Centrifuge Modelling of Liquefaction-Induced Settlement of Shallow Foundations

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INTRODUCTION

Research Tools

Centrifuge Experiment

Results

Future Work

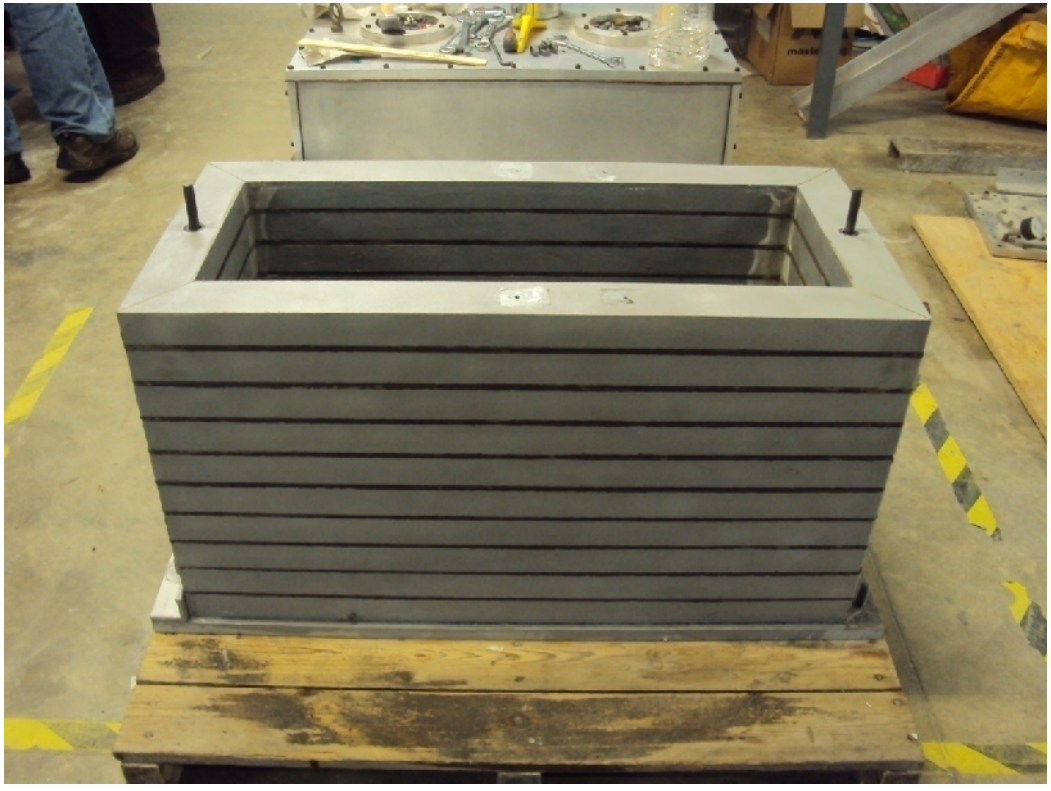
10m Turner Beam Centrifuge

(Photo adapted from Schofield Centre Archive)

SAM actuator

(Photo adapted from Schofield Centre Archive)

ESB container



Automatic Sand Pourer

Model Saturation

Instrumentation

- Accelerometers (acc) ;

- Pore Pressure Transducers (PPT);

- Microelectromechanical system accelerometer (MEMS);

- Linear Variable Displacement Transducer (LVDT).

