



ITACA (ITalian ACcelerometric Archive)

# RAN

## *Rete Accelerometric Nazionale*

*(National Accelerometric Network)*

Recording Station

**Valle dell'Aterno  
(AQ)**

Station Code

**AQA**

	Day	Month	Year
<b>First compilation</b>	17	october	2006
<b>Last update</b>	28	october	2008

# General Information

Station  
photograph



Code

**AQA**

Owner

**DPC (Italian Civil Protection Department)**

Type of network

**Permanent**

Activation date

**17 April 2001**

Removal date

-

Instrument type

**Digital**

Instrument  
model

-

Location

**Aterno River bank (hydrographic right side). Near Guardia di Finanza barrack**

Housing

**Free field**

Notes

-

# Geographical Information (1)

## Location

Region **Abruzzo**

Province **L'Aquila**

City **L'Aquila**

Place / Address **Coppito**

ISTAT Code **13066049**

Notes **-**



Location map  
(Italy and Region)

# Geographical Information (2)

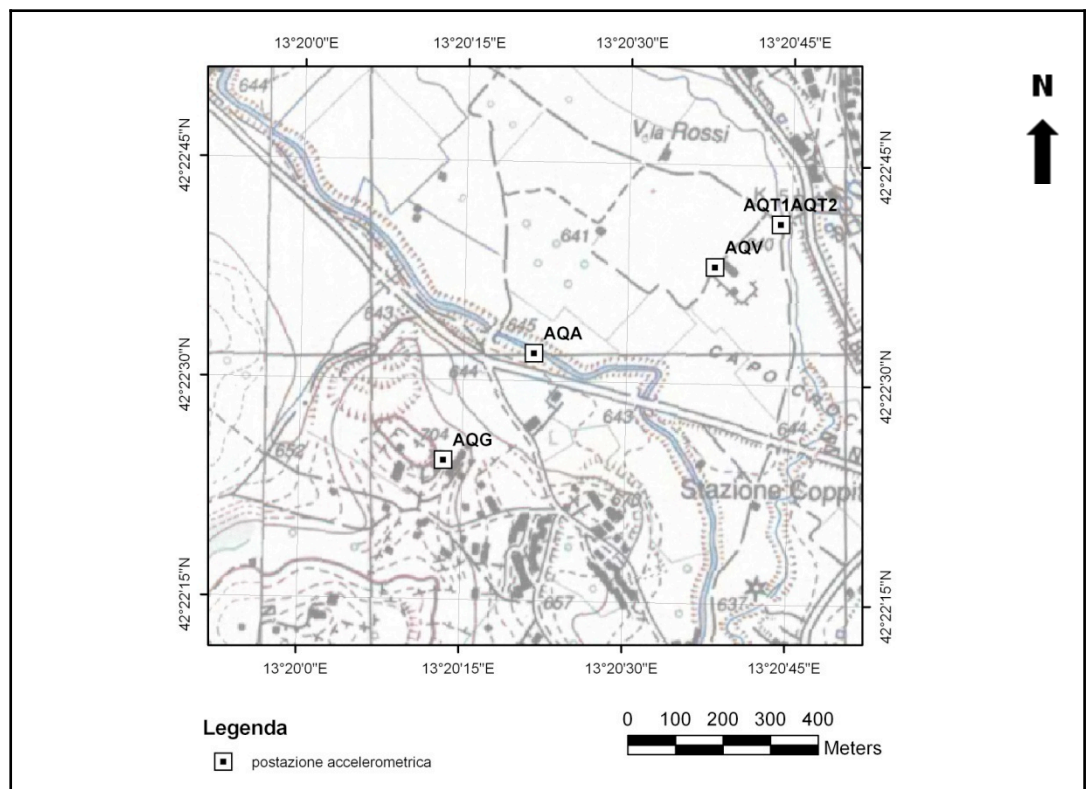
## Coordinates

	Latitude	Longitude
Geographic (WGS84)	<b>42.375530</b>	<b>13.339298</b>
UTM (WGS84 zone 33)	<b>4692807.9</b>	<b>363274.44</b>
Gauss-Boaga (M.M. fuso 2)	<b>4692903</b>	<b>2383265</b>
Elevation (m a.s.l.)	<b>693</b>	

## Cartography

	Scale	Code
Topographic map (I.G.M.I.)	<b>1:25.000</b>	<b>139 II SE</b>
	Scale	Element number
Regional technical map (C.T.R.)	-	-

I.G.M.I. map



# Geomorphology

## Site morphology

Plain	<b>Valley (centre)</b>	<b>Valley (edge)</b>	Alluvial fan
Saddle	Slope	Edge of scarp	Ridge

## Landslides

Not present

Present

Active or quiescent

Inactive or stabilized

Distance (m)

