Station Description Sheet

# GRA

## 1. GENERAL INFORMATION

**Station Code:** GRA
**Network:** Euroseis
**Instrumentation:** Check the up-to-date EUROSEISTEST stations history file at http://euroseisdb.civil.auth.gr/stations
**Power supply:** AC
**Housing:** in a greenhouse close to Profitis village

## 2. GEOGRAPHICAL INFORMATION / GEOMORPHOLOGY


**Figure 1:** Location map of GRA station

**Location:** in the Mygdonian basin
**Elevation (from sea level):** 61 m
**Station coordinates:** 23.289389$^0$E / 40.675442$^0$N
**Projection system:** WGS84
**Site morphology**: Valley center

## 3. GEOLOGICAL INFORMATION

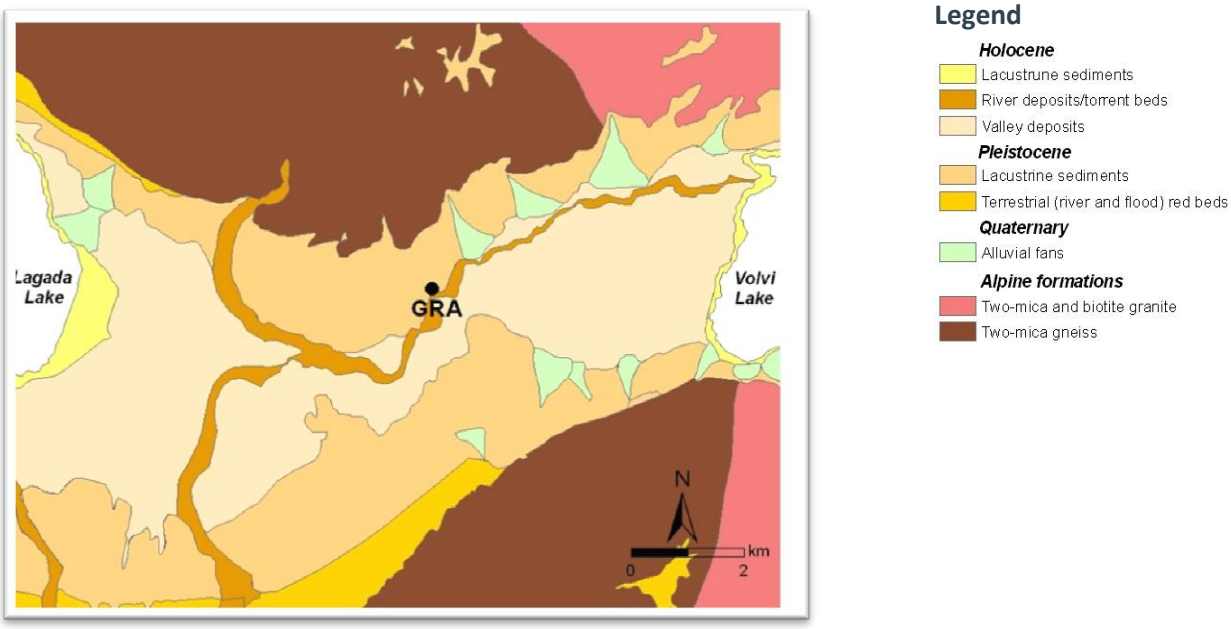


**Figure 2:** Geological map of the central Mygdonian basin

**Surface geology (from geological map):** on Holocene lacustrine sediments
**Reference for geological map:** Geological map of Greece - Scale 1:50000, Map Sheets of "Thermi" and "Zagliverion", (IGME, 1978)
**Boreholes (with core description) in the proximity of the station:** not known

## 4. GEOTECHNICAL SITE CHARACTERIZATION

**Geotechnical site characterization data for station GRA include:**

1. Sampling borehole (EUROSEISTEST Project Reports, 1993-1995).
2. Normal Penetration Test (EUROSEISTEST Project Reports, 1993-1995).
3. Cone Penetration Test (EUROSEISTEST Project Reports, 1993-1995).
4. Laboratory tests (G-γ-D curves, etc.) (EUROSEISTEST Project Reports, 1993-1995).

