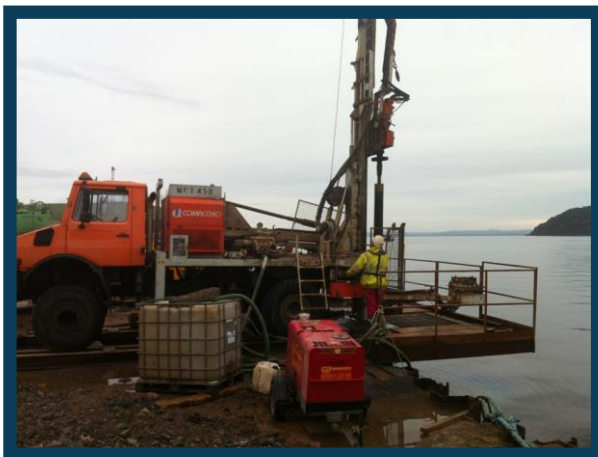




Cable percussion boring rig (Dando 3000) set-up on cantilevered platform for putting down borehole overwater, adjacent to quay wall.



Rotary drilling rig (Comacchio 450) set-up on quayside with cantilevered platform for putting down borehole overwater, adjacent to quay wall.

Ground Investigation

Nigg South Quay Development: Tender Stage Ground Investigation

Client: Global Energy (Nigg) Limited

Client's Representative: Royal HaskoningDHV

Site operations: October to November 2013

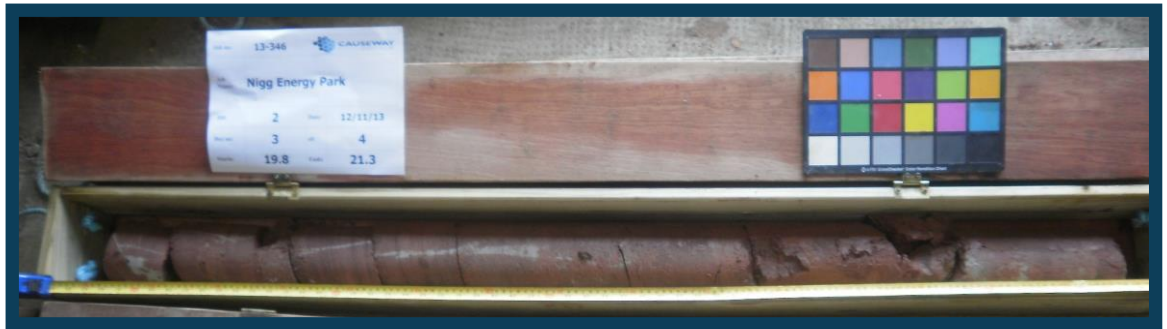
Causeway Geotech were appointed by Global Energy Nigg Limited to complete ground investigation works to provide geotechnical information for the input to the design and construction of the proposed South Quay Development at their Nigg facility, comprising a quay extension and deepening to facilitate the berthing of larger vessels.

The scope of works included three overwater boreholes (by cable percussion boring with rotary follow-on drilling) put down using a cantilevered working platform, three landside boreholes and trial trenching to ascertain the position and nature of the anchor wall and tie rods.

Works were carried out under the supervision of a Site Engineer from Causeway Geotech who liaised with the Client's Representative from Royal HaskoningDHV accordingly.

The boreholes were put down to depths of up to 35.5m below ground level. Cable percussion boring was used to advance the boreholes to refusal on destructured bedrock, after which follow-on rotary coring by means of Geobor S triple-tube wireline coring was employed. Biodegradable polymer drilling fluid was utilised to maximise core recovery throughout the extremely weak, poorly cemented Old Red Sandstone, with TCR typically of 95-100%.

By deploying our bespoke cantilever working platform, this limited the cost to the Client who may otherwise have employed the services of more expensive overwater plant. The project was subsequently completed safely, within budget and on schedule.



Geobor S triple tube wireline coring yielded excellent recovery in the weakly cemented, extremely weak sandstone bedrock

Project Summary – Nigg South Quay Development

- combined land and marine ground investigation, completed without the requirement for expensive overwater plant
- cantilever platform was used for putting down combined cable percussion & rotary follow-on drilled boreholes overwater adjacent to the quay wall
- full-time supervision from Causeway Geotech Site Engineer included MMO duties
- Geobor S triple-tube wireline coring employed to maximise core recovery of extremely weak, poorly cemented Old Red Sandstone bedrock
- site operations conducted over October to November 2013
- completed within the Client's deadlines for issue of tender information
- ZERO INCIDENTS