I.F.F.I. map

Notes

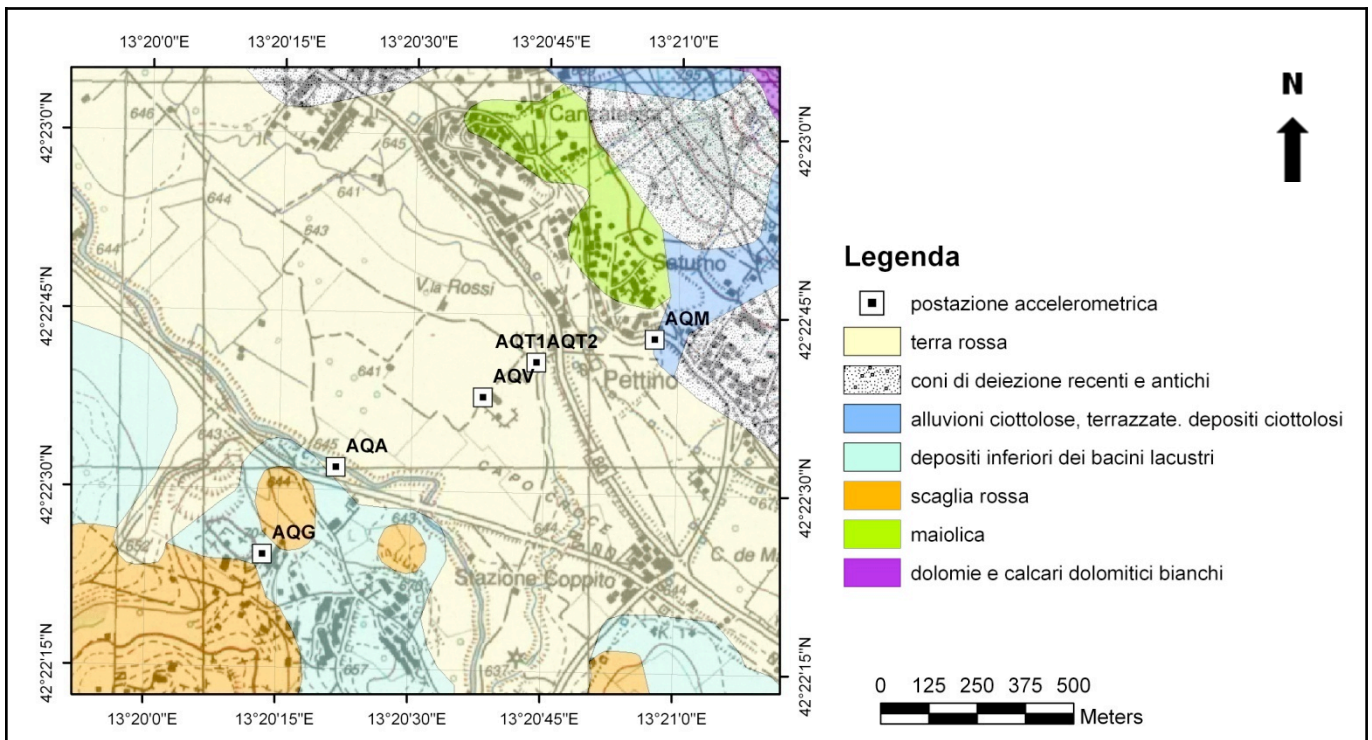
-



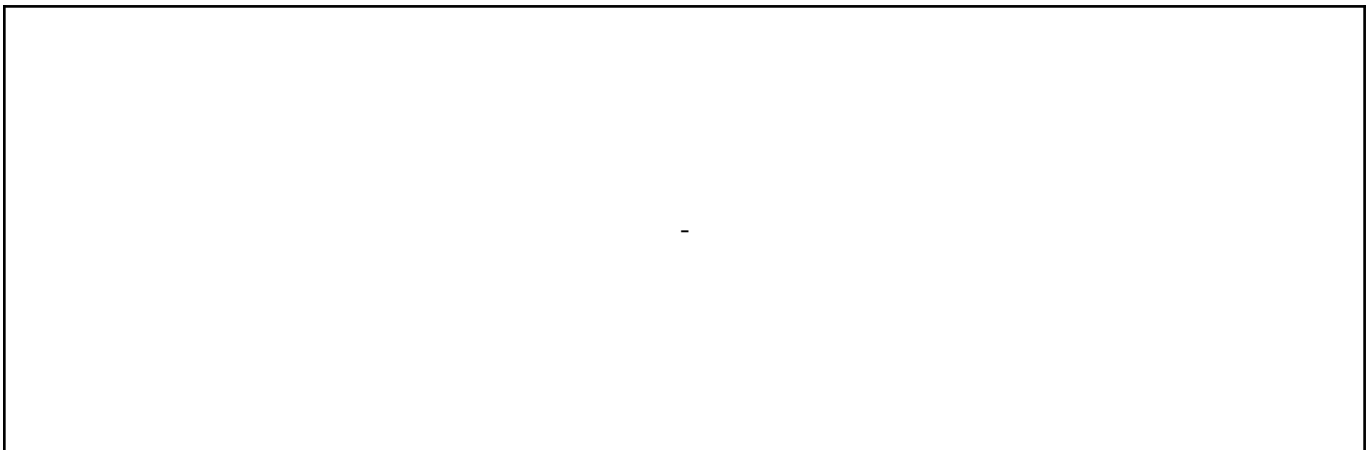
# Geology

## Cartography

Geological map	Scale	Sheet number	Sheet name
	<b>1:100.000</b>	<b>139</b>	<b>L'Aquila</b>



## Geological cross section



Fault



present

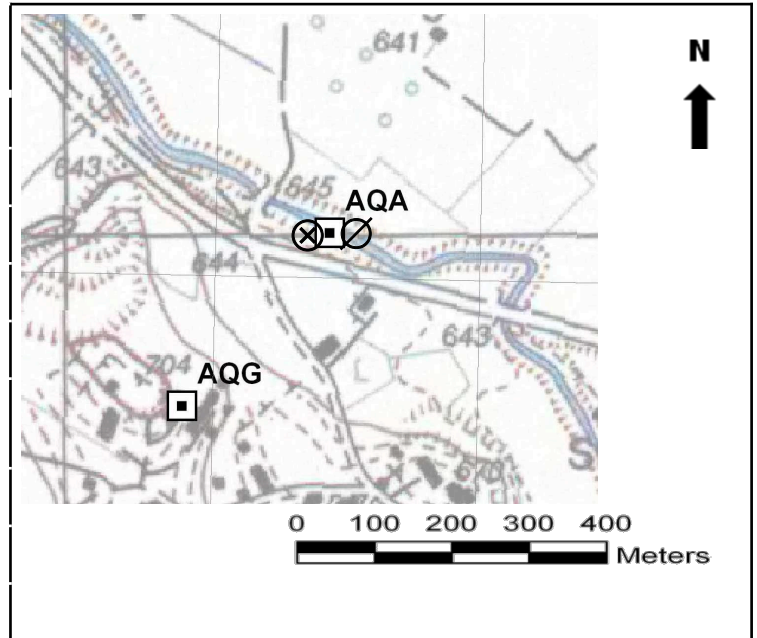
(if fault-station distance < 300 m)

