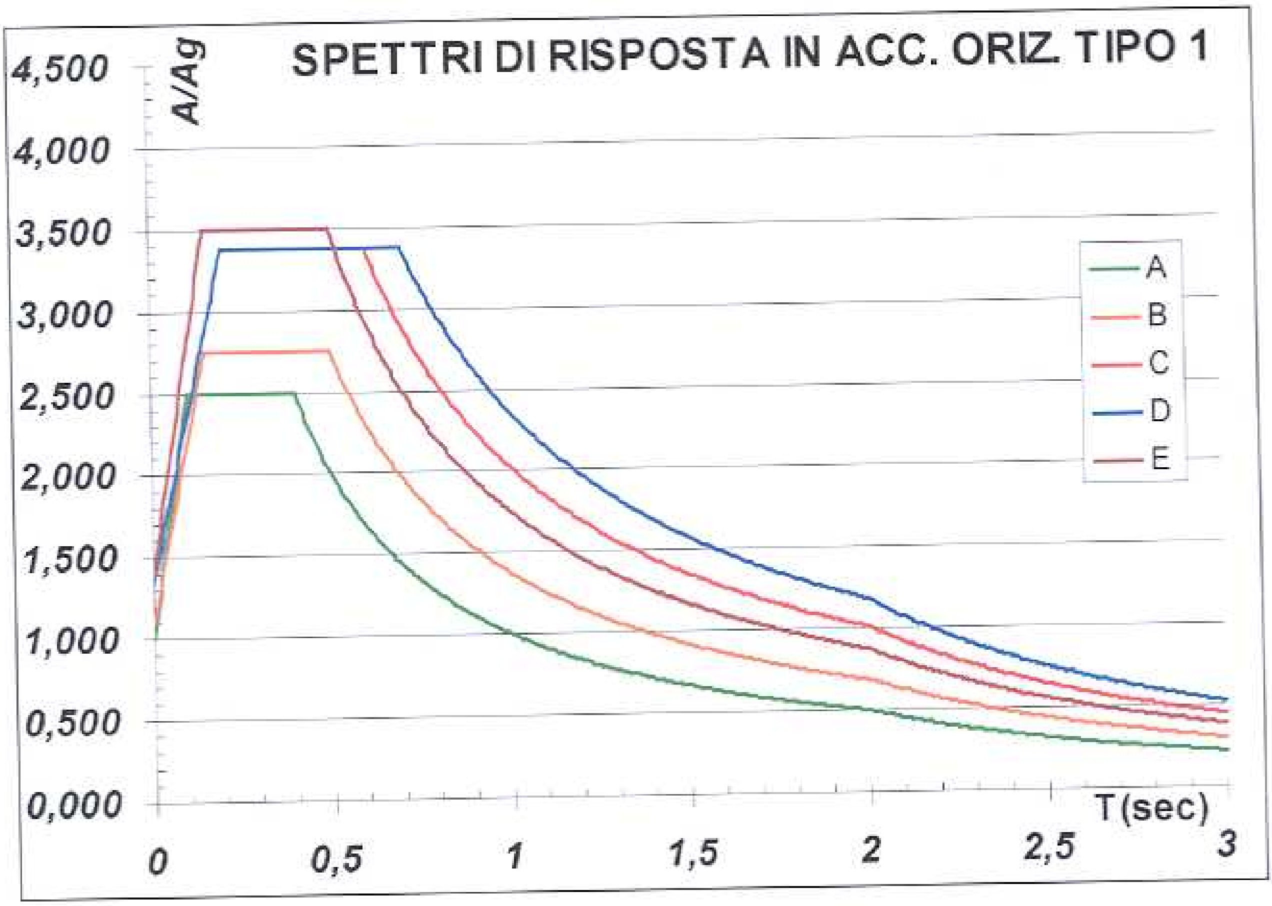
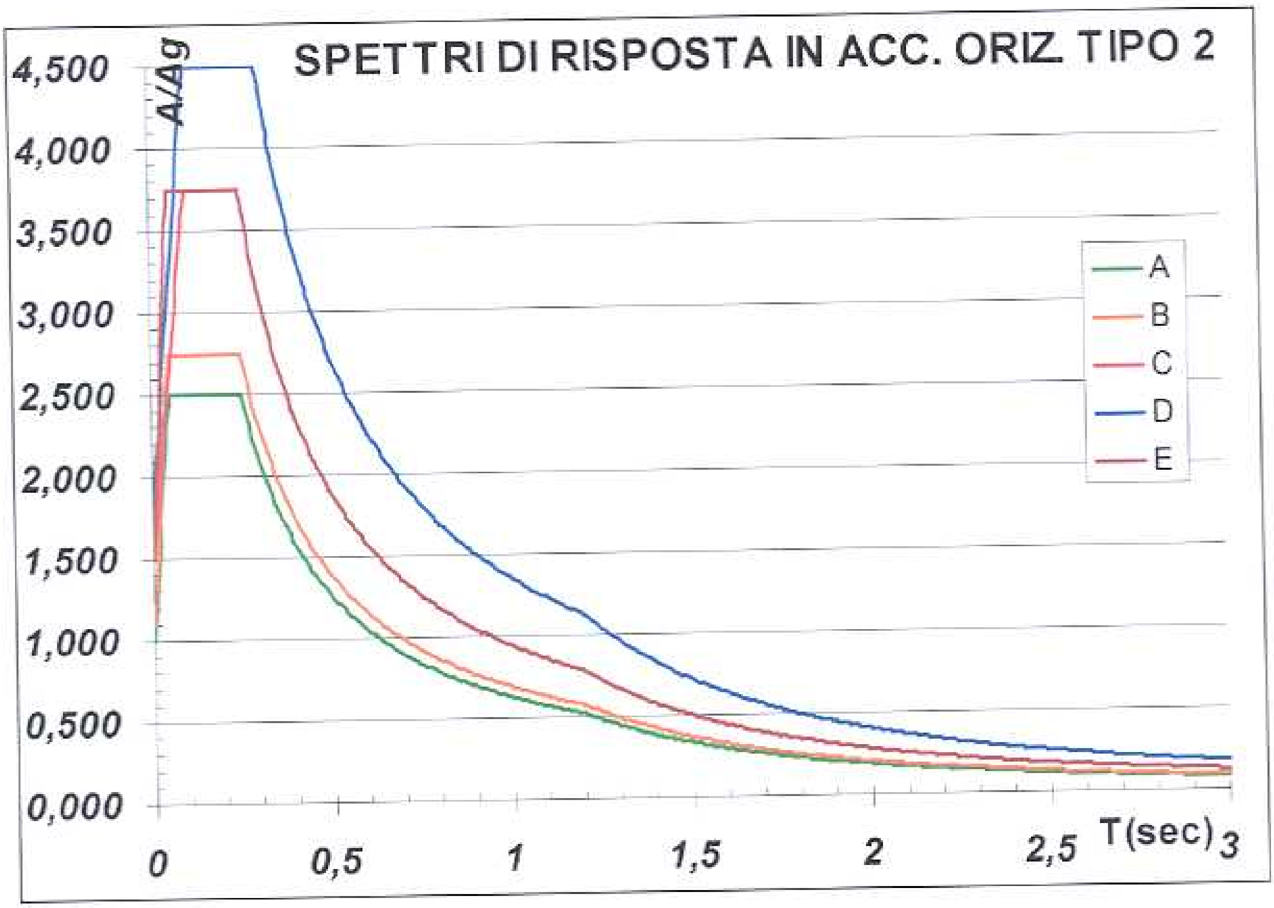

SPETTRI DI RISPOSTA IN ACC. ORIZ. TIPO 1
A/Ag
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
0,500
0,000
0
0,5
1
1,5
2
2,5
3
T(sec)
A
B
C
D
E


SPETTRI DI RISPOSTA IN ACC. ORIZ. TIPO 2
A/Ag
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
0,500
0,000
0
0,5
1
1,5
2
2,5
3
T(sec)
A
B
C
D
E

