

**GeALab – Applied Geophysics Laboratory for  
environmental geology, heritage  
and earthquake engineering  
- IGAG Milano and Montelibretti**



Institute of Environmental Geology and Geoengineering

\* No VAT charge

Description	Unit	Unit cost for Third Parties*	Unit cost for Research Institutions (-30%)*
<b>Surface geophysical surveys</b>			
Maximum costs for equipments transport and in-field operation preparation (fixed price including the <i>house-to-house</i> carriage and the round trip). Accessibility charges are excluded.	each	€ 250,00	€ 175,00
Additional price based on difficult conditions of carriage/logistics and/or carriage distances > 250 Km on road and/or in-field operation >1 work day.	to be estimated		
<b>HVSR measurements</b>			
Noise single-station acquisitions through three-component velocimetric sensors with eigen-frequency <= 1 Hz for site natural frequencies estimates. Interpretation and reports are included: to a maximum of 6 measurements for each work day	each	€ 120,00	€ 84,00
more than than 6 measurements for each work day	each	to be estimated	
<b>Seismic-seismological monitoring</b>			
Earthquakes monitoring at single station through three-component velocimetric sensors with eigen-frequency <= 1 Hz; sampling frequency ≥ 100 Hz; GPS sincronization. Continous seismic recordings with stand-alone data backup, solar panels installation and data analyses in terms of: P-S arrives detection, HVSRs, Receiver Functions, Standard Spectral Ratios, are included in the price.	month	€ 1.200,00	€ 840,00
Network of seismic stations. Installation of the network with a number of stations > 5 and a recording duration > 1 month.	to be estimated		
<b>Multisensor active recording arrays and 2D multisensor passive recording arrays</b>			
Multichannel Analysis of Surface Waves (MASW) with vertical geophones. Interpretation and reports are included.	linear meter	€ 16,00	€ 11,20
Extra cost for P wave refraction interpretation	linear meter	€ 4,80	€ 3,36
Extra cost for horizontal geophones use	linear meter	€ 4,80	€ 3,36
2D multisensor passive recording arrays with vertical geophones (ESAC, f-k, MSPAC techniques). Interpretation and reports are included.	each	€ 1.000,00	€ 700,00
Extra cost for horizontal geophones use.	each	€ 300,00	€ 210,00
2D multisensor passive recording arrays with seismic stations (ESAC, f-k, MSPAC techniques). Interpretation and reports are included.	each	€ 2.200,00	€ 1.540,00
<b>Near surface seismic refraction surveys: Seismic tomography and seismic imaging</b>			
Seismic refraction prospecting: seismic profiles with at least 24 geophones and 7 shots (5 internal and 2 external to the base), installation, acquisition processing of the data, with tomographic techniques and with Stacked Refraction Convolution Section method. Final reports are included:			
with seismic-gun or sledge-hammer, geophones spacing 2 m; seismo stratigraphic sections and in field topographic profile surveys are included.	linear meter	€ 13,00	€ 9,10
with seismic-gun or sledge-hammer, geophones spacing 5 m; seismo stratigraphic sections and in field topographic profile surveys are included.	linear meter	€ 12,00	€ 8,40
with seismic-gun or sledge-hammer, geophones spacing 10 m; seismo stratigraphic sections and in field topographic profile surveys are included.	linear meter	€ 10,00	€ 7,00
High resolution seismic tomography. Acquisition with accelerated mass drop system 'Minipulse' (energy 2400 joule) with geophones spacing and source distance 5 m - 10 m. Minimum line length > = 500 m	to be estimated		
Additional price based on difficult conditions of carriage/logistics and/or carriage distances > 250 Km on road and/or in-field operation >1 work day.	to be estimated		
Additional price for S waves acquisition and processing (until 50%)		€ 50,00	€ 35,00

