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Announcement: Award-winning papers in 2018

Papers published in *Géotechnique* are eligible for awards from the Institution of Civil Engineers. Papers from any of the ICE journals can be nominated for several awards. In addition, each journal has awards dedicated to their specific subject area.

On Friday 4 October 2019, ICE president Andrew Wyllie presented awards to the following papers published in *Géotechnique* in 2018. The editorial panel nominated their best papers and an awards committee chaired by Robert Armitage allocated the awards.

ICE president Andrew Wyllie (far left) with Telford Gold Medal winners (from left) Núria Mercè Pinyol Puigmartí, Mauricio Alvarado Bueno, Eduardo Alonso and Francisco Zabala

The Telford Gold Medal, presented to the best paper published in all the ICE journals, was awarded to Pinyol *et al.* (2018).

ABSTRACT

The paper describes a thermo-hydro-mechanical formulation to model thermally induced effects due to the irreversible work input generated during soil deformation. The model was implemented into a material point calculation procedure. The method is applied to the analysis of landslides. A simple slope stability is first analysed. Mechanical work essentially dissipates in shearing bands, which develop excess pore water pressures. The marked effect of soil permeability to control the slide motion after failure is described. Shear band thickness is also a relevant control variable. The problem posed by the non-realistic thickness of shear bands in numerical calculation is addressed by means of a numerical procedure that includes consideration of embedded shear bands where the strains are assumed to be localised. Balance equations describing local flow and thermal interactions between shear bands and the remaining material are formulated. The method is applied to model the instability and subsequent rapid motion of Vajont landslide. Calculated run-out and sliding velocity reproduce, in a satisfactory manner, field observations.

Pauline Truong Suzuki receiving the Geotechnical Research Medal from ICE president Andrew Wyllie

The Geotechnical Research Medal, presented for the best paper on geotechnical research, was awarded to Truong & Lehane (2018).

ABSTRACT

A series of lateral tests conducted in a centrifuge on displacement piles in kaolin is used to examine the effects of pile shape, pile end-condition and clay overconsolidation on the lateral load transfer (p–y) curves in soft clay. These experimental tests are supported by finite-element analyses, which examine the responses of the circular, square and H pile sections used in the centrifuge tests. The experimental and numerical results reveal an important effect of pile shape on p–y curves, but no discernible effect of the pile end condition. These results also indicate comparable dependencies of net ultimate pressures on normalised depth and undrained shear strength. The findings enable development of a new formulation for p–y curves in soft clay, which incorporates the effects of pile shape and uses the triaxial compression consolidated undrained shear strength as the reference undrained strength.

ICE president Andrew Wyllie (far left) with David Hislop Award winners (from left) Róisín Buckley, Richard Jardine, Felix Schroeder, Stavroula Kontoe and Duncan Parker

The David Hislop Award, presented to the best paper published on heavy marine design and construction with particular reference to offshore engineering, was awarded to Buckley *et al.* (2018).

This paper reports a programme of static and cyclic loading tests on seven open steel tubes driven in low- to medium-density chalk at a well-characterised test site, describing their response to driving, ageing in situ and loading under both static and cyclic conditions. Back analysis of dynamic monitoring identifies the distributions of notably low shaft resistances that develop during installation, showing that these depend strongly on the relative pile tip depth (h/R). The shaft capacities available to 'virgin' piles are shown to increase markedly after driving, following a hyperbolic trend that led to a fivefold gain after 250 days. Pre-failed piles do not follow the same trend when re-tested. Pile exhumation confirmed that driving remoulded the chalk, creating a puttified zone around the shaft. Excess pore water pressure dissipation, which is likely to have been rapid during and after driving, led to markedly lower water contents close to the shaft. Axial cyclic testing conducted around 250 days after driving led to a range of responses, from manifesting stable behaviour over 1000 cycles to failing after low numbers of cycles after developing sharp losses of static capacity. The dependence of permanent displacement on the cyclic loading parameters is explored and characterised. The experiments provide the first systematic study of which the authors are aware into the effects of undisturbed ageing and cyclic loading on previously unfailed piles driven in chalk. Potential predictive tools may now be tested against the reported field measurements.

The Tso Kung Hsieh Award, presented to the best paper on structural and soil vibration caused by mechanical plant, was awarded to Ni *et al.* (2018).

Seismic faulting is extremely detrimental to buried pipelines owing to bending moments and axial forces generated by the soil–pipe interaction. Pipe responses to ground rupture are usually evaluated by beam-on-spring analysis. However, the empirical data used to define the spring response were obtained for steel pipes with high flexural stiffness and the effectiveness of the resulting spring stiffness values for flexible pipes is questionable. This paper presents full-scale tests undertaken using a new split-box apparatus which permits the testing of pipes in dry sand subject to a normal fault with dip angle of 90°. Four polyvinyl chloride (PVC) pipes (various diameters), one instrumented with strain gauges and three instrumented with fibre optic sensors, were tested to provide experimental evidence for flexible pipes. The research includes confirmation of the effectiveness of fibre optic strain measurement, which has the advantage of providing much more data than the limited discrete values obtained from conventional strain gauges. However, the fibre optic strain sensing technique is limited to strain values below 1%. The prototype-scale testing permits assessment of the efficacy of the current design approaches, including the relative success of accounting for reduced spring stiffness or patterns of imposed deformation.

ICE president Andrew Wyllie (far left) with Tso Kung Hsieh Award winners (from left) Andy Take and Penpeng Ni

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