PROTEZIONE CIVILE
Presidenza del Consiglio dei Ministri
Dipartimento della Protezione Civile

RegioneEmilia-Romagna

CONFERENZA DELLE REGIONI E DELLE PROVINCE AUTONOME

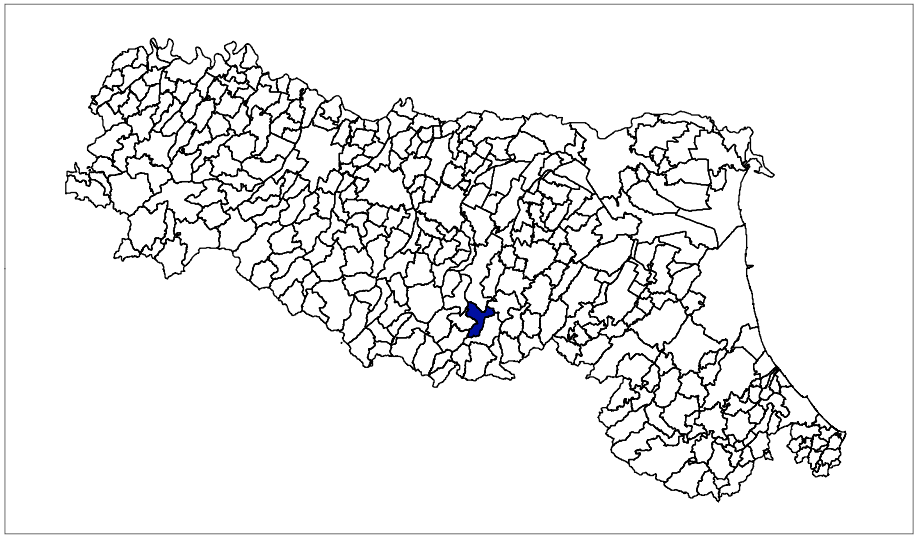
Attuazione dell'articolo 11 della legge 24 giugno 2009, n.77

MICROZONAZIONE SISMICA

Schede verifiche stabilità di versante

Regione Emilia-Romagna

Comune di Vergato



Regione	Soggetto realizzatore	Amministrazione comunale
Emilia Romagna	Studio Geologico CENTROGEO *Progetto:* Gian Pietro Mazzetti	*Sindaco:* Giuseppe Argentieri
Studio realizzato con il contributo di cui all'OCDPC 344/2016 DET ER 8757/2017. Coordinamento della Regione Emilia-Romagna - Servizio Geologico Luca Martelli	*Collaboratori:* Stefano Gilli Mauro Mazzetti Camilla Mazzetti	*Responsabile Urbanistica - Edilizia - Ambiente:* Katia Lenzi
		Data Febbraio 2021

Profilo 1

CENTROGEO SURVEY SNC
42015 Correggio (RE) - Piazza S.Quirino, 6 - tel 0522/641001 - Fax: 632162

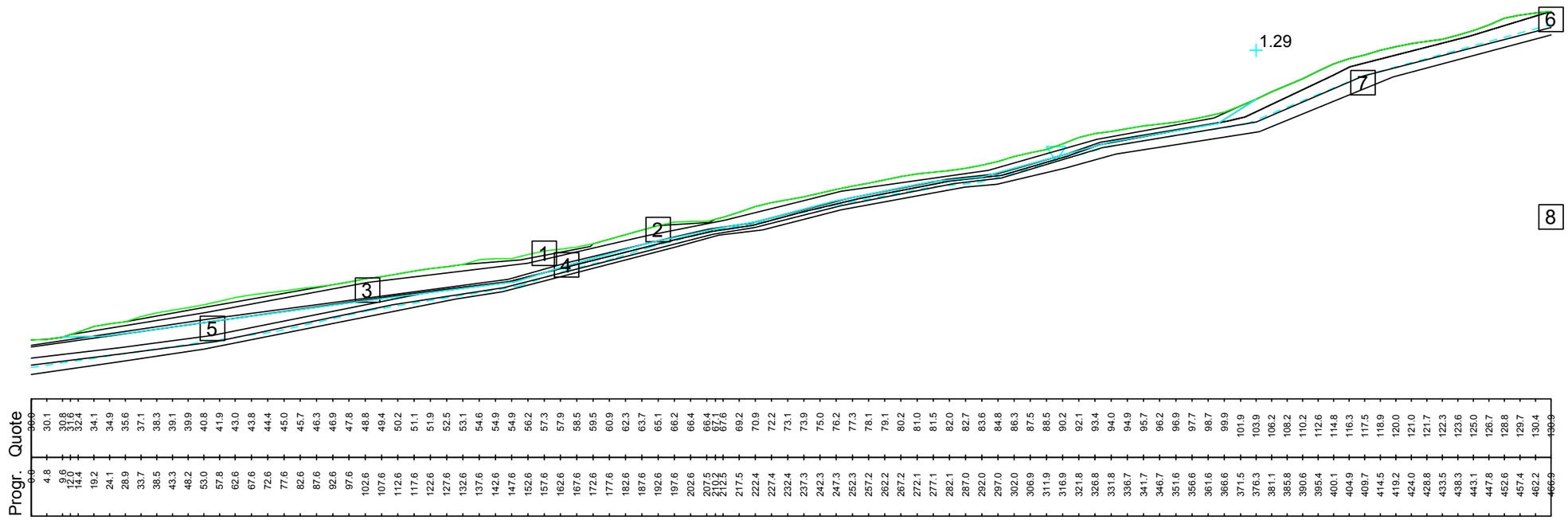
Verifiche stabilità Vergato - Istituto Fantini Profilo 1 - sup 1condizioni drenate