Notes

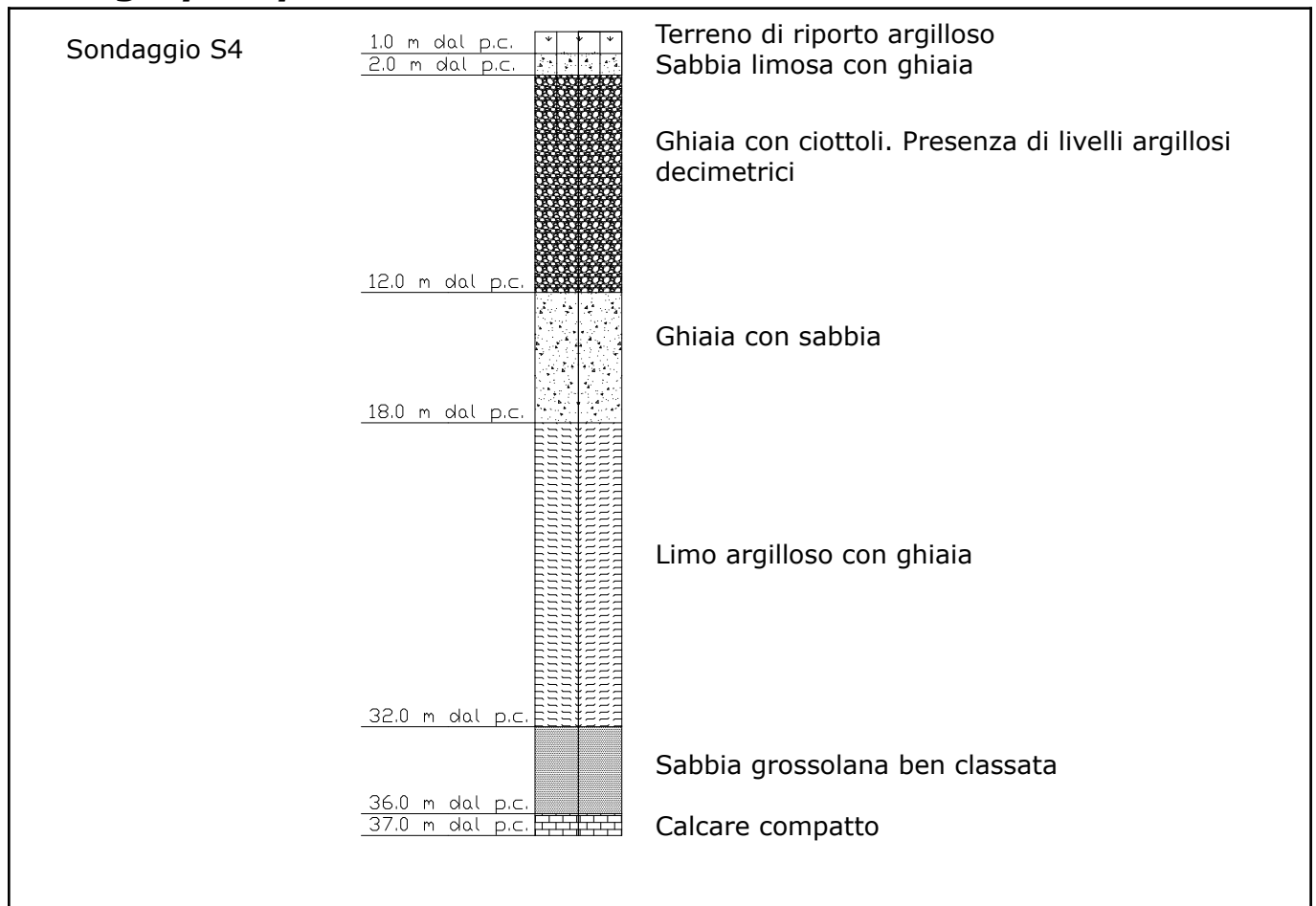
# Geotechnical & Geophysical Information (1)

## Test summary and location

X	⊗	Borehole
	P	Piezometer
	▲	Penetration tests (SPT, CPT)
	⊕	Down-Hole, Cross-Hole (DH, CH)
	∇-∇	Seismic refraction/reflection
	O	SASW, MASW
X	⊘	Spectral Ratio (H/V)
	◇-◇	Geoelectric
		Lab tests



