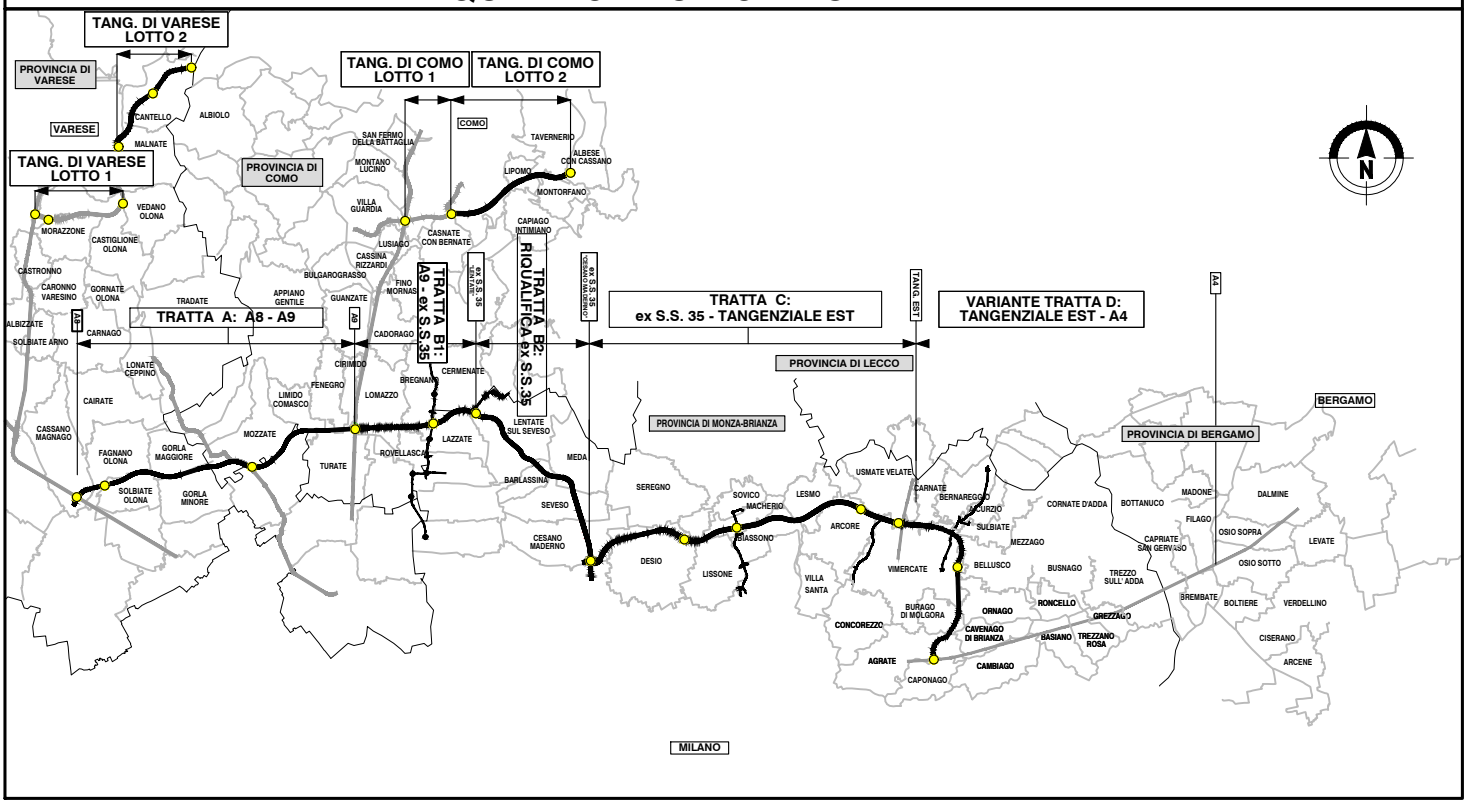
QUADRO DI UNIONE GENERALE



CONCESSIONI AUTOSTRADALI LOMBARDE

Autostrada Pedemontana Lombarda

COLLEGAMENTO AUTOSTRADALE
DALMINE-COMO-VARESE-VALICO DEL GAGGIOLO E OPERE AD ESSO CONNESSE

CODICE C.U.P. F11B06000270007

PROGETTO DEFINITIVO
VARIANTE TRATTA D

STUDI E INDAGINI

GEOTECNICA

Verifiche di stabilità

IDENTIFICAZIONE ELABORATO

WBS								
FASE PROGETTUALE	AMBITO	TRATTA	CATEGORIA	OPERA	PARTE DI OPERA	TIPO ELABORATO	PROGRESSIVA	REVISIONE ESTERNA
D	GT	DD	000	GE00	000	GT	003	A

DATA 30 Giugno 2023

SCALA

PROGETTAZIONE

Autostrada Pedemontana Lombarda

DATA	REVISIONE	
30 Giugno 2023	EMISSIONE	A

ELABORAZIONE PROGETTUALE

Direzione Ingegneria BIM Center
Arch. Fabio Massimo Saldini

RESPONSABILE INTEGRAZIONE PRESTAZIONI SPECIALISTICHE
Ing. Lucia Samorani

Redatto: Dott.Geol. Seminari
Visto: Dott. Geol. Seminari
Contributo specialistico: Ing. Norese

CONCEDENTE

CONCESSIONI AUTOSTRADALI LOMBARDE

CONCESSIONARIO

Direttore Ingegneria e BIM Center: Arch. Fabio Massimo Saldini
Direttore Tecnico: Ing. Paolo Simonetta
Responsabile Funzione Tecnica, Project Financing e ACT Ing. Andrea Monguzzi

VERIFICA E VALIDAZIONE

RTI: Conteco Check S.r.l. (Mandante), Rina Check S.r.l. (Mandataria), Bureau Veritas Italia S.p.a. (Mandataria)

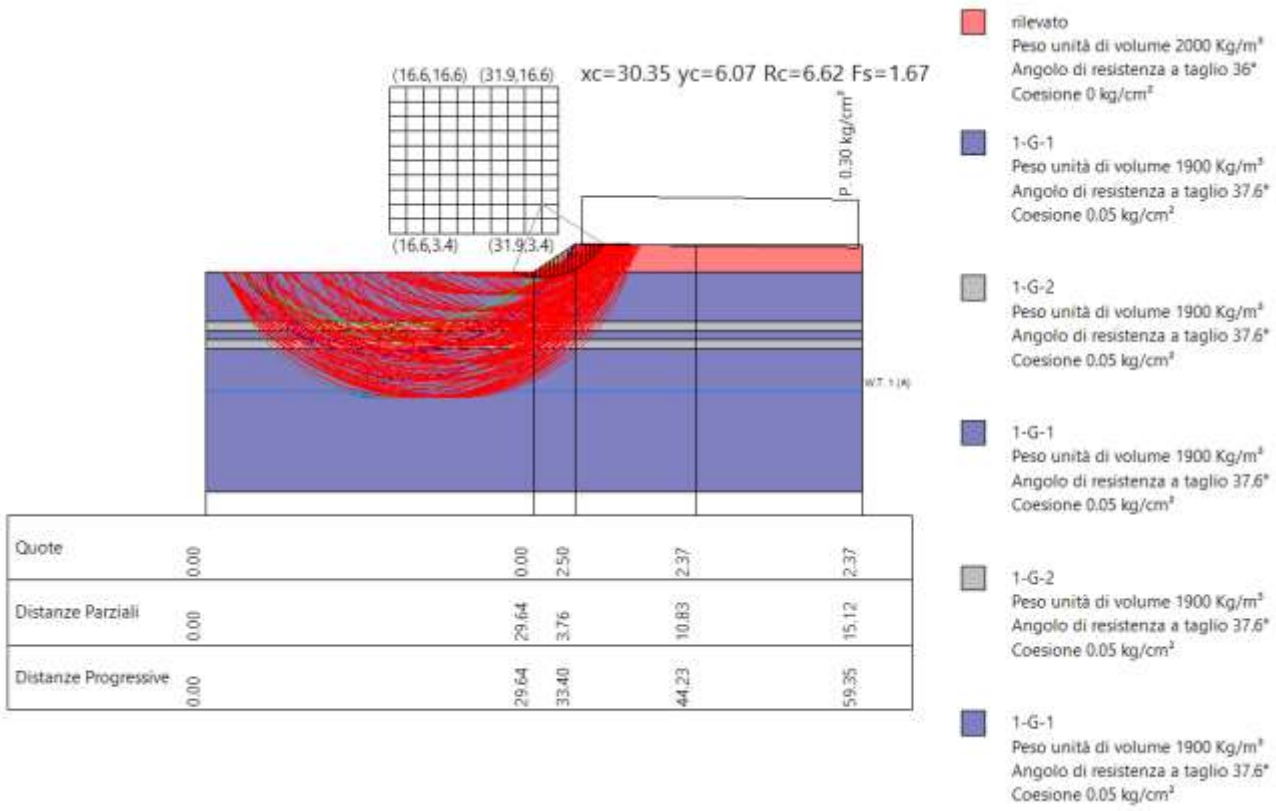
INDICE

1 VERIFICHE DI STABILITÀ

Di seguito vengono riportati i risultati delle analisi di stabilità riferite a ogni singola sezione analizzata nelle condizioni descritte in relazione.

1.1 SEZIONE 8

1.1.1 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	6.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	16.59 m
Ordinata vertice sinistro inferiore yi	3.44 m
Ascissa vertice destro superiore xs	31.88 m
Ordinata vertice destro superiore ys	16.61 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

==========

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	29.64	0.0
3	33.4	2.5
4	44.23	2.37
5	59.35	2.37

Falda

Nr.	X (m)	y (m)
1	0.0	-10.8
2	14.71	-10.8
3	30.12	-10.8
4	59.35	-10.8

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	20.66	0.0
3	29.64	0.0
4	59.35	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-4.5
2	8.11	-4.5
3	16.27	-4.5
4	59.35	-4.5

Vertici strato 3

N	X (m)	y (m)
1	0.0	-5.3
2	10.12	-5.3
3	20.32	-5.3
4	59.35	-5.3

Vertici strato 4

N	X (m)	y (m)
1	0.0	-6.15
2	11.24	-6.15
3	17.7	-6.15
4	59.35	-6.15

Vertici strato 5

N	X (m)	y (m)
1	0.0	-7.0
2	26.18	-7.0
3	44.8	-7.0
4	59.35	-7.0

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36	2000	0	rilevato	
2	0.05		37.6	1900	2000	1-G-1	
3	0.05		37.6	1900	2000	1-G-2	
4	0.05		37.6	1900	2000	1-G-1	
5	0.05		37.6	1900	2000	1-G-2	
6	0.05		37.6	1900	2000	1-G-1	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	33.97	2.45	58.97	2.128525	0.3

Risultati analisi pendio [A2+M2+R2]

Fs minimo individuato	1.67
Ascissa centro superficie	30.35 m
Ordinata centro superficie	6.07 m
Raggio superficie	6.62 m

xc = 30.347 yc = 6.074 Rc = 6.619 Fs=1.669
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.41	-21.51	0.44	65.71
2	0.41	-17.74	0.43	179.04
3	0.41	-14.06	0.42	269.58
4	0.41	-10.43	0.42	338.56
5	0.41	-6.85	0.41	386.85
6	0.41	-3.29	0.41	591.26
7	0.41	0.26	0.41	822.85
8	0.41	3.8	0.41	1034.76
9	0.41	7.36	0.41	1226.86
10	0.41	10.95	0.42	1398.79
11	0.41	14.59	0.42	1549.91
12	0.41	18.28	0.43	1679.32
13	0.41	22.06	0.44	1785.74
14	0.37	25.73	0.41	1659.31
15	0.45	29.74	0.52	1971.93
16	0.41	34.14	0.49	2437.69
17	0.41	38.54	0.52	2533.34
18	0.41	43.24	0.56	2239.57
19	0.41	48.34	0.62	1891.83
20	0.41	54.02	0.7	1172.81

