

# GEO-CHARACTERIZATION ACCORDING TO RECENT ADVANCES OF EUROCODE (EC8)

Savvaidis A.<sup>\*a</sup>, Margaritis B.<sup>a</sup>, Theodoulidis N.<sup>a</sup>, Lekidis V.<sup>a</sup>, Karakostas Ch.<sup>a</sup>, Mangriotis M-D.<sup>a</sup>, Kalogeras I.<sup>b</sup>, Koutrakis S.<sup>b</sup>, Vafidis A.<sup>c</sup>, Steiakakis M.<sup>c</sup>, Agioutantis Z.<sup>c</sup>, Rozos D.<sup>d</sup>, Loupasakis C.<sup>d</sup>, Rondoyanni Th.<sup>d</sup>, Tsangaratos P.<sup>d</sup>, Dikmen U.<sup>e</sup>, Papadopoulos N.<sup>f</sup>, Sarris A.<sup>f</sup>, Soupios P.<sup>g</sup>, Kokkinou E.<sup>g</sup>, Papadopoulos I.<sup>g</sup>, Kouli M.<sup>g</sup>, and Vallianatos F.<sup>g</sup>

<sup>a</sup>Institute of Engineering Seismology and Earthquake Engineering (EPPO), Thessaloniki, Greece; <sup>b</sup>Geodynamic Institute, National Observatory of Athens, Greece; <sup>c</sup> Department of Mineral Resources Engineering, Technical University of Crete, Greece; <sup>d</sup>Laboratory of Engineering Geology and Hydrogeology, Department of Geological Sciences, School of Mining and Metallurgical Engineering, National Technical University of Athens, Greece; <sup>e</sup> Department of Geophysics, Ankara University, Turkey; <sup>f</sup>Laboratory of Geophysical-Remote Sensing & Archaeoenvironment, Institute for Mediterranean Studies, Foundation for Research & Technology Hellas, Greece; <sup>g</sup>Laboratory of Geophysics and Seismology, Department of Natural Resources and Environment, Technological Educational Institute of Crete, Chania, Crete, Greece

## ABSTRACT

For the seismic action estimation according to Eurocode (EC8) one has to characterize site conditions and suitably estimate soil amplification and corresponding peak ground motion for the site. For this reason, as specified, one has to define a design spectrum through the ground-type/soil-category (S), and the peak ground acceleration (PGA) of the reference return period (TNCR) for the corresponding seismic zone and for structural technical requirements chosen by the designer. Ground type is defined through geophysical/geotechnical parameters, i.e. (a) the average shear wave velocity up to 30 meters depth, (b) the Standard Penetration Test blow-count, and (c) the undrained shear strength of soil.

Through the “GEO-CHARACTERIZATION” THALIS-PROJECT we combine different geophysical and geotechnical methods in order to more accurately define the ground conditions in selected sites of the Hellenic Accelerometric Network (HAN) in the area of Crete Island. More specifically in the present efforts, geological information shear wave velocity and attenuation model calculated from seismic surface geophysical measurements is used. Additionally we utilize the ground acceleration recorded through HAN from intermediate depth earthquakes in the broader area of South Aegean Sea.

Using the recorded ground motion data and the procedure defined in EC8, the corresponding elastic response spectrum is calculated for selected sites. The resulting information are compared with the values defined for the corresponding EC8 spectrum for the seismic zone comprising the island of Crete.

As a final outcome of this work we intend to propose regional normalized elastic spectra for seismic design of structures and urban development planning and compare them with Eurocode.

**Keywords:** Natural Hazards, Earthquake Risk, Eurocode, Environmental protection, Crete.

---

\*[alexandros@itsak.gr](mailto:alexandros@itsak.gr); phone +3023100476081; fax +302310476085; [www.itsak.gr](http://www.itsak.gr)