Presenza battente idrico
Presenza sollecitazione sismica
scala 1:1500

Litotipo 1:	phi [°] = 15.4	c [kN/m²] = 3.2	gamma [kN/m³] = 18
Litotipo 2:	phi [°] = 12.9	c [kN/m²] = 4	gamma [kN/m³] = 17.5
Litotipo 3:	phi [°] = 15.4	c [kN/m²] = 5.6	gamma [kN/m³] = 18.5
Litotipo 4:	phi [°] = 12.9	c [kN/m²] = 5.6	gamma [kN/m³] = 18
Litotipo 5:	phi [°] = 14.6	c [kN/m²] = 6.4	gamma [kN/m³] = 18.7
Litotipo 6:	phi [°] = 16.2	c [kN/m²] = 8	gamma [kN/m³] = 19
Litotipo 7:	phi [°] = 17.9	c [kN/m²] = 8.8	gamma [kN/m³] = 19.5
Litotipo 8:	phi [°] = 19.6	c [kN/m²] = 12	gamma [kN/m³] = 20

Gamma acqua [kN/m³] =10 Comp. sismica orizz.=.072 Comp. sismica vert.=.036

Metodo: Sarma



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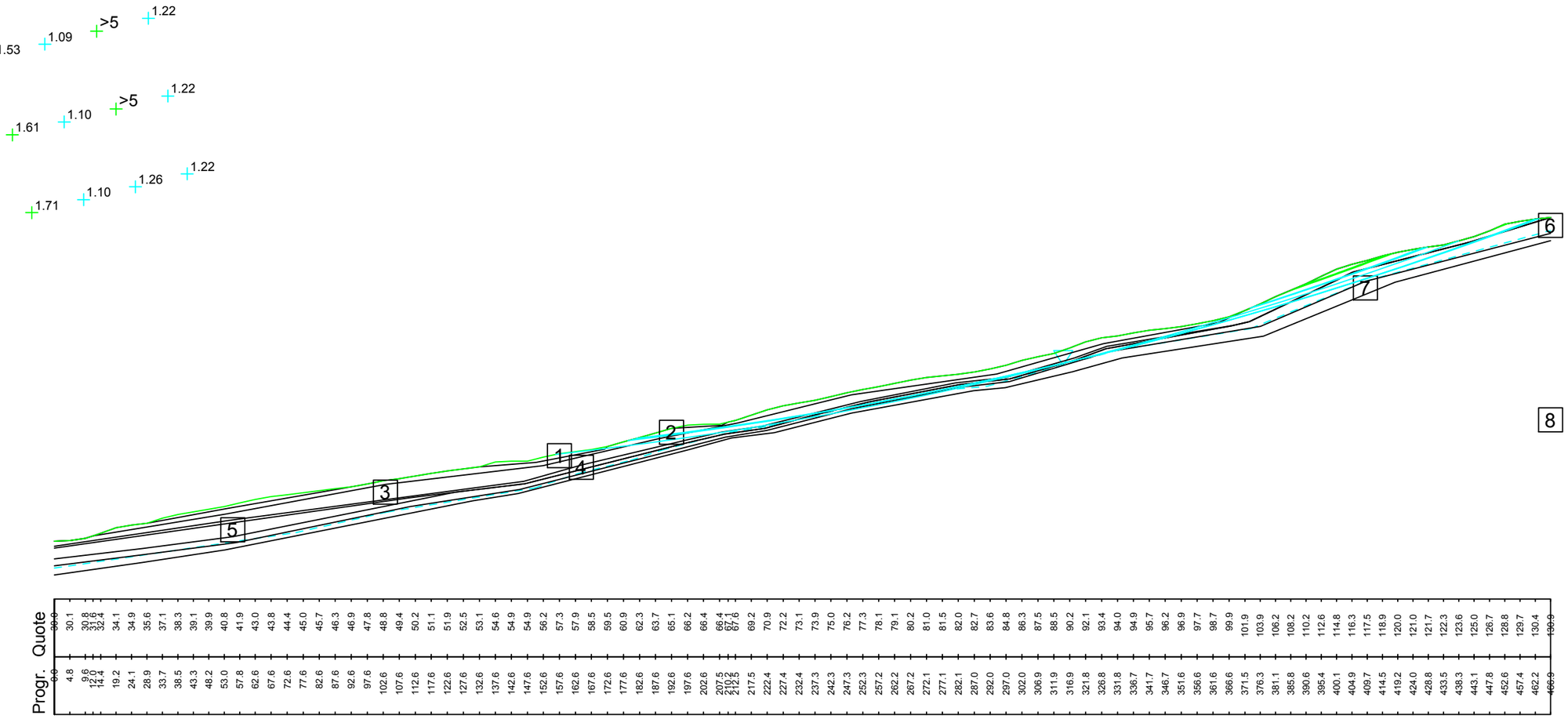
Verifiche stabilità Vergato - Istituto Fantini Profilo 1 - tan 5 condizioni drenate