Data are available in ascii format in:
http://euroseisdb.civil.auth.gr/uploads/station/geotechnical/ 8/Site_characterization_geotechnical_GRA.txt

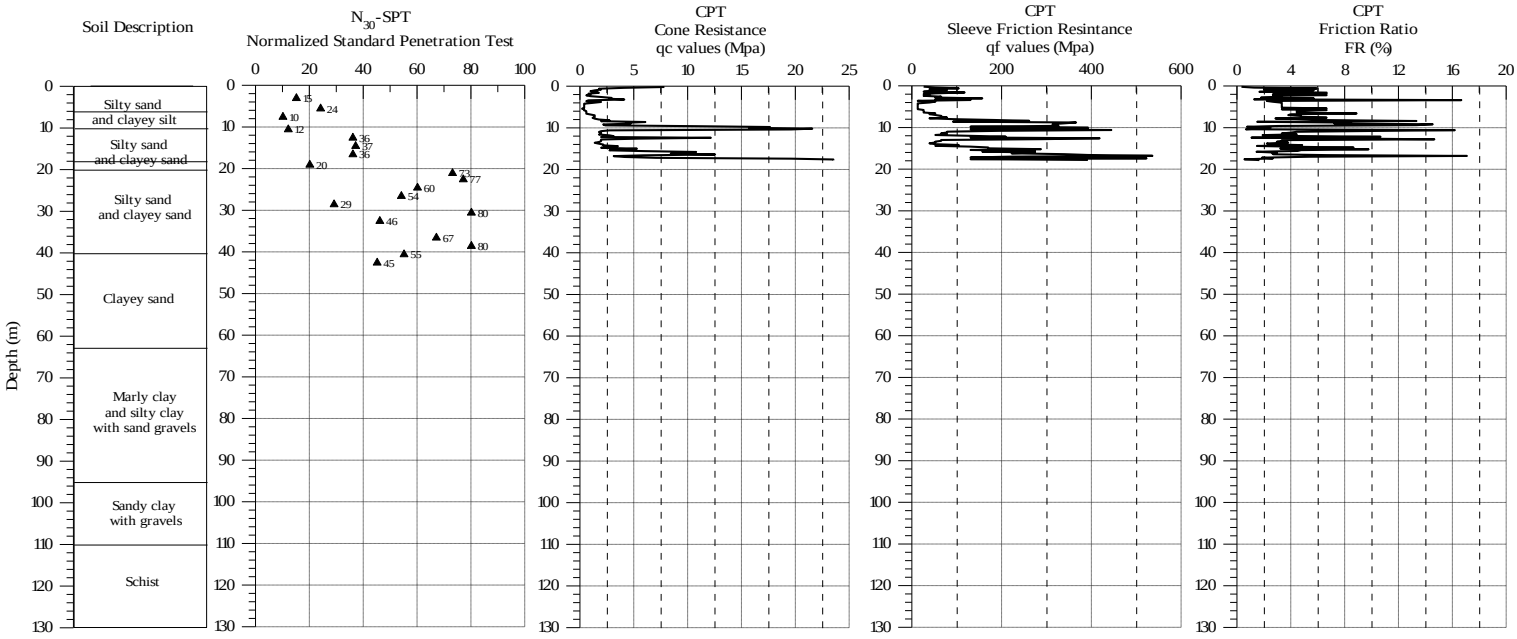


**Figure 3:** Geotechnical data at station GRA

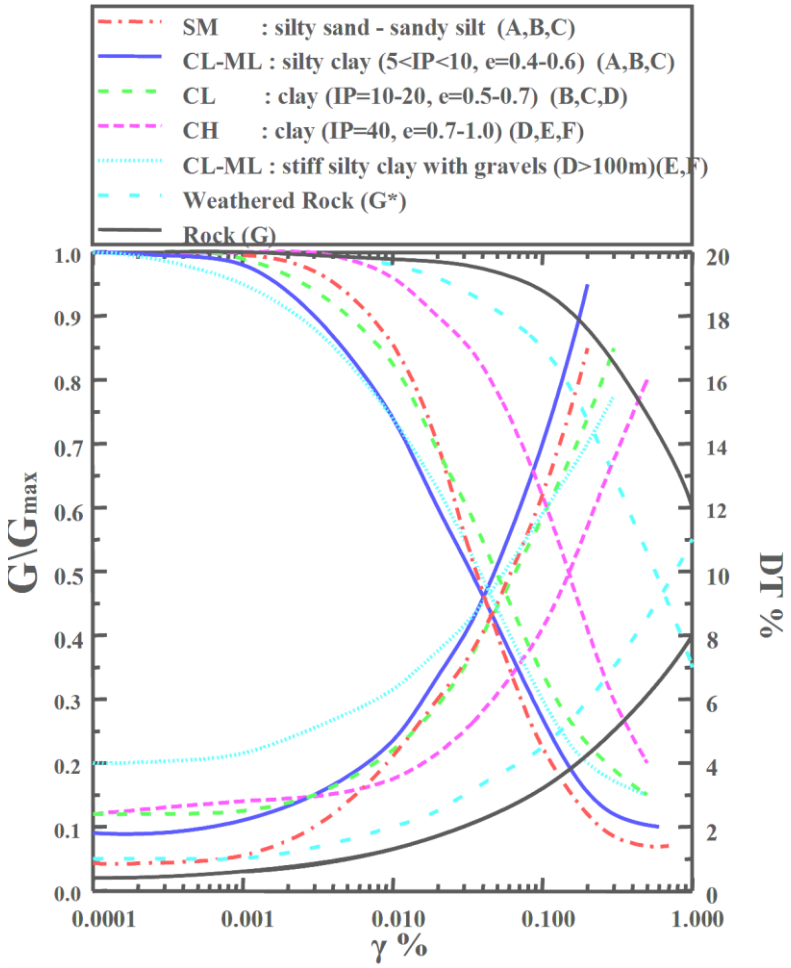


**Figure 4:** Mean G/Go-γ-D curves from resonant column and cyclic triaxial tests for all geotechnical formations occur at station GRA. The curves describe the shear modulus degradation with the shear strain and the respective internal damping increase.

## 5. GEOPHYSICAL SITE CHARACTERIZATION

**Geophysical site characterization data for station GRA include:**

1. Shear wave velocity values (Vs) / determined by Cross-Hole method (Raptakis et al., 2000).
2. Compression wave velocity values (Vp) / determined by Cross-Hole method (Raptakis et al., 2000).

Data are available in ascii format in:
http://euroseisdb.civil.auth.gr/uploads/station/geophysical/ 8/Site_characterization_geophysical_GRA.txt