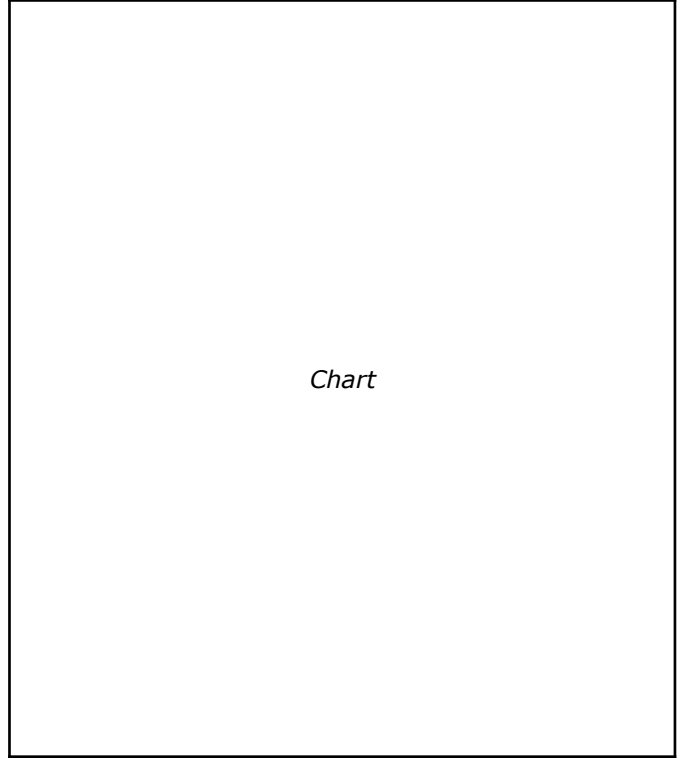
## Stratigraphic profile



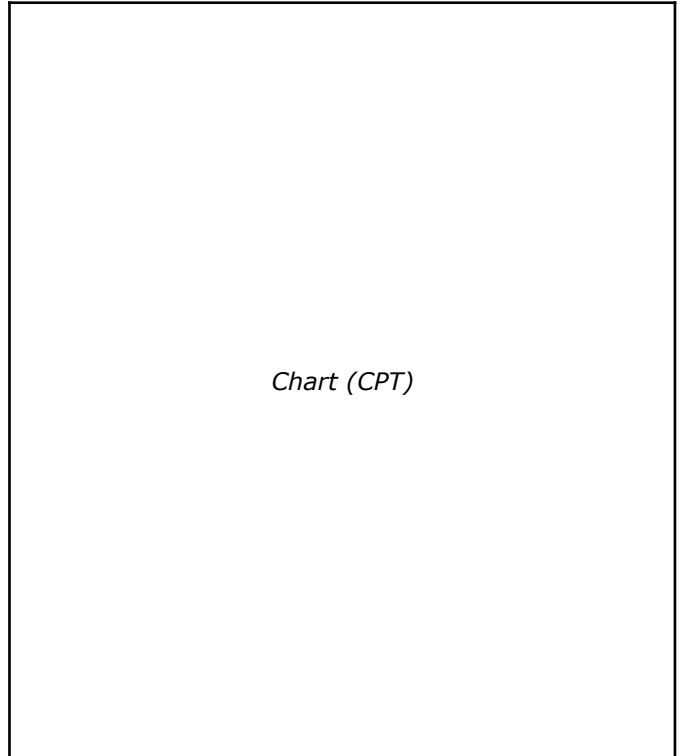
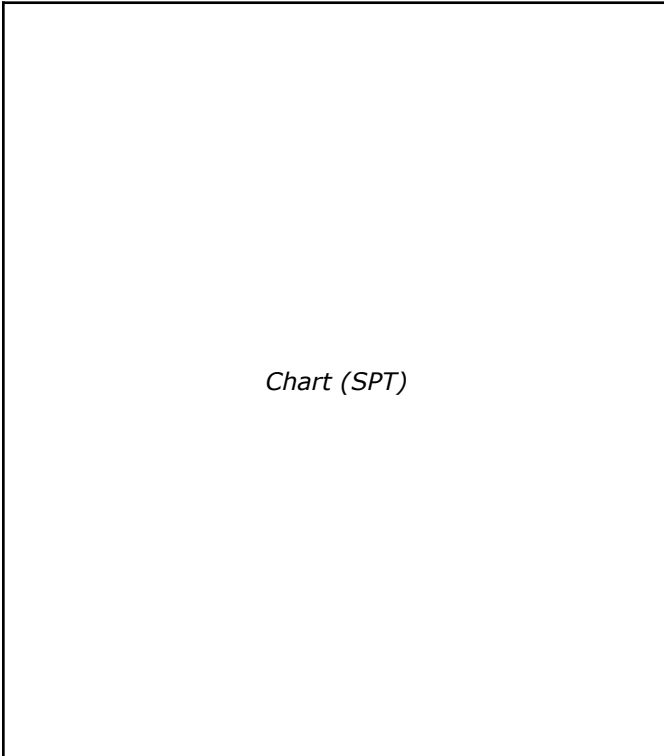
# Geotechnical & Geophysical Information (2)