Presenza battente idrico
Presenza sollecitazione sismica
scala 1:1500

Litotipo 1:	phi [°] = 15.4	c [kN/m²] = 3.2	gamma [kN/m³] = 18
Litotipo 2:	phi [°] = 12.9	c [kN/m²] = 4	gamma [kN/m³] = 17.5
Litotipo 3:	phi [°] = 15.4	c [kN/m²] = 5.6	gamma [kN/m³] = 18.5
Litotipo 4:	phi [°] = 12.9	c [kN/m²] = 5.6	gamma [kN/m³] = 18
Litotipo 5:	phi [°] = 14.6	c [kN/m²] = 6.4	gamma [kN/m³] = 18.7
Litotipo 6:	phi [°] = 16.2	c [kN/m²] = 8	gamma [kN/m³] = 19
Litotipo 7:	phi [°] = 17.9	c [kN/m²] = 8.8	gamma [kN/m³] = 19.5
Litotipo 8:	phi [°] = 19.6	c [kN/m²] = 12	gamma [kN/m³] = 20

Gamma acqua [kN/m³] =10 Comp. sismica orizz.=.072 Comp. sismica vert.=.036

Metodo: Sarma



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Profilo 2

CENTROGEO SURVEY SNC
42015 Correggio (RE) - Piazza S.Quirino, 6 - tel 0522/641001 - Fax: 632162

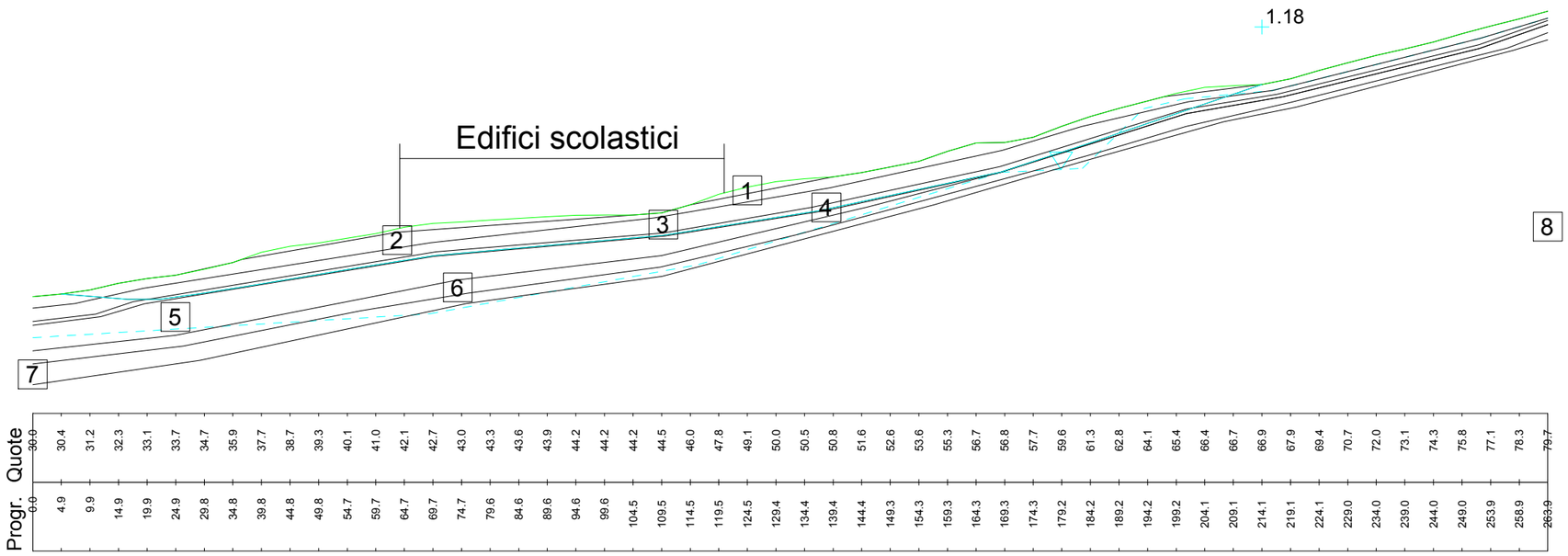
Verifiche stabilità Vergato - Istituto Fantini Profilo 2 - sup 1 condizioni drenate

