THE UNIVERSITY OF HONG KONG

DEPARTMENT OF CIVIL ENGINEERING

SEMINAR

The behaviour of piles driven in chalk, a very weak limestone, and new practical approaches for their design

Professor Richard Jardine
Imperial College London

Date: July 3, 2025 (Thursday)
Time: 10:30 a.m. – 11:30 a.m.
Venue: Room 612B, 6/F Haking Wong Building, The University of Hong Kong

Abstract
The talk describes how the ALPACA and ALPACA Plus Joint Industry projects, led by Imperial College London and Oxford University ran from 2017 to 2022 to investigate the behaviour of piles driven in chalk, a very weak limestone. The main driver was an urgent need to better support foundation design for the large offshore windfarms being developed at northern European chalk sites, and also inform other port and bridge projects that employ large open steel piles driven in chalk strata. The talk describes how the research led to more rational, representative and reliable design procedures than were available previously, based on secure knowledge regarding pile driving at chalk sites, the piles' subsequent ageing behaviour and their responses to monotonic-and-cyclic, axial-and-lateral, loading. The research included intensive characterisation of the chalk at the St Nicholas at Wade (SNW) onshore test site in Kent, in the UK. This work progressed in parallel with advanced field testing on over 40 piles driven at SNW. Close analysis of these experiments led to new design methods which are now being applied in developing offshore wind farms and other onshore works. The ALPACA JIPs advanced in parallel with analytical and database studies, including the ALPHA 3D-FE lateral loading analysis project reported by Pedone et al (2023), the analysis of independent driven pile in chalk testing conducted at other sites, as reported by Jardine (2023) and Vinck et al (2023) and the axial load-displacement analyses described by Wen et al (2023). The work has been published extensively in Geotechnique and elsewhere; several of the researchers involved have subsequently taken up academic posts at a range of well-known universities.

About the Speaker
Richard Jardine is a College Proconsul and Professor of Geomechanics, at Imperial College London; he is also a visiting Professor at Zhejiang University (ZJU) in China. Richard is an internationally leading figure in geotechnical engineering who was elected as a Fellow of the UK Royal Society in 2024 and Royal Academy of Engineering in 2002, His numerous awards include prizes from the UK Institution of Civil Engineers, British Geotechnical Association, Royal Academy of Engineering as well as the Canadian, French, Japanese and US national Geotechnical Societies. Richard's recent research includes the PISA, PAGE and ALPACA international Joint Industry Projects, investigating offshore renewable energy foundations, and collaborating with Grenoble, Oxford, the Norwegian Geotechnical Institute (NGI), University College Dublin, University of Western Australia (UWA) and Zhejiang University China (ZJU). He has authored over 350 papers and regularly delivers keynote lectures worldwide, including the prestigious Coulomb (2006), Zeng-Guoxi (2008), Rankine (2016) and ISSMGE Bishop (2013) and McClelland (2023) Honour Lectures. He also advises industry on major international projects covering offshore renewable energy, flood defences and other topics.

- ALL ARE WELCOME -

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