ISTITUTO NAZIONALE DI GEOFISICA E VULCANOLOGIA

Geological report at the seismic station IT.ATI – Atina (Frosinone)

Report geologico per il sito della stazione sismica IT.ATI – Atina (Frosinone)

Working Group: **Deborah DI NACCIO** **Daniela FAMIANI** **Luca MINARELLI**	Date: December 2019
Subject: **Final report illustrating the geological setting for station IT.ATI**	

Convenzione DPC-INGV 2019-21, All.B2- WP1, Task 2: "Caratterizzazione siti accelerometrici" (Coord.: G. Cultrera, F. Pacor)
Cite as: Working group INGV "Agreement DPC-INGV 2019-21, All.B2- WP1, Task 2", (2019). Geological report at the seismic station *IT.ATI – Atina*. http://hdl.handle.net/2122/12960

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1. INTRODUCTION

The geological description is related to the site of studied seismic station. The coordinates are reported in Table 1.

Table 1.

CODE	NAME	LAT [°]	LON [°]	ELEVATION [m]
IT.ATI	Atina (Frosinone)	41.62197	13.79480	444*
ADDRESS	1247, Via Sferracavallo, Atina, FR 03042, 03042 Atina FR, Italy			

* Coordinates from ITACA (Dec. 2019)

2. TOPOGRAPHIC AND GEOLOGICAL INFORMATION

Topographic information related to the site are reported in Table 2. Table 3 summarizes all available geological maps from literature for geological analyses.

Table 2.

Topography	Description	Topography Class	Morphology Class	EC8 Class
	reliefs with ridge top width much smaller than the base and slope 15°≤i<=30°	T3	SL*	B

*According to the nomenclature of ITACA (Dec. 2019)

Table 3.

Geological map	Source	Scale
IT.ATI	Geological map of Italy sheet *160* (Cassino)	1:100.000
IT.ATI	Carta Geologica-Tecnica per la Microzonazione Sismica di Livello 1, Regione Lazio, comune di Atina (2012)	1:10.000

In Table 4 Geological, Lithological and Lithotechnical Units (according to Seismic Microzonation classification; Technical Commission MS, 2015) are described and are concerned to maps of following chapters. The term "original" means the result comes from a preexisting cartography (Table 3); the term "deduced" means the result comes from an interpretation of a preexisting cartography according to the nomenclature of corresponding cartography.

Table 4

GEOLOGICAL UNITS		**LITHOTECHNICAL UNIT**	
(100k Geological map of Cassino) *original*		(MZS) *original*	
code	**description**	**code**	**description**
G	Dolostone	LP	Geological bedrock. Stony rocks

3. GEOLOGICAL MAP

In Figure 1 Geological Map is reported in a 1kmx1Km square around the station.