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<b>High resolution seismic reflection surveys</b>			
Geophysical prospecting with high-resolution seismic reflection method, maximum depth of investigation from 100 to 200 m, seismic bases with at least 48 geophonic groups, geophones spacing 2-5 m, minimum 48-recording channels, minimum coverage 2400%. Data processing with tomographic technique, seismic-stratigraphic sections, three-dimensional model of the subsoil, final report, original records and Vs30 value are included:			
with geophones spacing 2m	linear meter	€ 33,00	€ 23,10
with geophones spacing 5m	linear meter	€ 28,00	€ 19,60
additional price for coverage 4800%	linear meter	€ 22,00	€ 15,40
<b>Down-hole measurements</b>			
Maximum costs for equipments transport and in-field operation preparation (fixed price including the house-to-house carriage and the round trip). Accessibility charges are excluded.	€		385,00
Additional price based on difficult conditions of carriage/logistics and/or carriage distances > 250 Km on road and/or in-field operation > 1 work day.		to be estimated	
Down-hole tests in P and/or S waves in pre-equipped boreholes. Digital seismograph, two sensors with three orthogonal components and source placed at a distance of 3 m from the center of the borehole are used. At least 1m resolution in depth is guaranteed. P wave source with vertical impact and S+ and S- wave sources with opposite horizontal impacts are included in the price. Interpretation and reports are included.	linear meter	€ 60,00	€ 42,00
<b>GEORADAR SURVEYS</b>			
Geophysical prospecting with continuous and non-destructive Radar methodology, with different frequencies antennas to provide the better requested resolution. The location of the lines, density of the mesh type and the antenna configuration depend from the lithotypes to investigate, the investigation depth and the required resolution. Data stored on digital support for computer processing, as well as data processing with radar-grams, Radar-stratigraphic sections with indication of the depth of anomalies are included:			
Maximum costs for equipments transport and in-field operation preparation (fixed price). Accessibility charges are excluded.	€		385,00
outside profiles along ground surfaces	linear meter	€ 7,00	€ 4,90
tunnel profiles	linear meter	€ 10,00	€ 7,00
georadar prospecting in borehole, with Tx and Rx borehole antennas, including data processing along vertical sections.	linear meter	€ 15,00	€ 10,50
Cross-Hole radar prospecting, between two vertical boreholes, with continuous measurement d between the holes and data processing:			
for depths up to 40 m	linear meter	€ 89,00	€ 62,30
for depths greater than 40 m	linear meter	€ 104,00	€ 72,80
<b>MAGNETIC GRADIOMETER SURVEYS</b>			
Maximum costs for equipments transport and in-field operation preparation (fixed price). Accessibility charges are excluded.	€		250,00
Gradiometric surveys for each meter of profile, for a total acquired lines > = 500m in continuous	linear meter	€ 0,50	€ 0,35

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<b>GEOELECTRICAL SURVEYS</b>			
Maximum costs for equipments transport and in-field operation preparation (fixed price). Accessibility charges are excluded.	€		385,00
Vertical electrical surveys acquisition, all field operations, installation and removal of the equipment, final report with attachments are included:			
A-B to 100 m (minimum 10 S.E.V.)	each	€ 183,00	€ 128,10
A-B to 200 m (minimum 5 S.E.V.)	each	€ 210,00	€ 147,00
A-B to 400 m (minimum 4 S.E.V.)	each	€ 301,00	€ 210,70
A-B to 600 m (minimum 2 S.E.V.)	each	€ 597,00	€ 417,90
Resistivity profiles with Schlumberger method, acquisition considering three electrode distances (AB = 50 m, AB = 100 m and AB = 200 m), and MN = 5 m, interpretation and graphic rendering of data are included.	linear meter	€ 5,40	€ 3,78
Mise a la mase survey with a first electrode placed in the resurgence point and a second one placed at infinity. Interpretation and graphic rendering of data are included:			
mesh 5x5 m at the measuring point	each	€ 19,00	€ 13,30
mesh 10x10 m at the measuring point	each	€ 26,00	€ 18,20
Electro-tomographic surveys for highly detailed resistive and characterization of the structures along two-dimensional sections. The measurements are carried out with specific instruments with automatic control of the measurement cycles, according to the different traditional electrode configurations (Schlumberger, Wenner, Dipole-dipole, etc.). The data processing must be carried out with two-dimensional inversion programs:			
electro-tomographic prospecting with at least 48 electrodes, and electrodic interval 1 m	linear meter	€ 10,00	€ 7,00
electro-tomographic prospecting with at least 48 electrodes, and electrodic interval 3 m	linear meter	€ 9,00	€ 6,30
electro-tomographic prospecting with at least 48 electrodes, and electrodic interval 5 m	linear meter	€ 8,00	€ 5,60
electro-tomographic prospecting with at least 48 electrodes, and electrodic interval 10 m	linear meter	€ 7,00	€ 4,90
<b>STRUCTURES MONITORING AND VIBROMETRY</b>			
Maximum costs for equipments transport and in-field operation preparation (fixed price including the house-to-house carriage and the round trip). Accessibility charges are excluded.	€		385,00
Dynamic analysis of structural elements (beams, slabs, columns) in order to compare the modal parameters among homologous structural elements and to evaluate their congruence with the numerical reference models, by means of the detection of the oscillation characteristics using the responses obtained at accelerometers or seismometers of adequate eigen-frequency respect to the tested item. The processing of the acquired data, in terms of displacement, velocity, acceleration and response spectra, are included. The price refers to a single structural element tested in 2 survey points.	each	€ 879,00	€ 615,30
Vibrometric test for vibrations monitoring of explosions or other sources using highly dynamic data acquisition units and three-dimensional velocimetric sensors with resonance frequency <= 1 Hz, and record in continuous, maximum sampling frequency, 250 / sec. Data processing with velocity, acceleration and frequency spectra determination, comparison with reference standard DIN 4150 and final report drafting are included:			
for each measurement point	h	€ 100,00	€ 70,00
for complex case studies or works which require very long acquisitions		to be estimated	
Data interpretation and final reports.		to be estimated	