Subsoil class	Description of stratigraphic profile	Parameters		
		$V_{s,30}$ (m/s)	N_{SPT} (bl/30cm)	c_u (kPa)
A	Rock or other rock-like geological formation, including at most 5 m of weaker material at the surface	> 800	–	–
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	360 – 800	> 50	> 250
C	Deep deposits of dense or medium-dense sand, gravel or stiff clay with thickness from several tens to many hundreds of m	180 – 360	15 - 50	70 - 250
D	Deposits of loose-to-medium cohesionless soil (with or without some soft cohesive layers), or of predominantly soft-to-firm cohesive soil	< 180	< 15	< 70
E	A soil profile consisting of a surface alluvium layer with $V_{s,30}$ values of class C or D and thickness varying between about 5 m and 20 m, underlain by stiffer material with $V_{s,30} > 800$ m/s			
S_1	Deposits consisting – or containing a layer at least 10 m thick – of soft clays/silts with high plasticity index (PI > 40) and high water content	< 100 (indicatively)	–	10 - 20
S_2	Deposits of liquefiable soils, of sensitive clays, or any other soil profile not included in classes A –E or S_1			

(2) The average shear wave velocity $V_{s,30}$ is computed according to the following expression:

$$V_{s,30} = \frac{30}{\sum_{i=1,N} \frac{h_i}{V_i}} \quad (3.1)$$

where hi and Vi denote the thickness and shear-wave velocity of the N formations or layers existing in the top 30 metres. The site will be classified according to the value of Vs,30 if this is available, otherwise the value of NSPT will be used. {14}

(3) For sites with ground conditions matching the two special subsoil classes S1 and S2, special studies for the definition of the seismic action are required. For these classes, and particularly for S2, the possibility of soil failure under the seismic action must be considered. {15}

***(2)** Further sub-division of this classification is permitted **to better conform with special soil conditions.** The seismic actions defined for any sub-class shall not be less than those corresponding to the main class as specified in Table 3.1. {16}*

~~1.1.2~~***Basic representation of the seismic action***

(1) P Within the scope of Eurocode 8 the earthquake motion at a given point of the surface is generally represented by an elastic ground acceleration response spectrum, henceforth called "elastic response spectrum".

(2) P The horizontal seismic action is described by two orthogonal components considered as independent and represented by the same response spectrum.

Notes: The National Authority must decide which elastic response spectrum, Type 1 or Type 2, to adopt for their national territory or part thereof.

In selecting the appropriate spectrum, consideration should be given to the magnitude of earthquakes that affect the national territory or part thereof. If the largest earthquake that is expected within the national territory has a surface-wave magnitude Ms not greater than 5½ {21}, then it is recommended that the Type 2 spectrum should be adopted.

The selection of the Type 1 or Type 2 spectrum should be based on the magnitude of earthquakes that are actually expected to occur rather than conservative upper limits (e.g. Maximum Credible Earthquake) defined for the purpose of probabilistic hazard assessment.

(3)–When the earthquakes affecting the national territory or part thereof are generated by widely differing sources, the possibility of using both Type 1 and Type 2 spectra shall be contemplated to adequately represent the design seismic actions In such circumstances, different values of ag will normally be required for each type of earthquake would normally be required. {22}

SEISMIC ZONES

(1) P For the purpose of this Eurocode, national territories shall be subdivided by the National Authorities into seismic zones, depending on the local hazard. By definition, the hazard within each zone can be assumed to be constant.

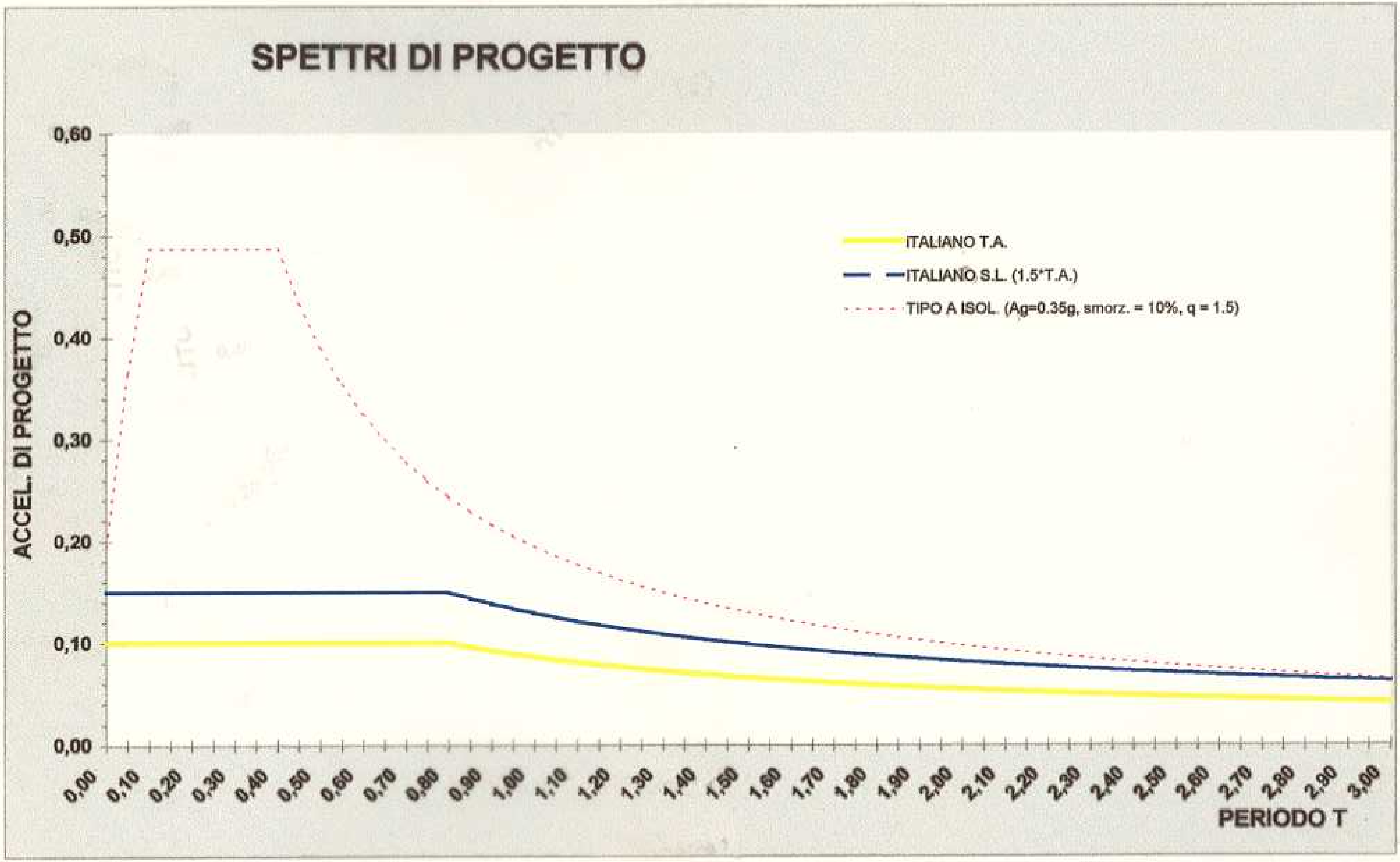
(2) For most of the applications of this Eurocode, the hazard is described in terms of a single parameter, i.e. the value ag of the peak ground acceleration in rock or firm soil {17} henceforth called "design ground acceleration". Additional parameters required for specific types of structures are given in the relevant Parts of Eurocode 8.

(3) The design ground acceleration, chosen by the National Authorities for each seismic zone, corresponds to a reference return period of [475] years. To this reference return period an importance factor γI equal to 1,0 is assigned.