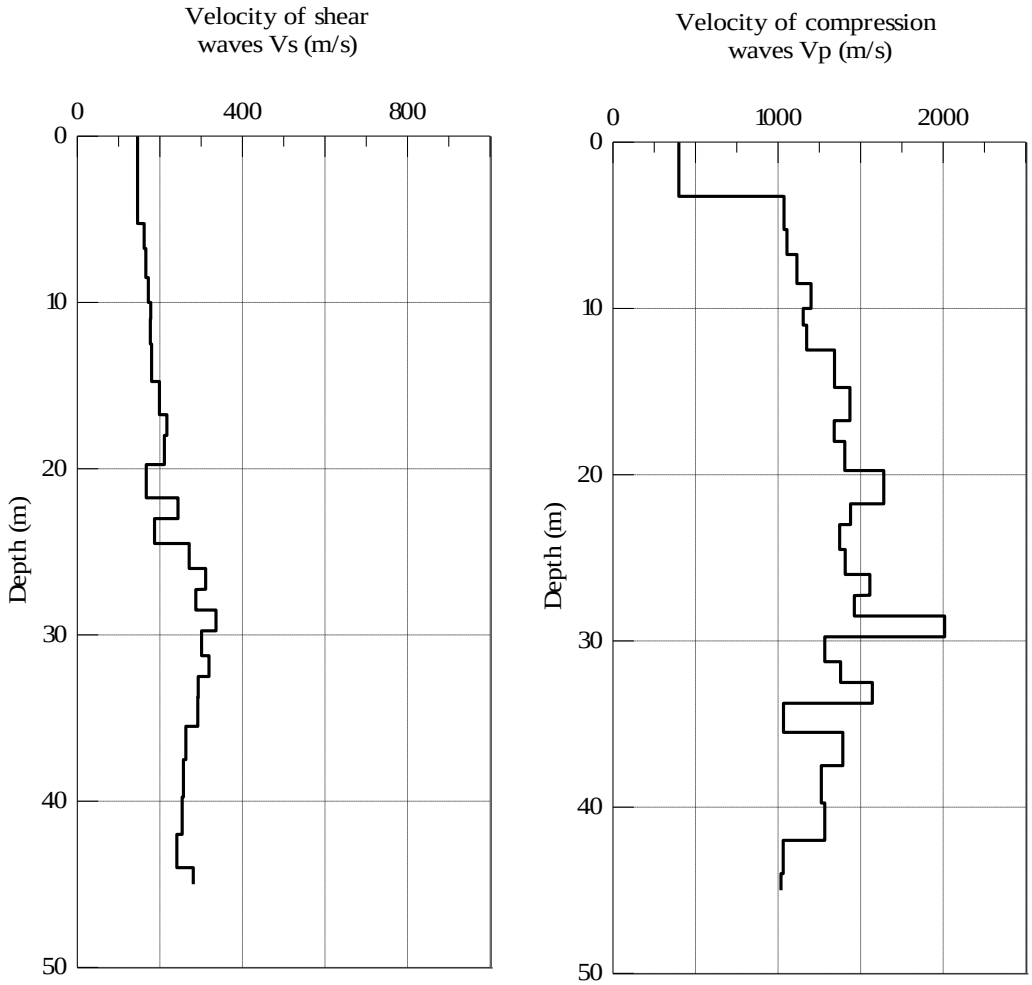


**Figure 5:** Shear and compression wave velocity values at station GRA

## 6. SITE RESPONSE

**Site response data for station GRA include:**

1. Standard Spectral Ratio technique (SSR) / applied on the whole part of earthquakes recorded in the permanent station GRA (Raptakis et al., 1998)

Data are available in ascii format in:
http://euroseisdb.civil.auth.gr/uploads/station/response/8/Site_response_GRA.txt

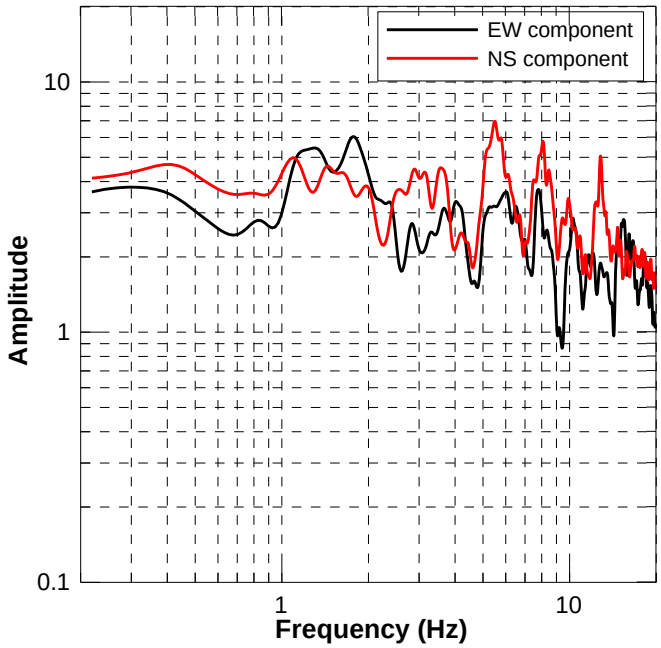


**Figure 6:** Standard Spectral Ratios (SSR) for the two horizontal components at station GRA. Ratios are based on the whole part of earthquakes recorded in the permanent station GRA

## 7. REFERENCES

EUROSEISTEST Project Reports, 1993–1995. *(Available in PDF upon request)*

EUROSEISRISK Project Reports, 2002–2005. *(Available in PDF upon request)*

IGME, 1978. Geological map of Greece - Scale 1:50.000. Map Sheets of "Thermi" and "Zagliverion".

Raptakis D, Theodulidis N, Pitilakis K., 1998. Data Analysis of the EURO-SEISTEST Strong Motion Array in Volvi (Greece): Standard and Horizontal-to-Vertical Spectral Ratio Techniques. Earthquake Spectra, Vol. 14(1), pp. 203-223.

Raptakis D., F.J. Chávez-García, K. Makra and K. Pitilakis, 2000. Site effects at Euroseistest Part I. Determination of the valley structure and confrontation of observations with 1D analysis, Soil Dynamics and Earthquake Engineering, Vol. 19, pp. 1-22.