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**96.37**	**277.25**	**0.0**	**0.0**	**-130.17**	**57.33**	**0.0**
2	**221.59**	**637.5**	**96.37**	**277.25**	**-58.52**	**81.33**	**0.0**
3	**357.75**	**1029.21**	**221.59**	**637.5**	**34.28**	**113.71**	**0.0**
4	**493.36**	**1419.36**	**357.75**	**1029.21**	**128.96**	**147.27**	**0.0**
5	**621.07**	**1786.76**	**493.36**	**1419.36**	**213.5**	**177.53**	**0.0**
6	**767.78**	**2208.82**	**621.07**	**1786.76**	**419.62**	**253.06**	**0.0**
7	**925.9**	**2663.73**	**767.78**	**2208.82**	**666.76**	**344.11**	**0.0**
8	**1081.5**	**3111.38**	**925.9**	**2663.73**	**906.92**	**432.96**	**0.0**
9	**1223.48**	**3519.83**	**1081.5**	**3111.38**	**1128.29**	**515.26**	**0.0**
10	**1342.92**	**3863.45**	**1223.48**	**3519.83**	**1321.34**	**587.51**	**0.0**
11	**1432.68**	**4121.69**	**1342.92**	**3863.45**	**1478.12**	**646.81**	**0.0**
12	**1487.13**	**4278.32**	**1432.68**	**4121.69**	**1591.98**	**690.78**	**0.0**
13	**1501.93**	**4320.91**	**1487.13**	**4278.32**	**1657.27**	**717.41**	**0.0**
14	**1438.46**	**4138.29**	**1501.93**	**4320.91**	**1472.76**	**512.79**	**0.0**
15	**1318.63**	**3793.58**	**1438.46**	**4138.29**	**1645.22**	**572.84**	**0.0**
16	**1111.7**	**3198.26**	**1318.63**	**3793.58**	**1854.78**	**645.81**	**0.0**
17	**836.14**	**2405.49**	**1111.7**	**3198.26**	**1702.9**	**592.92**	**0.0**
18	**535.45**	**1540.43**	**836.14**	**2405.49**	**1257.87**	**437.97**	**0.0**
19	**228.35**	**656.93**	**535.45**	**1540.43**	**801.69**	**279.14**	**0.0**
20	**0.0**	**0.0**	**228.35**	**656.93**	**291.63**	**101.54**	**0.0**

Numero di superfici esaminate....(221)

N°	Xo	Yo	Ro	Fs
1	16.6	3.4	14.8	250.57
2	17.4	4.1	13.9	20.00
3	18.1	3.4	13.2	218.79
4	18.9	4.1	12.3	20.00
5	19.6	3.4	14.8	28.37
6	20.4	4.1	15.4	17.81
7	21.2	3.4	14.8	20.00
8	21.9	4.1	15.4	13.26
9	22.7	3.4	11.7	17.84
10	23.5	4.1	13.9	10.82
11	24.2	3.4	11.7	10.75
12	25.0	4.1	12.3	8.54
13	25.8	3.4	10.1	8.05
14	26.5	4.1	9.3	6.24
15	27.3	3.4	8.6	5.82
16	28.1	4.1	7.7	4.27
17	28.8	3.4	5.5	3.63
18	29.6	4.1	6.2	2.68
19	30.3	3.4	5.5	2.62
20	31.1	4.1	6.2	2.50
21	31.9	3.4	5.5	2.63
22	16.6	4.8	14.2	20.00
23	17.4	5.4	13.5	20.00
24	18.1	4.8	13.0	20.00
25	18.9	5.4	12.1	20.00
26	19.6	4.8	16.1	19.62
27	20.4	5.4	16.8	14.79
28	21.2	4.8	16.1	13.91
29	21.9	5.4	16.8	11.70
30	22.7	4.8	16.1	11.20
31	23.5	5.4	13.7	9.50
32	24.2	4.8	13.0	8.92
33	25.0	5.4	12.1	7.32
34	25.8	4.8	9.9	6.83
35	26.5	5.4	9.0	5.23
36	27.3	4.8	8.4	4.64
37	28.1	5.4	7.5	3.28
38	28.8	4.8	6.8	2.89
39	29.6	5.4	7.5	2.57
40	30.3	4.8	6.8	2.49
41	31.1	5.4	7.5	2.52
42	31.9	4.8	6.9	2.60

43	16.6	6.1	14.8	20.00
44	17.4	6.7	14.2	20.00
45	18.1	6.1	17.4	23.55
46	18.9	6.7	16.5	21.88
47	19.6	6.1	17.4	15.60
48	20.4	6.7	18.1	12.81
49	21.2	6.1	17.4	12.20
50	21.9	6.7	16.5	10.56
51	22.7	6.1	15.9	10.02
52	23.5	6.7	15.0	8.50
53	24.2	6.1	12.8	7.86
54	25.0	6.7	11.9	6.41
55	25.8	6.1	11.2	5.87
56	26.5	6.7	10.3	4.53
57	27.3	6.1	8.1	3.88
58	28.1	6.7	7.3	2.68
59	28.8	6.1	6.6	2.00
60	29.6	6.7	7.3	1.70
61	30.3	6.1	6.6	1.67
62	31.1	6.7	7.3	1.81
63	31.9	6.1	6.6	1.96
64	16.6	7.4	15.5	20.00
65	17.4	8.0	15.0	20.00
66	18.1	7.4	18.1	20.69
67	18.9	8.0	19.0	14.75
68	19.6	7.4	18.7	13.72
69	20.4	8.0	19.4	11.66
70	21.2	7.4	17.2	11.16
71	21.9	8.0	16.3	9.67
72	22.7	7.4	15.6	9.07
73	23.5	8.0	14.7	7.66
74	24.2	7.4	14.1	7.11
75	25.0	8.0	13.2	5.85
76	25.8	7.4	11.0	5.09
77	26.5	8.0	10.1	3.94
78	27.3	7.4	9.5	3.33
79	28.1	8.0	8.6	2.09
80	28.8	7.4	7.9	1.82
81	29.6	8.0	8.6	1.74
82	30.3	7.4	7.9	1.75
83	31.1	8.0	8.6	1.92
84	31.9	7.4	8.0	2.06
85	16.6	8.7	16.2	20.00
86	17.4	9.4	15.8	20.00
87	18.1	8.7	18.7	18.51
88	18.9	9.4	19.6	13.62

89	19.6	8.7	19.9	12.28
90	20.4	9.4	19.2	10.87
91	21.2	8.7	18.5	10.28
92	21.9	9.4	17.6	8.95
93	22.7	8.7	15.4	8.31
94	23.5	9.4	16.1	7.13
95	24.2	8.7	13.8	6.37
96	25.0	9.4	13.0	5.18
97	25.8	8.7	12.3	4.63
98	26.5	9.4	11.4	3.53
99	27.3	8.7	9.2	3.01
100	28.1	9.4	9.9	1.94
101	28.8	8.7	9.2	1.78
102	29.6	9.4	9.9	1.79
103	30.3	8.7	9.3	1.83
104	31.1	9.4	9.9	2.03
105	31.9	8.7	9.1	2.12
106	16.6	10.0	17.0	20.00
107	17.4	10.7	17.9	50.46
108	18.1	10.0	19.4	16.71
109	18.9	10.7	20.3	12.68
110	19.6	10.0	20.6	11.49
111	20.4	10.7	20.0	10.17
112	21.2	10.0	18.3	9.53
113	21.9	10.7	17.4	8.30
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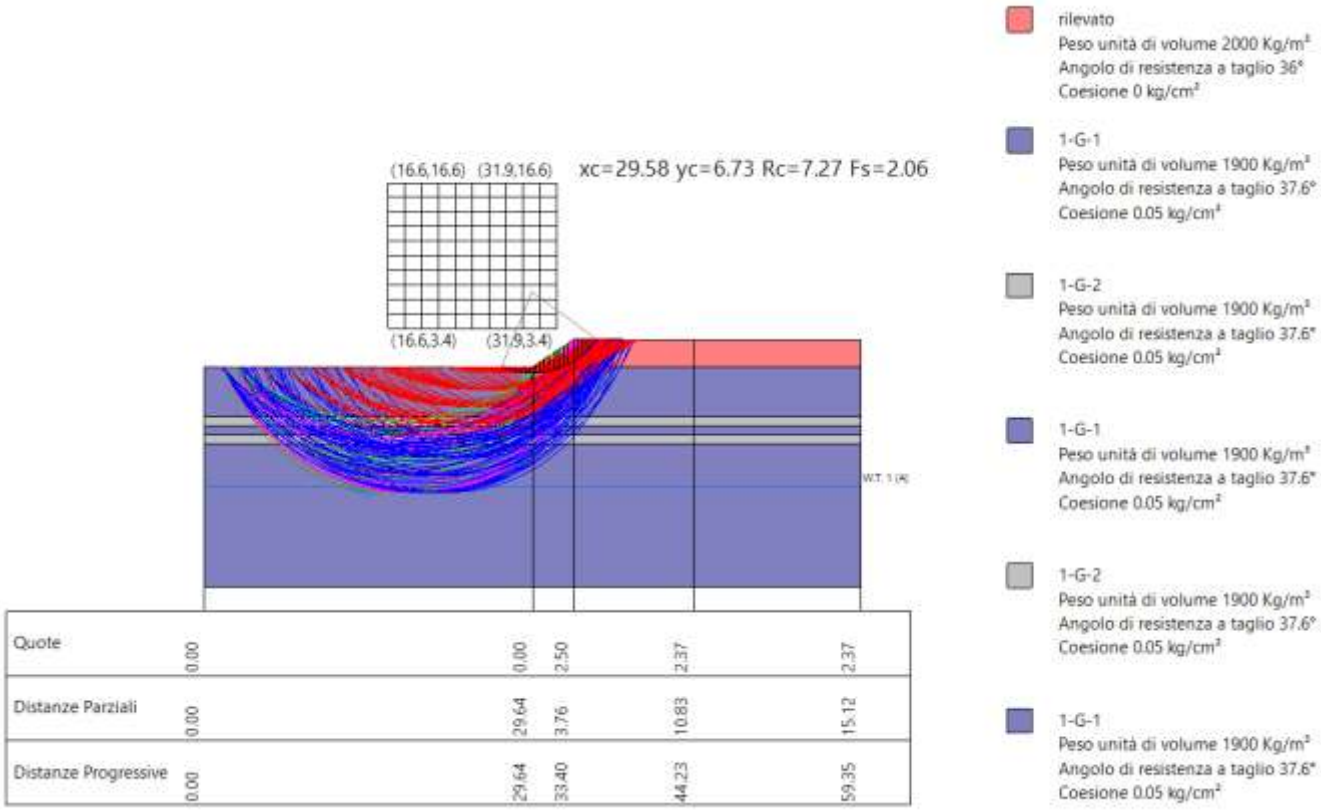
115	23.5	10.7	15.8	6.50
116	24.2	10.0	15.2	5.96
117	25.0	10.7	14.3	4.84
118	25.8	10.0	12.1	4.17
119	26.5	10.7	12.7	3.34
120	27.3	10.0	10.5	2.32
121	28.1	10.7	11.2	1.92
122	28.8	10.0	10.6	1.82
123	29.6	10.7	11.2	1.88
124	30.3	10.0	10.6	1.95
125	31.1	10.7	11.2	2.10
126	31.9	10.0	10.3	2.16
127	16.6	11.3	18.9	52.36
128	17.4	12.0	18.7	43.95
129	18.1	11.3	20.1	14.72
130	18.9	12.0	21.1	11.89
131	19.6	11.3	19.9	11.19
132	20.4	12.0	20.8	9.59
133	21.2	11.3	19.4	8.96
134	21.9	12.0	18.7	7.82

