

Wison Mk III

The WISON Mk III Cone Penetration Test (CPT) System enables in situ soil properties to be measured from the base of a borehole either offshore or on land.

EQUIPMENT

With the present wireline system, tests can be performed at any depth down to 650 m below drillfloor level if the depth limitations of the drilling system permit. The tests can be performed consecutively or intermittently throughout the borehole providing a continuous or semi-continuous profile of measured parameters.

The WISON consists of a downhole jacking unit with a 3 metre stroke and a thrust capacity of 90 kN.

The ability to perform tests to these depths is particularly useful in applications such as the design of offshore piles since the in situ properties of the soils can be determined down to and beyond the proposed pile tip level.

TESTING PROCEDURES

The WISON is normally used in conjunction with a straight flush rotary drilling system and open bit. After the borehole has been advanced to the required test level it is cleaned by mud flushing and if there is a centre plug in the bit it is retrieved. The WISON is lowered by its electro-hydraulic umbilical to the bit, where it seats and latches under its own weight.

The test sequence is then activated from the surface control cabin and the cone penetrometer is hydraulically pushed into the soil at a constant rate of 20 mm/s. Throughout the test the measurements of cone tip resistance, sleeve friction and pore pressure, if measured, are displayed graphically in the control cabin. These data can be simultaneously recorded by computer on disk. This facilitates more detailed data processing, interpretation and presentation both offshore and onshore.

Upon reaching the maximum achievable stroke of 3 m, or the limiting thrust capacity of 90 kN, the test is terminated and the system depressurised. The drillstring is lifted to retract the test rod and the WISON unit is retrieved; the complete operation having taken 10-15 minutes.