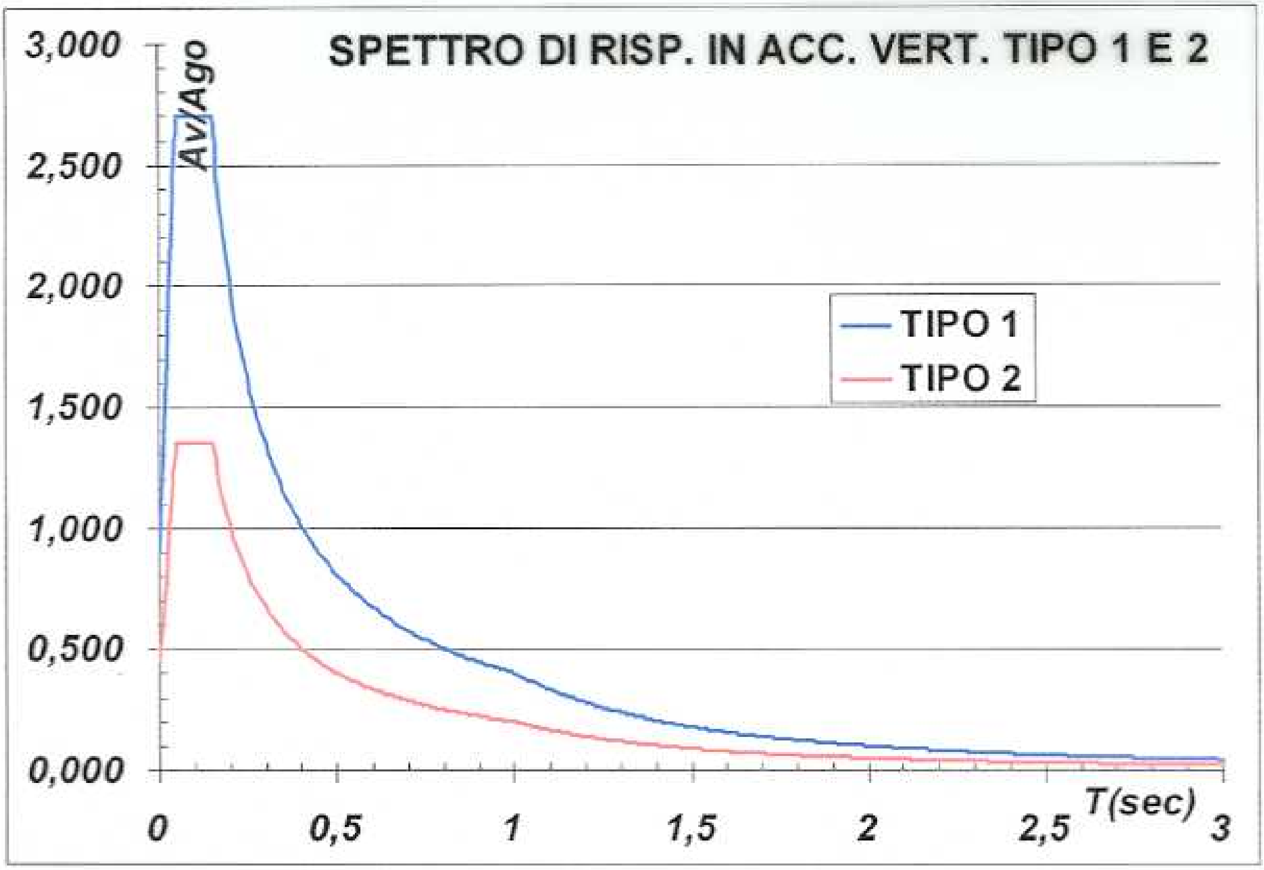
(4) Seismic zones with a design ground acceleration ag not greater than [0,10].g are low seismicity zones, for which reduced or amplified seismic design procedures for certain types or categories of structures may be used.

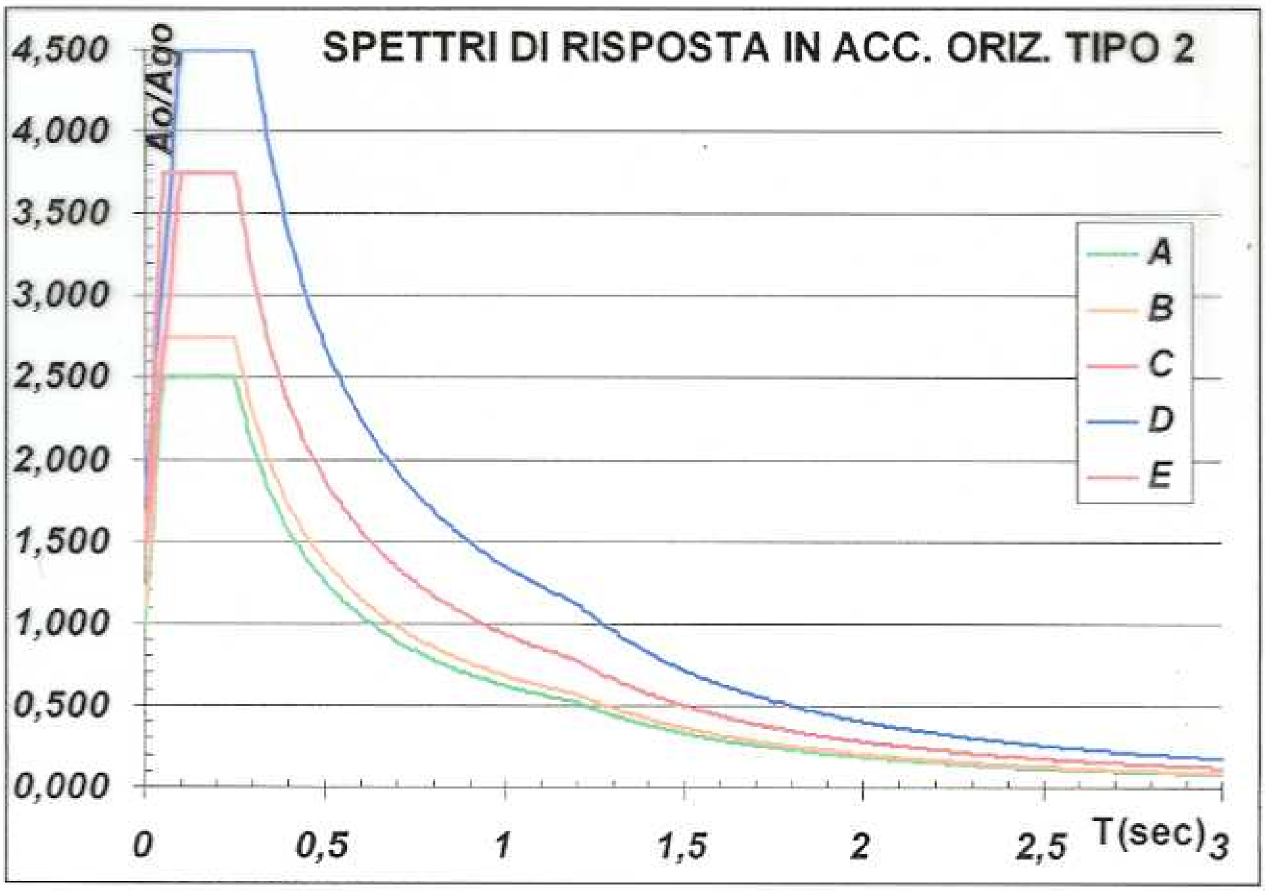
(5) P In seismic zones with a design ground acceleration ag not greater than [0,05].g {19}]·g the provisions of Eurocode 8 need not be observed. {18}

