

Benthic Geotech has developed an improved penetrometer that enables high resolution strength profiling in very soft to firm fine grained soils

Benthic Geotech Pty Ltd, an Australian marine geotechnical services company, is the developer and operator of the world's most advanced undersea robotic drilling rig, PROD*. The rig is capable of performing rotary diamond drilling, piston and push coring and a range of in situ tests to sub sea bed depths of greater than 100m in water depths of up to 2,000m. PROD, the Portable Remotely Operated Drill, and its associated equipment is transported in 20' shipping containers and can be deployed from a variety of vessels.

The Spherical Ball Penetrometer, 'BPT', is a specialist in situ tool that can be deployed as an alternative to Benthic Geotech's standard piezocone system. The BPT comprises a large, smooth spherical ball that is attached to a smaller diameter, high tensile steel shaft. The steel shaft is screwed into the tip load cell of Benthic Geotech's standard piezocone system, and is used to measure the penetration resistance of the ball as it is pushed into, or pulled out of the soil. Pore water pressure at the mid-point of the ball is continuously monitored.

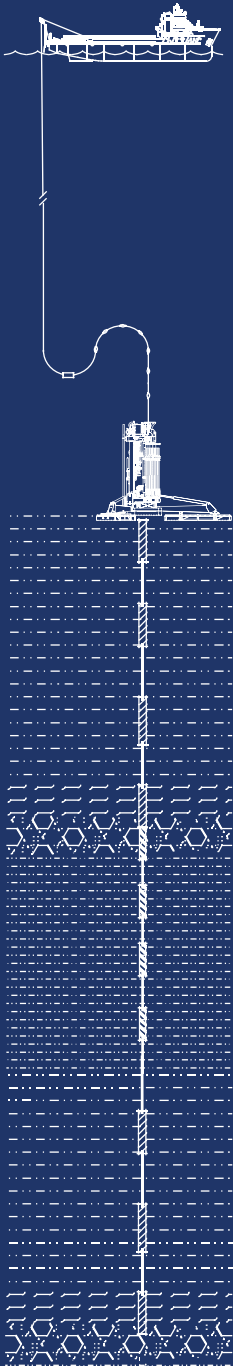
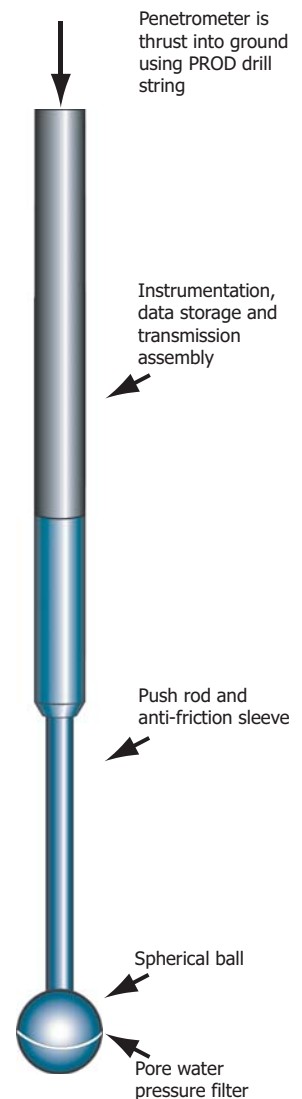
Continuous strength profiling and cyclic testing

The BPT provides an accurate definition of the shear strength profile of very soft to firm, fine-grained soils. The BPT can measure a range of shear strengths comparable to an in-situ vane and, unlike the vane tool, can undertake continuous strength profiling.

The large bearing area of the BPT enhances the resolution of the measuring system. The closed-form solution for undrained shear strength greatly reduces uncertainty in selection of appropriate coefficients for the calculation of true in-situ shear strength.

The tool's capability to measure excess pore water pressure enables dissipation measurements to be taken at any point during the course of testing. The ability to investigate the in-situ response of the soil to cyclic loading greatly enhances understanding of the soil's ability to withstand cyclic degradation and liquefaction.

The BPT is a key addition to Benthic Geotech's suite of integrated down-hole geotechnical tools aimed at meeting the needs of clients at the frontiers of offshore geotechnics.



Contact

Peter Williamson
Chief Executive Officer
Benthic Geotech Pty Ltd
Phone: +612 9833 4004
Fax: +612 9623 6199
Web: www.bgt.com.au

Head Office

Benthic Geotech Pty Ltd
Unit 2, 14 Vallance Street
St. Marys NSW 2760
Australia

Penetrometer Assembly

Ball Bearing Pressure, q_{bc}
Bearing pressure resolution, Δq_b
Ball Pullout Pressure, q_{bt}
Water Pressure, U_b
Penetration rate
Real time data transmission
Internal backup memory
Battery life
No. of probes per deployment
Depth control relative to PROD
Depth control relative to mudline

Standard 60 mm diameter, hardened, smooth steel sphere attached to a 200 mm long x 20 mm diameter, high tensile push rod
Maximum 7 MPa (assuming a ball dia. 60mm)
<6.2 kPa (real time data), <0.2 kPa (memory data)
Maximum 5 MPa (monitored)
Total 25 MPa (Hydrostatic + Excess)
Nominal 20 mm/sec
Acoustic transmission (up to 100m drill string length)
Minimum 24 hours, 1 reading/sec, non volatile
>24 hours per probe (expended whilst down the hole)
Up to 3
PROD carriage position system, resolution 1 mm
PROD baseplate monitored relative to mudline, resolution 25mm

* This system and other PROD related drilling, sampling, and subsea technologies and methods are protected by international patents, patents pending, and patent applications.