

CASE STUDY

CYCLIC LOADING



FIELD TRIAL HELPS CHALK RESEARCH

Lankelma has trialled a new CPT technique in North Kent, as part of a research project aiming to improve the design of piles subjected to cyclic loading in chalk – such as those supporting wind turbines.

“Cyclic loading can have a significant detrimental effect on piling capacity”, explained Dr. Andrea Diambra of the University of Bristol and leader of the research team including Lankelma and WindSupport Ltd. “Offshore structures are subjected to cyclic loading from wind and wave action, so this already forms a key part of pile design in these environments. However, while the phenomenon is relatively understood in sands and clays, little is known about how pile capacity degrades in soft rocks, such as chalk”.

PROJECT SPECIFICATION

LOCATION	North Kent
CLIENT	Wind Support Ltd
DATE OF WORKS	March 2014
TESTING UNDERTAKEN	Cyclic Loading
RIG	UK15

Lankelma modified the set-up of one of its piezocone’s (CPTu) to allow small cyclic motions of the cone and measured the progressive degradation of sleeve friction and changes in pore water pressure, acting in effect like a miniature driven pile.

Results suggested that CPTu has the potential to increase the understanding of the underlying mechanisms involved in cyclic loading and help pile design in chalk – although more research is needed.

“Lankelma’s involvement and skills were fundamental in exploring the idea of performing cyclic CPTu’s in chalk,” Dr. Andrea said. “The high quality of the data obtained was guaranteed by Lankelma’s great reliability and experience”.

This new cyclic technique appears to have promising potential for all soils types and we look forward to exploring further developments with Dr. Andrea Diambra and the rest of his research team.

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