

2.2 SEISMIC SHIELDING OF URBAN AREAS BY USING INTEGRATED GEOPHYSICAL METHODS

P. Kirmizakis^{1*}, G. Kritikakis², E. Kokkinou³, N. Theodoulidis⁴, B. Margaris⁴, N. Papadopoulos⁵, M. Steiakakis², U. Dikmen⁶, M. Mangriotis⁷, A. Savaidis⁸, C. Loupasakis⁹, A. Vafidis² and P. Soupios¹

¹Department of Geosciences, College of Petroleum Engineering & Geosciences, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia

²School of Mineral Resources Engineering, Technical University of Crete, Chania, Greece

³Department of Agriculture, Hellenic Mediterranean University, Heraklion, Greece

⁴Institute of Engineering Seismology and Earthquake Engineering (EPPO), Thessaloniki, Greece

⁵Institute for Mediterranean Studies, Foundation for Research & Technology Hellas, Heraklion, Greece

⁶National Oceanography Centre Southampton (NOCS), University of Southampton, UK

⁷Department of Geophysical Engineering, Ankara University, Ankara, Turkey

⁸University of Texas, Texas, USA

⁹School of Mining and Metallurgical Engineering, National Technical University of Athens, Athens, Greece

*Corresponding author e-mail: p.kirmizakiss@kfupm.edu.sa

ABSTRACT

Estimating the strong motion parameters for the shallow geological formations is essential for engineering seismology, earthquake hazard assessment, design of structures, soil mechanics, and development of ground motion prediction equations. These parameters provide valuable information that helps engineers and seismologists design earthquake-resistant structures and infrastructure. For this reason, the sites of the accelerometer network must cover different geological settings and provide accurate measurements of ground motion during an earthquake. In this research, the Crete Island in Greece was selected as a well-known region prone to earthquakes, to characterize the subsurface of the accelerometer sites by using a combination of geophysical and geological data to analyze the strong motion parameters of shallow geological formations. The study area comprises a variety of geological and tectonic settings, making it an ideal location for investigating the effects of different geological conditions on ground motion parameters.

KEY WORDS : geocharacterization, multiphysics, earthquake hazard assessment