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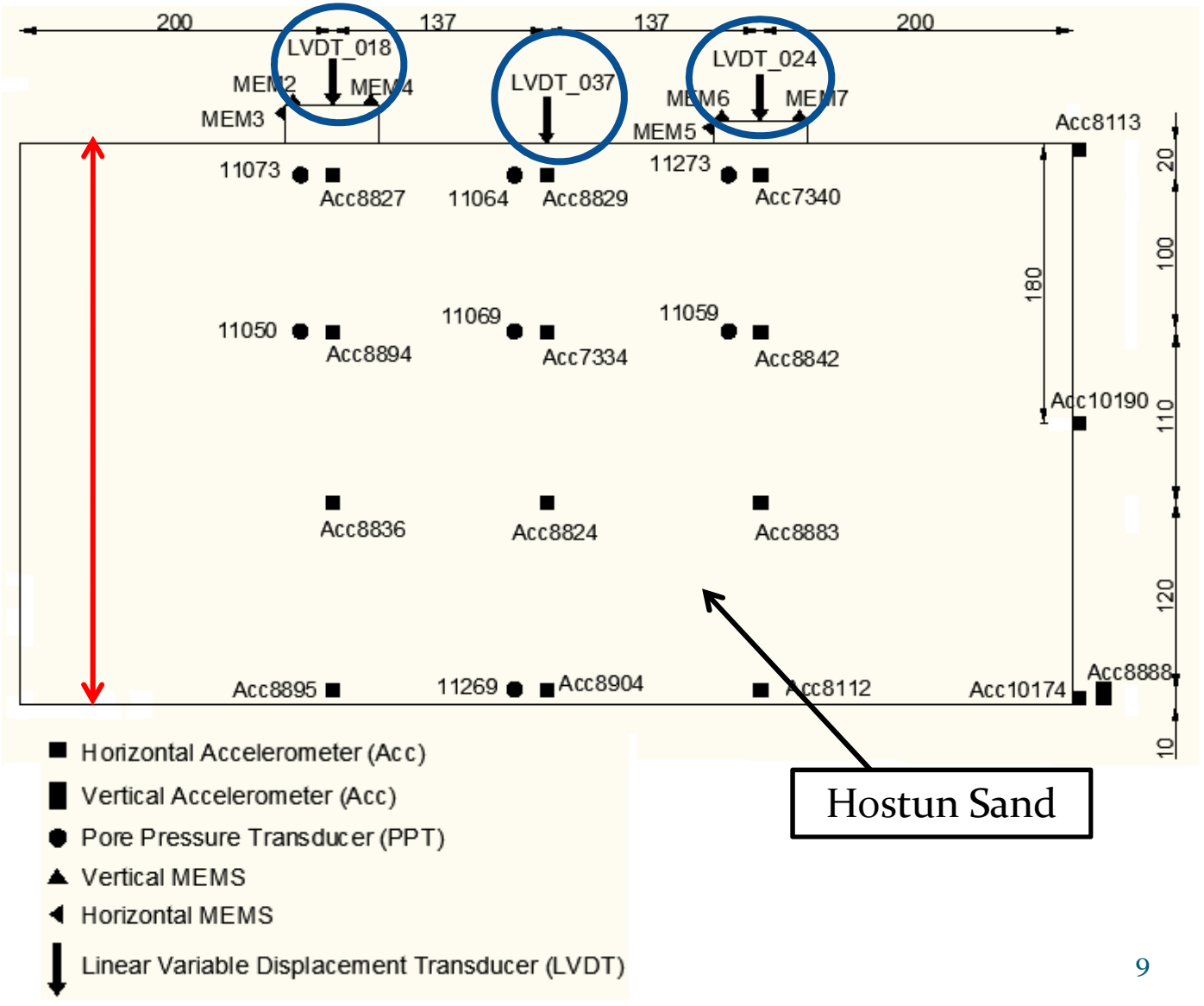