135	22.7	11.3	16.5	7.24
136	23.5	12.0	17.1	6.11
137	24.2	11.3	14.9	5.40
138	25.0	12.0	14.0	4.52
139	25.8	11.3	13.4	3.75
140	26.5	12.0	12.5	2.66
141	27.3	11.3	11.9	2.13
142	28.1	12.0	12.5	1.95
143	28.8	11.3	11.9	1.89
144	29.6	12.0	12.5	1.99
145	30.3	11.3	11.9	2.05
146	31.1	12.0	12.3	2.13
147	31.9	11.3	11.4	2.15
148	16.6	12.7	18.7	268.23
149	17.4	13.3	19.6	37.24
150	18.1	12.7	19.7	18.15
151	18.9	13.3	20.6	12.02
152	19.6	12.7	22.0	10.22
153	20.4	13.3	21.6	9.12
154	21.2	12.7	20.3	8.49
155	21.9	13.3	19.7	7.41
156	22.7	12.7	17.8	6.67
157	23.5	13.3	16.9	5.70
158	24.2	12.7	16.2	5.10
159	25.0	13.3	15.4	4.08
160	25.8	12.7	14.7	3.61
161	26.5	13.3	13.8	2.39
162	27.3	12.7	13.2	2.09
163	28.1	13.3	13.8	2.00
164	28.8	12.7	13.2	1.96
165	29.6	13.3	13.9	2.08
166	30.3	12.7	13.2	2.13
167	31.1	13.3	13.5	2.14
168	31.9	12.7	12.5	2.14
169	16.6	14.0	19.6	245.32
170	17.4	14.6	21.6	17.62
171	18.1	14.0	21.7	12.83
172	18.9	14.6	22.7	10.51
173	19.6	14.0	22.8	9.73
174	20.4	14.6	21.2	8.66
175	21.2	14.0	19.7	8.04
176	21.9	14.6	19.2	7.03
177	22.7	14.0	19.0	6.35
178	23.5	14.6	18.2	5.41
179	24.2	14.0	16.0	4.89
180	25.0	14.6	16.7	3.93

181	25.8	14.0	16.0	3.50
182	26.5	14.6	15.1	2.30
183	27.3	14.0	14.5	2.09
184	28.1	14.6	15.2	2.06
185	28.8	14.0	14.5	2.04
186	29.6	14.6	15.2	2.16
187	30.3	14.0	14.4	2.14
188	31.1	14.6	14.6	2.05
189	31.9	14.0	13.7	2.25
190	16.6	15.3	21.6	35.90
191	17.4	15.9	21.5	27.67
192	18.1	15.3	22.6	12.10
193	18.9	15.9	23.6	10.02
194	19.6	15.3	22.4	9.32
195	20.4	15.9	22.1	8.27
196	21.2	15.3	20.7	7.59
197	21.9	15.9	20.2	6.68
198	22.7	15.3	20.0	6.08
199	23.5	15.9	19.3	5.19
200	24.2	15.3	17.3	4.47
201	25.0	15.9	18.0	3.80
202	25.8	15.3	15.8	2.76
203	26.5	15.9	16.5	2.26
204	27.3	15.3	15.8	2.12
205	28.1	15.9	16.5	2.12
206	28.8	15.3	15.8	2.12
207	29.6	15.9	16.4	2.21
208	30.3	15.3	15.5	2.13
209	31.1	15.9	15.7	2.15
210	31.9	15.3	14.8	2.36
211	16.6	16.6	21.6	167.24
212	18.1	16.6	22.4	14.01
213	19.6	16.6	23.4	8.91
214	21.2	16.6	21.7	7.27
215	22.7	16.6	21.0	5.86
216	24.2	16.6	18.6	4.24
217	25.8	16.6	17.1	2.57
218	27.3	16.6	17.1	2.17
219	28.8	16.6	17.1	2.21
220	30.3	16.6	16.6	2.10
221	31.9	16.6	16.0	2.49

1.1.2 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	6.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.2
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	16.59 m
Ordinata vertice sinistro inferiore yi	3.44 m
Ascissa vertice destro superiore xs	31.88 m
Ordinata vertice destro superiore ys	16.61 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

==========

Coefficiente azione sismica orizzontale 0.032
Coefficiente azione sismica verticale 0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	29.64	0.0
3	33.4	2.5
4	44.23	2.37
5	59.35	2.37

Falda

Nr.	X (m)	y (m)
1	0.0	-10.8
2	14.71	-10.8
3	30.12	-10.8
4	59.35	-10.8

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	20.66	0.0
3	29.64	0.0
4	59.35	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-4.5
2	8.11	-4.5
3	16.27	-4.5
4	59.35	-4.5

Vertici strato 3

N	X (m)	y (m)
1	0.0	-5.3
2	10.12	-5.3
3	20.32	-5.3
4	59.35	-5.3

Vertici strato 4

N	X (m)	y (m)
1	0.0	-6.15
2	11.24	-6.15
3	17.7	-6.15
4	59.35	-6.15

Vertici strato 5

N	X (m)	y (m)
1	0.0	-7.0
2	26.18	-7.0
3	44.8	-7.0
4	59.35	-7.0

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	No

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36	2000	0	rilevato	
2	0.05		37.6	1900	2000	1-G-1	
3	0.05		37.6	1900	2000	1-G-2	
4	0.05		37.6	1900	2000	1-G-1	
5	0.05		37.6	1900	2000	1-G-2	
6	0.05		37.6	1900	2000	1-G-1	

Risultati analisi pendio

==========

Fs minimo individuato	2.06
Ascissa centro superficie	29.58 m
Ordinata centro superficie	6.73 m
Raggio superficie	7.27 m

==========

xc = 29.583 yc = 6.732 Rc = 7.269 Fs=2.059

Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.43	-20.34	0.46	68.86
2	0.43	-16.75	0.45	187.65
3	0.43	-13.23	0.44	282.44
4	0.43	-9.75	0.44	354.4
5	0.43	-6.31	0.43	404.35
6	0.43	-2.89	0.43	432.86
7	0.43	0.51	0.43	442.06
8	0.43	3.92	0.43	676.94
9	0.43	7.34	0.44	890.61
10	0.43	10.79	0.44	1082.7
11	0.43	14.28	0.45	1252.57
12	0.43	17.82	0.45	1399.28
13	0.43	21.44	0.46	1521.6
14	0.43	25.15	0.48	1611.22
15	0.52	29.36	0.59	1996.27
16	0.35	33.33	0.42	1285.43
17	0.43	37.11	0.54	1350.81
18	0.43	41.52	0.58	1041.05
19	0.43	46.25	0.62	678.21
20	0.43	51.45	0.69	247.76

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	65.2	214.5	0.0	0.0	-69.33	71.59	0.0
2	152.46	501.59	65.2	214.5	17.99	96.87	0.0
3	248.67	818.12	152.46	501.59	115.34	125.73	0.0
4	344.99	1135.04	248.67	818.12	208.18	153.57	0.0
5	435.57	1433.03	344.99	1135.04	286.97	177.38	0.0
6	516.69	1699.94	435.57	1433.03	345.42	195.18	0.0
7	586.51	1929.66	516.69	1699.94	381.22	206.23	0.0
8	661.25	2175.54	586.51	1929.66	626.93	283.03	0.0
9	730.61	2403.75	661.25	2175.54	854.17	354.39	0.0
10	786.24	2586.75	730.61	2403.75	1053.71	417.44	0.0
11	821.33	2702.22	786.24	2586.75	1217.87	469.83	0.0
12	830.5	2732.37	821.33	2702.22	1340.24	509.59	0.0
13	809.57	2663.53	830.5	2732.37	1415.48	535.14	0.0
14	721.37	2373.35	809.57	2663.53	1416.46	416.58	0.0
15	570.54	1877.09	721.37	2373.35	1624.57	477.79	0.0
16	448.4	1475.27	570.54	1877.09	949.79	279.33	0.0
17	295.09	970.86	448.4	1475.27	886.33	260.67	0.0
18	154.24	507.46	295.09	970.86	568.14	167.09	0.0
19	46.24	152.12	154.24	507.46	278.77	81.99	0.0
20	0.0	0.0	46.24	152.12	60.54	17.8	0.0

Numero di superfici esaminate....(221)

N°	Xo	Yo	Ro	Fs
1	16.6	3.4	14.8	39.67
2	17.4	4.1	15.4	28.32
3	18.1	3.4	13.2	38.03
4	18.9	4.1	15.4	19.56
5	19.6	3.4	14.8	19.22
6	20.4	4.1	15.4	15.34
7	21.2	3.4	14.8	15.27
8	21.9	4.1	15.4	13.24
9	22.7	3.4	13.2	13.09
10	23.5	4.1	12.3	11.12
11	24.2	3.4	11.7	10.87
12	25.0	4.1	10.8	8.87
13	25.8	3.4	8.6	8.32
14	26.5	4.1	7.7	6.40
15	27.3	3.4	7.1	5.85
16	28.1	4.1	6.2	3.99
17	28.8	3.4	5.5	3.59
18	29.6	4.1	6.2	3.17
19	30.3	3.4	5.5	3.16
20	31.1	4.1	6.2	3.19
21	31.9	3.4	5.5	3.43
22	16.6	4.8	14.2	41.22
23	17.4	5.4	15.1	30.27
24	18.1	4.8	16.1	20.30
25	18.9	5.4	16.8	16.30
26	19.6	4.8	16.1	15.44
27	20.4	5.4	16.8	13.97
28	21.2	4.8	14.5	13.56
29	21.9	5.4	13.6	11.94
30	22.7	4.8	13.0	11.40
31	23.5	5.4	12.1	9.70
32	24.2	4.8	11.4	9.28
33	25.0	5.4	10.6	7.61
34	25.8	4.8	9.9	7.15
35	26.5	5.4	9.0	5.51
36	27.3	4.8	6.8	4.61
37	28.1	5.4	7.5	3.61
38	28.8	4.8	6.8	3.33
39	29.6	5.4	7.5	3.17
40	30.3	4.8	6.8	3.13
41	31.1	5.4	7.5	3.25
42	31.9	4.8	6.9	3.41

43	16.6	6.1	16.2	28.66
44	17.4	6.7	17.2	19.43
45	18.1	6.1	17.4	17.07
46	18.9	6.7	16.5	15.76
47	19.6	6.1	17.4	14.19
48	20.4	6.7	18.1	12.63
49	21.2	6.1	15.9	12.31
50	21.9	6.7	15.0	10.78
51	22.7	6.1	14.3	10.35
52	23.5	6.7	13.4	8.89
53	24.2	6.1	11.2	8.25
54	25.0	6.7	10.3	6.90
55	25.8	6.1	9.7	6.05
56	26.5	6.7	8.8	4.74
57	27.3	6.1	8.1	4.03
58	28.1	6.7	7.3	2.56
59	28.8	6.1	6.6	2.13
60	29.6	6.7	7.3	2.06
61	30.3	6.1	6.6	2.08
62	31.1	6.7	7.3	2.33
63	31.9	6.1	6.6	2.59
64	16.6	7.4	15.5	34.71
65	17.4	8.0	16.4	23.54
66	18.1	7.4	18.1	15.46
67	18.9	8.0	19.0	13.45
68	19.6	7.4	17.2	13.04
69	20.4	8.0	16.3	11.72
70	21.2	7.4	17.2	11.22
71	21.9	8.0	16.3	9.90
72	22.7	7.4	14.1	9.35
73	23.5	8.0	13.2	8.04
74	24.2	7.4	12.5	7.49
75	25.0	8.0	11.6	6.13
76	25.8	7.4	11.0	5.57
77	26.5	8.0	10.1	4.29
78	27.3	7.4	7.9	3.63
79	28.1	8.0	8.6	2.33
80	28.8	7.4	7.9	2.15
81	29.6	8.0	8.6	2.17
82	30.3	7.4	7.9	2.21
83	31.1	8.0	8.6	2.46
84	31.9	7.4	8.0	2.69
85	16.6	8.7	17.5	23.27
86	17.4	9.4	17.1	21.41
87	18.1	8.7	18.7	14.23
88	18.9	9.4	19.6	12.62