## ***In situ Tests: Piezometric measurements***

*Table*



## ***In situ Tests: Penetration Test (SPT, CPT)***





# Geotechnical & Geophysical Information (3)

***In situ Tests:*** Down-Hole (DH), Cross-Hole (CH), SASW, MASW

*Table 1*

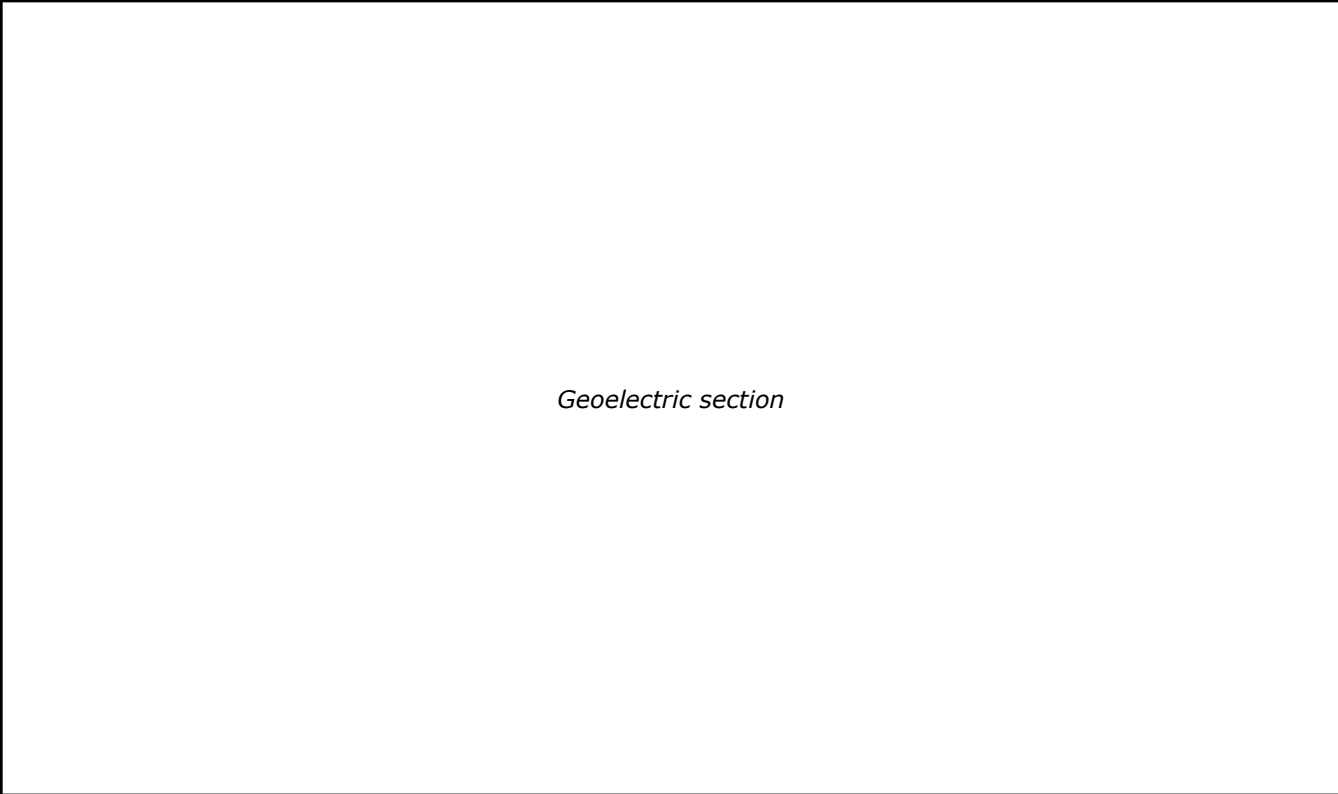
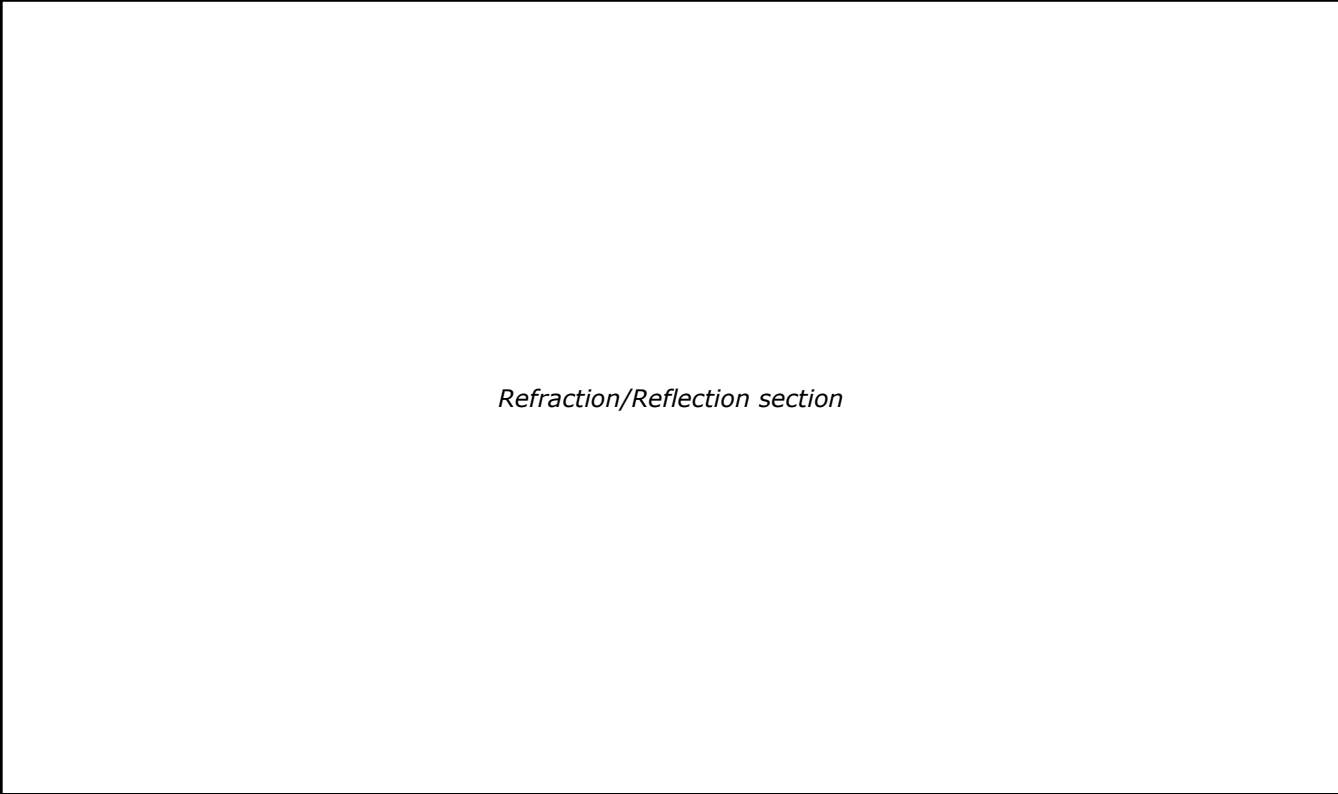
*Chart 1*  
*Depth (m) - Vs*

