

ESAME DI ABILITAZIONE ALLA PROFESSIONE DI GEOLOGO – SEZ. B junior

TEMI 1ª PROVA SCRITTA - 23/11/2016

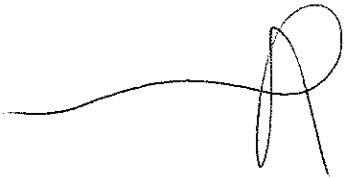
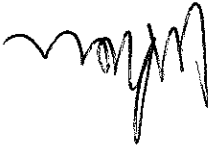
1) Descrivere come impostare una campagna di indagini di tipo geologico strutturale per la verifica di stabilità di un ammasso roccioso fratturato.

2) Il candidato descriva gli elementi di analisi preliminare geografica, climatologica e geomorfologica per affrontare lo studio di un dissesto in ambito collinare periadriatico.

3) Principi, modalità esecutive, precauzioni, vantaggi, differenze e limiti dell'utilizzo di prove penetrometriche continue di tipo CPT e DPSH per l'investigazione di terreni nell'ambito della geologia applicata all'ingegneria edile.

4) Il candidato illustri i criteri da adottare per la pianificazione di una campagna di indagine geognostica e geofisica finalizzata alla progettazione di un edificio di civile abitazione in area di piana costiera adriatica.

5) Il candidato descriva l'approccio all'elaborazione di una carta delle isopiezometriche in ambito di pianura alluvionale.



Allegato 4

Esami abilitazione geologo sezione B

II prova scritta

Tema 1

Si rediga un piano di indagini, con prove in sito e di laboratorio, nell'ambito del progetto per la realizzazione di un edificio pubblico, adibito a scuola, localizzato nella fascia collinare periadriatica. Si motivi la scelta delle varie indagini, evidenziando i vantaggi e le criticità di ciascuna delle scelte effettuate.

Tema 2

Il candidato descriva la metodologia, i dati e le informazioni necessarie per la redazione di una Cartografia di suscettibilità all'inquinamento di un acquifero alluvionale monostrato, in un contesto di piana alluvionale di un fiume adriatico, ove sorgano complessi industriali e commerciali.

Tema 3

In allegato sono riportati i tabulati relativi ad una prova penetrometrica statica con punta meccanica. Il candidato:

- descriva il contenuto e le modalità di acquisizione/elaborazione delle diverse colonne contenute nei tabulati della prova CPT;
- descriva i parametri geomeccanici ricavabili dalla prova CPT;
- proceda alla discretizzazione e parametrizzazione (in termini di parametri geotecnici nominali) del profilo di sottosuolo indagato dalla CPT.

