LANKELMA

Pushing technology NEWSLETTER

Autumn 2009

Overwater rams
Road rail truck
Pressuremeter testing
Combined seismic piezocone
Combined magnetometer cone
Antarctic R & D

Ὀωσψόρος
(Gk: lit., light bearing)

Lankelma recently successfully completed an overwater investigation at a lagoon, for client URS, to characterise and sample the lagoon mud sediments for 'white phosphorus' that had been produced locally and the resulting residues placed under water in the lagoon for safety reasons.

Elemental phosphorus exists in two forms; white phosphorus and red phosphorus. White phosphorus is extremely unstable, reactive, volatile and toxic and highly flammable. The material should be stored under water at all times as it represents a significant fire hazard due to its extreme reactivity with atmospheric oxygen.

White phosphorus is used in the production of military munitions and causes severe skin burns, consequently the CPT crew was equipped with heat retardant protective equipment, including; overalls; foot wear and gloves. In addition during CPT and sampling operations full face visors were worn.

sample of lagoon sediment containing residue of white phosphorous

overwater rams at the lagoon

The water depth at the lagoon varied between 6m and 8m and all penetration tests were performed from a spud leg floating barge. At the end of each shift all equipment and the barge spud legs were pressure washed to remove any residual white phosphorus that may have combusted in the presence of atmospheric oxygen.

In all, 20 piezocone penetration tests were performed to a maximum depth of 20m below mud line and 17 fixed piston stockinet samples were successfully taken at 17 locations to a maximum depth of 12m below mudline.
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Network Rail re-signalling

Lankelma has been working with Network Rail for part of the Cardiff area signal re-newal works.

A number of night shifts have already been completed with more in the pipe line; work for this area of signal renewal started in August 2009, with Monday – Thursday night shifts, in and around the Cardiff to Newport area and Caldicott.

Lankelma mobilised their unique road rail rig (above), to undertake the works in the four foot of the track.

Due to the nature of the works, classified as a spiking test by network rail, the site team from NR pre-dug inspection pits in the ballast to check for any underground services which may have been installed under the line.

At time of printing, progress has been excellent, with 61 exploratory holes completed in 12 5hr night shifts. A further 12 night shifts are currently confirmed booking, with more dates being added.
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Stop Press

Lankelma expands to the USA east coast with the purchase of ARA's assets in New Ellenton, South Carolina.

Lankelma began operations in the USA in January 2009. The recent expansion established the third location in the USA with offices now located in California, Texas, and South Carolina.
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Testing from 22m boom

Overcoming a specific access problem has opened up a new range of possibilities for UK14, our excavator mounted unit. A recent project saw UK14 mounted on a long reach excavator from specialist plant hirer, Land and Water.

The excavator's 22m boom extended the operation envelope of the CPT unit both in horizontal and vertical ranges (image below). We are now in discussion with Land and Water with prospects of mounting on larger and amphibious excavators to enable clients to tackle even more challenging access conditions.
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Worldwide TRT

Lankelma Green Energy's independent TRT (thermal response testing) capability is proceeding strongly, with successful tests being undertaken in North London, and forthcoming tests to be performed in both Peterborough and Cambridge.

We are now looking to offering our TRT services in the USA and worldwide.
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Abu Dhabi, Gardline Lankelma

For geotechnical SI onland, overwater, nearshore and offshore contact *simon.mallen@gardline.com*

Antarctic CPT rig

Lankelma has now completed the design and construction of UK11, a CPT rig designed to be attached to a tractor's rear 3-point linkage.

UK11 was constructed in-house (see images below) and includes all equipment necessary to conduct cone penetration testing in the harsh conditions of Antarctica. Hydraulic and electrical power are supplied by the tractor.

This rig is shortly to be shipped to the Antarctic by BAS for Adrian to use attached to BAS's John Deere or Challenger tractors for testing polar snow.
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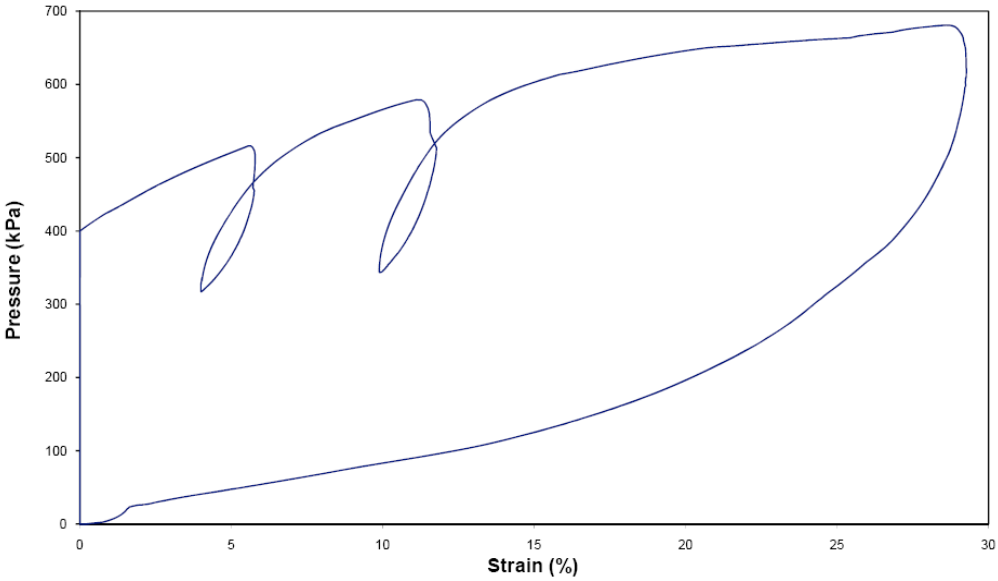

Graph showing pressure in kPA against strain in (%). The strain represents a percentage of the total expansion the spring loaded strain arms can undergo when not closed together inside the membrane.

Celtic Park Stadium

Lankelma carried out 23 full displacement pressuremeter tests, over 4 days, in the east end of Glasgow along a proposed link road. This is part of a regeneration project being undertaken throughout the area surrounding the Celtic Park Stadium.

With the area consisting of derelict land and industrial estates, made ground was found at all testing locations which were then pre-drilled down to natural ground and lined with sacrificial casing. The maximum test depth was 14 metres below ground level (10 metres of made ground).

The client was interested in obtaining the undrained shear strength and shear modulus of the materials below the made ground (see the graph above).

Testing was carried out in our UK3 track-truck. The use of tracks was required to traverse steep ground gradients found along various parts of the test area.
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Combinations combined

On behalf of Geotechnical Engineering, Lankelma undertook combined piezocone magnetometer and also combined piezocone seismic tests at a school in South Camden to provide geotechnical parameters for the design of additional buildings.

The combined magcone/CPTU unit was used at 8 locations to ensure the site was clear of any unexploded war ordnance. All the tests went to refusal, with the deepest being approximately 24m.

On completion of UXO survey, the system was changed over for the seismic/CPTU cone works, the switch over with the equipment took approximately 30 minutes and was completed during the morning set-up session.

There were 2 seismic locations, the first had seismic p wave and s wave tests at 0.5m intervals during penetration, while the second location had the tests carried out at 1.0m intervals.
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UK14 on 22m boom

UK11 with 3 point linkage


UK11 - rams, rod rack and workbench