

Sept 2004 - Excellent results for jack-up site investigation using Benthic Geotech's Ball Penetrometer

In late 2004, Benthic Geotech completed a safe and successful drilling, sampling and insitu testing program at the Trefoil location, Bass Strait, for Origin Energy.

The site investigation was conducted to understand the likely soil behaviour under spudding and pre-loading for the Ensco 102 jack-up drilling rig. Of particular interest in the investigation was the behaviour of the soil to cyclic loading.



Trial Launch of PROD on MV Mermaid Raider

Project Details

Date:	Aug. 2004 –Sept. 2004	Geology:	Interbedded calcareous sands, silts and clays.
Location:	Bass Strait, Australia	Description:	Sampled borehole to 27m penetration Four CPT probes, one to 28m and three to 13m, at each jack-up spud-can site. One BPT probe to 27m with cyclic tests at five discrete levels
Vessel:	47m MV Mermaid Raider 4 point anchor vessel		

Significant achievements at Trefoil using PROD and the BPT

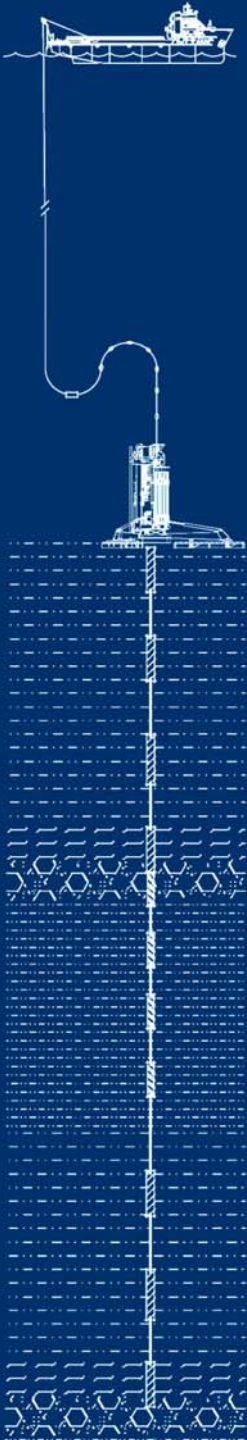
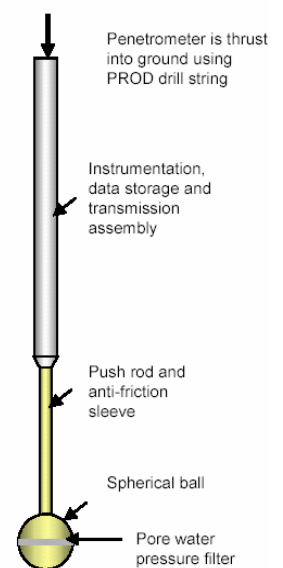
- Excellent productivity – The client scheduled one CPT borehole and one sample borehole to approx. 30m. With this work completed within one day the client extended the scope to include 4 additional boreholes. There was no equipment downtime or lost time on this project.
- Determination of the change in shear strength under cyclic loading - Benthic Geotech's Ball Penetrometer (BPT) was used to explore the insitu sensitivity of the fine-grained soil layers to cyclic loading. With PROD providing a stable seafloor platform, operators could apply precise two-way depth and velocity control to the penetrometer.

The cyclic test data indicated a high sensitivity of the soft soil layers at the site to cyclic loading. Degradation in ball penetration resistance (which may be correlated with cyclic shear strength) was observed in the fine-grained soil layers at the site.

The results were crucial to Ensco developing a safe and effective procedure for the spudding and pre-loading of the jack-up spud-cans into the soil.

Origin's on board representative commented: "PROD, with its Ball Penetrometer, is the ideal tool for characterisation of the soil for this type of shallow foundation structure at this site."

Further information on the use of the Ball Penetrometer is available in a technical paper authored by Dr P Kelleher (Benthic Geotech) and Prof. M Randolph (The University of Western Australia) "Seabed geotechnical characterisation with a ball penetrometer deployed from the Portable Remote Operated Drill" published in *Frontiers in Offshore Geotechnics*, Taylor & Francis Group, 2005.



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