Presenza di battente idrico sotterraneo
Presenza sollecitazione sismica
scala 1:1000

Litotipo 1:	phi [°] = 15.4	c [kN/m²] = 3.2	gamma [kN/m³] = 18
Litotipo 2:	phi [°] = 12.9	c [kN/m²] = 4	gamma [kN/m³] = 17.5
Litotipo 3:	phi [°] = 15.4	c [kN/m²] = 5.6	gamma [kN/m³] = 18.5
Litotipo 4:	phi [°] = 12.9	c [kN/m²] = 5.6	gamma [kN/m³] = 18
Litotipo 5:	phi [°] = 14.6	c [kN/m²] = 6.4	gamma [kN/m³] = 18.7
Litotipo 6:	phi [°] = 16.2	c [kN/m²] = 8	gamma [kN/m³] = 19
Litotipo 7:	phi [°] = 17.9	c [kN/m²] = 8.8	gamma [kN/m³] = 19.5
Litotipo 8:	phi [°] = 19.6	c [kN/m²] = 12	gamma [kN/m³] = 20

Gamma acqua [kN/m³] =10 Comp. sismica orizz.=.072 Comp. sismica vert.=.036

Metodo: Sarma



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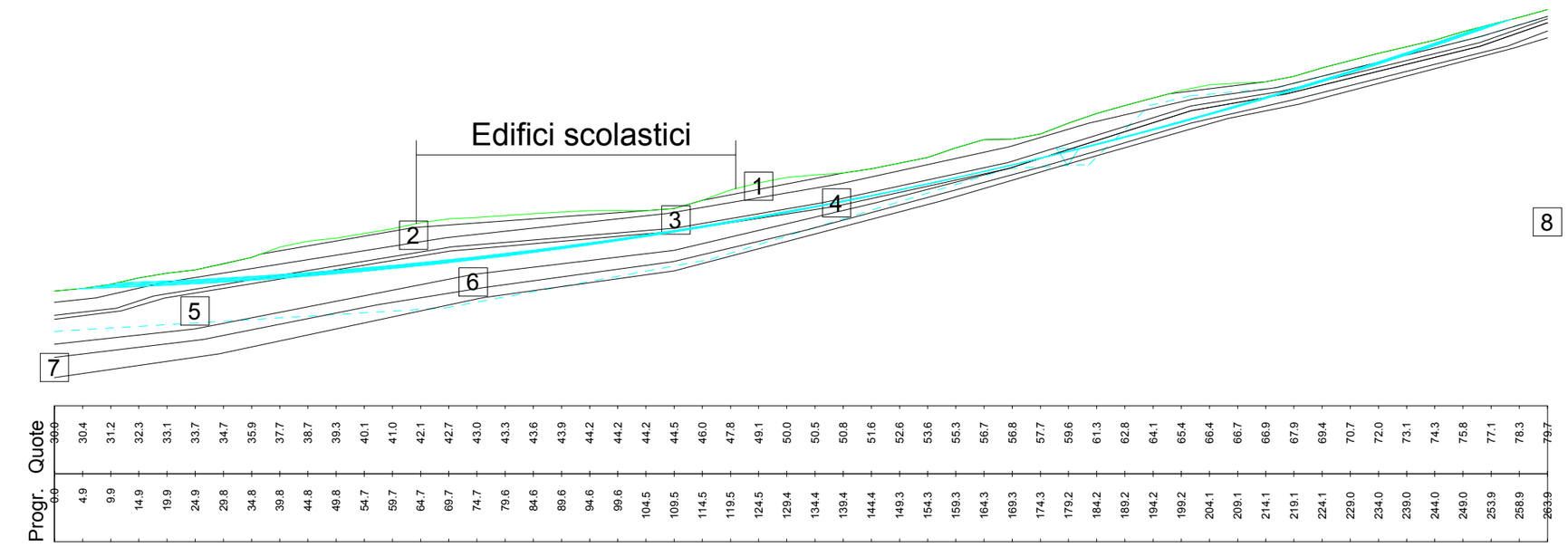
Verifiche stabilità Vergato - Istituto Fantini Profilo 2 - tan 5 condizioni drenate