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PROVA PENETROMETRICA STATICA CON PUNTA MECCANICA CPT

Profondità (m)	Lettura punta (Kg/cm ²)	Lettura laterale (Kg/cm ²)	qc (Kg/cm ²)	fs (Kg/cm ²)	qc/fs Begemann	fs/qcx100 (Schmertmann)
0,40	16,0	25,0	16,0	0,5333	30,0	3,33
0,60	20,0	28,0	20,0	1,9333	10,35	9,67
0,80	20,0	49,0	20,0	1,4	14,29	7,0
1,00	17,0	38,0	17,0	1,4	12,14	8,24
1,20	19,0	40,0	19,0	1,6667	11,4	8,77
1,40	17,0	42,0	17,0	1,8667	9,11	10,98
1,60	17,0	45,0	17,0	1,6	10,63	9,41
1,80	17,0	41,0	17,0	1,0667	15,94	6,27
2,00	15,0	31,0	15,0	1,1333	13,24	7,56
2,20	12,0	29,0	12,0	0,4667	25,71	3,89
2,40	11,0	18,0	11,0	0,6	18,33	5,45
2,60	12,0	21,0	12,0	0,6	20,0	5,0
2,80	15,0	24,0	15,0	0,8	18,75	5,33
3,00	14,0	26,0	14,0	0,5333	26,25	3,81
3,20	17,0	25,0	17,0	0,7333	23,18	4,31
3,40	17,0	28,0	17,0	0,7333	23,18	4,31
3,60	14,0	25,0	14,0	0,7333	19,09	5,24
3,80	12,0	23,0	12,0	0,6667	18,0	5,56
4,00	10,0	20,0	10,0	0,5333	18,75	5,33
4,20	10,0	18,0	10,0	0,5333	18,75	5,33
4,40	11,0	19,0	11,0	0,5333	20,63	4,85
4,60	8,0	16,0	8,0	0,5333	15,0	6,67
4,80	6,0	14,0	6,0	0,4667	12,86	7,78
5,00	6,0	13,0	6,0	0,4667	12,86	7,78
5,20	6,0	13,0	6,0	0,4	15,0	6,67
5,40	5,0	11,0	5,0	0,4667	10,71	9,33
5,60	6,0	13,0	6,0	0,4	15,0	6,67
5,80	9,0	15,0	9,0	0,5333	16,88	5,93
6,00	9,0	17,0	9,0	0,6667	13,5	7,41
6,20	8,0	18,0	8,0	0,6	13,33	7,5
6,40	9,0	18,0	9,0	0,7333	12,27	8,15
6,60	6,0	17,0	6,0	0,4667	12,86	7,78
6,80	4,0	11,0	4,0	0,2667	15,0	6,67
7,00	3,0	7,0	3,0	0,2	15,0	6,67
7,20	4,0	7,0	4,0	0,2667	15,0	6,67
7,40	6,0	10,0	6,0	0,4	15,0	6,67
7,60	5,0	11,0	5,0	0,3333	15,0	6,67
7,80	5,0	10,0	5,0	0,3333	15,0	6,67
8,00	7,0	12,0	7,0	0,6	11,67	8,57
8,20	10,0	19,0	10,0	0,8667	11,54	8,67
8,40	11,0	24,0	11,0	0,9333	11,79	8,48
8,60	12,0	26,0	12,0	0,9333	12,86	7,78
8,80	19,0	33,0	19,0	1,4	13,57	7,37
9,00	18,0	39,0	18,0	1,3333	13,5	7,41
9,20	23,0	43,0	23,0	1,6	14,38	6,96
9,40	20,0	44,0	20,0	1,4	14,29	7,0
9,60	20,0	41,0	20,0	1,2	16,67	6,0
9,80	14,0	32,0	14,0	0,9333	15,0	6,67
10,00	15,0	29,0	15,0	0,9333	16,07	6,22
10,20	12,0	26,0	12,0	0,9333	12,86	7,78
10,40	13,0	27,0	13,0	0,8	16,25	6,15
10,60	10,0	22,0	10,0	0,5333	18,75	5,33

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LEGENDA

ALLEGATO 13

SCALA 1: 25.000

QUATERNARY CONTINENTAL DEPOSITS

- Eluvio-colluvial deposits**
Silty-clay deposits, colluvial origin with sand fraction and with elements depending on the nature of the feeding basin. *Pleistocene - Holocene*
- Slope deposits**
Scree and talus deposits with variable grain size, well sorted or heterometric, unconsolidated or poorly cemented. The clasts are very angular to little or moderately rounded. *Pleistocene - Holocene*
- Landslide deposits**
Chaotic deposits with variable grain size, emplaced due to gravitational processes. *Holocene*
- Alluvial deposits**
a) fluvial deposits: mainly calcareous gravels, occurring along river beds.
b) alluvial fans: polygenic conglomerates, sands and silty-clay layers massive or thinly laminated. *Pleistocene - Holocene*
- Fluvio-lacustrine deposits**
Fine grained sediments and peat levels, mixed with coarser elements, deposited in lacustrine, fluvial-lacustrine and marsh swamp environments. *Middle / Upper Pleistocene - Holocene*
- Moraine deposits**
Chaotic deposits composed of heterometric clasts, up to the block size, with a silty matrix, locally cemented. *Pleistocene? - Holocene*
- Travertines**
Travertines and calcareous silt of fluvial and lacustrine environment. *Pleistocene - Holocene*