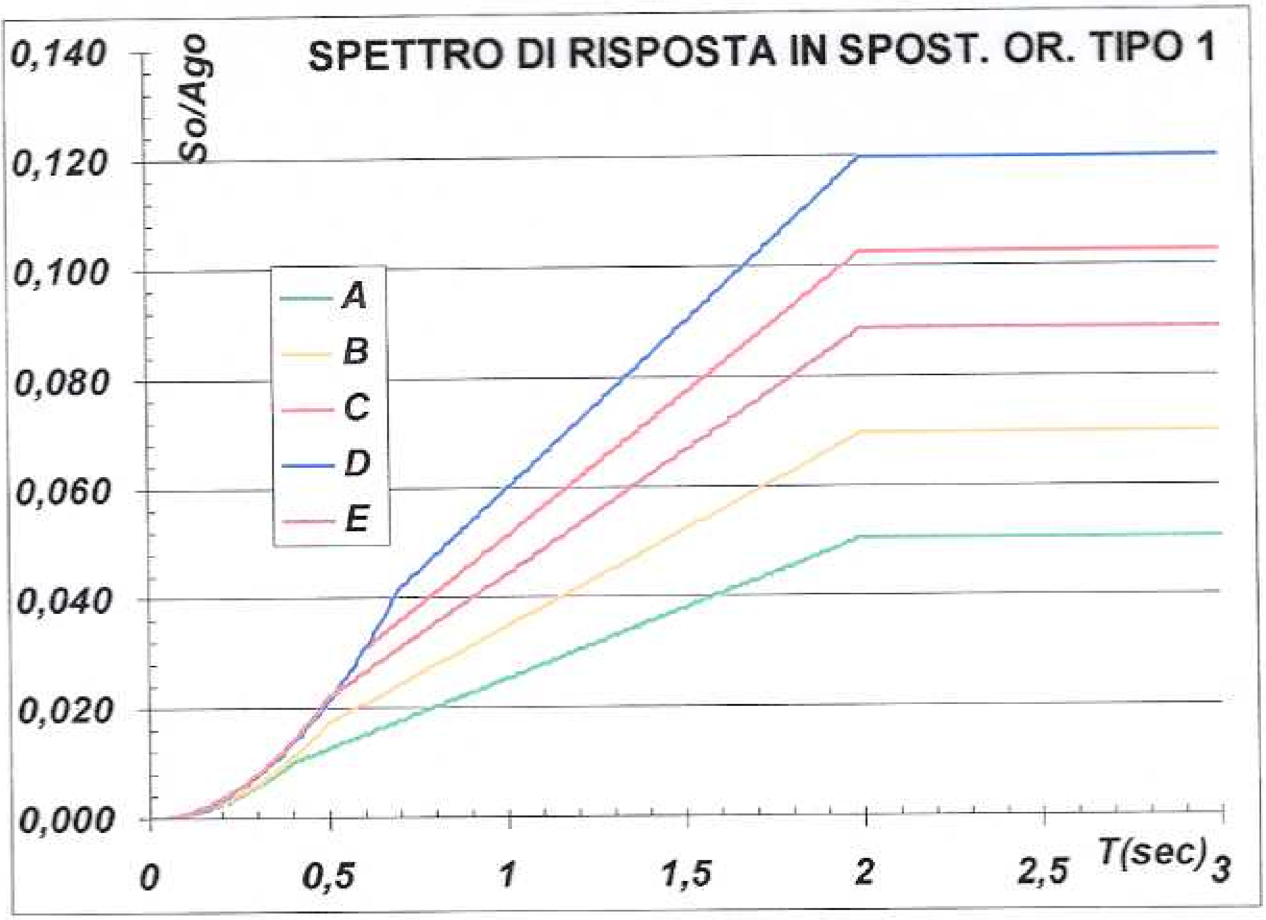
Editorial Note: Paragraphs (3), (4) and (5) may have to be adjusted in view of the intended decrease of the number of boxed values

