

Session ID: GEO-5

Title

CHALLENGES IN THE SEISMIC DESIGN OF SHALLOW FOUNDATIONS

Convenors

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Description

Performance-based design currently relies on the aboveground structural elements to face the seismic demand, admitting severe damages under the strongest motions. Outcomes of recent research works have highlighted that foundations can contribute to withstand earthquakes, launching the opportunity of a design approach integrating the performance of structure and foundations. A competent application of such approach would provide a reduction of the damage and consequently of the restoration time, ensuring an improvement of the resilience.

However, the performance-based design of foundations remains a challenging task for the earthquake geotechnical engineers. This is partially due to the complexity of the problem which involves soil mechanics, foundation engineering, soil foundation structure interaction, and rudiments on the dynamic behavior of structures.

This technical session is intended as an occasion to share the most recent advances on this topic connected to, but not limited to, the following issues:

1. evaluation of the seismic demand considering the soil foundation structure interaction,
2. calculation of the ultimate bearing capacity and earthquake induced permanent displacements,
3. quantification of the foundation contribution to dissipate the seismic energy,
4. type of analyses and modelling strategies to simulate the nonlinear soil foundation interaction.

The interpretations of experimental data and real case observations to derive practice-oriented recommendations are particularly welcomed.

Invited Speakers

S. Sica ³, I. Anastasopoulos ⁴, H. El Naggar ⁵

Affiliations

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