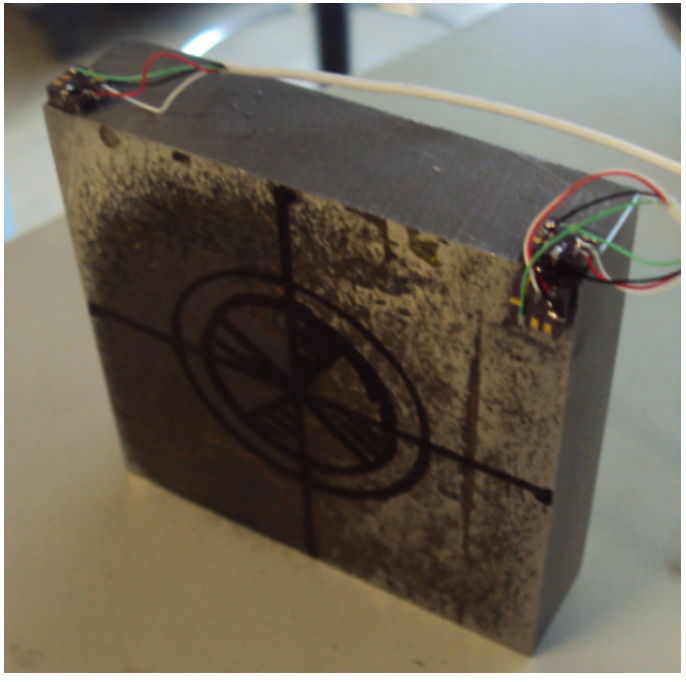
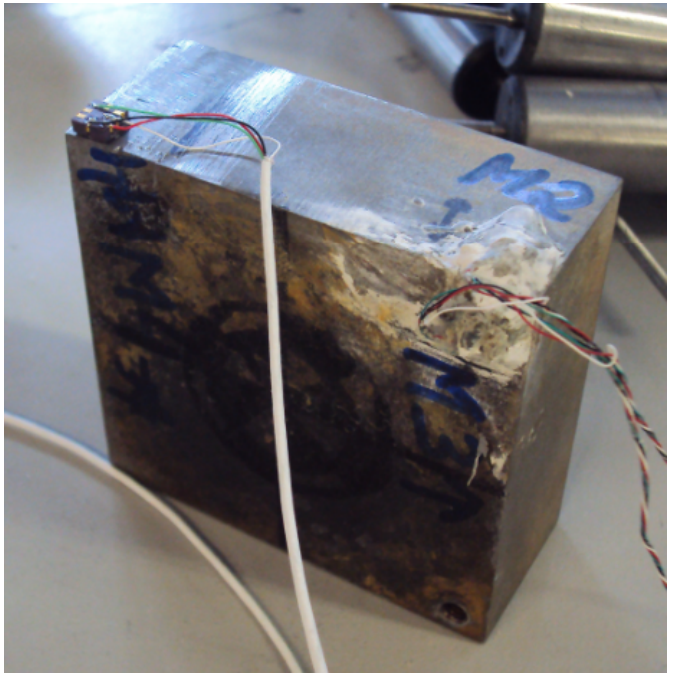
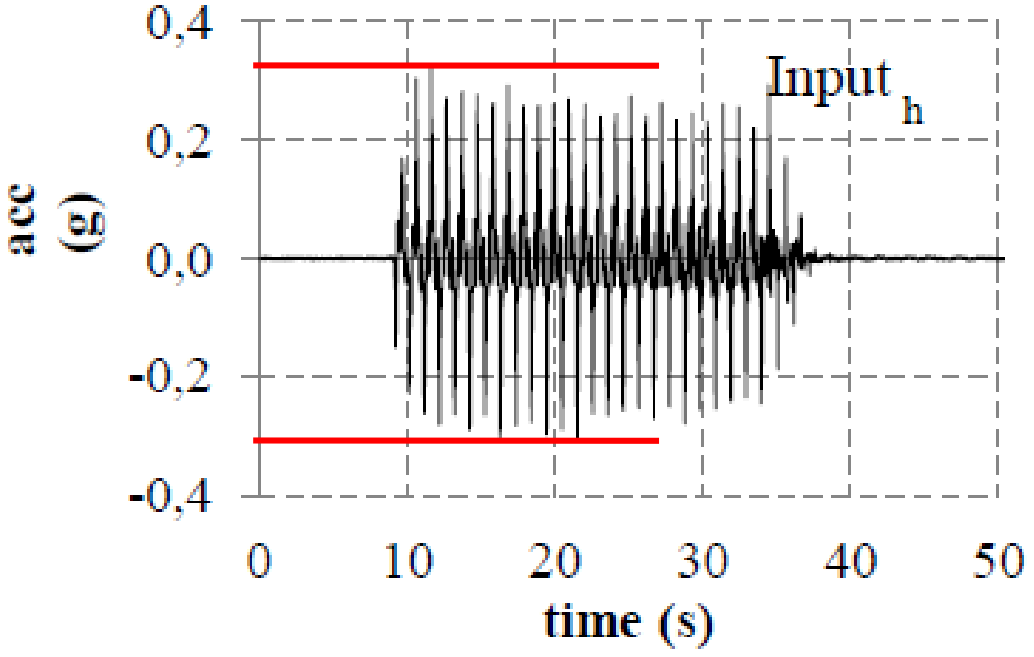