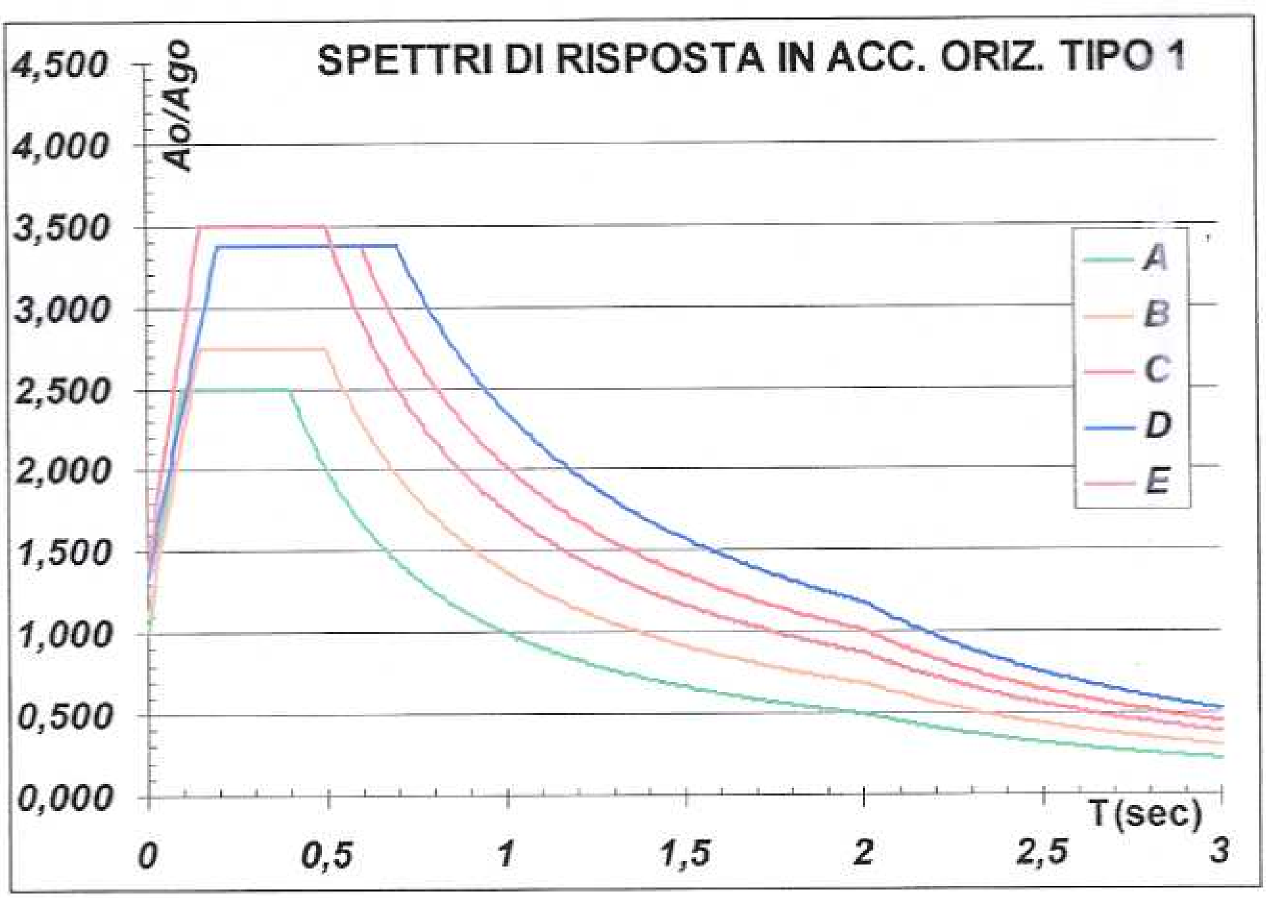


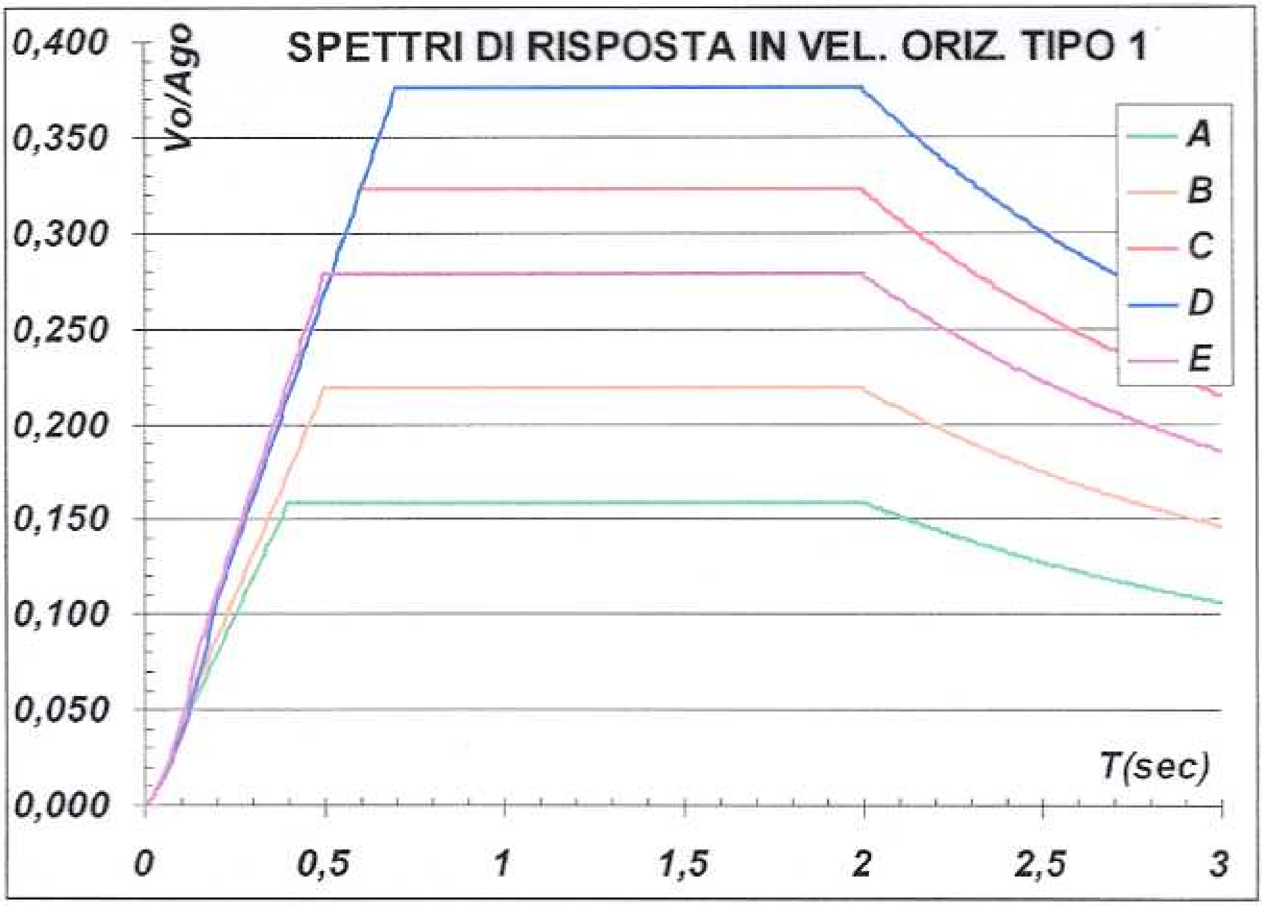
SPETTRI DI PROGETTO
ACCEL. DI PROGETTO
0,60
0,50
0,40
0,30
0,20
0,10
0,00
ITALIANO T.A.
ITALIANO S.L. (1.5*T.A.)
TIPO A ISOL. (Ag=0.35g, smorz. = 10%, q = 1.5)
0,00 0,10 0,20 0,30 0,40 0,50 0,60 0,70 0,80 0,90 1,00 1,10 1,20 1,30 1,40 1,50 1,60 1,70 1,80 1,90 2,00 2,10 2,20 2,30 2,40 2,50 2,60 2,70 2,80 2,90 3,00
PERIODO T

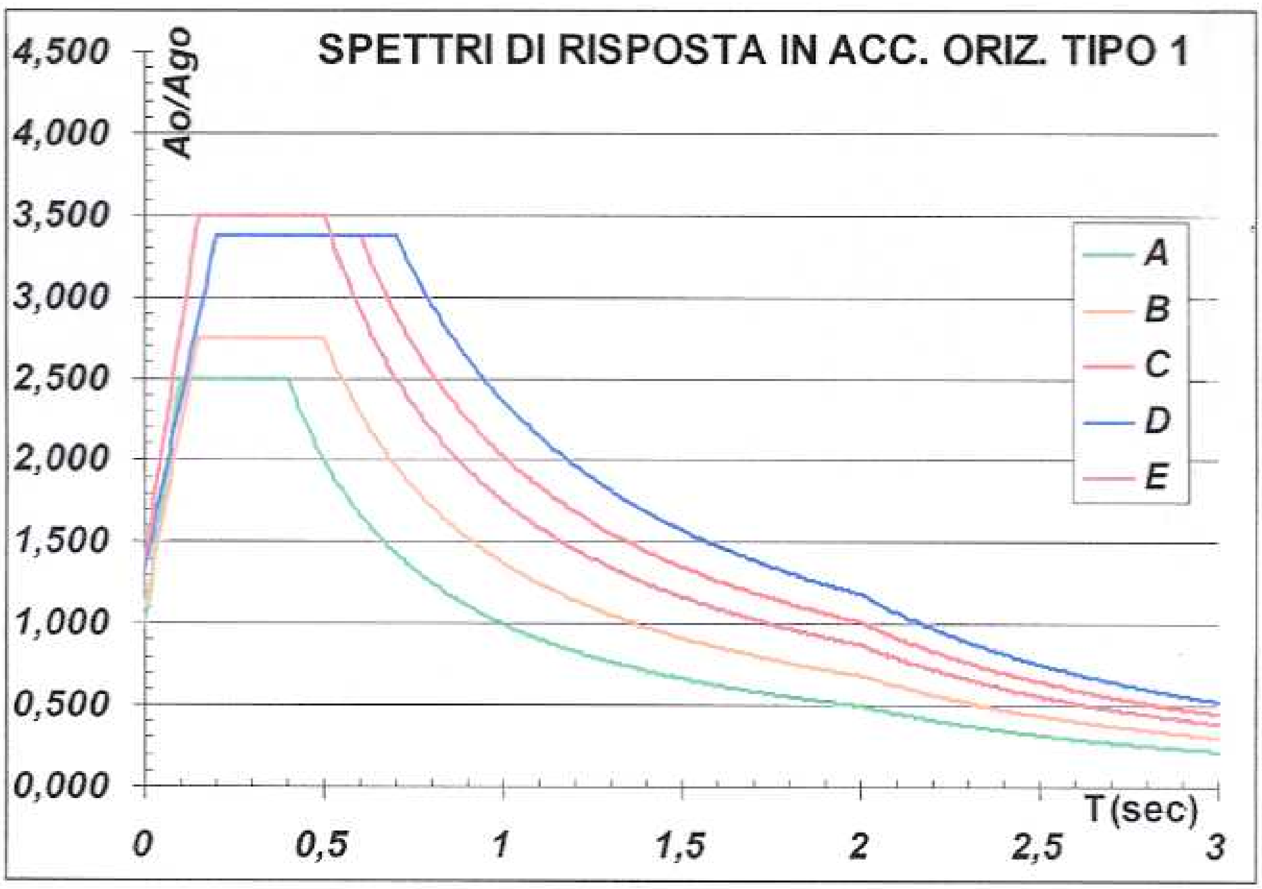

SPETTRO DI RISP. IN ACC. VERT. TIPO 1 E 2
Av/Ago
3,000
2,500
2,000
1,500
1,000
0,500
0,000
TIPO 1
TIPO 2
0
0,5
1
1,5
2
2,5
T(sec)
3