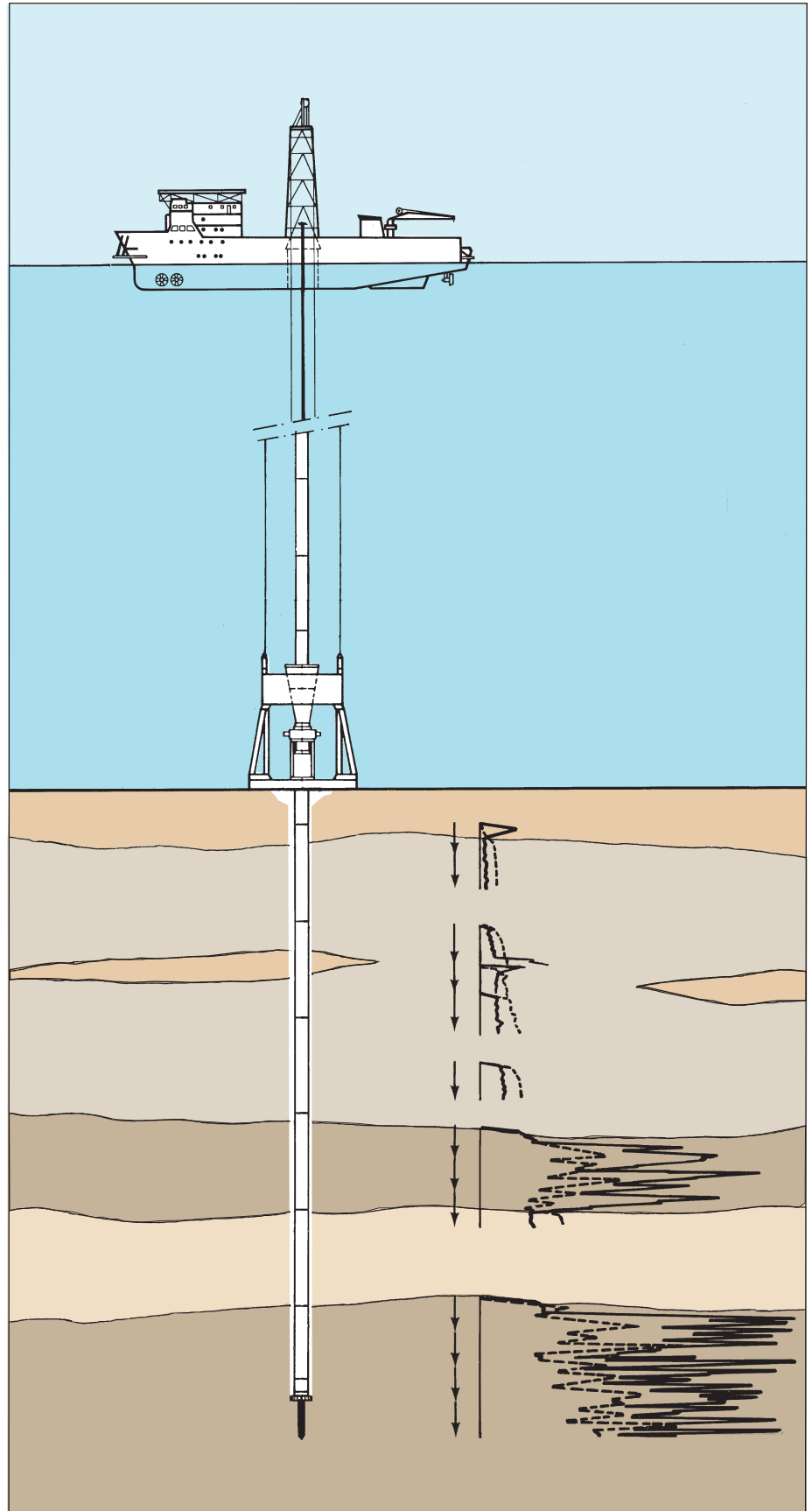


Fig. 1 - WISON Mk III in operation

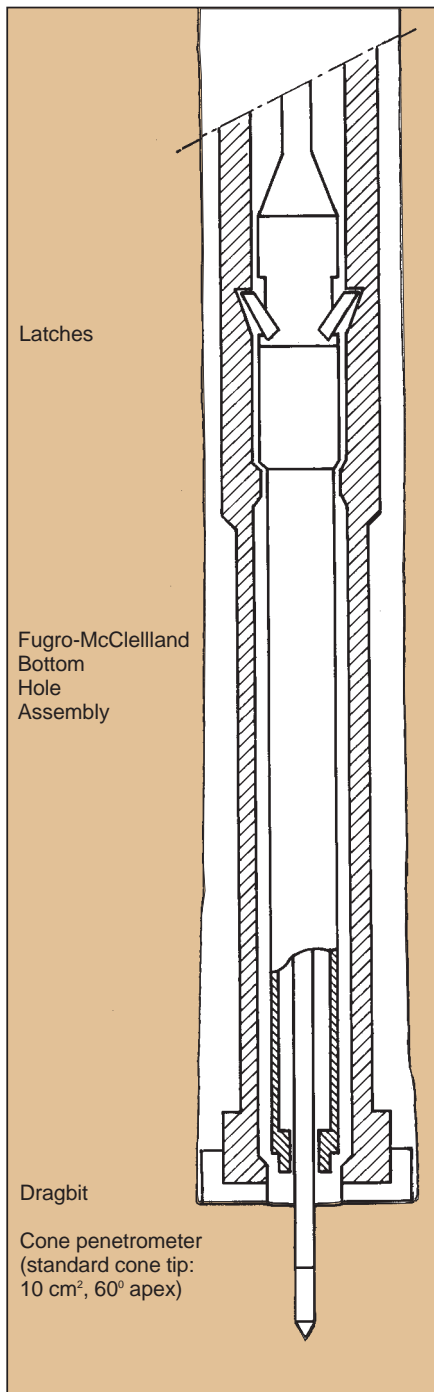


Fig. 2 - WISON Mk III

REACTION FORCE

During the test sufficient reaction force is required to balance the penetration thrust. If this is not available from the drillstring alone the system may be used in conjunction with the Fugro SEACLAM seabed reaction frame and/or the Drillstring Anchor inflatable packer system. (See relevant data sheets for more information).

TEST INTERPRETATION

With the aid of empirical correlations the cone measurements can be used to estimate soil type, relative density and angle of internal friction of granular soils and undrained shear strength of cohesive soils as well as other factors such as stress history.



Fig. 3 - Final check of WISON in the mousehole pipe before lowering it down the drillstring

EXPERIENCE

Since its debut in 1973 some 37,000 tests have been performed throughout the world with the WISON system. Of these, around 35,000 have been performed with the Mk III System, which was introduced in 1978. Analogue data transmission is used in the Mk III System, while the Mk IIIA System, introduced in 1985, uses digital data transmission. Project locations have included the North Sea, the Arctic, the Mediterranean, North and South America, the Middle East, Africa, India, Australia, Japan, China and the Far East.

CONE PENETROMETER SELECTION

To cope with the wide variety of soil and soft rock types that can be encountered, a range of cones of varying size, capacity and function have been developed. A list of the different cone types currently available is given below.

EQUIPMENT SPECIFICATION

| | |
|--|--------------------------------|
| Design depth below drillfloor | : 1500 m |
| Maximum depth below drillfloor (based on available umbilical cable length) | : 650 m |
| Maximum thrust | : 90 Kn |
| Cone tips/sensors | •friction cone |
| | •temperature cone |
| | •piezocone |
| | •seismic piezocone |
| | •electrical conductivity cone |
| | •heat flow probe |
| Cone base area | : 500 and 1000 mm ² |

For more details of our cone penetrometer tips please refer to our cone selection brochure.

The specification of the equipment in this data sheet may be subject to modifications without prior notice.

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