HIGH PRESSURE DILATOMETER

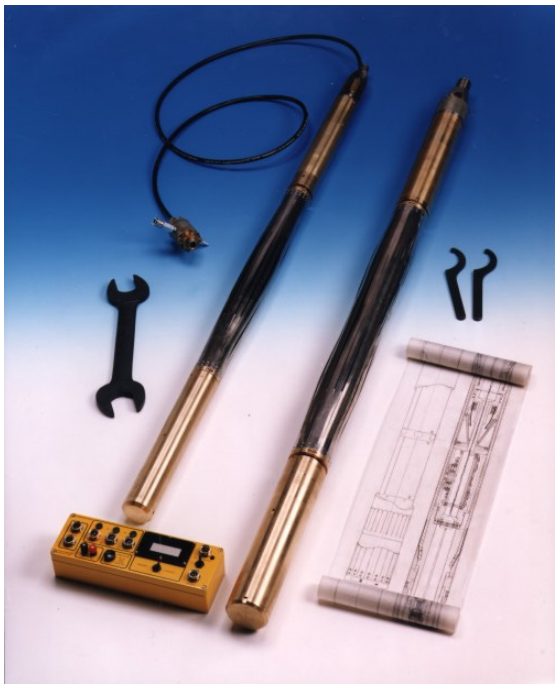
The high pressure dilatometer (HPD) is designed to perform in situ load-displacement tests to determine strength and stiffness properties of the ground. Primarily designed for testing in rock, the HPD can also be used for testing stiff clay and cemented sand. The HPD is inserted into a test pocket formed by conventional drilling methods and is referred to as a prebored pressuremeter.

HPD-95

SOCOTEC UK operate the 95 mm diameter pressuremeter (HPD-95). It comprises a cylindrical probe covered by a flexible membrane that is expanded against the ground by oil or gas pressure. Measurements are made internally by radial displacement strain arms and pressure cells, with digital data transmitted to the surface via an umbilical cable.

DRILLING & DEPLOYMENT

The HPD is operated in conjunction with a rotary drilling rig which is used to drill the test pocket, lower the probe into the borehole on drill rods and advance the borehole between test locations. The sequence of testing involves drilling at full borehole diameter to above the scheduled test depth, then drilling a 1.5 to 3.0 m long test pocket. Test pockets are preferably cored at HWAF size, so that the test material can be examined and to maximise the uniformity of the pocket diameter and wall quality. In some cases, the pocket can be formed by open-hole drilling. Longer test pockets can be drilled in suitable ground to enable 2 or more successive tests to be carried out.



TESTING & ANALYSIS

Testing is carried out under manual stress control using either biodegradable oil or compressed gas to pressurise the HPD at an appropriate loading and unloading rate to suit the ground conditions. It takes approximately 1 hour to carry out a full cycle of loading and unloading, with two or more reload cycles. Interpretation of the test data can be carried out to obtain material strength and soil stiffness (shear modulus, G).

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