



The importance of geological data and derived information in seismic response assessment for urban sites. An example from the Island of Crete, Greece

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The magnitude, frequency content and duration of an earthquake ground motion depends mainly on the surrounding geological, tectonic and geomorphological conditions. Numerous reports have been contacted illustrating the necessity of providing accurate geological information in order to estimate the level of seismic hazard. In this context, geological information is the outcome of processing primary, raw field data and geotechnical investigation data that are non – organized and associated with the geological model of the study area. In most cases, the geological information is provided as an advance element, a key component of the "function" that solves any geo-environmental problem and is primarily reflected on analogue or digital maps.

The main objective of the present study is to illustrate the importance of accurate geological information in the thirteen (13) selected sites of the Hellenic Accelerometric Network (HAN) in the area of Crete Island, in order to estimate the seismic action according to Eurocode (EC8).

As an example the detailed geological-geotechnical map of the area around HAN site in Rethymno city, Crete is presented. The research area covers a 250m radius surrounding the RTHE HAN-station at a scale of 1: 2000 with detail description of the geological and geotechnical characteristics of the formations as well as the tectonic features (cracks, upthrust, thrust, etc) of the rock mass. The field survey showed that the RTHE station is founded over limestones and dolomites formations. The formations exhibit very good geomechanical behaviour; however they present extensive fragmentation and karstification. At this particular site the identification of a fault nearby the station proved to be significant information for the geophysical research as the location and orientation of the tectonic setting provided new perspective on the models of seismic wave prorogation.

So, the geological data and the induced information along with the tectonic structure of the area, revealed variations that could alter the seismic wave prorogation models as well as the ground type/soil category of the foundation formations. In conclusion, the produced geological-geotechnical maps are the main mean of communication and flow of geological information between different scientific disciplines providing the bases for defining the ground type at each HAN site and calibrating the corresponding code prescribed spectra.

This study is part of the on-going project that has been co-financed by the European Union (European Social Fund – ESF) and Greek national funds through the Operational Program "Education and Lifelong Learning" of the National Strategic Reference Framework (NSRF) - Research Funding Program: THALES. Investing in knowledge society through the European Social Fund.