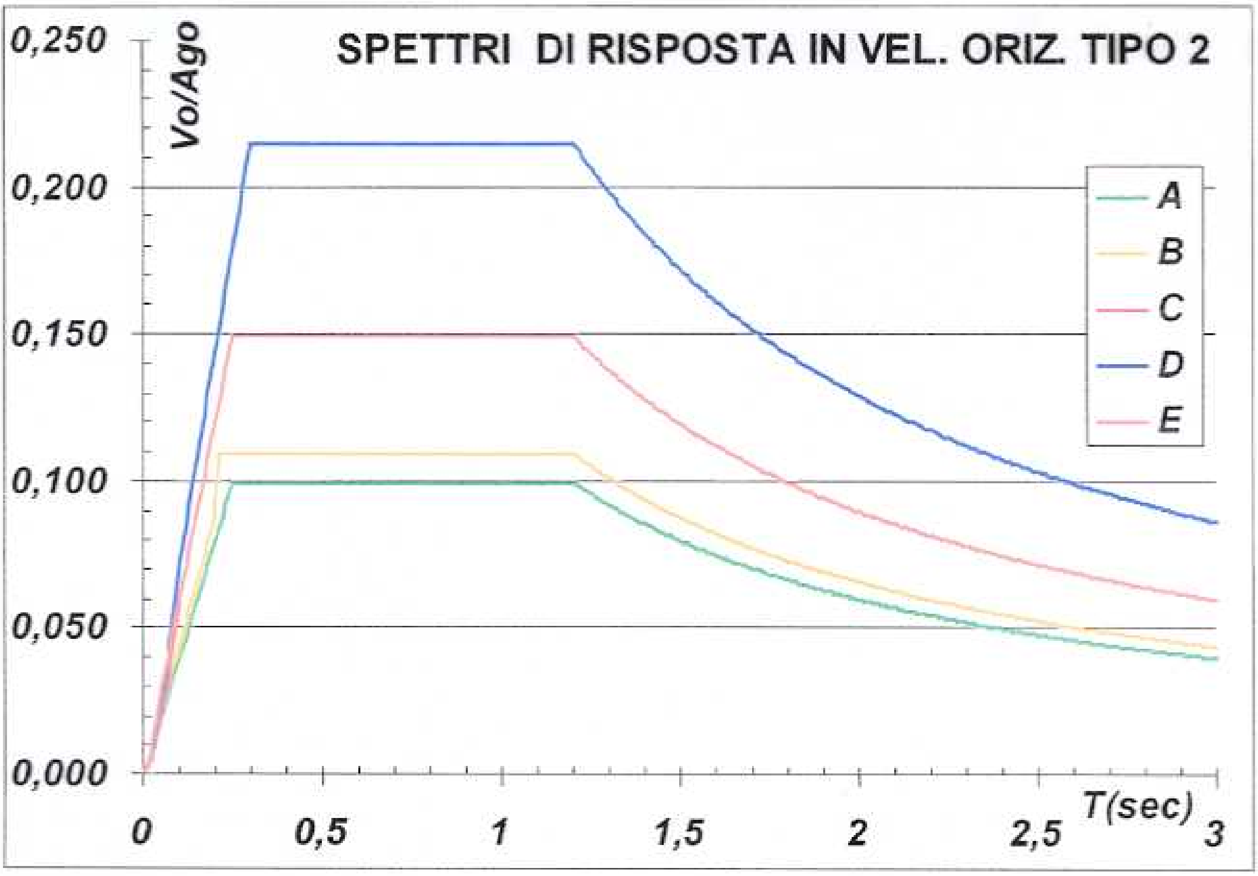

SPETTRI DI RISPOSTA IN ACC. ORIZ. TIPO 2
Ao/Ago
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
0,500
0,000
A
B
C
D
E
0
0,5
1
1,5
2
2,5
T(sec)
3

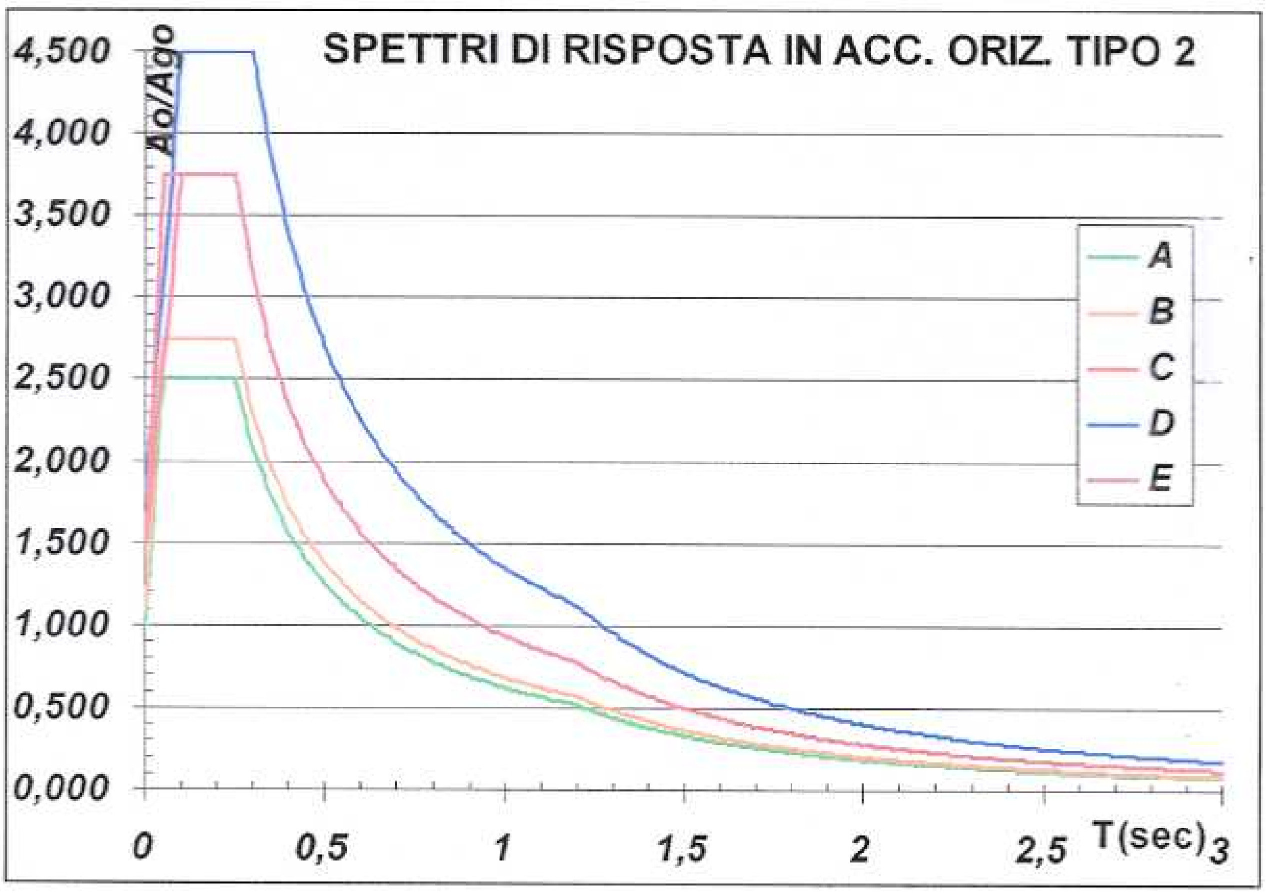

SPETTRO DI RISPOSTA IN SPOST. OR. TIPO 1
So/Ago
0,140
0,120
0,100
0,080
0,060
0,040
0,020
0,000
A
B
C
D
E
0
0,5
1
1,5
2
2,5
T(sec)
3