Presenza di battente idrico sotterraneo
Presenza sollecitazione sismica
scala 1:1000

Litotipo 1:	phi [°] = 15.4	c [kN/m²] = 3.2	gamma [kN/m³] = 18
Litotipo 2:	phi [°] = 12.9	c [kN/m²] = 4	gamma [kN/m³] = 17.5
Litotipo 3:	phi [°] = 15.4	c [kN/m²] = 5.6	gamma [kN/m³] = 18.5
Litotipo 4:	phi [°] = 12.9	c [kN/m²] = 5.6	gamma [kN/m³] = 18
Litotipo 5:	phi [°] = 14.6	c [kN/m²] = 6.4	gamma [kN/m³] = 18.7
Litotipo 6:	phi [°] = 16.2	c [kN/m²] = 8	gamma [kN/m³] = 19
Litotipo 7:	phi [°] = 17.9	c [kN/m²] = 8.8	gamma [kN/m³] = 19.5
Litotipo 8:	phi [°] = 19.6	c [kN/m²] = 12	gamma [kN/m³] = 20

Gamma acqua [kN/m³] =10 Comp. sismica orizz.=.072 Comp. sismica vert.=.036

Metodo: Sarma



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Profilo 3

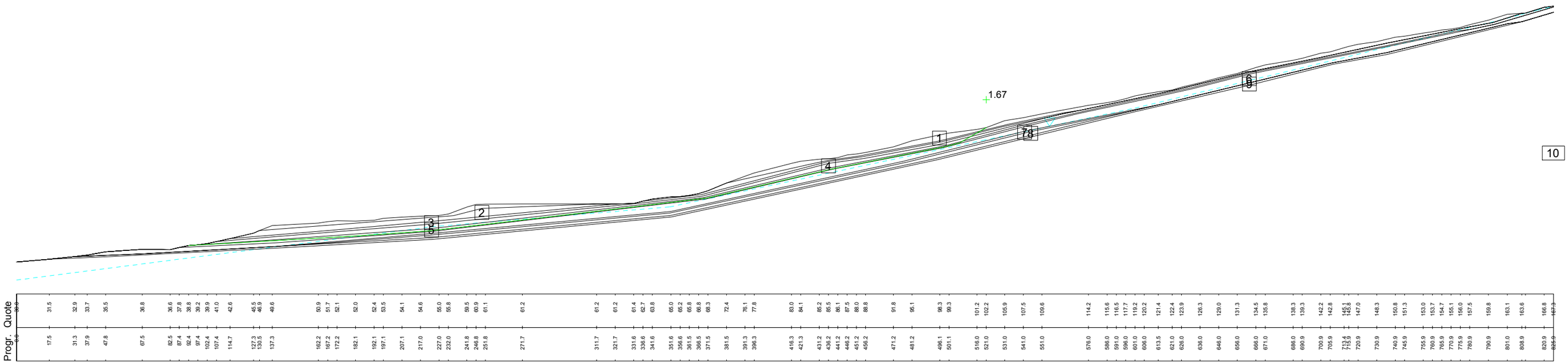
CENTROGEO SURVEY SNC
42015 Correggio (RE) - Piazza S.Quirino, 6 - tel 0522/641001 - Fax: 632162

Verifiche di stabilità Via Liserna - Vergato (BO)

Profilo 3 - Condizioni drenate
Presenza di falda
Presenza di sisma
Sup 1
scala 1:1500