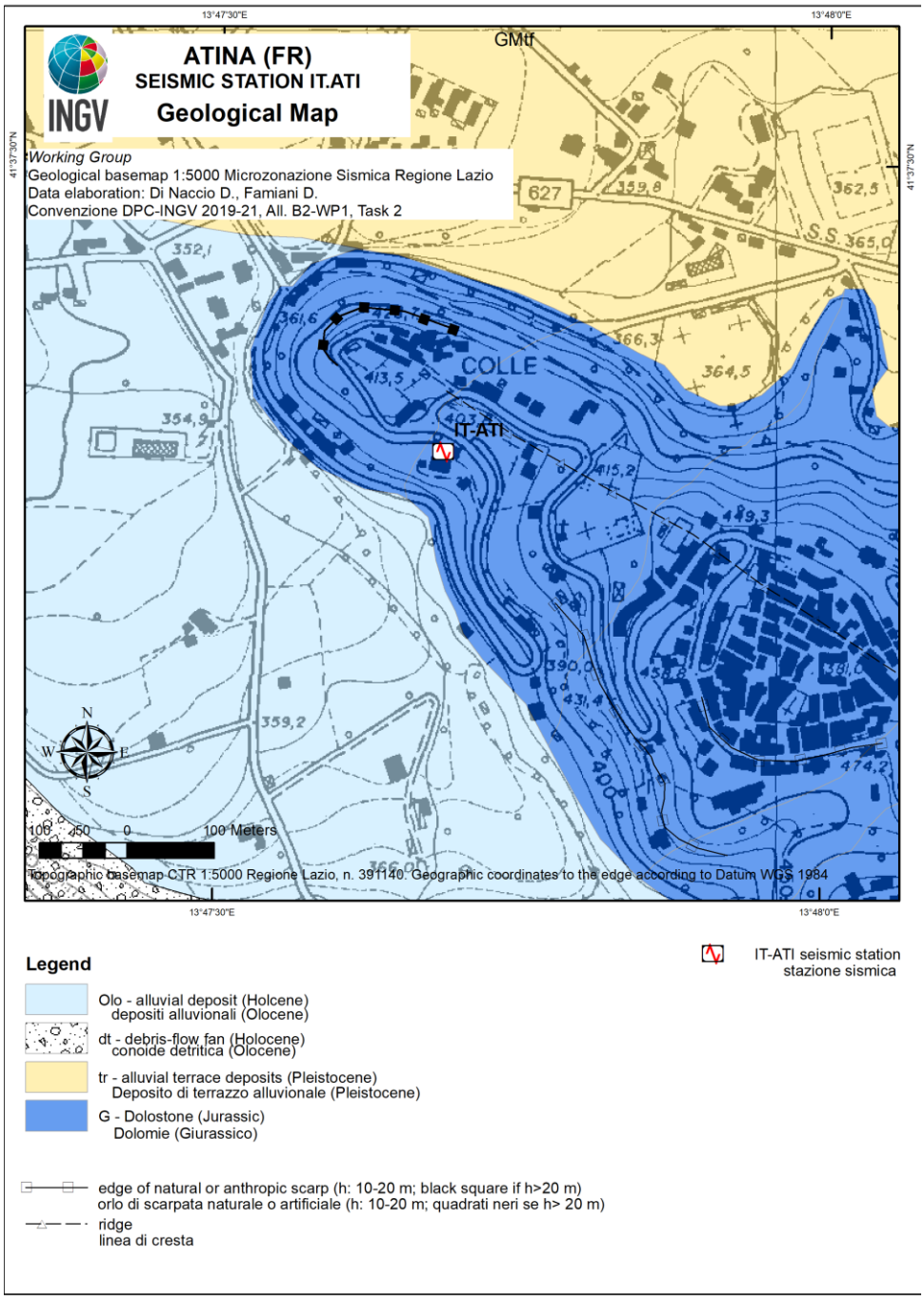

Figure 1. Geological map of seismic station IT.ATI. Scale 1:5.000. Geological units are established according to the nomenclature of geological map of Italy 1:100.000 (Sheet 160-Cassino).

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4. LITHOTECHNICAL MAP

In Figure 2 Lithotechnical Map is reported in a 1kmx1Km square around the station.