*Table 2*

*Chart 2*  
*Depth (m) - Vs*

# Geotechnical & Geophysical Information (4)

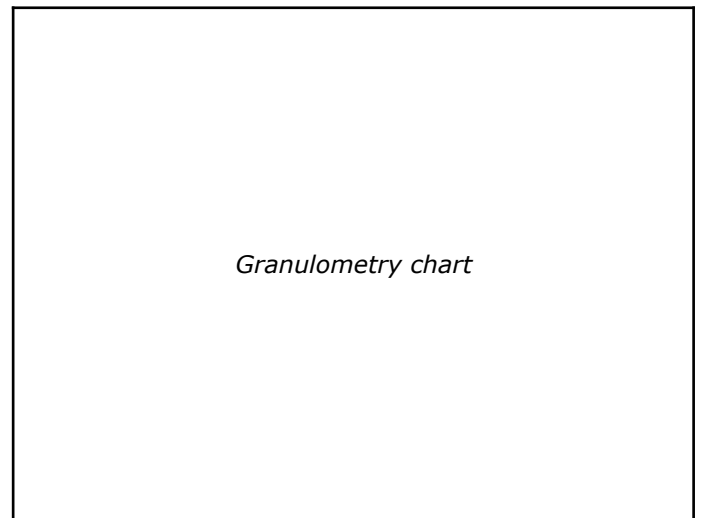
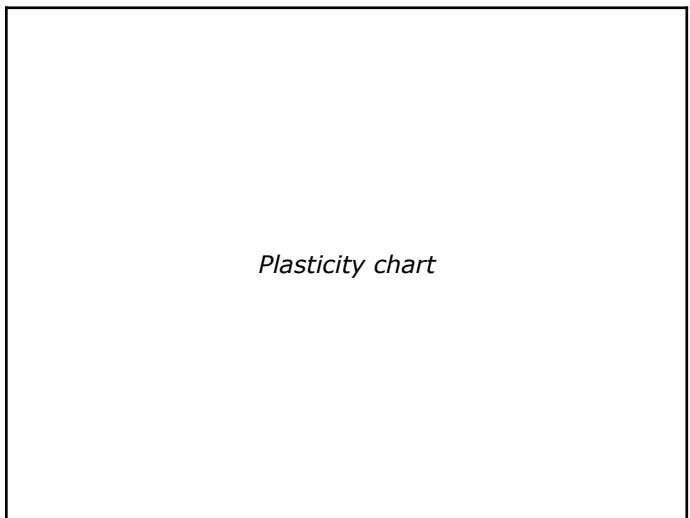
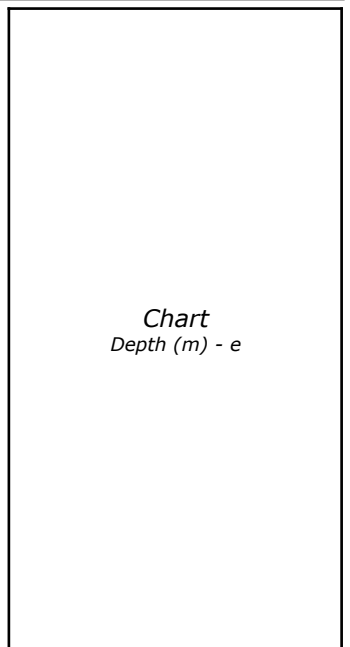
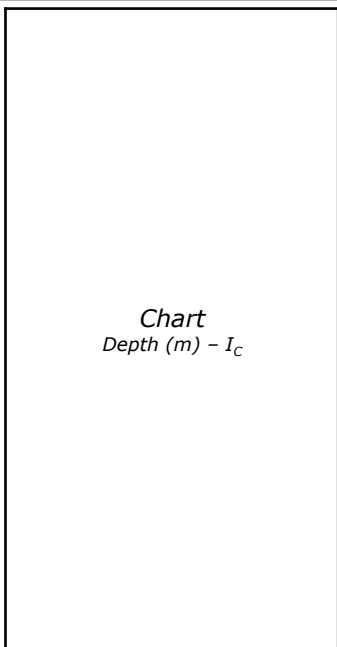
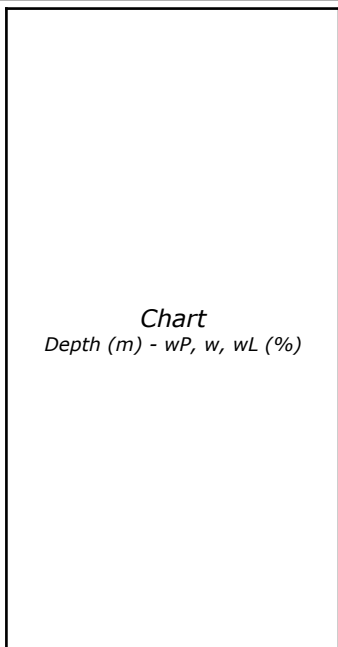
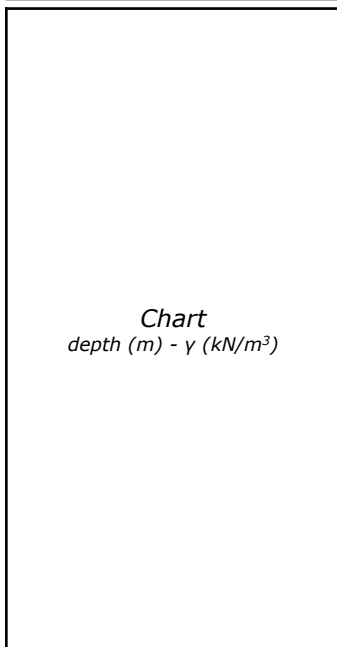
**In situ Tests:** Refraction/Reflection section – Geoelectric section



# Geotechnical & Geophysical Information (5)

## Laboratory Tests: physical properties

Borehole	Sample	Depth (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	w (%)	$\gamma_s$ (kN/m <sup>3</sup> )	$\gamma$ (kN/m <sup>3</sup> )	$w_L$ (%)	$I_p$ (%)	$I_c$	A	e