Structure	width (mm)	length (mm)	height (mm)
H	60	60	24.5
L	60	60	15



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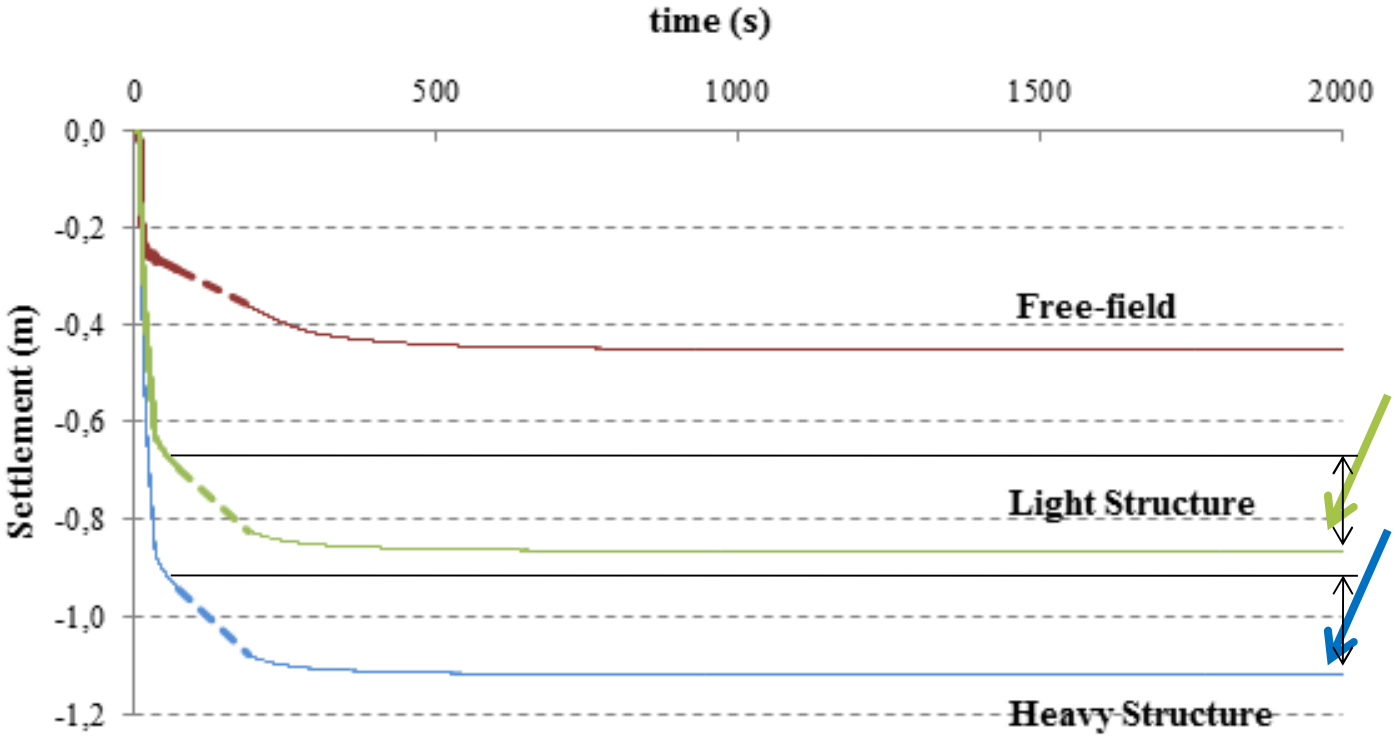