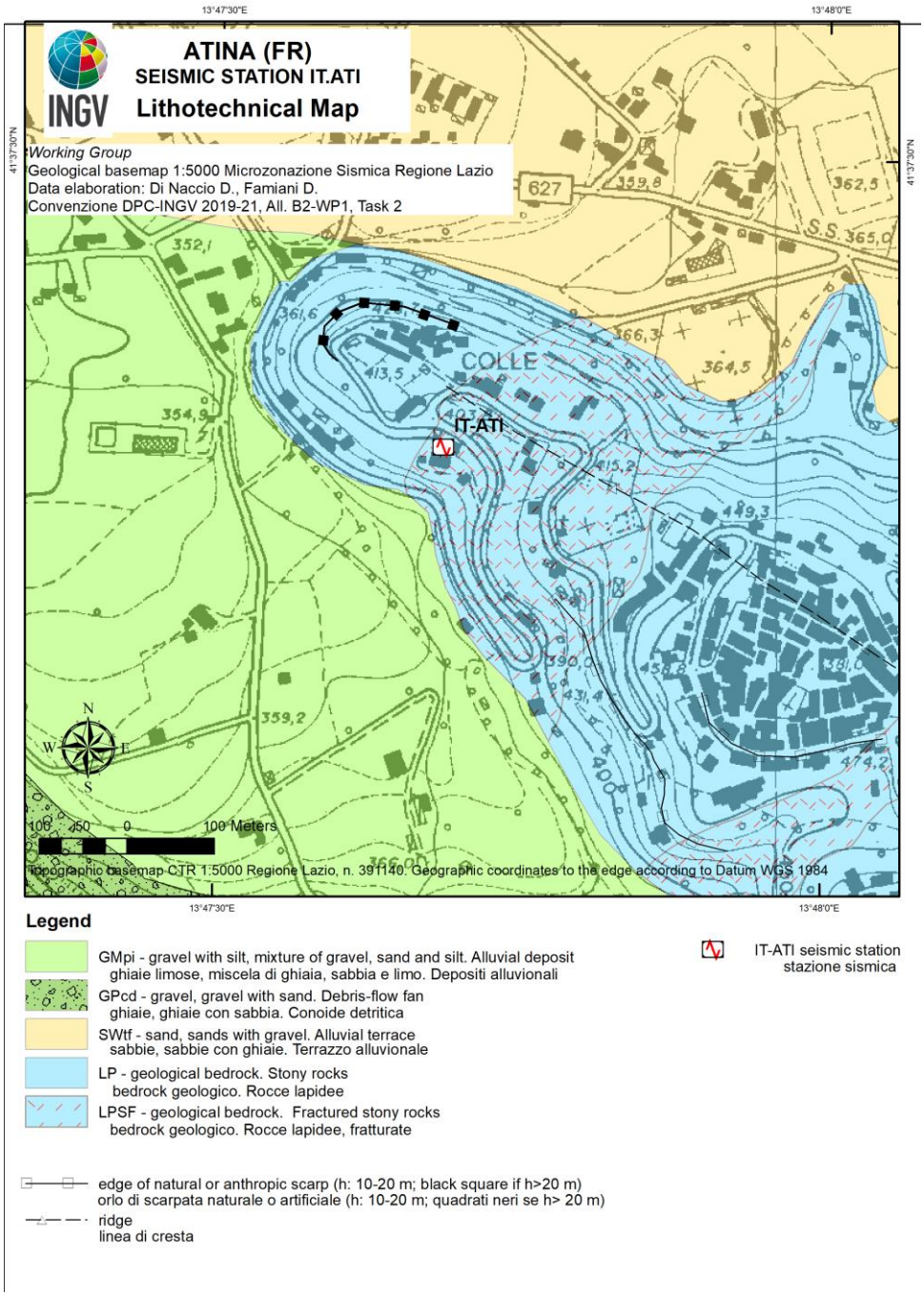

Figure 2: Lithotechnical map of the seismic station IT.ATI. Scale 1:5.000. The lithotechnical units are deduced according to the nomenclature of Seismic Microzonation (Technical Commission MS, 2015).

5. SURVEY MAP

Figure 3 shows the survey Map reported both previous investigations and geophysics surveys conducted by INGV Working Group.