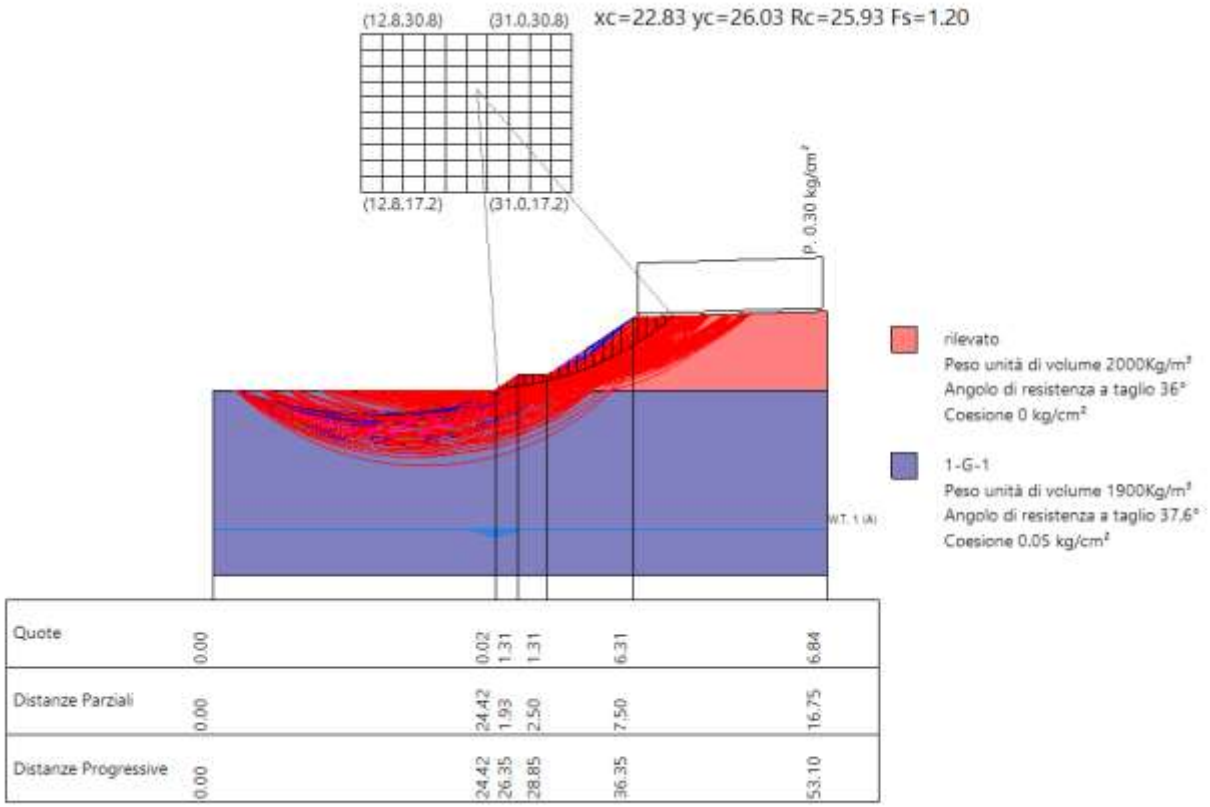
89	19.6	8.7	19.9	12.13
90	20.4	9.4	19.2	10.97
91	21.2	8.7	16.9	10.46
92	21.9	9.4	16.0	9.22
93	22.7	8.7	15.4	8.64
94	23.5	9.4	14.5	7.54
95	24.2	8.7	12.3	6.94
96	25.0	9.4	13.0	5.75
97	25.8	8.7	10.8	4.98
98	26.5	9.4	11.4	4.11
99	27.3	8.7	9.2	2.89
100	28.1	9.4	9.9	2.31
101	28.8	8.7	9.2	2.17
102	29.6	9.4	9.9	2.24
103	30.3	8.7	9.3	2.31
104	31.1	9.4	9.9	2.59
105	31.9	8.7	9.1	2.75
106	16.6	10.0	17.0	29.60
107	17.4	10.7	17.9	19.76
108	18.1	10.0	19.4	13.22
109	18.9	10.7	20.3	11.92
110	19.6	10.0	20.6	11.47
111	20.4	10.7	18.5	10.32
112	21.2	10.0	18.3	9.79
113	21.9	10.7	17.4	8.66
114	22.7	10.0	15.2	8.08
115	23.5	10.7	14.3	7.08
116	24.2	10.0	13.6	6.34
117	25.0	10.7	12.7	5.37
118	25.8	10.0	12.1	4.62
119	26.5	10.7	11.2	3.49
120	27.3	10.0	10.5	2.64
121	28.1	10.7	11.2	2.35
122	28.8	10.0	10.6	2.25
123	29.6	10.7	11.2	2.35
124	30.3	10.0	10.6	2.46
125	31.1	10.7	11.2	2.65
126	31.9	10.0	10.3	2.77
127	16.6	11.3	18.9	19.96
128	17.4	12.0	18.7	18.30
129	18.1	11.3	20.1	12.47
130	18.9	12.0	21.1	11.33
131	19.6	11.3	19.9	10.85
132	20.4	12.0	19.4	9.77
133	21.2	11.3	17.9	9.22
134	21.9	12.0	17.1	8.22

135	22.7	11.3	16.5	7.66
136	23.5	12.0	15.6	6.64
137	24.2	11.3	14.9	6.00
138	25.0	12.0	14.0	5.03
139	25.8	11.3	13.4	4.37
140	26.5	12.0	12.5	3.08
141	27.3	11.3	11.9	2.58
142	28.1	12.0	12.5	2.41
143	28.8	11.3	11.9	2.35
144	29.6	12.0	12.5	2.49
145	30.3	11.3	11.9	2.58
146	31.1	12.0	12.3	2.66
147	31.9	11.3	11.4	2.70
148	16.6	12.7	18.7	26.51
149	17.4	13.3	19.6	16.76
150	18.1	12.7	19.7	13.10
151	18.9	13.3	20.6	10.86
152	19.6	12.7	20.7	10.30
153	20.4	13.3	20.3	9.22
154	21.2	12.7	18.8	8.76
155	21.9	13.3	18.2	7.83
156	22.7	12.7	17.8	7.28
157	23.5	13.3	16.9	6.31
158	24.2	12.7	16.2	5.83
159	25.0	13.3	15.4	4.74
160	25.8	12.7	14.7	4.33
161	26.5	13.3	13.8	2.92
162	27.3	12.7	13.2	2.58
163	28.1	13.3	13.8	2.48
164	28.8	12.7	13.2	2.44
165	29.6	13.3	13.9	2.58
166	30.3	12.7	13.2	2.65
167	31.1	13.3	13.5	2.62
168	31.9	12.7	12.5	2.60
169	16.6	14.0	19.6	25.64
170	17.4	14.6	21.6	12.90
171	18.1	14.0	21.7	11.36
172	18.9	14.6	22.7	10.25
173	19.6	14.0	21.5	9.75
174	20.4	14.6	21.2	8.87
175	21.2	14.0	19.7	8.33
176	21.9	14.6	19.2	7.44
177	22.7	14.0	17.5	6.97
178	23.5	14.6	18.2	6.13
179	24.2	14.0	16.0	5.40
180	25.0	14.6	16.7	4.68

181	25.8	14.0	16.0	4.26
182	26.5	14.6	15.1	2.86
183	27.3	14.0	14.5	2.61
184	28.1	14.6	15.2	2.56
185	28.8	14.0	14.5	2.54
186	29.6	14.6	15.2	2.67
187	30.3	14.0	14.4	2.63
188	31.1	14.6	14.6	2.41
189	31.9	14.0	13.7	2.70
190	16.6	15.3	21.6	16.23
191	17.4	15.9	21.5	14.36
192	18.1	15.3	22.6	10.91
193	18.9	15.9	23.6	9.88
194	19.6	15.3	22.4	9.39
195	20.4	15.9	22.1	8.57
196	21.2	15.3	20.7	7.99
197	21.9	15.9	20.2	7.21
198	22.7	15.3	18.5	6.70
199	23.5	15.9	19.3	5.96
200	24.2	15.3	17.3	5.16
201	25.0	15.9	18.0	4.59
202	25.8	15.3	15.8	3.41
203	26.5	15.9	16.5	2.85
204	27.3	15.3	15.8	2.65
205	28.1	15.9	16.5	2.64
206	28.8	15.3	15.8	2.63
207	29.6	15.9	16.4	2.72
208	30.3	15.3	15.5	2.59
209	31.1	15.9	15.7	2.51
210	31.9	15.3	14.8	2.81
211	16.6	16.6	21.6	23.67
212	18.1	16.6	22.4	11.28
213	19.6	16.6	23.4	9.08
214	21.2	16.6	21.7	7.75
215	22.7	16.6	19.6	6.47
216	24.2	16.6	18.6	5.02
217	25.8	16.6	17.1	3.26
218	27.3	16.6	17.1	2.71
219	28.8	16.6	17.1	2.72
220	30.3	16.6	16.6	2.47
221	31.9	16.6	16.0	2.94

1.2 SEZIONE 26

1.2.1 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

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Calcolo eseguito secondo	NTC 2018
Numero di strati	6.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata

Superficie di forma circolare

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Maglia dei Centri

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Ascissa vertice sinistro inferiore xi	12.79 m
Ordinata vertice sinistro inferiore yi	17.17 m
Ascissa vertice destro superiore xs	31.05 m
Ordinata vertice destro superiore ys	30.81 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	24.42	0.02
3	26.35	1.31
4	28.85	1.31
5	36.35	6.31
6	53.1	6.84

Falda

Nr.	X (m)	y (m)
1	0.0	-12.0
2	24.42	-11.98
3	53.1	-11.98

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	24.42	0.02
3	53.1	0.02

Vertici strato 2

N	X (m)	y (m)

Vertici strato 3

N	X (m)	y (m)

Vertici strato 4

N	X (m)	y (m)

Vertici strato 5

N	X (m)	y (m)

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36	2000		rilevato	
2	0.05		37.6	1900	0	1-G-1	
3	0.05		37.6	1900	2000	1-G-2	
4	0.05		37.6	1900	2000	1-G-1	
5	0.05		37.6	1900	2000	1-G-2	
6	0.05		37.6	1900	2000	1-G-1	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	36.76	6.63	52.76	7.131486	0.3

Risultati analisi pendio

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Fs minimo individuato 1.2
Ascissa centro superficie 22.83 m
Ordinata centro superficie 26.03 m
Raggio superficie 25.93 m

==========

xc = 22.831 yc = 26.035 Rc = 25.933 Fs=1.203

Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.76	4.82	0.76	338.9
2	0.96	6.74	0.97	1368.33
3	0.55	8.43	0.56	1028.91
4	0.76	9.89	0.77	1250.53
5	0.76	11.6	0.77	1032.4
6	0.76	13.31	0.78	778.53
7	0.76	15.04	0.79	1202.15
8	0.76	16.78	0.79	1640.8
9	0.76	18.54	0.8	2041.15
10	0.76	20.32	0.81	2402.05
11	0.76	22.12	0.82	2722.19
12	0.76	23.94	0.83	3000.05
13	0.76	25.78	0.84	3233.9
14	0.76	27.66	0.86	3421.67
15	1.11	30.02	1.28	5240.06
16	0.41	31.96	0.48	1873.72
17	0.76	33.5	0.91	5199.15
18	0.76	35.53	0.93	4444.9
19	0.76	37.62	0.96	3628.22
20	0.76	39.77	0.99	2443.86