Litotipo 1:	phi [°] = 15.4	c [kN/m²] = 5.6	gamma [kN/m³] = 18
Litotipo 2:	phi [°] = 17.1	c [kN/m²] = 8	gamma [kN/m³] = 19
Litotipo 3:	phi [°] = 14.2	c [kN/m²] = 16	gamma [kN/m³] = 19.2
Litotipo 4:	phi [°] = 16.2	c [kN/m²] = 8	gamma [kN/m³] = 18.5
Litotipo 5:	phi [°] = 15.4	c [kN/m²] = 9.6	gamma [kN/m³] = 18.5
Litotipo 6:	phi [°] = 17.1	c [kN/m²] = 8	gamma [kN/m³] = 19
Litotipo 7:	phi [°] = 16.2	c [kN/m²] = 6.4	gamma [kN/m³] = 18.7
Litotipo 8:	phi [°] = 17.1	c [kN/m²] = 8	gamma [kN/m³] = 19.5
Litotipo 9:	phi [°] = 15.4	c [kN/m²] = 8	gamma [kN/m³] = 18.5
Litotipo 10:	phi [°] = 14.6	c [kN/m²] = 14.4	gamma [kN/m³] = 19.6

Gamma acqua [kN/m³] =10 Comp. sismica orizz.=.071 Comp. sismica vert.=.0355
Metodo: Sarma



www.geoandsoft.com

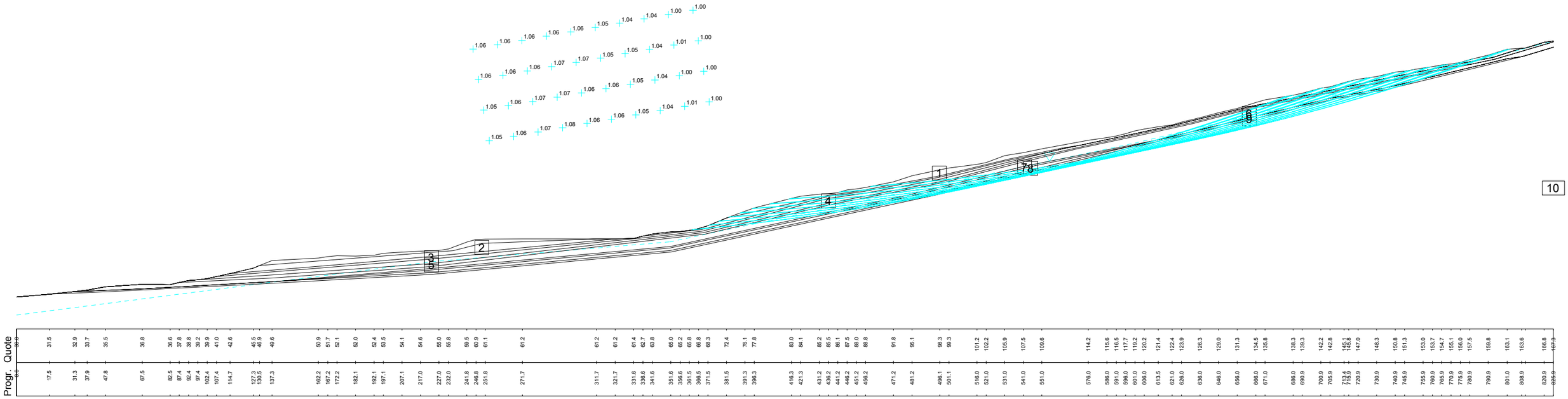
Verifiche di stabilità Via Liserna - Vergato (BO)

Profilo 3 - Condizioni drenate
Presenza di falda
Presenza di sisma
Tan 2
scala 1:1500

Litotipo 1:	phi [°] = 15.4	c [kN/m²] = 5.6	gamma [kN/m³] = 18
Litotipo 2:	phi [°] = 17.1	c [kN/m²] = 8	gamma [kN/m³] = 19
Litotipo 3:	phi [°] = 14.2	c [kN/m²] = 16	gamma [kN/m³] = 19.2
Litotipo 4:	phi [°] = 16.2	c [kN/m²] = 8	gamma [kN/m³] = 18.5
Litotipo 5:	phi [°] = 15.4	c [kN/m²] = 9.6	gamma [kN/m³] = 18.5
Litotipo 6:	phi [°] = 17.1	c [kN/m²] = 8	gamma [kN/m³] = 19
Litotipo 7:	phi [°] = 16.2	c [kN/m²] = 6.4	gamma [kN/m³] = 18.7
Litotipo 8:	phi [°] = 17.1	c [kN/m²] = 8	gamma [kN/m³] = 19.5
Litotipo 9:	phi [°] = 15.4	c [kN/m²] = 8	gamma [kN/m³] = 18.5
Litotipo 10:	phi [°] = 14.6	c [kN/m²] = 14.4	gamma [kN/m³] = 19.6