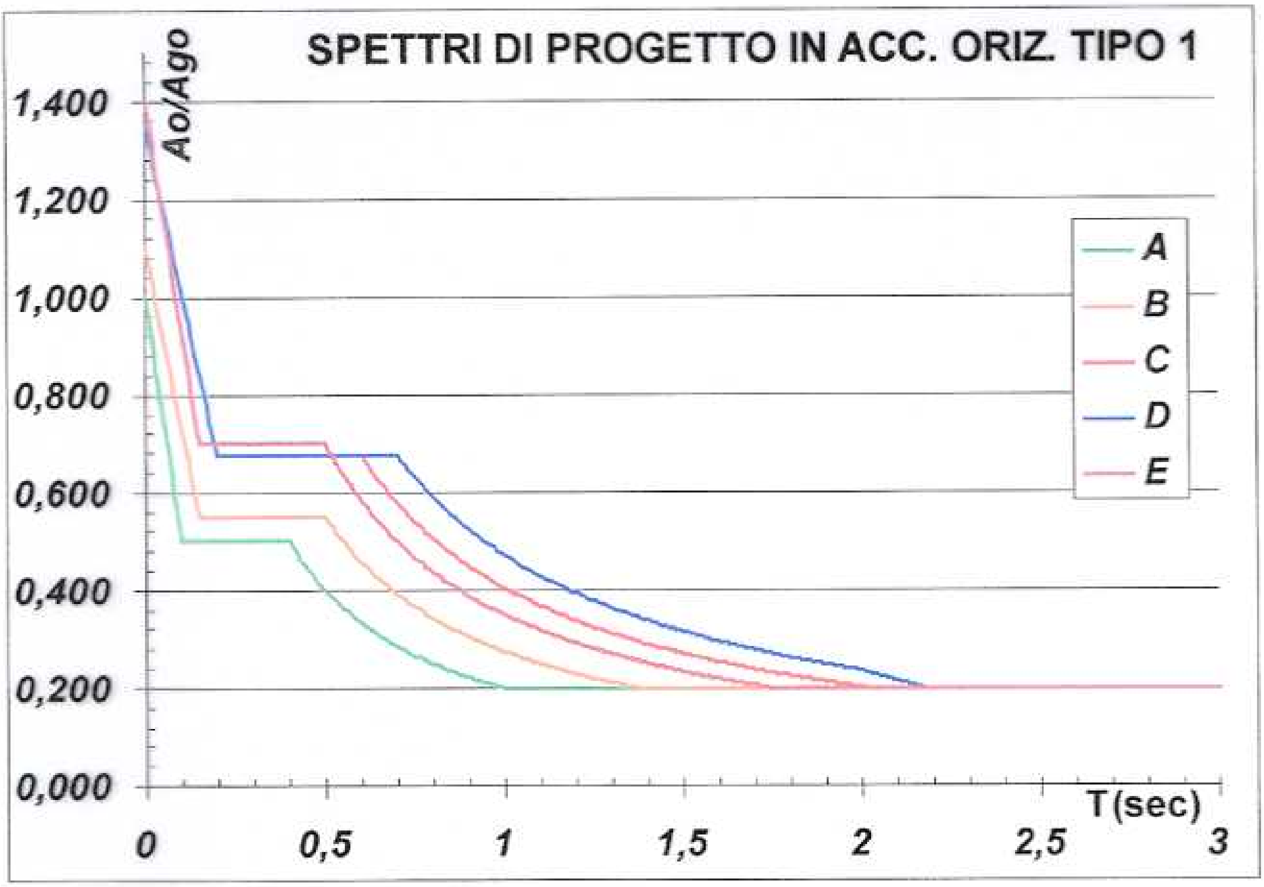

SPETTRI DI RISPOSTA IN ACC. ORIZ. TIPO 1
Ao/Ago
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
0,500
0,000
A
B
C
D
E
0
0,5
1
1,5
2
2,5
T(sec)
3

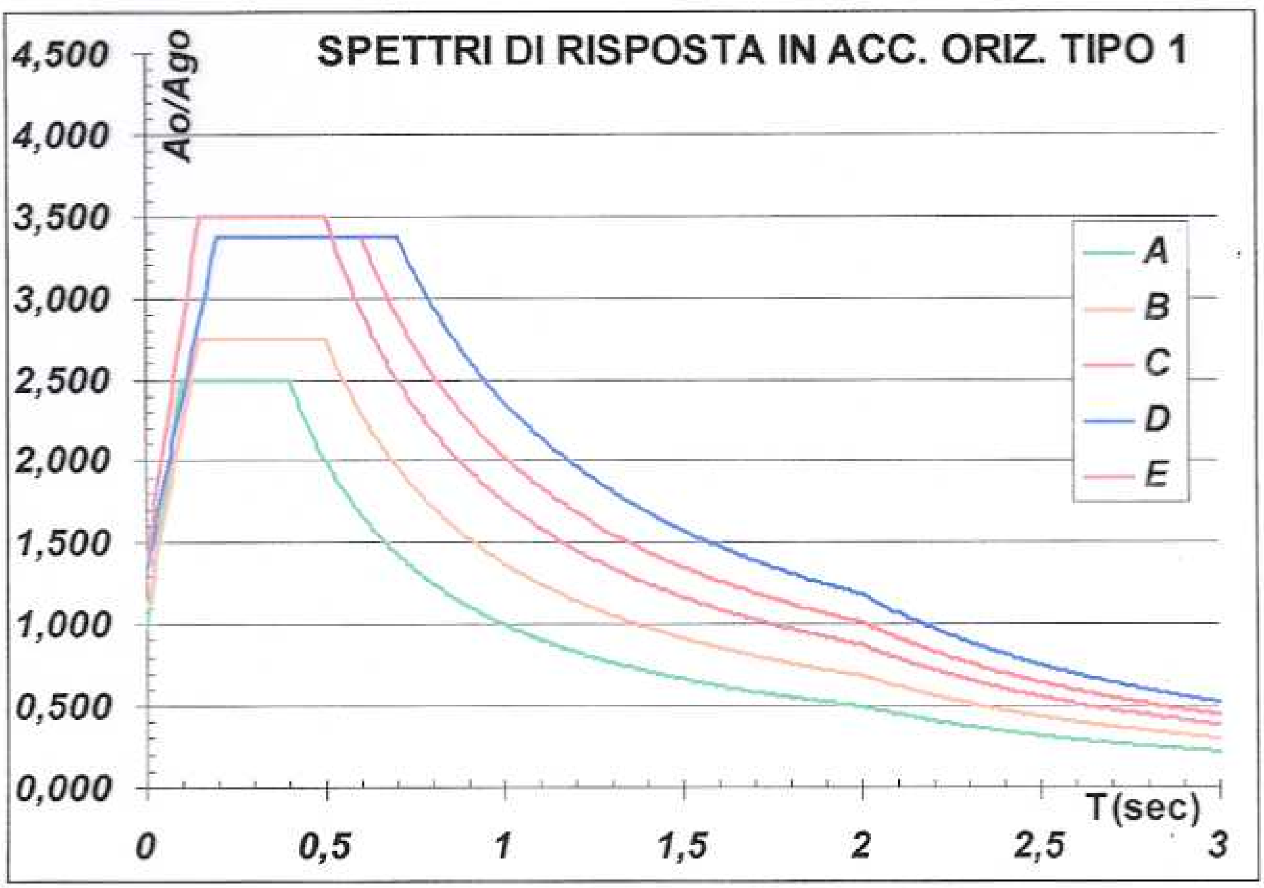

SPETTRI DI RISPOSTA IN VEL. ORIZ. TIPO 1
Vo/Ago
0,400
0,350
0,300
0,250
0,200
0,150
0,100
0,050
0,000
T(sec)
0
0,5
1
1,5
2
2,5
3
A
B
C
D
E