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	68.16	155.96	0.0	0.0	282.9	136.69	0.0
2	311.38	712.51	68.16	155.96	1182.63	571.44	0.0
3	474.22	1085.14	311.38	712.51	911.31	440.34	0.0
4	651.97	1491.89	474.22	1085.14	1126.7	544.41	0.0
5	780.24	1785.39	651.97	1491.89	944.69	456.46	0.0
6	863.56	1976.07	780.24	1785.39	720.42	348.1	0.0
7	972.3	2224.89	863.56	1976.07	1120.52	541.43	0.0
8	1094.4	2504.28	972.3	2224.89	1534.69	741.55	0.0
9	1214.51	2779.13	1094.4	2504.28	1908.72	922.28	0.0
10	1319.45	3019.25	1214.51	2779.13	2237.56	1081.17	0.0
11	1398.04	3199.09	1319.45	3019.25	2516.81	1216.1	0.0
12	1441.08	3297.58	1398.04	3199.09	2742.67	1325.24	0.0
13	1441.26	3297.98	1441.08	3297.58	2912.0	1407.05	0.0
14	1393.16	3187.93	1441.26	3297.98	3022.21	1460.31	0.0
15	1229.19	2812.71	1393.16	3187.93	4491.53	2170.27	0.0
16	1144.62	2619.2	1229.19	2812.71	1558.97	753.28	0.0
17	854.24	1954.72	1144.62	2619.2	4210.99	2034.72	0.0
18	543.99	1244.79	854.24	1954.72	3457.11	1670.45	0.0
19	239.74	548.59	543.99	1244.79	2689.91	1299.74	0.0
20	0.0	0.0	239.74	548.59	1711.9	827.17	0.0

Numero di superfici esaminate....(207)

N°	Xo	Yo	Ro	Fs
1	13.7	17.9	21.5	45.35
2	14.6	17.2	21.4	25.31
3	15.5	17.9	22.5	11.55
4	16.4	17.2	22.5	7.56
5	17.4	17.9	23.6	5.28
6	18.3	17.2	23.7	4.64
7	19.2	17.9	23.4	4.01
8	20.1	17.2	21.9	3.65
9	21.0	17.9	19.8	3.01
10	21.9	17.2	17.9	2.57
11	22.8	17.9	18.8	1.92
12	23.7	17.2	18.5	1.88
13	24.7	17.9	19.3	1.82
14	25.6	17.2	18.5	1.74
15	26.5	17.9	18.6	1.60
16	27.4	17.2	17.8	1.57
17	28.3	17.9	17.9	1.51
18	29.2	17.2	17.1	1.49
19	30.1	17.9	17.2	1.52
20	31.0	17.2	17.5	1.86
21	14.6	18.5	22.5	23.07
22	15.5	19.2	23.6	10.54
23	16.4	18.5	23.6	6.92
24	17.4	19.2	24.7	4.95
25	18.3	18.5	23.4	4.51
26	19.2	19.2	23.0	3.79
27	20.1	18.5	21.5	3.36
28	21.0	19.2	20.9	2.68
29	21.9	18.5	19.1	2.17
30	22.8	19.2	19.9	1.73
31	23.7	18.5	19.6	1.76
32	24.7	19.2	20.4	1.72
33	25.6	18.5	19.5	1.64
34	26.5	19.2	19.7	1.53
35	27.4	18.5	18.8	1.51
36	28.3	19.2	19.0	1.45
37	29.2	18.5	18.1	1.49
38	30.1	19.2	18.1	1.49
39	31.0	18.5	18.3	1.73
40	14.6	19.9	23.6	21.97
41	15.5	20.6	24.7	9.36
42	16.4	19.9	23.5	8.47

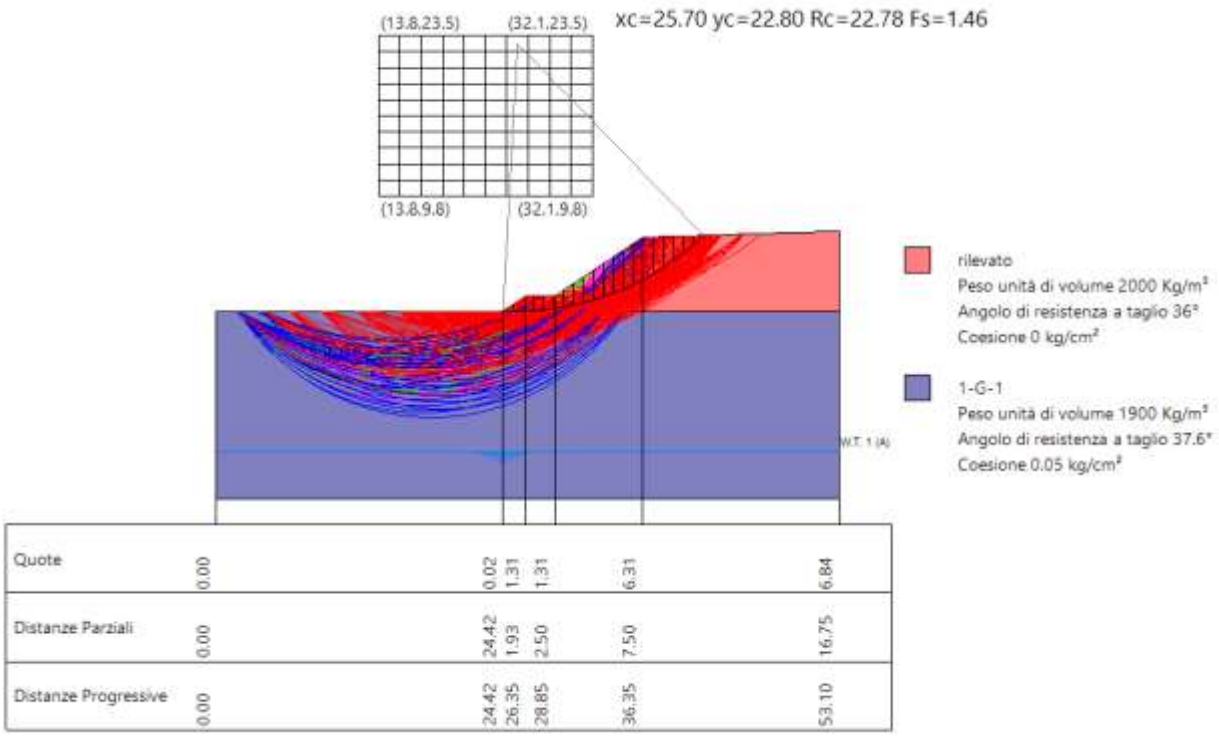
43	17.4	20.6	25.7	4.65
44	18.3	19.9	24.4	4.17
45	19.2	20.6	24.1	3.55
46	20.1	19.9	22.6	3.13
47	21.0	20.6	22.1	2.46
48	21.9	19.9	20.3	1.84
49	22.8	20.6	21.1	1.60
50	23.7	19.9	20.8	1.67
51	24.7	20.6	21.4	1.63
52	25.6	19.9	20.5	1.56
53	26.5	20.6	20.7	1.46
54	27.4	19.9	19.8	1.41
55	28.3	20.6	20.0	1.45
56	29.2	19.9	19.2	1.49
57	30.1	20.6	20.3	1.69
58	31.0	19.9	19.2	1.71
59	13.7	21.9	24.9	40.22
60	14.6	21.3	24.8	20.50
61	15.5	21.9	24.8	17.44
62	16.4	21.3	25.7	5.55
63	17.4	21.9	26.8	4.33
64	18.3	21.3	25.5	3.88
65	19.2	21.9	25.2	3.29
66	20.1	21.3	23.7	2.90
67	21.0	21.9	23.2	2.24
68	21.9	21.3	21.5	1.56
69	22.8	21.9	22.3	1.48
70	23.7	21.3	22.0	1.60
71	24.7	21.9	22.5	1.54
72	25.6	21.3	21.6	1.49
73	26.5	21.9	21.8	1.38
74	27.4	21.3	20.9	1.41
75	28.3	21.9	21.1	1.45
76	29.2	21.3	20.2	1.47
77	30.1	21.9	21.3	1.68
78	31.0	21.3	20.2	1.70
79	14.6	22.6	25.9	18.37
80	15.5	23.3	27.0	7.58
81	16.4	22.6	25.8	6.79
82	17.4	23.3	27.9	4.08
83	18.3	22.6	26.6	3.69
84	19.2	23.3	25.1	3.11
85	20.1	22.6	23.5	2.67
86	21.0	23.3	24.4	2.09
87	21.9	22.6	24.1	2.06
88	22.8	23.3	23.5	1.39

89	23.7	22.6	23.1	1.54
90	24.7	23.3	23.6	1.46
91	25.6	22.6	22.7	1.41
92	26.5	23.3	22.9	1.38
93	27.4	22.6	22.0	1.42
94	28.3	23.3	22.2	1.46
95	29.2	22.6	22.4	1.66
96	30.1	23.3	22.2	1.66
97	31.0	22.6	21.1	1.72
98	13.7	24.7	27.3	38.35
99	14.6	24.0	27.1	16.17
100	15.5	24.7	27.1	13.71
101	16.4	24.0	28.0	4.77
102	17.4	24.7	29.0	3.89
103	18.3	24.0	27.8	3.53
104	19.2	24.7	26.3	2.86
105	20.1	24.0	24.7	2.34
106	21.0	24.7	25.6	1.95
107	21.9	24.0	25.3	1.96
108	22.8	24.7	24.7	1.28
109	23.7	24.0	24.3	1.49
110	24.7	24.7	24.7	1.35
111	25.6	24.0	23.8	1.35
112	26.5	24.7	24.0	1.39
113	27.4	24.0	23.1	1.42
114	28.3	24.7	24.4	1.63
115	29.2	24.0	23.3	1.65
116	30.1	24.7	23.2	1.68
117	31.0	24.0	23.3	1.85
118	13.7	26.0	28.5	37.50
119	14.6	25.4	27.4	39.23
120	15.5	26.0	29.3	5.84
121	16.4	25.4	29.2	4.48
122	17.4	26.0	29.1	3.74
123	18.3	25.4	27.8	3.31
124	19.2	26.0	27.5	2.67
125	20.1	25.4	25.9	2.08
126	21.0	26.0	26.8	1.85
127	21.9	25.4	26.5	1.90
128	22.8	26.0	25.9	1.20
129	23.7	25.4	25.5	1.45
130	24.7	26.0	25.8	1.33
131	25.6	25.4	24.9	1.36
132	26.5	26.0	25.1	1.40
133	27.4	25.4	24.3	1.43
134	28.3	26.0	25.4	1.62

135	29.2	25.4	24.3	1.64
136	30.1	26.0	25.3	1.82
137	31.0	25.4	24.2	1.85
138	13.7	27.4	29.7	36.71
139	14.6	26.7	29.5	11.83
140	15.5	27.4	29.5	9.79
141	16.4	26.7	29.3	4.79
142	17.4	27.4	30.3	3.51
143	18.3	26.7	28.9	3.09
144	19.2	27.4	28.7	2.45
145	20.1	26.7	27.2	1.83
146	21.0	27.4	28.0	1.75
147	21.9	26.7	27.7	1.82
148	22.8	27.4	27.2	1.22
149	23.7	26.7	26.7	1.30
150	24.7	27.4	26.9	1.33
151	25.6	26.7	26.0	1.37
152	26.5	27.4	26.3	1.41
153	27.4	26.7	26.5	1.61
154	28.3	27.4	26.4	1.62
155	29.2	26.7	25.3	1.65
156	30.1	27.4	26.3	1.82
157	31.0	26.7	25.2	1.89
158	13.7	28.8	31.0	35.98
159	14.6	28.1	30.7	10.08
160	15.5	28.8	31.7	4.85
161	16.4	28.1	30.5	4.33
162	17.4	28.8	31.5	3.36
163	18.3	28.1	30.1	2.93
164	19.2	28.8	29.9	2.31
165	20.1	28.1	28.4	1.63
166	21.0	28.8	29.3	1.65
167	21.9	28.1	28.9	1.78
168	22.8	28.8	28.4	1.24
169	23.7	28.1	27.8	1.31
170	24.7	28.8	28.0	1.34
171	25.6	28.1	27.2	1.38
172	26.5	28.8	28.6	1.59
173	27.4	28.1	27.5	1.60
174	28.3	28.8	27.4	1.62
175	29.2	28.1	27.4	1.79
176	30.1	28.8	27.3	1.84
177	31.0	28.1	26.2	1.93
178	13.7	30.1	32.2	35.29
179	14.6	29.4	32.0	8.49
180	15.5	30.1	32.0	6.58