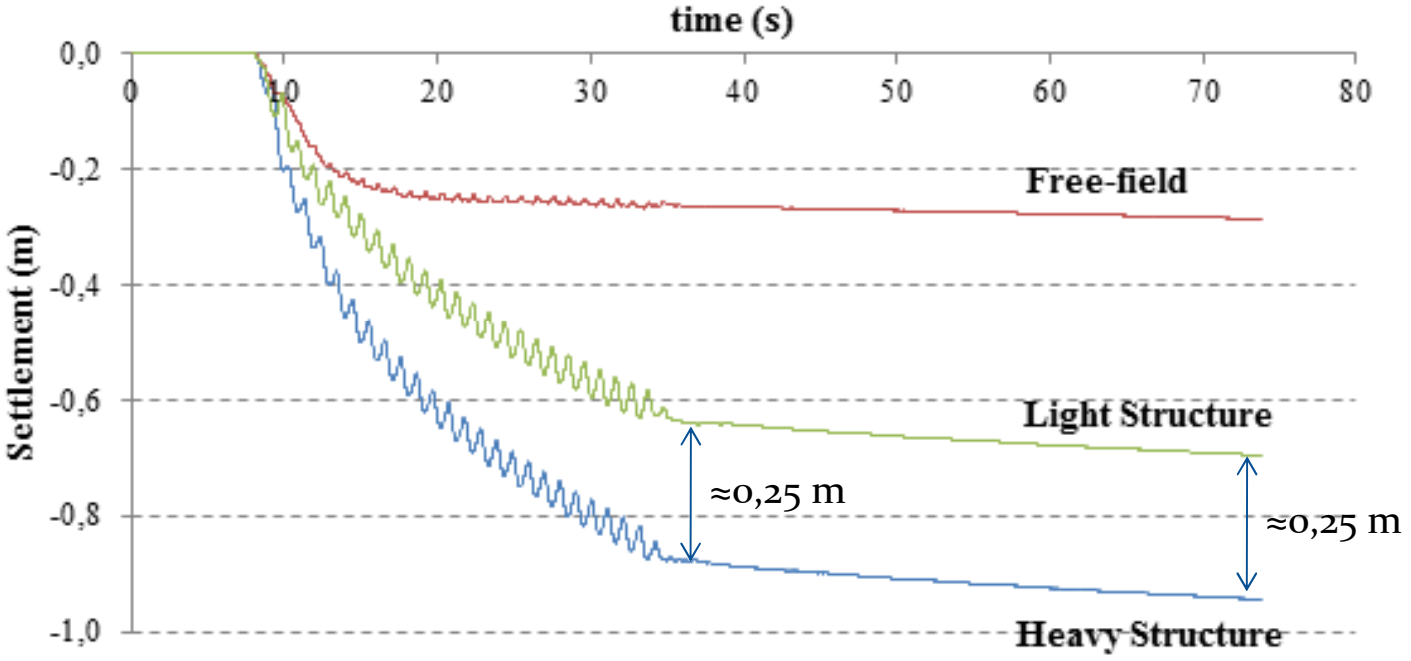

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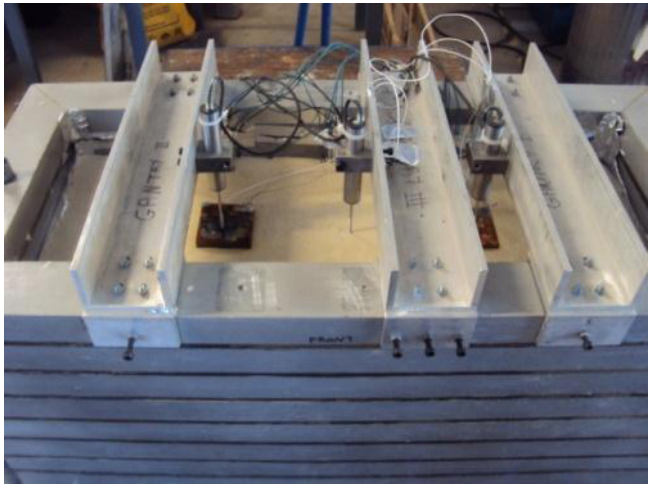