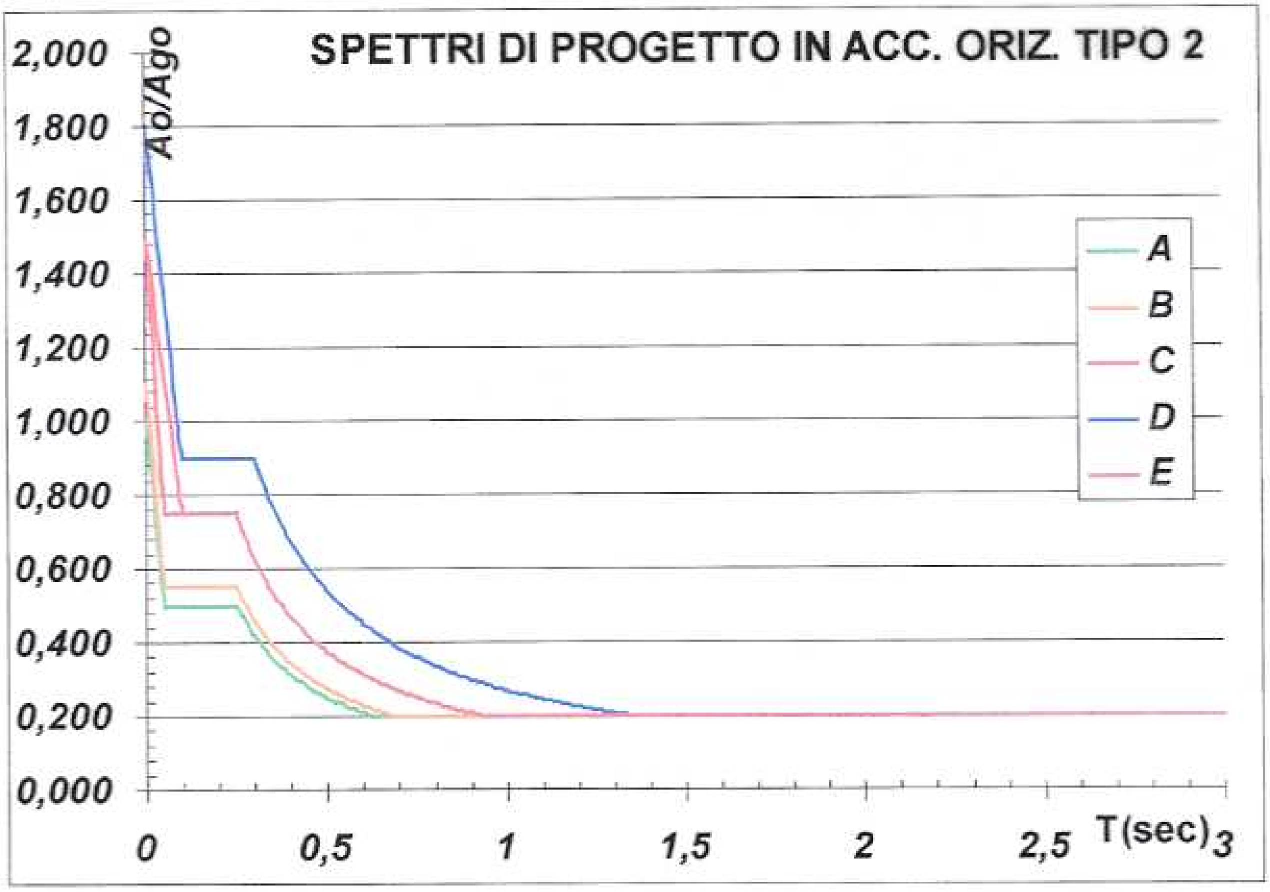

SPETTRI DI RISPOSTA IN ACC. ORIZ. TIPO 1
Ao/Ago
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
0,500
0,000
T(sec)
0
0,5
1
1,5
2
2,5
3
A
B
C
D
E

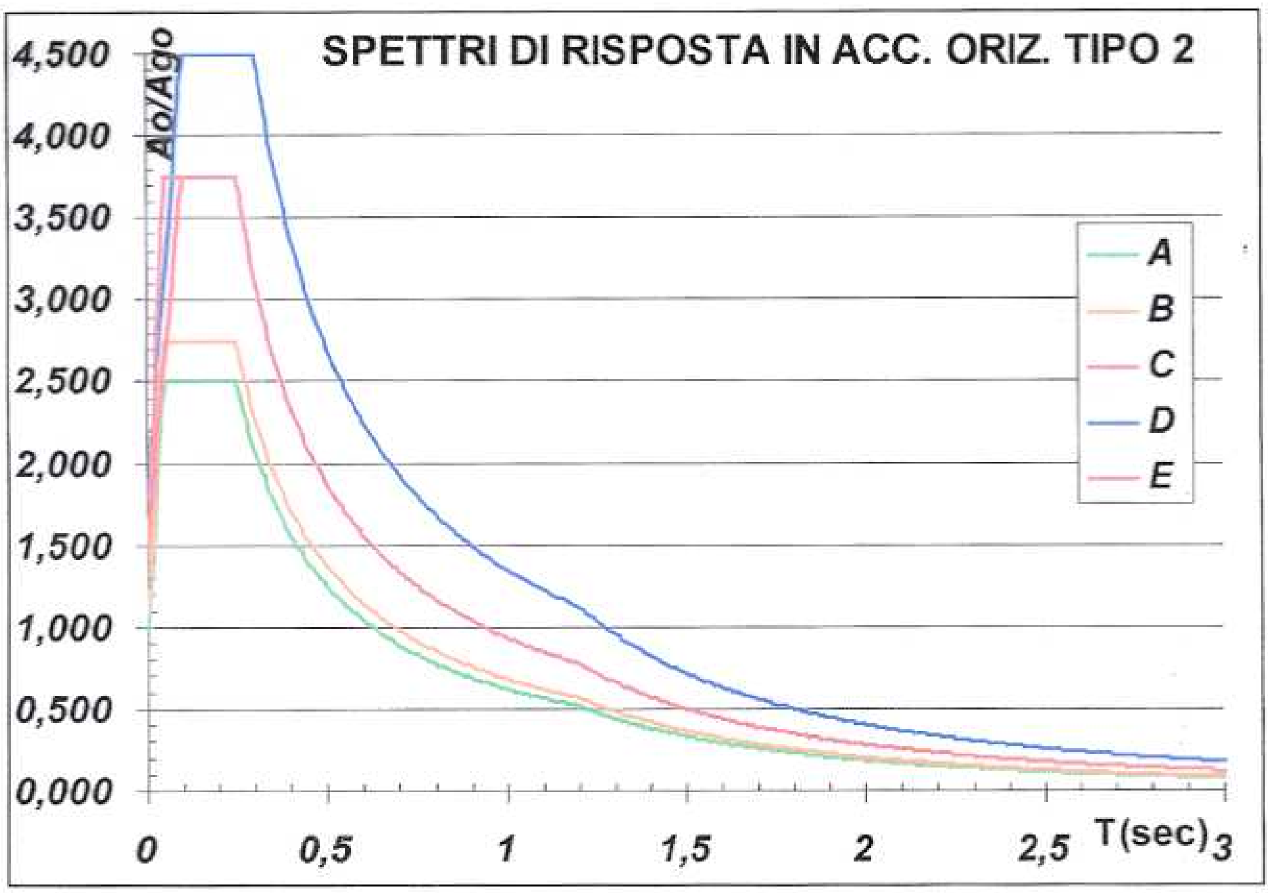

SPETTRI DI RISPOSTA IN VEL. ORIZ. TIPO 2
Vo/Ago
0,250
0,200
0,150
0,100
0,050
0,000
A
B
C
D
E
0
0,5
1
1,5
2
2,5
T(sec)
3


SPETTRI DI RISPOSTA IN ACC. ORIZ. TIPO 2
Ao/Ago
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
0,500
0,000
A
B
C
D
E
0
0,5
1
1,5
2
2,5
T(sec)
3


SPETTRI DI PROGETTO IN ACC. ORIZ. TIPO 1
Ao/Ago
1,400
1,200
1,000
0,800
0,600
0,400
0,200
0,000
A
B
C
D
E
T(sec)
0
0,5
1
1,5
2
2,5
3


SPETTRI DI RISPOSTA IN ACC. ORIZ. TIPO 1
Ao/Ago
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
0,500
0,000
A
B
C
D
E
T(sec)
0
0,5
1
1,5
2
2,5
3


SPETTRI DI PROGETTO IN ACC. ORIZ. TIPO 2
Ao/Ago
2,000
1,800
1,600
1,400
1,200
1,000
0,800
0,600
0,400
0,200
0,000
0
0,5
1
1,5
2
2,5
3
T(sec)
A
B
C
D
E


SPETTRI DI RISPOSTA IN ACC. ORIZ. TIPO 2
Ao/Ago
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
0,500
0,000
0
0,5
1
1,5
2
2,5
3
T(sec)
A
B
C
D
E