



MARINE GEOTECHNICS

Robertson Geo Services (RGS) provide downhole logging for marine geotechnical ground investigations across diverse applications, including offshore wind farms, bridges, tunnels, port developments, land reclamation studies and sea defences. RGS undertake projects globally providing a turnkey service or can rent equipment with full professional training available. Customers purchasing Robertson Geo marine resistant equipment can benefit from a full commissioning and training package anywhere worldwide.



Geophysical logging probes make a significant contribution to an overall ground investigation, providing calibrated data for accurate measurement of soil and rock properties. The PS Logger® has become an industry reference probe for marine geotechnics, allowing velocity profiles, Poisson's ratio and small strain moduli to be derived. All Robertson Geo marine equipment has been rigorously designed using corrosion resistant materials to withstand the harshest of marine environments.



MARINE GEOTECHNICS



OFFSHORE WIND FARMS

OWF (Ships and Jack-Up Platforms)

RGS has extensive international experience as a specialist provider of logging services and rental equipment to the OWF industry. By using only marine capable equipment and highly trained engineers, a near perfect reliability record has been achieved. From complex heave compensated drill ship setups to jack-up platform environments, Robertson Geo have the all the necessary equipment and trained personnel to ensure successful project delivery.

The Robertson Geo PS Logger® probe has become essential for OWF geotechnical investigations. From 2007 to the present day, RGS have undertaken projects across more than 50 wind farms globally. RGS also provides rental systems for OWF, with on-site training. Equipment and technologies purchased from Robertson Geo have seen action on numerous global OWFs.



BRIDGES & STRUCTURES

Bridges, Platforms, Port Developments, Pipelines, Sea Defences, Harbours, Land Reclamation

RGS and equipment purchase clients have used Robertson Geo technology on some of the world's most prominent projects, including the Bay Bridge, Hong Kong - Macau Bridge and, more recently, the Greater Male Connectivity Project. The PS Logger® has become the tool of choice for the ground investigation phase of projects and is essential for earthquake-prone areas. For piling installation the Sonar Caliper® is available for delineating pile sockets, steel caisson inspection and determining volumes for poured concrete.



TUNNELS

Under Sea Tunnelling, Cross Harbour Studies

Geophysical logging is used extensively in the planning of cross-harbour and sea tunnels. The technique provides valuable information about the subsurface geology and geotechnical properties of the tunnel route, which is essential for designing and constructing the tunnel. These projects include offshore and land investigations.

The Robertson Geo PS Logger®, High Resolution Acoustic Televiwer (HRAT)®, High Resolution Optical Televiwer (Hi-OPTV)®, Formation Density and Triple Sonic® are just some of the probes commonly used on such projects.

Logging Service Overview

Professional and committed service

Robertson Geo and senior personnel are affiliated with major professional organisations, including AGS, BDA, BGA, SUT, EAGE and the Geological Society. With a commitment to continuous R & D programmes, often in partnership with leading universities, recent pioneering developments include a Sonar Caliper®, GeoCAD® processing software, plus Hi-OPTV® and HRAT® televiewers which have established new industry standards for high-resolution fracture studies. Robertson Geo are ISO9001 accredited, adhering to quality processes for all design, manufacturing and service activities.

Marine Geotechnics Services

RGS engineers are highly trained and fully certified for all offshore logging work, conducting cost effective borehole logging operations in any offshore environment. Only probes calibrated and conformance certified at our borehole testing and calibration centre at Tre Morfa are deployed by RGS. Marine geotechnics has been an RGS specialty for over 15 years, providing subsurface data for offshore wind farm geotechnical investigations. A comprehensive risk assessment system and a rigorous adherence to safety matters serves to inspire confidence in RGS from clients.

Why choose Robertson Geo Services?