181	16.4	29.4	31.7	3.99
182	17.4	30.1	32.7	3.19
183	18.3	29.4	30.3	2.60
184	19.2	30.1	31.2	2.20
185	20.1	29.4	30.8	2.16
186	21.0	30.1	30.5	1.59
187	21.9	29.4	30.1	1.72
188	22.8	30.1	29.7	1.26
189	23.7	29.4	28.9	1.31
190	24.7	30.1	29.2	1.35
191	25.6	29.4	28.3	1.39
192	26.5	30.1	29.6	1.59
193	27.4	29.4	28.5	1.60
194	28.3	30.1	29.6	1.76
195	29.2	29.4	28.5	1.79
196	30.1	30.1	28.4	1.88
197	31.0	29.4	27.3	1.97
198	14.6	30.8	33.2	6.99
199	16.4	30.8	33.9	3.59
200	18.3	30.8	31.5	2.33
201	20.1	30.8	32.1	2.09
202	21.9	30.8	31.4	1.68
203	23.7	30.8	30.1	1.32
204	25.6	30.8	30.7	1.56
205	27.4	30.8	29.6	1.60
206	29.2	30.8	29.5	1.80
207	31.0	30.8	28.3	2.02

1.2.2 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	2.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.2
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	13.83 m
Ordinata vertice sinistro inferiore yi	9.85 m
Ascissa vertice destro superiore xs	32.09 m
Ordinata vertice destro superiore ys	23.49 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

==========

Coefficiente azione sismica orizzontale 0.032
Coefficiente azione sismica verticale 0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	24.42	0.02
3	26.35	1.31
4	28.85	1.31
5	36.35	6.31
6	53.1	6.84

Falda

Nr.	X (m)	y (m)
1	0.0	-12.0
2	24.42	-11.98
3	53.1	-11.98

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	24.42	0.02
3	53.1	0.02

Coefficienti parziali azioni

==========

Sfavorevoli: Permanenti, variabili 1.0 1.0
Favorevoli: Permanenti, variabili 1.0 1.0

==========

Coefficienti parziali per i parametri geotecnici del terreno

==========

Tangente angolo di resistenza al taglio 1.25
Coesione efficace 1.25
Coesione non drenata 1.4
Riduzione parametri geotecnici terreno No

==========

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36	2000		rilevato	
2	0.05		37.6	1900	0	1-G-1	

Risultati analisi pendio

==========

Fs minimo individuato	1.46
Ascissa centro superficie	25.7 m
Ordinata centro superficie	22.8 m
Raggio superficie	22.78 m

==========

xc = 25.698 yc = 22.803 Rc = 22.777 Fs=1.455

Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.86	-2.0	0.86	520.11
2	1.02	0.36	1.02	1933.63
3	0.69	2.51	0.69	1734.99
4	0.86	4.46	0.86	2081.69
5	0.86	6.62	0.86	1939.9
6	0.86	8.79	0.87	2112.03
7	0.86	10.97	0.87	2832.49
8	0.86	13.17	0.88	3494.89
9	0.86	15.4	0.89	4097.73
10	0.86	17.64	0.9	4639.28
11	0.86	19.91	0.91	5117.29
12	0.86	22.22	0.92	5529.21
13	0.86	24.56	0.94	5871.81
14	0.76	26.82	0.85	5454.36
15	0.95	29.26	1.09	6448.01
16	0.86	31.9	1.01	4945.7
17	0.86	34.47	1.04	4035.22
18	0.86	37.12	1.07	3026.54
19	0.86	39.87	1.11	1909.34
20	0.86	42.74	1.16	670.34

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**113.77**	**277.32**	**0.0**	**0.0**	**405.29**	**168.64**	**0.0**
2	**479.07**	**1167.72**	**113.77**	**277.32**	**1604.46**	**667.6**	**0.0**
3	**763.24**	**1860.4**	**479.07**	**1167.72**	**1505.09**	**626.25**	**0.0**
4	**1059.99**	**2583.71**	**763.24**	**1860.4**	**1863.78**	**775.5**	**0.0**
5	**1293.39**	**3152.61**	**1059.99**	**2583.71**	**1784.37**	**742.46**	**0.0**
6	**1503.06**	**3663.67**	**1293.39**	**3152.61**	**1981.18**	**824.35**	**0.0**
7	**1727.53**	**4210.84**	**1503.06**	**3663.67**	**2691.72**	**1120.0**	**0.0**
8	**1937.54**	**4722.73**	**1727.53**	**4210.84**	**3344.04**	**1391.43**	**0.0**
9	**2108.25**	**5138.83**	**1937.54**	**4722.73**	**3924.97**	**1633.15**	**0.0**
10	**2218.81**	**5408.31**	**2108.25**	**5138.83**	**4423.19**	**1840.45**	**0.0**
11	**2252.06**	**5489.36**	**2218.81**	**5408.31**	**4828.88**	**2009.26**	**0.0**
12	**2194.29**	**5348.55**	**2252.06**	**5489.36**	**5133.84**	**2136.15**	**0.0**

13	**2035.16**	**4960.66**	**2194.29**	**5348.55**	**5331.19**	**2218.26**	**0.0**
14	**1802.53**	**4393.64**	**2035.16**	**4960.66**	**4818.53**	**2004.95**	**0.0**
15	**1421.85**	**3465.73**	**1802.53**	**4393.64**	**5492.92**	**2285.56**	**0.0**
16	**1044.5**	**2545.94**	**1421.85**	**3465.73**	**4016.78**	**1671.35**	**0.0**
17	**670.07**	**1633.27**	**1044.5**	**2545.94**	**3099.04**	**1289.49**	**0.0**
18	**338.58**	**825.28**	**670.07**	**1633.27**	**2169.97**	**902.91**	**0.0**
19	**96.76**	**235.85**	**338.58**	**825.28**	**1257.29**	**523.15**	**0.0**
20	**0.0**	**0.0**	**96.76**	**235.85**	**396.63**	**165.03**	**0.0**

Numero di superfici esaminate....(218)

N°	Xo	Yo	Ro	Fs
1	13.8	9.8	15.7	19.81
2	14.7	10.5	16.8	15.26
3	15.7	9.8	17.1	12.51
4	16.6	10.5	18.1	8.97
5	17.5	9.8	18.5	7.50
6	18.4	10.5	19.6	6.06
7	19.3	9.8	18.2	5.82
8	20.2	10.5	17.4	4.93
9	21.1	9.8	15.6	4.64
10	22.0	10.5	14.5	3.84
11	23.0	9.8	12.4	3.40
12	23.9	10.5	13.2	2.77
13	24.8	9.8	12.7	2.58
14	25.7	10.5	13.3	2.37
15	26.6	9.8	12.6	2.30
16	27.5	10.5	13.0	2.16
17	28.4	9.8	12.2	2.14
18	29.4	10.5	12.3	2.05
19	30.3	9.8	11.4	2.13
20	31.2	10.5	11.5	2.14
21	32.1	9.8	10.7	2.23
22	13.8	11.2	16.6	18.91
23	14.7	11.9	16.4	17.26
24	15.7	11.2	17.9	11.39
25	16.6	11.9	19.0	8.15
26	17.5	11.2	19.2	6.83
27	18.4	11.9	20.3	5.64
28	19.3	11.2	18.9	5.33
29	20.2	11.9	18.2	4.54
30	21.1	11.2	16.5	4.18
31	22.0	11.9	15.5	3.43
32	23.0	11.2	13.4	3.04
33	23.9	11.9	14.2	2.50
34	24.8	11.2	11.8	1.94

35	25.7	11.9	12.5	1.65
36	26.6	11.2	11.7	1.61
37	27.5	11.9	13.9	2.04
38	28.4	11.2	13.1	2.02
39	29.4	11.9	13.2	1.96
40	30.3	11.2	12.4	2.04
41	31.2	11.9	12.4	2.03
42	32.1	11.2	11.6	2.11
43	13.8	12.6	17.5	18.17
44	14.7	13.3	18.6	14.10
45	15.7	12.6	17.4	13.14
46	16.6	13.3	19.9	7.49
47	17.5	12.6	20.1	6.25
48	18.4	13.3	19.6	5.37
49	19.3	12.6	19.8	4.94
50	20.2	13.3	19.2	4.23
51	21.1	12.6	17.4	3.84
52	22.0	13.3	16.6	3.16
53	23.0	12.6	14.5	2.71
54	23.9	13.3	15.3	2.31
55	24.8	12.6	13.0	1.70
56	25.7	13.3	13.5	1.50
57	26.6	12.6	14.8	2.09
58	27.5	13.3	14.9	1.94
59	28.4	12.6	14.0	1.92
60	29.4	13.3	14.1	1.88
61	30.3	12.6	13.3	1.95
62	31.2	13.3	13.4	1.92
63	32.1	12.6	12.4	1.87
64	13.8	13.9	18.5	17.56
65	14.7	14.6	19.6	13.68
66	15.7	13.9	19.7	9.85
67	16.6	14.6	19.5	8.51
68	17.5	13.9	20.9	5.73
69	18.4	14.6	20.6	4.95
70	19.3	13.9	19.1	4.60
71	20.2	14.6	18.5	3.89
72	21.1	13.9	16.7	3.59
73	22.0	14.6	17.6	2.94
74	23.0	13.9	15.6	2.47
75	23.9	14.6	16.4	2.17
76	24.8	13.9	14.1	1.50
77	25.7	14.6	16.6	2.04
78	26.6	13.9	15.7	1.98
79	27.5	14.6	15.8	1.83
80	28.4	13.9	15.0	1.84

