 0,005 mm,
- Operating temperature: (0 - +45) °C.

The soil is loaded with a circular plate in at least 5 steps. The increase in load from one stage to the other is to be gradual and at each stage the load is maintained without any fluctuations until the compression is stabilized. The load is then increased to the next stage. The load plate then releases smoothly to zero.


display
low battery indication
network adapter connection indication
alphanumeric keypad
linear track sensor
Measuring beam
adjustable support
microcomputer unit
printer
telescopic sensing arm of the measuring beam
strain gauge sensor
piston hydraulic load system
magnetic head with a joint
counterweight
min. 520 mm
circular loading plate
pressure valve
hand pump

Record – Static plate load test

Site name:

Location (x, y, z; GPS):

Test date:

Static plate load diameter:

Sketch (scale / without scale) with a direct geotechnical survey:							

point n.	phase of the test	contact stress [MPa]	plate settlement [mm]
ground water level:			