# Geotechnical & Geophysical Information (6)

## Laboratory Tests: Direct shear/Triaxial tests

Table

Chart

Table

Chart

**Legend**

DS = Direct shear

CIU = Triaxial-Consolidated Undrained

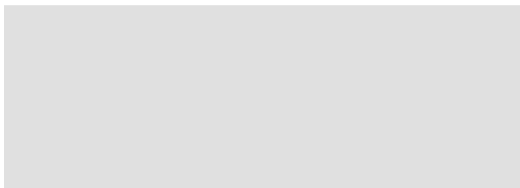
CID = Triaxial-Consolidated Drained

UU = Triaxial-Unconsolidated Undrained

**Average values of mechanical parameters**

Litotype	$c'$ (kPa)	$\phi'$ ( $^{\circ}$ )	$C_{c1}$ (kPa)

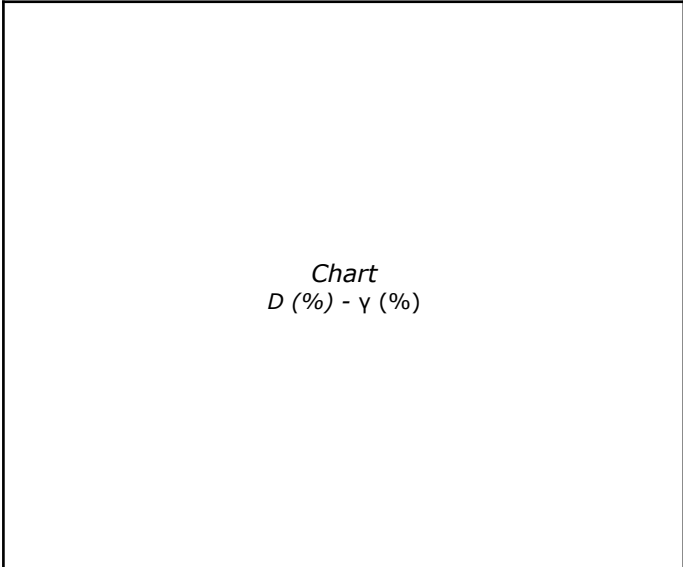
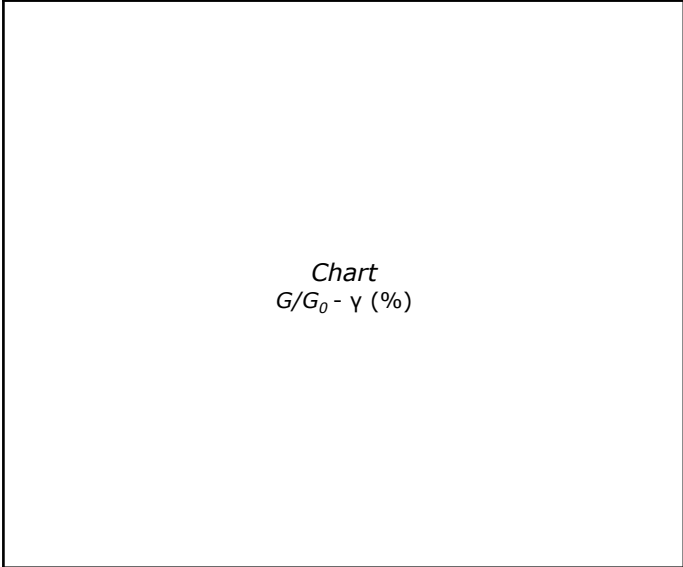
Note



# Geotechnical & Geophysical Information (7)

## Laboratory Tests: Resonant Column (RC)

Borehole / Sample / Depth (m)													
	Y (%)												
	G/G <sub>0</sub>												
	D (%)												
	Y (%)												
	G/G <sub>0</sub>												
	D (%)												
	Y (%)												
	G/G <sub>0</sub>												
	D (%)												