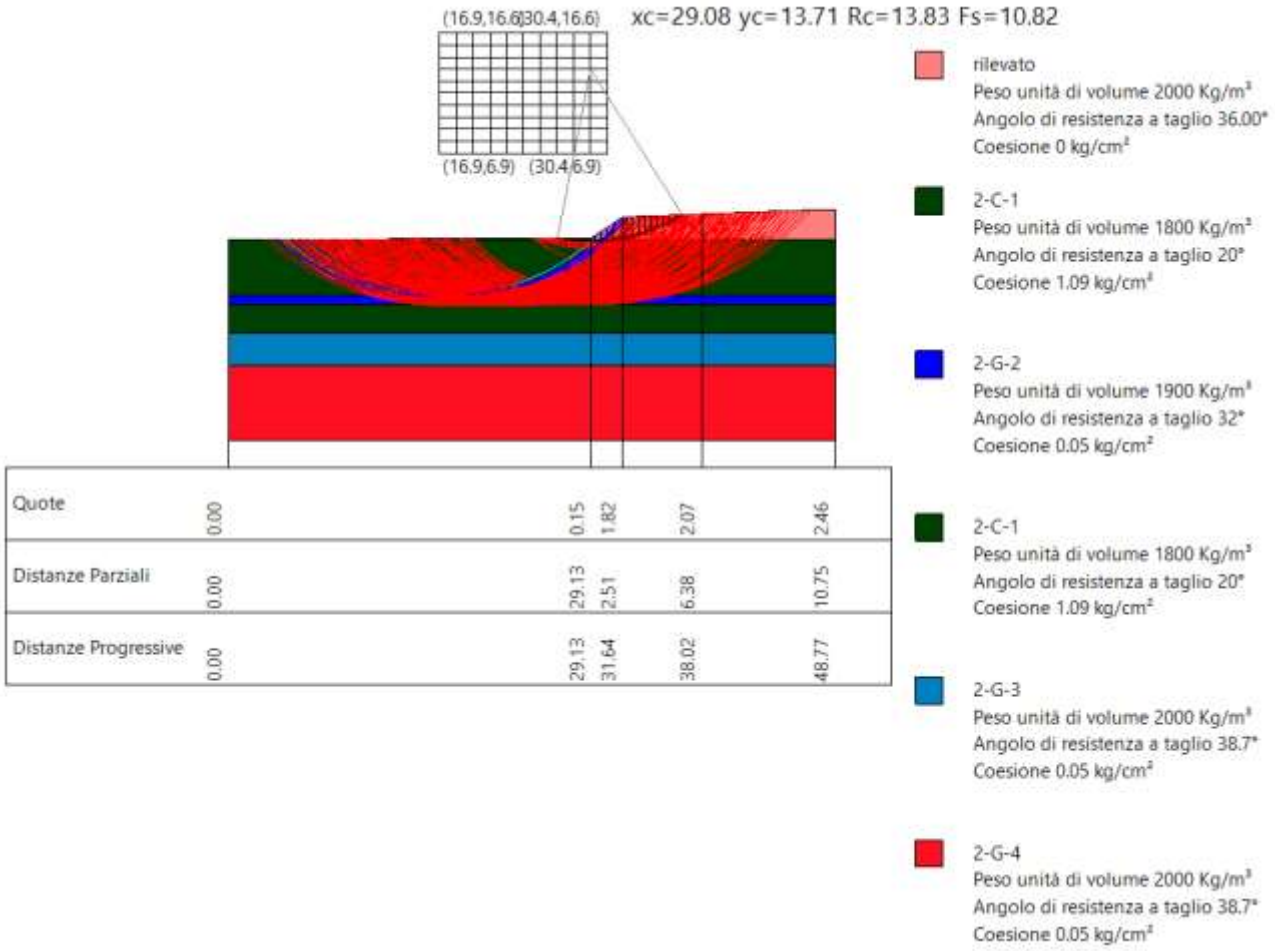
81	29.4	14.6	15.1	1.83
82	30.3	13.9	14.3	1.87
83	31.2	14.6	14.3	1.78
84	32.1	13.9	13.3	1.82
85	13.8	15.3	19.5	17.05
86	14.7	16.0	19.5	15.74
87	15.7	15.3	20.7	9.14
88	16.6	16.0	21.7	6.34
89	17.5	15.3	21.9	5.31
90	18.4	16.0	23.0	4.65
91	19.3	15.3	20.1	4.26
92	20.2	16.0	19.5	3.62
93	21.1	15.3	17.8	3.26
94	22.0	16.0	17.0	2.61
95	23.0	15.3	16.7	2.23
96	23.9	16.0	17.5	2.04
97	24.8	15.3	17.3	2.10
98	25.7	16.0	17.6	1.93
99	26.6	15.3	16.7	1.88
100	27.5	16.0	16.8	1.77
101	28.4	15.3	16.0	1.78
102	29.4	16.0	16.1	1.75
103	30.3	15.3	15.2	1.73
104	31.2	16.0	15.2	1.73
105	32.1	15.3	14.1	1.81
106	13.8	16.7	20.6	16.62
107	14.7	17.3	20.6	15.49
108	15.7	16.7	21.7	8.40
109	16.6	17.3	22.8	5.87
110	17.5	16.7	21.5	5.43
111	18.4	17.3	22.5	4.39
112	19.3	16.7	21.1	4.00
113	20.2	17.3	20.6	3.40
114	21.1	16.7	18.9	2.97
115	22.0	17.3	18.1	2.28
116	23.0	16.7	17.8	2.07
117	23.9	17.3	18.7	1.96
118	24.8	16.7	18.4	2.03
119	25.7	17.3	18.6	1.84
120	26.6	16.7	17.7	1.80
121	27.5	17.3	17.8	1.70
122	28.4	16.7	17.0	1.72
123	29.4	17.3	17.1	1.65
124	30.3	16.7	16.3	1.71
125	31.2	17.3	16.1	1.72
126	32.1	16.7	16.4	1.99

127	13.8	18.0	21.7	16.25
128	14.7	18.7	22.7	12.05
129	15.7	18.0	22.7	7.84
130	16.6	18.7	22.6	6.68
131	17.5	18.0	22.6	5.02
132	18.4	18.7	23.6	4.17
133	19.3	18.0	22.2	3.77
134	20.2	18.7	21.7	3.19
135	21.1	18.0	20.0	2.76
136	22.0	18.7	19.3	2.00
137	23.0	18.0	19.0	1.92
138	23.9	18.7	19.8	1.87
139	24.8	18.0	19.4	1.93
140	25.7	18.7	19.6	1.75
141	26.6	18.0	18.7	1.71
142	27.5	18.7	18.9	1.66
143	28.4	18.0	18.0	1.60
144	29.4	18.7	18.2	1.64
145	30.3	18.0	17.2	1.68
146	31.2	18.7	18.4	1.92
147	32.1	18.0	17.3	1.95
148	14.7	20.1	23.9	11.39
149	15.7	19.4	23.8	7.27
150	16.6	20.1	24.9	5.05
151	17.5	19.4	24.9	4.54
152	18.4	20.1	24.6	3.94
153	19.3	19.4	23.2	3.61
154	20.2	20.1	21.4	3.03
155	21.1	19.4	21.1	2.57
156	22.0	20.1	20.4	1.77
157	23.0	19.4	20.1	1.79
158	23.9	20.1	21.0	1.79
159	24.8	19.4	20.5	1.83
160	25.7	20.1	20.6	1.69
161	26.6	19.4	19.8	1.64
162	27.5	20.1	19.9	1.54
163	28.4	19.4	19.1	1.59
164	29.4	20.1	19.2	1.63
165	30.3	19.4	18.2	1.65
166	31.2	20.1	19.3	1.88
167	32.1	19.4	18.2	1.97
168	14.7	21.4	24.0	15.01
169	15.7	20.8	24.9	6.62
170	16.6	21.4	26.0	4.76
171	17.5	20.8	25.9	4.34
172	18.4	21.4	25.7	3.75

173	19.3	20.8	23.0	3.37
174	20.2	21.4	22.5	2.72
175	21.1	20.8	22.3	2.44
176	22.0	21.4	21.6	1.56
177	23.0	20.8	21.3	1.68
178	23.9	21.4	22.1	1.73
179	24.8	20.8	21.5	1.73
180	25.7	21.4	21.7	1.59
181	26.6	20.8	20.8	1.58
182	27.5	21.4	21.0	1.54
183	28.4	20.8	20.1	1.59
184	29.4	21.4	20.2	1.60
185	30.3	20.8	20.4	1.85
186	31.2	21.4	20.2	1.88
187	32.1	20.8	19.1	2.00
188	13.8	22.1	25.1	15.23
189	14.7	22.8	25.2	14.99
190	15.7	22.1	26.0	6.14
191	16.6	22.8	26.0	5.16
192	17.5	22.1	25.8	4.18
193	18.4	22.8	25.6	3.57
194	19.3	22.1	24.2	3.17
195	20.2	22.8	23.7	2.46
196	21.1	22.1	23.4	2.28
197	22.0	22.8	24.3	2.18
198	23.0	22.1	22.5	1.59
199	23.9	22.8	23.3	1.67
200	24.8	22.1	22.6	1.65
201	25.7	22.8	22.8	1.46
202	26.6	22.1	21.9	1.50
203	27.5	22.8	22.1	1.54
204	28.4	22.1	21.2	1.59
205	29.4	22.8	22.4	1.80
206	30.3	22.1	21.3	1.83
207	31.2	22.8	21.2	1.91
208	32.1	22.1	20.1	2.03
209	15.7	23.5	27.2	5.67
210	17.5	23.5	27.0	3.99
211	19.3	23.5	25.3	3.01
212	21.1	23.5	24.6	2.17
213	23.0	23.5	23.7	1.50
214	24.8	23.5	23.7	1.55
215	26.6	23.5	23.0	1.50
216	28.4	23.5	22.3	1.57
217	30.3	23.5	22.3	1.82
218	32.1	23.5	22.2	2.11

1.3 SEZIONE 30

1.3.1 Fine costruzione



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	6.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	16.92 m
Ordinata vertice sinistro inferiore yi	6.94 m
Ascissa vertice destro superiore xs	30.43 m
Ordinata vertice destro superiore ys	16.61 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	29.13	0.15
3	31.64	1.82
4	38.02	2.07
5	48.77	2.46

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	21.3	0.0
3	29.15	0.0
4	48.77	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-4.5
2	17.32	-4.5
3	33.57	-4.5
4	48.77	-4.5

Vertici strato 3

N	X (m)	y (m)
1	0.0	-5.2
2	17.49	-5.2
3	32.06	-5.2
4	48.77	-5.2

Vertici strato 4

N	X (m)	y (m)
1	0.0	-7.5
2	16.61	-7.5
3	31.35	-7.5
4	48.77	-7.5

Vertici strato 5

N	X (m)	y (m)
1	0.0	-10.1
2	15.06	-10.1
3	31.65	-10.1
4	48.77	-10.1

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	2000	2100.00	rilevato	
2	1.09	0	20	1800	1900	2-C-1	
3	0.05		32	1900	2000	2-G-2	
4	1.09	0	20	1800	1900	2-C-1	
5	0.05		38.7	2000	2100	2-G-3	
6	0.05		38.7	2000	2100	2-G-4	

Risultati analisi pendio [A2+M2+R2]

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Fs minimo individuato	10.82
Ascissa centro superficie	29.08 m
Ordinata centro superficie	13.71 m
Raggio superficie	13.83 m

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xc = 29.078 yc = 13.709 Rc = 13.831 Fs=10.816

Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.5	-10.05	0.51	48.29
2	0.5	-7.94	0.51	130.55
3	0.5	-5.85	0.5	189.08
4	0.5	-3.76	0.5	229.77
5	0.71	-1.25	0.71	364.03
6	0.29	0.83	0.29	208.75
7	0.5	2.48	0.5	613.37
8	0.5	4.56	0.5	921.09
9	0.5	6.65	0.51	1212.2
10	0.71	9.18	0.72	2170.77
11	0.29	11.29	0.3	989.4
12	0.5	12.98	0.51	1616.86
13	0.5	15.13	0.52	1510.11
14	0.5	17.29	0.53	1383.05
15	0.5	19.48	0.53	1235.0
16	0.5	21.7	0.54	1065.16
17	0.5	23.96	0.55	872.53
18	0.5	26.25	0.56	655.97
19	0.5	28.6	0.57	414.07
20	0.5	30.99	0.59	145.18

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**2.08**	**11.74**	**0.0**	**0.0**	**43.45**	**2.33**	**0.0**
2	**6.74**	**38.06**	**2.08**	**11.74**	**121.05**	**6.5**	**0.0**
3	**85.48**	**482.61**	**6.74**	**38.06**	**64.49**	**408.3**	**0.0**
4	**162.59**	**918.01**	**85.48**	**482.61**	**123.77**	**408.65**	**0.0**
5	**238.09**	**1344.29**	**162.59**	**918.01**	**279.19**	**580.82**	**0.0**
6	**310.32**	**1752.14**	**238.09**	**1344.29**	**142.42**	**239.59**	**0.0**
7	**380.03**	**2145.71**	**310.32**	**1752.14**	**560.18**	**419.91**	**0.0**
8	**442.77**	**2499.96**	**380.03**	**2145.71**	**883.8**	**429.53**	**0.0**
9	**495.13**	**2795.58**	**442.77**	**2499.96**	**1186.27**	**439.12**	**0.0**

10	**454.75**	**2567.58**	**495.13**	**2795.58**	**2146.41**	**115.34**	**0.0**
11	**430.07**	**2428.24**	**454.75**	**2567.58**	**967.14**	**51.97**	**0.0**
12	**381.56**	**2154.35**	**430.07**	**2428.24**	**1561.28**	**83.9**	**0.0**
13	**326.55**	**1843.74**	**381.56**	**2154.35**	**1429.85**	**76.84**	**0.0**
14	**267.17**	**1508.47**	**326.55**	**1843.74**	**1277.6**	**68.65**	**0.0**
15	**205.96**	**1162.89**	**267.17**	**1508.47**	**1106.76**	**59.47**	**0.0**
16	**145.96**	**824.12**	**205.96**	**1162.89**	**920.14**	**49.45**	**0.0**
17	**90.74**	**512.32**	**145.96**	**824.12**	**721.22**	**38.76**	**0.0**
18	**44.5**	**251.27**	**90.74**	**512.32**	**514.3**	**27.64**	**0.0**
19	**12.22**	**69.01**	**44.5**	**251.27**	**304.67**	**16.37**	**0.0**
20	**-0.23**	**-1.31**	**12.22**	**69.01**	**98.92**	**5.32**	**0.0**