MARINE SUCCESSION

LAGA BASIN

- Laga Formation**
Turbiditic sandstones which consist of three members: pre-evaporitic, evaporitic and post-evaporitic members.
The first (LAG₁) is formed by some lithofacies associations: arenaceous (prevailing), arenaceous-pelitic and pelitic-arenaceous, defined by the sandstone/pelite ratio, which alternate in a vertical direction. The thickness is about 800 m.
The evaporitic member (LAG₂) consists essentially of an arenaceous lithofacies that includes a level of black anoxic bituminous marls and the typical "gessarenitic key-bed" (G). The thickness is about 500 m. In the northernmost sector this member is replaced by the bituminous clays and marls of the Gessoso-solfifera Formation (GES).
The post-evaporitic (LAG₃) member is prevalently formed by a pelitic-arenaceous lithofacies in which numerous arenaceous-pelitic and arenaceous levels are inserted. In the upper part the "volcanoclastic key-bed" (V) is present. The outcropping thickness is 900 m. *Messinian*

- Mame con Cerrognia - Schlier**
The Mame con Cerrognia are constituted by light grey marls, calcareous marls and clayey marls with medium to thick bedded calcareous turbidities. A severe bioturbation is present. The uppermost part (Mame a Pteropodi) consists of grey-green marls and clayey marls, bituminous and laminated in the upper part. The thickness is 100-300 m. In the northernmost sector the Mame con Cerrognia Unit is replaced by the Schlier. *Burdigalian p.p. - Early Messinian*

CAMERINO BASIN

- Camerino Formation**
Arenaceous turbidites, formed by three lithofacies: arenaceous, arenaceous-pelitic and pelitic-arenaceous lithofacies, which are defined by the sandstone/pelite ratio.
The lithofacies are spatially associated in different ways. The thickness is about 500 m. *Tortonian p.p. - Messinian p.p.*
- Schlier**
Grey marls and clayey-siltose marls, white calcareous marls and calcarenitic levels. The thickness varies from 80 to 200 m. *Burdigalian p.p. - Tortonian p.p.*
- Bisciaro**
Dark grey marly and siliceous limestones, limestones with black cherts nodules, in medium to thick beds, alternated with grey calcareous marls and clayey marls. The lower part contains thin intercalations of altered ocreaceous volcanoclastic. Frequent bioturbations are also present. The thickness varies from 50-60 to 100-150 m. *Aquitanian p.p. - Burdigalian p.p.*
- Scaglia cinerea**
Green-grey to cinder-grey calcareous marls, marls, and clayey marls, in medium-thin beds. Subordinately there are marly limestone levels especially in the lower part. Grey calcarenites, rich in Nummulites, in 10-60 cm thick levels, are also present. The unit is 200 m thick. *Bartonian p.p. - Aquitanian p.p.*
- Scaglia variegata**
Red, grey and green limestones and marly limestones, in thin-medium beds, alternated with grey and red marls and calcareous marls. The maximum thickness is about 50 m. *Lutetian p.p. - Bartonian p.p.*
- Scaglia rossa**
Pink, dark, red, rarely white marly limestones and limestones, stratified in medium beds, with very thin pelitic levels and red or pink chert in nodules and ribbon missing in the middle part. The latter contains thick marly levels. Thick grey or white calcarenite levels are also present. The thickness is 250-450 m. *Lower Tortonian p.p. - Lutetian p.p.*
- Scaglia bianca**
White limestones and marly limestones, in medium beds, with chert beds and ribbons, black or brown in the upper part, pink in the lower one. In the uppermost part, the "Livello Bonarelli", made up of black anoxic bituminous shales, is present, with a maximum thickness of 1.5 m. The usual thickness of the unit is about 50-80 m. *Upper Albian p.p. - Lower Tortonian p.p.*
- Mame a Fuocidi**
Grey, green and red marls and shaly marls, marly limestone, with abundant clay levels, frequently bituminous ("black shales"). The marls and the shaly marls prevail in the lower part; the marly limestones in the upper one, where the green chert is also present. Calcarenites and calcinities are frequent. The thickness varies from 50 to 80 m. *Lower Aptian p.p. - Upper Albian p.p.*
- Maiolica**
White and ivory calcinities, in thin-medium beds, containing grey chert nodules and lenses, black in the upper part, white or grey in the lower one. The thickness is variable ranging from 150 to 450 m. *Upper Tithonian - Lower Aptian p.p.*

