WARWICK
THE UNIVERSITY OF WARWICK

Civil and Environmental Engineering

Invitation to Seminar

The Generalized Coefficients of Earth Pressure: A Unified Approach

In his presentation Professor Pantelidis will present his analytical work “the Generalized Coefficients of Earth Pressure: A Unified Approach”, focusing mainly on the validation of the proposed expressions. The validation will include, among others, comparison with numerical results, in-situ earth pressure cell reads, and contemporary centrifuge test results (carried out at the Berkley University of California). Further comparison with EN1998-5:2004, the draft standard prEN1998-5:2021 and AASHTO standard will give rise to explaining the long-standing “negative root” problem that these methods present.

The proposed method is a holistic continuum mechanics approach for deriving earth pressure coefficients for any soil state between the “at rest” state and the active or passive state, applicable to cohesive-frictional soils and both horizontal and vertical pseudo-static conditions. It is worth mentioning that under static conditions this rather complicated analysis based on Cauchy’s first law of motion (extended suitably to deformable bodies with internal resistance) leads to the well-known Rankine’s expression for cohesive-frictional soils for the active state. By just changing the arithmetic value of a controlling parameter from infinity to 1, the same approach leads to Jaky’s well-known $K_o=1-\sin\varphi'$ expression for the earth pressure at rest with an additional term for the cohesion of soil. Analytical expressions for the calculation of the required wall movement for the mobilization of the active or passive state are also given and numerically validated.

Dr Lysandros Pantelidis

Associate Professor in Geotechnical Engineering
Cyprus University of Technology

Lysandros Pantelidis is an Associate Professor of Geotechnical Engineering at the Cyprus University of Technology (CUT). The time span between 2003 and 2010, Dr Pantelidis was Adjunct Professor at the department of Civil Infrastructure Engineering of Technological Educational Institute of Thessaloniki, Greece (now part of the International Hellenic University, Greece). He obtained a Ph.D. degree from the Aristotle University of Thessaloniki (Greece) in 2009; the following year he was postdoctoral researcher at Colorado School of Mines (USA). He joined CUT in 2011. His research interests cover a wide range of subjects, among others, analytical and numerical modelling in geotechnical engineering, analytical and numerical probabilistic analysis of geotechnical engineering problems based on the theory of random fields, reliability of geotechnical engineering structures with respect of field investigation, landslide risk assessment, investigation of rockfall measures adequacy and cost-effectiveness and soil erosion risk assessment.

Wednesday 20 October 2021, 12.00pm-1.00pm

Online (via Teams)

The seminar is open to all.
For more information, contact Dr Rezania (m.rezania@warwick.ac.uk).