SEMINARI INGEO – ERASMUS STAFF MOBILITY

UNIVERSITÀ DEGLI STUDI "G. D'ANNUNZIO" – CHIETI PESCARA

Case studies using in situ and laboratory geotechnical data in Turkey

Prof. Ing. Müge Akin

8 Aprile 2024 – ore 12

Aula 28, Dipartimento INGEO (Piano terra, Pescara)

Short CV

Dr Müge Akın received her BSc 1997 and MSc 2001 in Department of Geological Engineering from Ankara University and PhD in Geological Engineering from Middle East Technical University (2009, on her studies in METU, she focused on the seismic microzonation of urban areas and dynamic soil characterization as a Fulbright Visiting Scholar, she has a chance to make collaboration with Prof Dr Steven L Kramer in the University of Washington (Seattle, USA) who is a worldwide well known expert in Geotechnical Earthquake Engineering, she studied interdisciplinary (Civil Engineering and Geological-Geotechnical Engineering) topics for her PhD study). Her PhD has been awarded by a couple of prizes 2009 Erguvanlı Engineering Geology Prize by Turkish IAEG for the best PhD dissertation in Engineering Geology and METU Mustafa Parlar Foundation Prize for the best PhD dissertation in 2009-2010. She has co-authored numerous conference papers and SCI journals. Her research areas are Engineering geology/Geotechnical engineering, Seismic microzonation, Soil mechanics, Geotechnical earthquake engineering, Site investigation, Site response and Soil amplification, Liquefaction, Seismic hazard analyses, Rocfall hazards, Numerical modeling, Ground improvement techniques, Geographical Information System (3D modeling, Digitizing, Multi Criteria Decision Analyses).

Abstract

The topic aims to present a collection of case studies that control in-situ data obtained from various regions in Turkey, offering valuable insights into geotechnical applications. In-situ data, acquired through direct measurements or observations at the site of interest, require essential information for understanding geological, geotechnical, and environmental processes. The case studies showcased herein demonstrate the diverse range of applications for in-situ data in Turkey, encompassing areas such as soil characterization, groundwater monitoring, slope stability analysis, etc. By combining field observations with laboratory analyses and numerical modeling techniques, researchers and practitioners have been able to address critical challenges related to infrastructure development and environmental management. Furthermore, these case studies highlight the importance of interdisciplinary collaboration and data-driven decision-making in addressing complex geotechnical issues in Turkey. Through the distribution of knowledge and best practices derived from these case studies, local geological and environmental conditions can be leading to more informed and resilient engineering solutions for sustainable development in geotechnical applications.

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UNIVERSITÀ DEGLI STUDI "G. D'ANNUNZIO" – CHIETI PESCARA

Introduction to geotechnical earthquake engineering – Focus on liquefaction

Prof. Ing. Müge Akin

9 Aprile 2024 – ore 11

Aula 28, Dipartimento INGEO (Piano terra, Pescara)

Abstract

Geotechnical earthquake engineering involves a fundamental aspect of infrastructure resilience against seismic events, with liquefaction being a prominent phenomenon of concern. Liquefaction is one of the critical problems in the field of Geotechnical Earthquake Engineering. Liquefaction of saturated soils has been the cause of most geotechnical hazards during earthquakes. Development of excess pore pressures in saturated soils when subjected to cyclic loading has been related to the cause of liquefaction, which can be simply described as the transformation of stable soil structure into an unstable liquid stage. The related mechanisms and triggers of liquefaction, highlighting factors such as soil type, saturation, and seismic characteristics that influence its occurrence will be outlined within this context. Besides, assessing liquefaction potential, including empirical and analytical approaches, as well as recent advancements in numerical modeling techniques will also be explained with suitable case studies. Through interdisciplinary collaboration and continued research efforts, advancements in geotechnical earthquake engineering will contribute to the development of safer and more sustainable communities in earthquake-prone regions.

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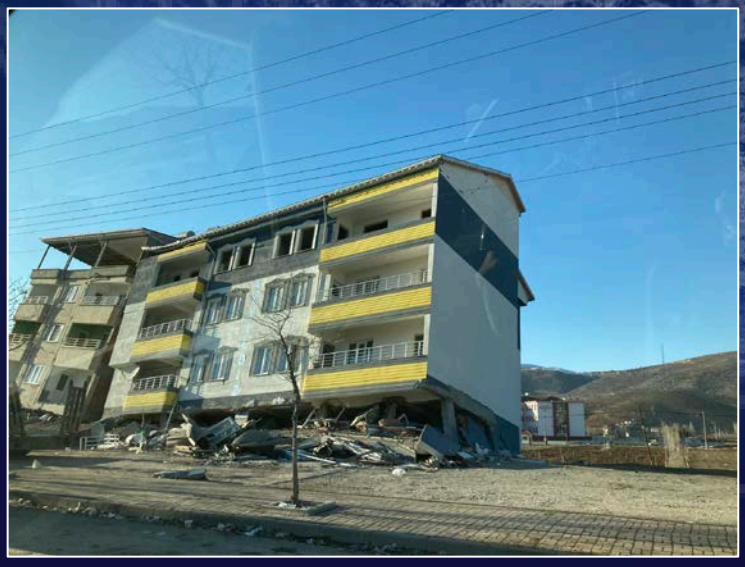
General details of 2023 Maras earthquakes (Turkey-Syria earthquakes) and site observations

Prof. Ing. Müge Akin

10 Aprile 2024 – ore 11

Aula 39, Dipartimento INGEO (Piano terra, Pescara)



Abstract

The Kahramanmaras earthquakes, also known as the Turkey-Syria earthquakes, represent a series of seismic events that hit the region with significant intensity, causing widespread damage and loss of life. Within this framework, an overview of the general details surrounding these seismic occurrences, as well as site observations gathered from post-event assessments. The earthquakes, originating from the active tectonic boundaries between the Anatolian and Arabian plates including East Anatolian Fault Zone, exhibited characteristics of crustal faulting, contributing to their destructive potential. Site observations following the earthquakes revealed a variety of structural and geotechnical vulnerabilities, including building collapses, ground deformations, and infrastructure damages. Factors such as soil type, local geology, and construction practices played crucial roles in determining the extent of damage and the resilience of affected communities. By incorporating lessons learned from the Kahramanmaras earthquakes into disaster preparedness and mitigation efforts, stakeholders can enhance the resilience of vulnerable regions to seismic hazards, fostering safer and more sustainable communities in the face of future earthquakes.

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