COMPLETE JURASSIC SUCCESSION

- Calcarei diasprigni**
The lower portion of the Calcarei diasprigni is formed by red, green and grey, finely to very finely bedded siliceous calcinities, alternating with green, red or grey cherts and some marly levels. Locally clastic and bioclastic limestones, in medium to very thick beds, are present ("membro seicifero"). The upper part ("Calcarei a Saccocoma e Aptici") is characterized by grey, green, sometimes red, cherty limestone, in medium-thin beds, frequently with aptichis. The maximum thickness is about 150 m. *Upper Bajocian - Lower Tithonian*
- Calcarei a Posidonia**
Whitish or brown limestones and marly limestones, sometimes nodular, stratified in medium beds, with abundant Posidonia filaments and cherts increasing upward. Clastic and bioclastic limestones, stratified in medium - to very thick beds, are present. The maximum thickness is about 200 m. *Upper Toarcian p.p. - Lower Bajocian*
- Rosso ammonitico**
Dark red, pink, sometimes grey-green nodular limestones and marly limestones alternating with red marls and shaly marls. The whole unit, 40 m thick, is regularly stratified in medium - to thin (3-25 cm) beds. The limestones and marly limestones prevail in the lower part. Local calcareous resedimented materials are present. The unit can be partly or totally replaced by the Mame del Monte Serrone Fm. *Toarcian p.p.*
- Mame del M. Serrone**
Green and grey marly limestones, in beds of various thickness, alternating with grey marls or shaly marls and grey-brown clastic limestones in medium-thick beds. The thickness varies from a few to 150 m. The age is variable and reaches up to *Plimstachium p.p. - Toarcian p.p.*
- Corniola**
Grey or brown limestones, in 10-50 cm thick beds (occasionally thicker), with nodules and ribbons of white and grey chert. Calcareous turbidites and sometimes megabreccias and olistoliths of Calcare massiccio are frequently present, whereas grey-green thin shaly-marly interbeds are abundant in the upper part. The upper part can be replaced by the Mame del M. Serrone. The unit thickness can exceed 500 m. *Lower Sinemurian p.p. - Lower Toarcian p.p.*

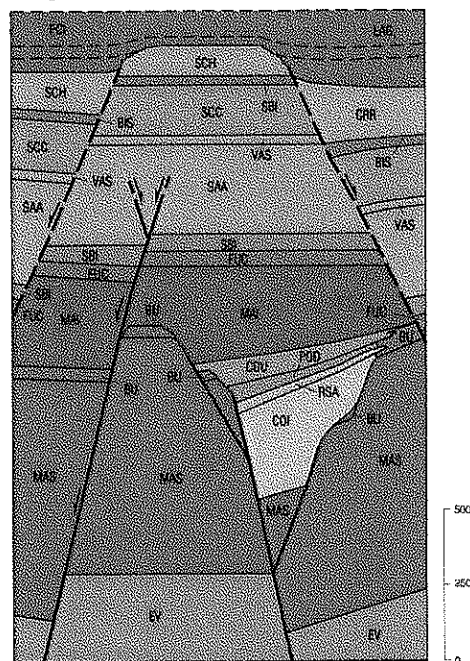
CONDENSED JURASSIC SUCCESSION

- Bugarone Group**
Grey, brown or pink micrites, with nodular texture, locally dolomitized, in 20-40 cm thick beds, with green marls in the middle part. ammonites, crinoids particles and brachiopods are present. The thickness reaches 40 m. *Carixian p.p. - Lower Tithonian*
- Calcare massiccio**
White, grey or pale brown limestones, made up of grainstones, packstones and less common wackestones. The unit is massive or coarsely bedded; the beds display cyclothemic features, indicating a tidal environment. The uppermost part consists of bioclastic and ooid grainstone. The unit reaches a thickness of 700 m. *Hettangian - Carixian p.p.*