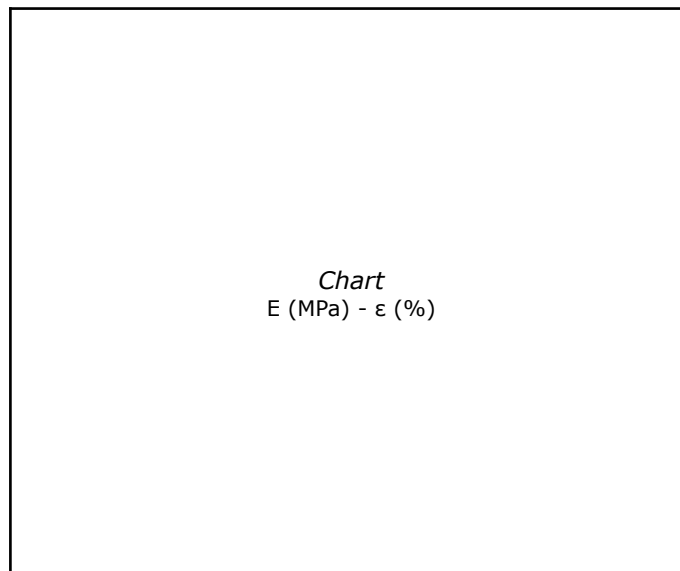




# Geotechnical & Geophysical Information (8)

## Laboratory Tests: Cyclic Triaxial (CTX)

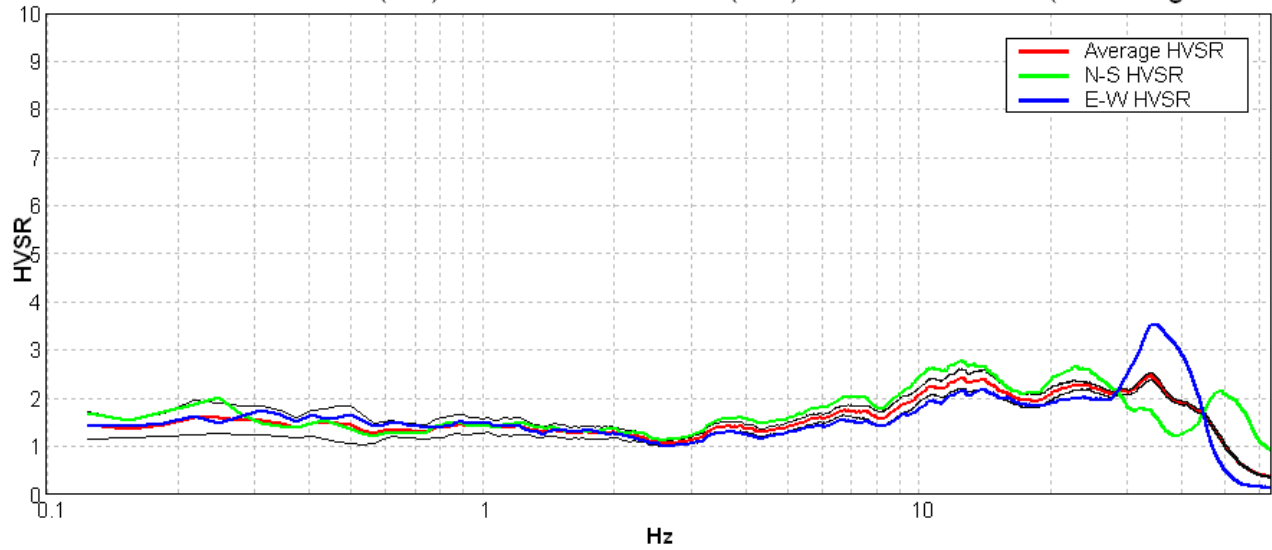
Borehole / Sample	$p'_c$ (MPa)												
		$\epsilon$ (%)											
		E (MPa)											
		$\epsilon$ (%)											
		E (MPa)											
		$\epsilon$ (%)											
		E (MPa)											



# Microtremor H/V spectral ratio

Table

HVSR at  $12.53 \pm 1.35$  Hz. Max.(N-S)/V:  $12.53 \pm 1.9$  Hz. Max.(E-W)/V:  $14.13 \pm 2.34$  Hz. (In the range 0.0 - 20.



$f_0$  (mt) (Hz)

Date of measurements

Day	Month	Year
<input type="text"/>	<input type="text"/>	<input type="text"/>

# Earthquake H/V spectral ratio

Table

Chart

$f_0$  (eq) (Hz)

List of selected records from ITACA

Year-Month-Day\_Hour:Minute:Second

Year-Month-Day_Hour:Minute:Second

# Site classification (EC8 – NTC2008)

## Lithostratigraphic classification

### Estimated

Method <sup>1</sup>	Soil class <sup>2</sup>	Notes

Legend	1	GEO Geological data
		EC Empirical correlation
		HV H/V spectral ratio

### Based on in-situ measurements

Method <sup>3</sup>	$V_{s30}$ (m/s)	Soil class <sup>3</sup>

Legend	2	A	Rock or other rock-like geological formation, including at most 5 m of weaker material at the surface ( $V_{s30} > 800$ m/s).	Legend	3	CH	Cross-Hole
		B	Deposits of very dense sand, gravel, or very stiff clay, at least several tens of m in thickness, characterised by a gradual increase of mechanical properties with depth ( $V_{s30} = 360-800$ m/s).			DH	Down-Hole
		C	Deep deposits of dense or mediumdense sand, gravel or stiff clay with thickness from several tens to many hundreds of m ( $V_{s30} = 180-360$ m/s).			MW	MASW
		D	Deposits of loose-to-medium cohesionless soil (with or without some soft cohesive layers), or of predominantly soft-to-firm coesive soil ( $V_{s30} < 180$ m/s).			SH	SH-Refraction
		E	A soil profile consisting of a surface alluvium layer with $V_s$ values of type C or D and thickness varying between about 5 m and 20 m, underlain by stiffer material with $V_s > 800$ m/s.			SW	SASW

## Topographic classification

Topographic category <sup>4</sup>
T1

Legend	4	T1	Flat surface, isolated slopes and cliffs with average slope angle $i \leq 15^\circ$ .
		T2	Slopes with average slope angle $i > 15^\circ$ .
		T3	Ridges with crest width significantly less than the base width and average slope angle $15^\circ \leq i \leq 30^\circ$ .
		T4	Ridges with crest width significantly less than the base width and average slope angle $i > 30^\circ$ .

# Synthesis of information

## Information relevant to site classification

## Notes

$V_{s30}$  (m/s)

-

Average  $N_{SPT}$  to 30m

-

Average  $c_u$  to 30m (kPa)

-

Site class (EC8 – NTC2008)

-

Topographic category (EC8 – NTC2008)

T1

## Geological and geomorphological information

Lithology

Gravel, silt and sand layers

Morphology

Valley  
centre/  
edge

## Other information relevant to seismic site response

Depth to bedrock (m)

> 36

Average  $V_s$  to bedrock (m/s)

-

$f_0$  from H/V microtremors (Hz)

-

$f_0$  from H/V earthquakes (Hz)

-

Observed anomalies of station response

-



# References

## ***Geomorphology & Geology***

Carta geologica d'Italia in scala 1:100.000 – Foglio n. 139 "L'Aquila". Servizio Geologico Nazionale
Petitta M. e Tallini M. (2003). <i>Groundwater resources and human impacts in a quaternary intramontane basin (L'Aquila Plain, Central Italy)</i> . Water International, Volume 28, number 1
Sito web del Progetto IFFI: <a href="http://www.mais.sinanet.apat.it/cartanetiffi/">http://www.mais.sinanet.apat.it/cartanetiffi/</a>

## ***Geotechnical & Geophysical Information***

Microtremor measurements by DPC

# Enclosures

## ***List***

N.	Description