- *Safety focused operations performed by highly trained, experienced logging engineers*
- *Logging probes conformance certified and calibrated at the Robertson Geo borehole testing and calibration Centre at Tre Morfa*
- *ISO9001 Certified Quality Management System (QMS) for logging operations, probe design, manufacture and calibration*
- *Expertise and experience gained from over 45 years of global logging service and thousands of borehole applications*
- *Comprehensive risk assessment process, RAMS and POWRA, backed by an established QHSE management system*
- *Technologies that are 'battle proven' through own use of Robertson Geo logging technologies in service operations*
- *Multi-tier backup system for remote logging operations*
- *Adherence to external industry recognised standards and in-house standards*
- *Robertson Geo developed acquisition and processing software, GeoCAD®*
- *Professional, standardised data processing and reporting*
- *Expert training for all users of Robertson Geo equipment through the RG Academy®*



Marine Geotechnics Equipment

Robertson Geo is the market leader in the supply of slim-hole logging instrumentation, with systems sold to customers in more than 165 countries worldwide. Robertson Geo is the only manufacturer with comprehensive in-house design, manufacturing facilities, and a proven operational logging service, supported by Robertson Geo staff in key global locations and a network of regional agents.

All Robertson Geo probes are fully tested and calibrated at the Conwy facility before dispatch, eliminating testing time on-site and ensuring the probes are fully operational before downhole use. Depending on customer needs, operational and customised training can be provided; for winch use, probe deployment, logging techniques, data capture, equipment maintenance and troubleshooting.

Equipment rental

Robertson Geo Services (RGS) maintain a pool of equipment which is available to rent. Complete systems (including winches) or individual probes can be rented as required, with borehole and classroom-based training available through the RG Academy®. For rental customers, the in-house Data Solutions Team is available for client data QC and processing help. All offshore systems come complete with spare probes and surface units, together with essential spares to mitigate problems and minimise/eliminate expensive vessel downtime.



Quality Control

Robertson Geo is an ISO9001 accredited company and all aspects of design, manufacture, calibration and service operate under this framework. Conformance certification for all probes includes visual and mechanical inspection before calibration and borehole testing at the Robertson Geo borehole testing and calibration centre at Tre Morfa. Data from 1000's of borehole runs in the Tre Morfa test borehole is collated to provide a reference standard used to check that probe responses are within tight tolerances. Borehole logging for marine geotechnics is essentially a data business and data integrity is achieved by using only conformance certified probes deployed by highly trained engineers.

About Robertson Geo

For over four decades, Robertson Geo has pioneered the development of advanced wireline instrumentation for geophysical and petrophysical applications. Our ethos begins and ends with research and development - we listen and learn from our customers and develop better products suited for their specific applications.

Integrity is at the heart of everything we do - many of our logging technologies are unique in the industry, being calibrated, validated and manufactured under an ISO9001 manufacturing environment.

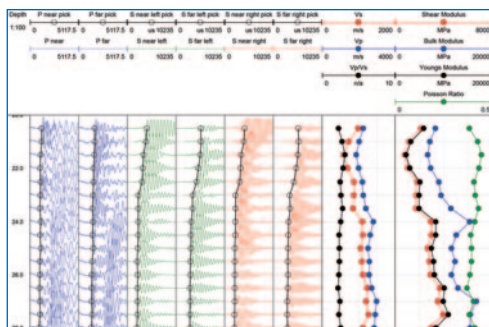
As an end-user of our own technologies, the Robertson Geo engineering feedback loop from direct field experience fosters a continuous improvement culture driven by our own use, leading to mature systems that are truly "industry hardened". All are widely recognised for their ingenuity, simplicity and effectiveness in ensuring that our customers reach their objectives efficiently and cost-effectively across diverse market segments in over 165 countries.

ANY PROJECT • ANYWHERE • ANYTIME

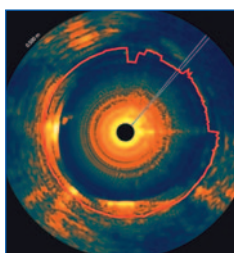
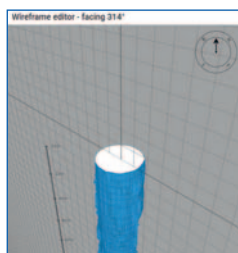


Recommended Probes

PSLogger® Since 1979



PS Logger®: the go-to probe for investigating seabed strength, providing measurements within a single borehole of high-resolution shear-wave and compressional velocity data in rock and soils. The probe is critical for earthquake engineering applications and the tool of choice for offshore structures and windfarms.