Gamma acqua [kN/m³] =10 Comp. sismica orizz.=.07 Comp. sismica vert.=.035

Metodo: Sarma



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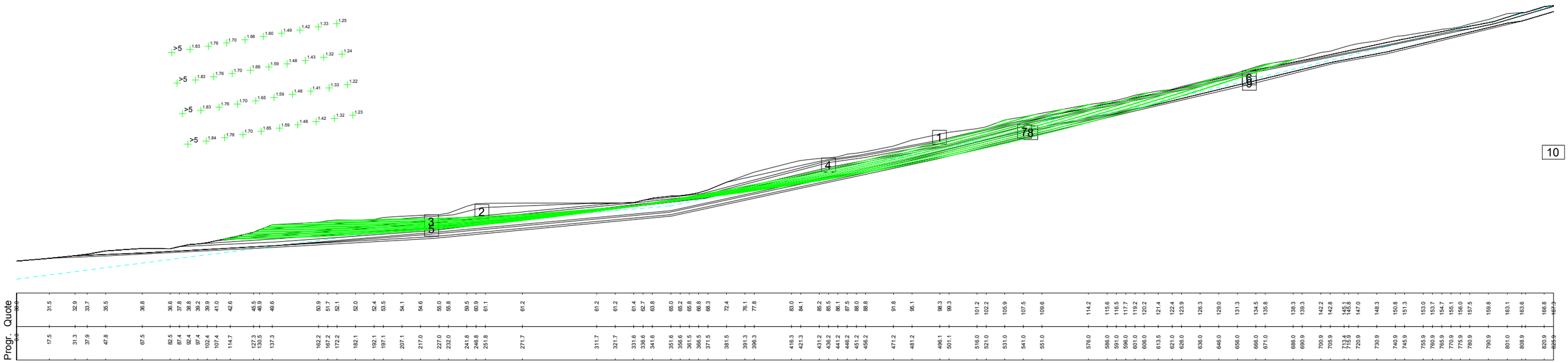
Verifiche di stabilità Via Liserna - Vergato (BO)

Profilo 3 - Condizioni drenate
Presenza di falda
Presenza di sisma
Tan 3
scala 1:1500

Litotipo 1:	phi [°] = 15.4	c [kN/m²] = 5.6	gamma [kN/m³] = 18
Litotipo 2:	phi [°] = 17.1	c [kN/m²] = 8	gamma [kN/m³] = 19
Litotipo 3:	phi [°] = 14.2	c [kN/m²] = 16	gamma [kN/m³] = 19.2
Litotipo 4:	phi [°] = 16.2	c [kN/m²] = 8	gamma [kN/m³] = 18.5
Litotipo 5:	phi [°] = 15.4	c [kN/m²] = 9.6	gamma [kN/m³] = 18.5
Litotipo 6:	phi [°] = 17.1	c [kN/m²] = 8	gamma [kN/m³] = 19
Litotipo 7:	phi [°] = 16.2	c [kN/m²] = 6.4	gamma [kN/m³] = 18.7
Litotipo 8:	phi [°] = 17.1	c [kN/m²] = 8	gamma [kN/m³] = 19.5
Litotipo 9:	phi [°] = 15.4	c [kN/m²] = 8	gamma [kN/m³] = 18.5
Litotipo 10:	phi [°] = 14.6	c [kN/m²] = 14.4	gamma [kN/m³] = 19.6

Gamma acqua [kN/m³] =10 Comp. sismica orizz.=.07 Comp. sismica vert.=.035
Metodo: Sarma