LEGENDA DEI SIMBOLI

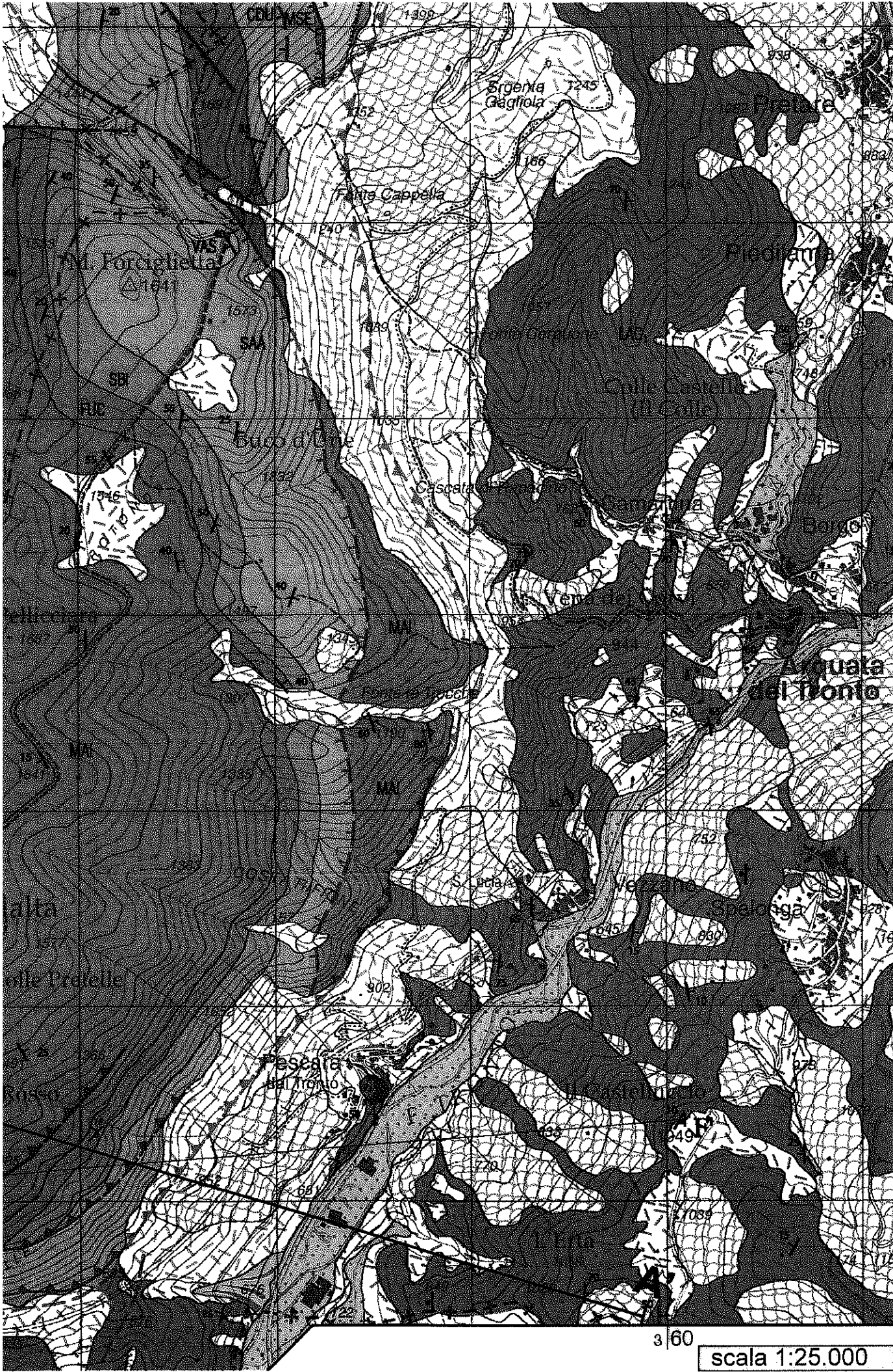
- Bedding attitude**
- Attitude of overturned strata**
- Attitude of horizontal strata**
- Attitude of vertical strata**
- Stratigraphic boundary**
- Unconformable stratigraphic contact**
- Fault**
- Normal and transpressive fault**
- Reverse and thrust fault**

SCHEMA STRATIGRAFICO



stralcio della «Carta dei Monti Sibillini»
da Pierantoni et al. 2013

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