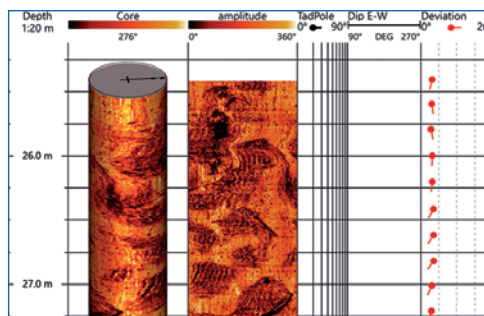


SonarCaliper®

Sonar Caliper®: provides a scaled and oriented cross-section of large bores and shafts, combining accurate diameter measurement with an oriented 360° view. For piling installation the Sonar Caliper® is deployed for delineating pile sockets, steel caisson inspection and determining volumes for poured concrete.

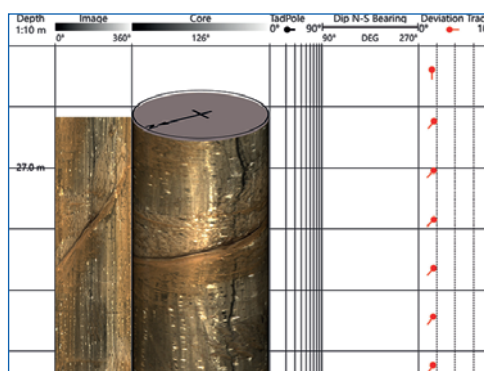
HRAT® 360°
TELEVIEWER

High Resolution Acoustic Televiewer (HRAT)®: used for borehole imaging in fluid and mud-filled boreholes. The probe provides a 360° 'unwrapped' and an orientated ultrasound image of the borehole walls. The probe is ideal for fracture identification and orientation (dip and direction), stratigraphic studies, local stress analysis (breakouts) and core orientation.



Hi-OPTV® 360°
TELEVIEWER

High Resolution Optical Televiewer (Hi-OPTV)®: provides a continuous, very high-resolution oriented image of the borehole walls. The probe can be used in dry and water (clear fluid) filled boreholes. The probe offers a full-colour image of the borehole, which can assist in mineral identification; it is ideal for fracture identification and orientation (dip and direction), stratigraphic studies, mineral identification, and core orientation.



TripleSonic®

Full Waveform Triple Sonic®: is explicitly designed for geotechnical and mining applications. It acquires transit-time and full wave data simultaneously from a single transmitter and three receivers. Formation velocity is calculated in triplicate independently of the borehole fluid path, and the waveform data is used for the calculation of compressional (P), Shear (S) and Stoneley velocities.

Natural Gamma: measure the activities of naturally occurring or man-made isotopes.

Formation Density: uses multiple detectors to provide an accurate borehole-compensated density measurement with excellent bed-boundary resolution. This can be used to determine lithology, density and porosity, rock strength and elasticity parameters when combined with the sonic probe and detection of weathered or fractured zones.

3-Arm Caliper: provides a single continuous log of borehole diameter as recorded by three mechanically coupled arms in contact with the borehole wall - an ideal tool for checking the borehole condition before logging.

Other probes are available.



**ROBERTSON
GEO**

Unlocking Your GeoData



Robertson Geologging Ltd.

Tre Morfa Enterprise Park,
Conwy, LL32 8FB, United Kingdom

T: +44 (0) 1492 582 323

Sales & Corporate

E: steveparry@robertson-geo.com

Services

E: ijones@robertson-geo.com

Robertson Geologging (USA) Inc.

55 W Hoover Ave, Suite 9, Mesa,
AZ 85210, USA

T: +1 (480) 427 2559

E: sstroud@robertson-geo.com

Robertson Geologging (Asia) Ltd.

Flat 21A, Village Tower, 7 Village Road,
Happy Valley, Hong Kong

T: +852 650 33486

E: steveparry@robertson-geo.com

www.robertson-geo.com



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