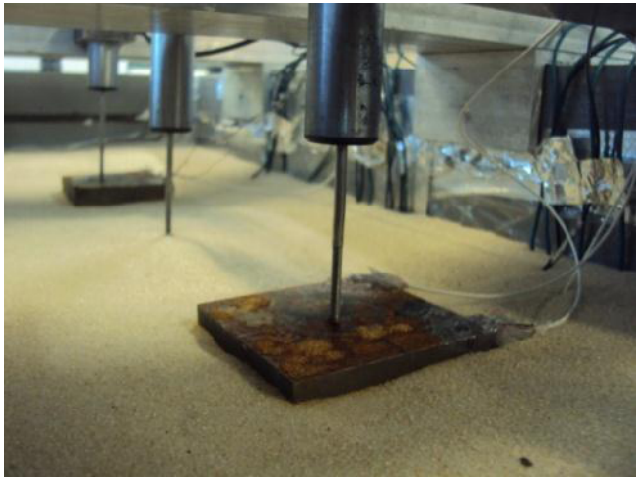

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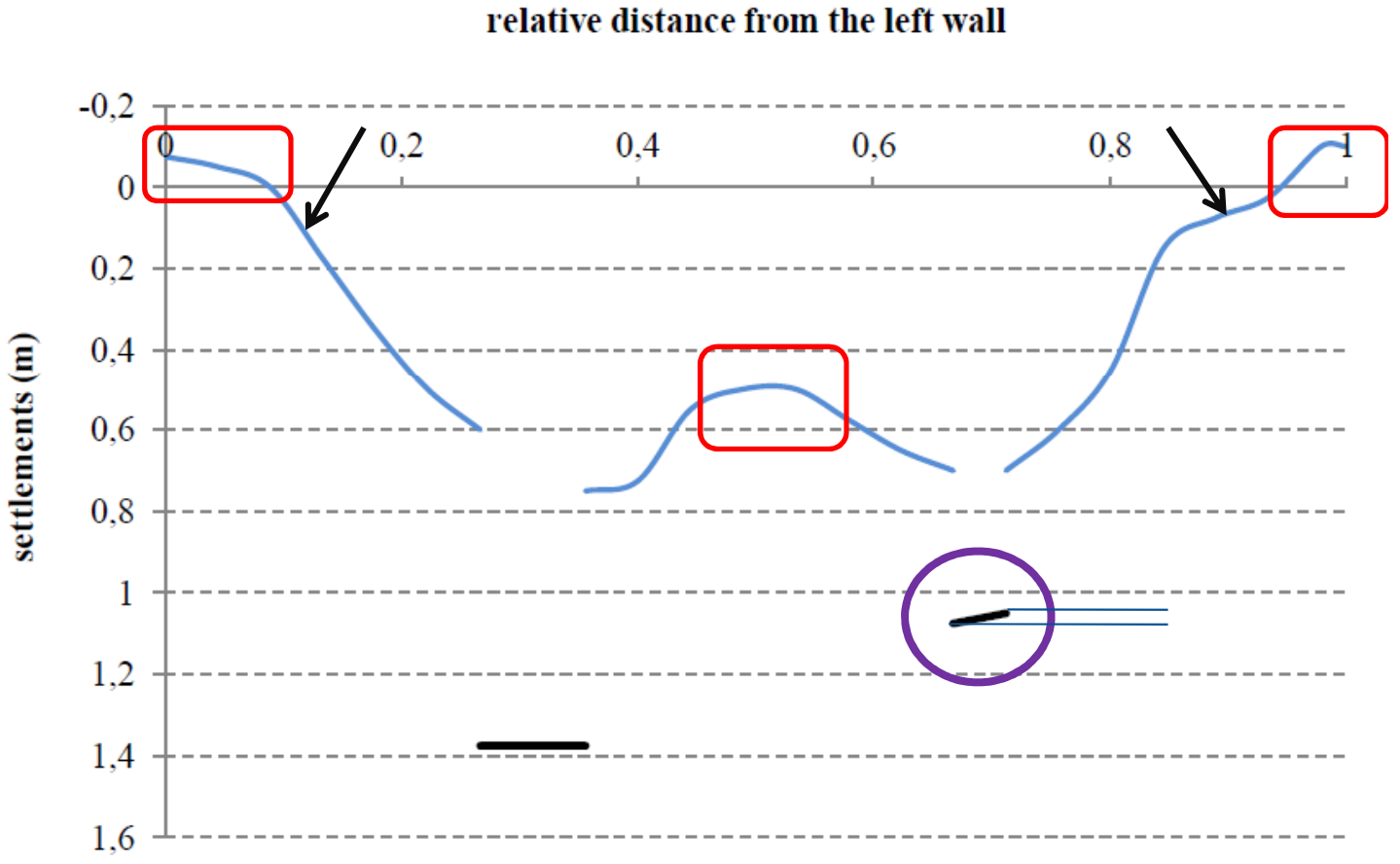

- evaluate the development of excess pore pressures during the seismic simulation, post-earthquake response to the high transient hydraulic gradients, and the propagation of the accelerations under the footings and free-field during the seismic motion.

- clarify the importance of the characteristics of the seismic loading on the performance of the soil-structure system, especially by comparing realistic seismic loading with constant amplitude and frequency sinusoidal cyclic loading;

- assess the effectiveness of narrow densified zones with selectively positioned high-capacity vertical drains in the mitigation of earthquake-induced liquefaction effects;

- numerical tools to perform realistic numerical predictions of the behaviour of the shallow foundations affected by seismic loading inducing ground liquefaction.

THE END