

UNIVERSITY OF MACAU
FACULTY OF SCIENCE AND TECHNOLOGY
DEPARTMENT of CIVIL and ENVIRONMENTAL
ENGINEERING

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**The Role of Dynamic Testing in Geotechnical
Characterisation**

By

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Date: 31/8/2012 (Friday)

Time: 3:00-4:30pm

Venue: HG01

Abstract

Soil-structure interaction problems under either static or dynamic loading have been the major problem to dominate in modelling the behavior of building and general civil engineering structures. Movements of structures or internal movements of ground are still difficult to evaluate mostly by the lack of information about the stress-strain behavior of soil under small strains. The deformation properties at these small strains can be linked to the elastic properties, although the stress-strain behavior could be highly non-linear.

This has led to the development of design methods that take this into account, such that stiffness non-linearity is now routinely incorporated into many standard computer codes. These achievements have been paralleled by developments in either in situ or laboratory testing methods that allow the details of the stress-strain response to be examined, even at strains as low as 10^{-6} .

Measurement of seismic wave velocities is a practical, non-destructive, frequently non-invasive and cost-effective means of determining the small strain stiffness of soils. Given the particulate

nature of soils, wave-based techniques present unique advantages to study geomaterials without affecting the fabric, structure and inherent mechanical properties. In fact, seismic wave velocities in soils are influenced by a number of factors, such as the stress state, void ratio or porosity, structure and inherent anisotropy. These properties are indeed important for a variety of geotechnical applications including seismic ground response and liquefaction analyses.

An overview and critical discussion about the role of dynamic testing in geotechnical characterisation involving the most recent wave-based in situ and laboratory techniques applied in major projects in Portugal will be presented in detail.

About the Speaker

Academic and Professional Positions:

Associate Professor at Instituto Superior Técnico & Director at CENOR Consulting Engineers. Member of various national committees and international professional societies. Senior Member and Geotechnical Specialist of the Portuguese Association of Engineers (Ordem dos Engenheiros).

Education:

Civil Engineering Degree, Instituto Superior Técnico, Technical University of Lisbon, 1988.
M.Sc. in Soil Mechanics, Faculty of Science and Technology, New University of Lisbon, 1993.
Ph.D. in Civil Engineering, Instituto Superior Técnico, Technical University of Lisbon, 2000.

Research Interests:

- Static and dynamic soil characterisation.
- Liquefaction.
- Piles under static and dynamic loading.
- Seismic behaviour of underground structures.

Summary:

- Author or co-author of more than 100 papers in international and national journals and conferences.
- Participation as design author or director of more than 90 projects involving geotechnical works and structures.
- Supervision of 7 PhD and 15 MSc theses.
- Participation as member or coordinator of 10 scientific research projects.
- Coordinator of the Master Programme in Civil Engineering at IST (2009-2012).
- Chairman of the 8th International Conference on the Application of Stress Wave Theory to Piles (Stress Wave 2008).

Honors and Awards:

- Soils and Rocks Prize - Best Paper 2007-2008. Brazilian Society for Soil Mechanics and Geotechnical Engineering (ABMS), Brazilian Society for Engineering and Environmental Geology (ABGE) and Portuguese Geotechnical Society (SPG).
- Manuel Rocha Prize - Best PhD thesis 2000-2003. Portuguese Geotechnical Society.

ALL ARE WELCOME!