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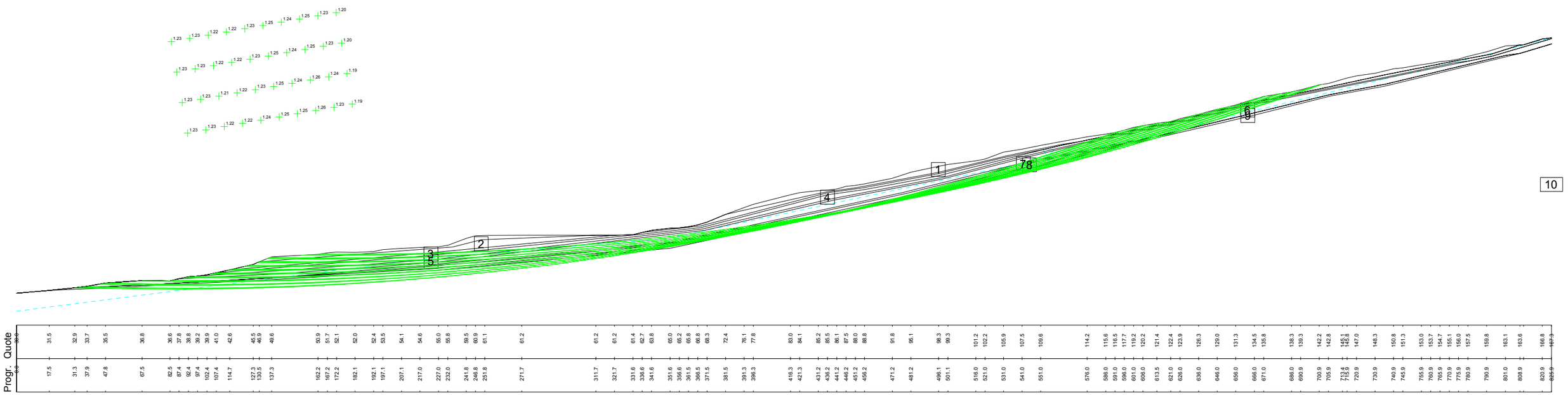
Verifiche di stabilità Via Liserna - Vergato (BO)

Profilo 3 - Condizioni drenate
Presenza di falda
Presenza di sisma
Tan 4
scala 1:1500

Litotipo 1:	phi [°] = 15.4	c [kN/m²] = 5.6	gamma [kN/m³] = 18
Litotipo 2:	phi [°] = 17.1	c [kN/m²] = 8	gamma [kN/m³] = 19
Litotipo 3:	phi [°] = 14.2	c [kN/m²] = 16	gamma [kN/m³] = 19.2
Litotipo 4:	phi [°] = 16.2	c [kN/m²] = 8	gamma [kN/m³] = 18.5
Litotipo 5:	phi [°] = 15.4	c [kN/m²] = 9.6	gamma [kN/m³] = 18.5
Litotipo 6:	phi [°] = 17.1	c [kN/m²] = 8	gamma [kN/m³] = 19
Litotipo 7:	phi [°] = 16.2	c [kN/m²] = 6.4	gamma [kN/m³] = 18.7
Litotipo 8:	phi [°] = 17.1	c [kN/m²] = 8	gamma [kN/m³] = 19.5
Litotipo 9:	phi [°] = 15.4	c [kN/m²] = 8	gamma [kN/m³] = 18.5
Litotipo 10:	phi [°] = 14.6	c [kN/m²] = 14.4	gamma [kN/m³] = 19.6

Gamma acqua [kN/m³] =10 Comp. sismica orizz.=.07 Comp. sismica vert.=.035
Metodo: Sarma



Progr.	Quote
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31.3	32.9
37.9	33.7
47.8	35.5
67.5	36.8
82.5	36.6
87.4	37.8
92.4	38.8
97.4	39.2
102.4	39.9
107.4	41.0
114.7	42.6
127.3	45.5
130.5	46.9
137.3	49.6
162.2	50.9
167.2	51.7
172.2	52.1
182.1	52.0
192.1	52.4
197.1	53.5
207.1	54.1
217.0	54.6
227.0	55.0
232.0	55.8
241.8	59.5
246.8	60.9
251.8	61.1
271.7	61.2
311.7	61.2
321.7	61.2
331.6	61.4
336.6	62.7
341.6	63.8
351.6	65.0
356.6	65.2
361.5	65.8
366.5	66.8
371.5	68.3
381.5	72.4
391.3	76.1
396.3	77.8
416.3	83.0
421.3	84.1
431.2	85.2
436.2	85.5
441.2	86.1
446.2	87.5
451.2	88.0
456.2	88.8
471.2	91.8
481.2	95.1
496.1	98.3
501.1	99.3
516.0	101.2
521.0	102.2
531.0	105.9
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601.0	119.2
606.0	120.2
613.5	121.4
621.0	122.4
626.0	123.9
636.0	126.3
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666.0	134.5
671.0	135.8
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705.9	142.8
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715.9	145.6
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730.9	148.3
740.9	150.8
745.9	151.3
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760.9	153.7
765.9	154.7
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775.9	156.0
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801.0	163.1
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820.9	166.8
825.9	167.3

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