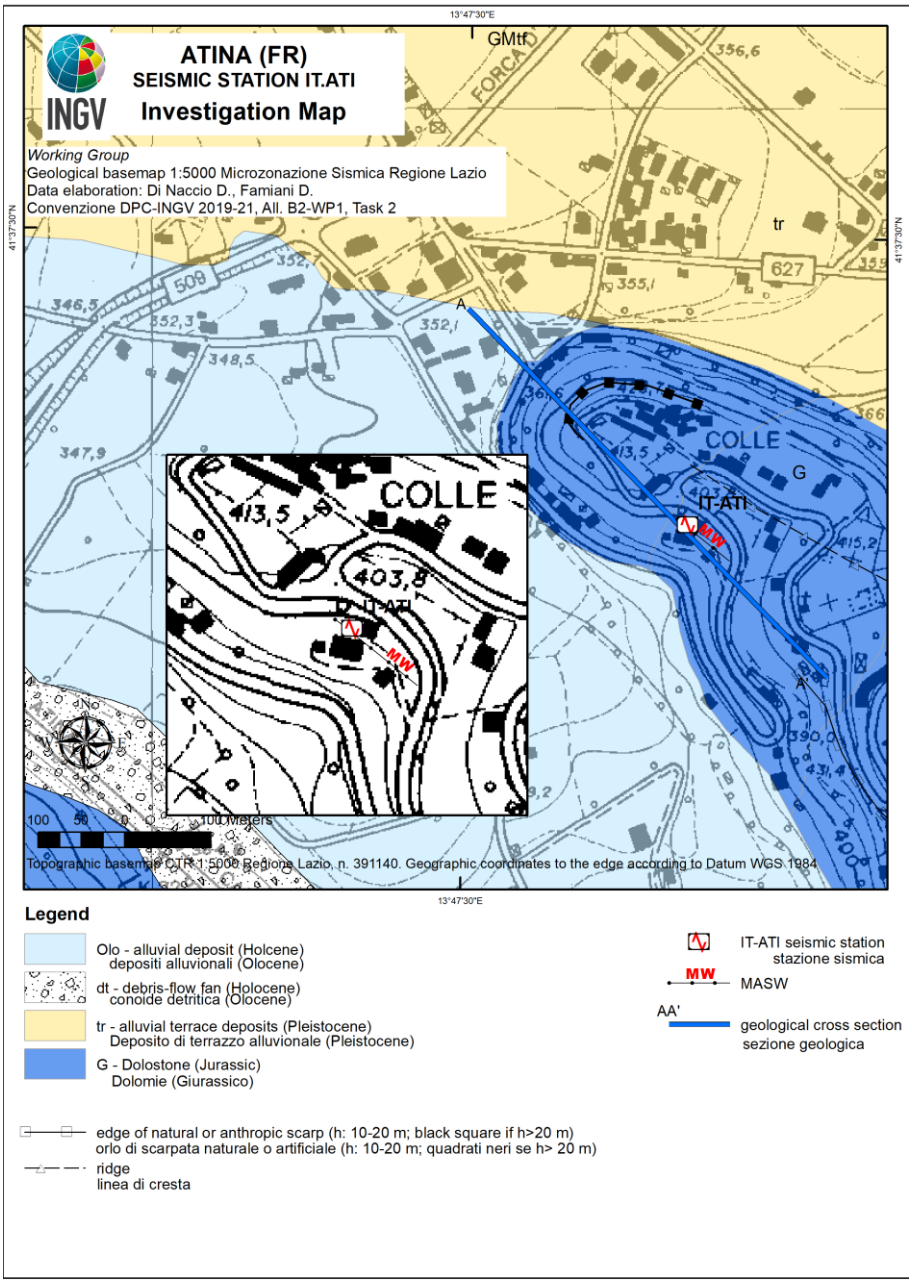

Figure 3: Map of the surveys in the surroundings of the station IT.ATI. Scala 1: 15.000. The box at the bottom contains a zoom of the area with the detail of the geophysical investigation conducted by INGV Working Group for the seismic characterization of the site (Convenzione DPC-INGV 2019-21,

Allegato B2-WP1, Task B; Velocity profile report at the seismic stations IT.ATI, http://hdl.handle.net/2122/12970)

6. GEOLOGICAL MODEL

6.1 General description

The seismic station is located at the base of dolostone relief of the Venafro Mts in the southern sector of the Val Comino basin in central Apennines. The western flank of Venafro Mts is bound by the SW-dipping Atina San Pietro normal fault considered a segment of the Roveto Valley–Atina fault. The Roveto Valley is a narrow elongated depression trending NW-SE, bounded by the Simbruini-Ernici Mts. main thrust and the Val Roveto-Atina line. Westward another important tectonic lineament is represented by the regional thrust closing the right side of the Latina Valley and involving the Western Aurunci Mts.

A NW–SE minor thrust bound the Cairo and Venafro Mts to the North and superimposes the carbonate units to the Miocene silicoclastic deposits.

In the area of seismic station, the geological bedrock is represented by massive or coarsely bedded dolostone and calcareus dolostone often fractured and belonging to the Lazio-Abruzzo platform. Upper Miocene silicoclastic and marly deposits filled the valley floor. The bedrock is overlaid by Quaternary continental deposits consisting of recent alluvial deposits, Pleistocene terraced deposits and slope deposits.

6.2 Geological Section

The geological cross section and the subsoil model (Figura 4) accompanying geological survey map provide an interpretation of the third dimension. It is based on the extrapolation of surface data in combination with pre-existing geological studies, recognized local structural style, geophysical investigations performed for the seismic characterization of the site (Convenzione DPC-INGV 2019-21, Allegato B2-WP1, Task B) and the determined seismic velocities profiles (http://hdl.handle.net/2122/12970) as well as data from other subsurface sources.

6.3 Subsoil model

The lithotecnical units considered representative of the site around the IT-ATI-seismic station (Figures 1-2 and Table 4) are the following:

G: fractured white dolostone overlaying by few meters-thick anthropic deposits. It represents the geological bedrock in agreement with the geophysical data (Convenzione DPC-INGV 2019-21, Allegato B2-WP1, Task B, Velocity profile at the seismic stations IT.ATI, http://hdl.handle.net/2122/12970).

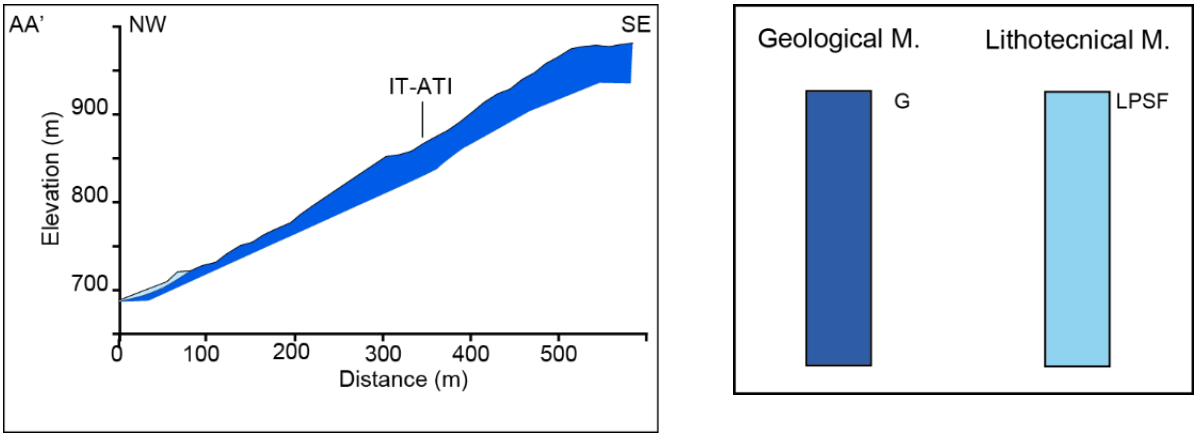

Figure 4: Left: Geological section A-A' crossing seismic station IT.ATI. Right: Subsoil model under the IT.ATI seismic station and classification according to the nomenclature of geological map of Italy 1:100.000: G: Dolostone; according to SM: LPSF: fractured stony rocks.

7. REFERENCES

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