Numero di superfici esaminate....(209)

N°	Xo	Yo	Ro	Fs
1	18.9	7.4	12.7	367.70
2	19.6	6.9	12.2	201.98
3	20.3	7.4	12.7	80.27
4	21.0	6.9	12.2	53.89
5	21.6	7.4	11.9	55.89
6	22.3	6.9	11.4	44.52
7	23.0	7.4	12.7	24.97
8	23.7	6.9	12.2	21.96
9	24.3	7.4	12.7	18.60
10	25.0	6.9	12.2	17.34
11	25.7	7.4	11.9	19.58
12	26.4	6.9	10.7	18.25
13	27.1	7.4	11.1	16.69
14	27.7	6.9	10.6	15.71
15	28.4	7.4	12.7	13.31
16	29.1	6.9	12.2	12.82
17	29.8	7.4	12.7	12.77
18	30.4	6.9	8.9	13.71
19	18.9	8.4	13.7	185.98
20	19.6	7.9	13.2	114.03
21	20.3	8.4	12.9	126.22
22	21.0	7.9	12.4	77.83
23	21.6	8.4	13.6	32.00
24	22.3	7.9	13.2	28.31
25	23.0	8.4	13.6	22.82
26	23.7	7.9	13.2	20.98
27	24.3	8.4	12.9	22.97
28	25.0	7.9	12.4	21.23
29	25.7	8.4	12.9	19.18

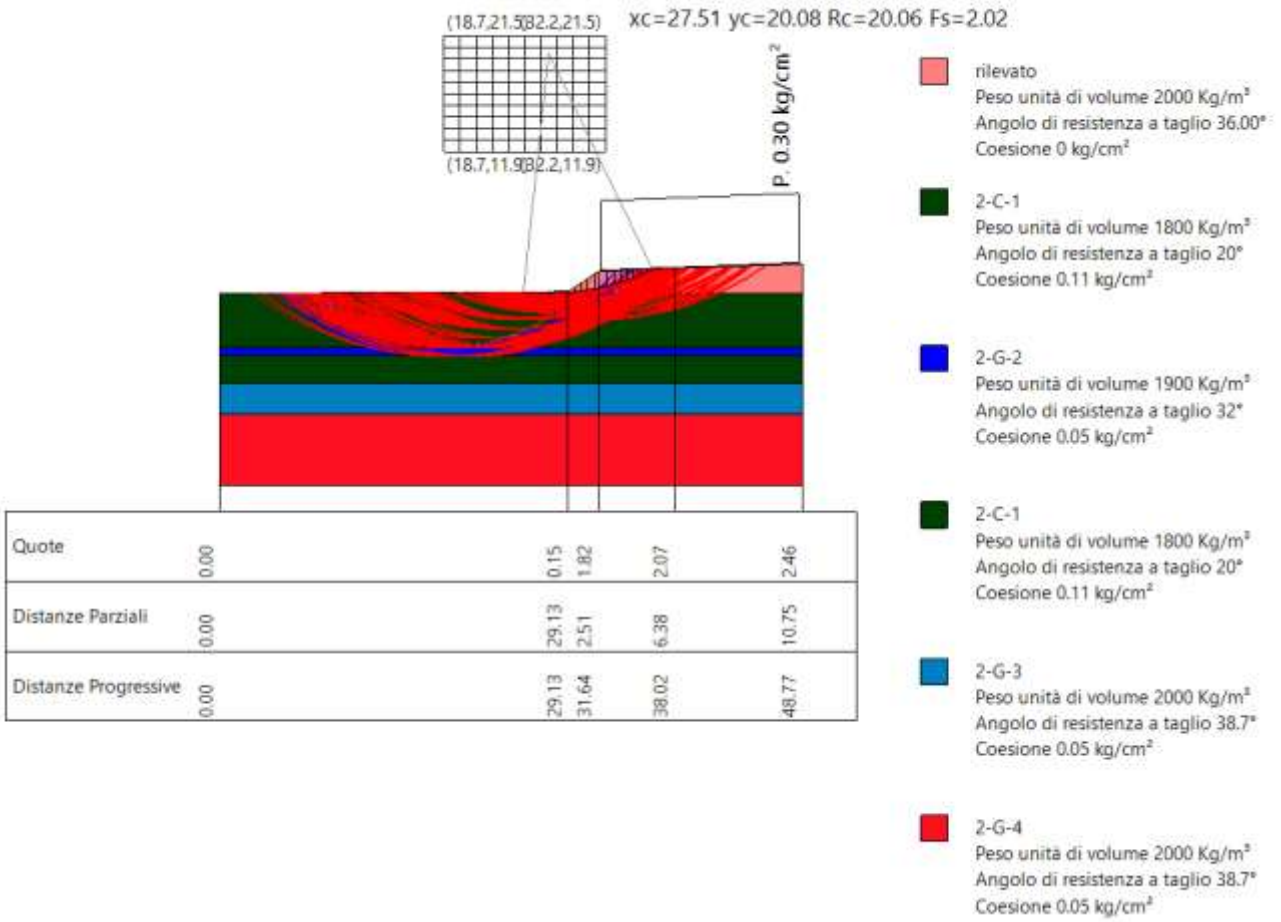
30	26.4	7.9	11.6	17.94
31	27.1	8.4	13.6	14.19
32	27.7	7.9	13.1	14.47
33	28.4	8.4	13.6	13.36
34	29.1	7.9	13.1	13.31
35	29.8	8.4	13.6	12.80
36	30.4	7.9	9.8	14.18
37	18.3	8.9	14.1	368.89
38	18.9	9.4	13.9	451.39
39	19.6	8.9	13.4	230.34
40	20.3	9.4	14.6	45.44
41	21.0	8.9	14.1	40.26
42	21.6	9.4	14.6	28.52
43	22.3	8.9	14.1	25.13
44	23.0	9.4	13.9	28.08
45	23.7	8.9	13.4	25.42
46	24.3	9.4	14.6	18.05
47	25.0	8.9	13.4	20.71
48	25.7	9.4	14.6	15.52
49	26.4	8.9	14.1	14.67
50	27.1	9.4	14.6	15.00
51	27.7	8.9	12.6	15.86
52	28.4	9.4	10.0	15.55
53	29.1	8.9	9.5	14.12
54	29.8	9.4	13.8	14.44
55	30.4	8.9	9.9	14.08
56	18.9	10.3	15.6	74.16
57	19.6	9.8	15.1	54.88
58	20.3	10.3	15.6	41.59
59	21.0	9.8	15.1	33.20
60	21.6	10.3	14.8	35.42
61	22.3	9.8	14.3	31.00
62	23.0	10.3	15.6	20.95
63	23.7	9.8	15.1	19.38
64	24.3	10.3	15.6	17.75
65	25.0	9.8	15.1	16.25
66	25.7	10.3	15.6	15.34
67	26.4	9.8	13.6	17.75
68	27.1	10.3	14.0	16.75
69	27.7	9.8	14.3	15.65
70	28.4	10.3	15.6	13.30
71	29.1	9.8	15.1	13.63
72	29.8	10.3	14.7	14.58
73	30.4	9.8	15.0	12.45
74	17.6	11.3	16.6	182.64
75	18.3	10.8	16.1	111.23

76	18.9	11.3	16.6	56.62
77	19.6	10.8	16.1	47.28
78	20.3	11.3	15.8	52.01
79	21.0	10.8	15.3	39.67
80	21.6	11.3	16.5	24.97
81	22.3	10.8	16.1	22.80
82	23.0	11.3	16.5	20.35
83	23.7	10.8	16.1	18.90
84	24.3	11.3	16.5	17.50
85	25.0	10.8	15.3	20.04
86	25.7	11.3	15.8	18.00
87	26.4	10.8	16.0	15.28
88	27.1	11.3	16.5	14.12
89	27.7	10.8	16.0	13.82
90	28.4	11.3	16.5	13.35
91	29.1	10.8	16.0	13.12
92	29.8	11.3	16.5	12.51
93	30.4	10.8	15.9	12.49
94	16.9	11.8	17.0	352.91
95	17.6	12.3	16.8	401.25
96	18.3	11.8	17.0	75.16
97	18.9	12.3	17.5	49.39
98	19.6	11.8	16.3	63.21
99	20.3	12.3	17.5	31.27
100	21.0	11.8	16.3	37.63
101	21.6	12.3	17.5	23.97
102	22.3	11.8	17.0	21.87
103	23.0	12.3	17.5	19.87
104	23.7	11.8	16.3	23.08
105	24.3	12.3	17.5	17.32
106	25.0	11.8	17.0	16.58
107	25.7	12.3	17.5	16.45
108	26.4	11.8	17.0	14.59
109	27.1	12.3	17.5	14.17
110	27.7	11.8	15.5	16.42
111	28.4	12.3	17.5	13.32
112	29.1	11.8	17.0	12.85
113	29.8	12.3	17.4	12.58
114	30.4	11.8	16.9	12.56
115	16.9	12.7	18.0	194.48
116	17.6	13.2	18.5	78.08
117	18.3	12.7	17.3	133.23
118	18.9	13.2	18.5	45.20
119	19.6	12.7	17.3	55.23
120	20.3	13.2	18.5	29.40
121	21.0	12.7	18.0	26.23

122	21.6	13.2	18.5	23.15
123	22.3	12.7	17.2	27.46
124	23.0	13.2	18.5	19.48
125	23.7	12.7	18.0	18.26
126	24.3	13.2	17.7	20.06
127	25.0	12.7	18.0	16.73
128	25.7	13.2	18.5	15.53
129	26.4	12.7	17.2	17.43
130	27.1	13.2	17.7	17.28
131	27.7	12.7	18.0	13.96
132	28.4	13.2	13.7	15.44
133	29.1	12.7	13.0	13.52
134	29.8	13.2	14.0	14.75
135	30.4	12.7	13.4	13.85
136	16.9	13.7	18.3	377.21
137	17.6	14.2	19.5	63.81
138	18.3	13.7	18.2	89.18
139	18.9	14.2	18.7	58.97
140	19.6	13.7	19.0	32.95
141	20.3	14.2	19.5	27.66
142	21.0	13.7	18.2	32.71
143	21.6	14.2	19.4	22.41
144	22.3	13.7	19.0	20.89
145	23.0	14.2	18.7	22.98
146	23.7	13.7	19.0	18.08
147	24.3	14.2	19.4	17.44
148	25.0	13.7	18.2	18.96
149	25.7	14.2	19.4	15.58
150	26.4	13.7	18.9	14.70
151	27.1	14.2	18.7	16.48
152	27.7	13.7	18.9	14.00
153	28.4	14.2	19.4	13.09
154	29.1	13.7	13.8	10.82
155	29.8	14.2	19.3	12.06
156	30.4	13.7	18.8	12.03
157	16.9	14.7	19.2	274.44
158	17.6	15.2	19.7	98.48
159	18.3	14.7	19.9	47.55
160	18.9	15.2	20.4	34.81
161	19.6	14.7	19.2	41.45
162	20.3	15.2	20.4	26.60
163	21.0	14.7	19.2	29.86
164	21.6	15.2	19.7	26.25
165	22.3	14.7	19.9	20.50
166	23.0	15.2	20.4	18.98
167	23.7	14.7	19.2	21.26

168	24.3	15.2	20.4	17.81
169	25.0	14.7	19.9	15.59
170	25.7	15.2	19.6	18.07
171	26.4	14.7	19.9	15.13
172	27.1	15.2	20.4	14.35
173	27.7	14.7	19.9	13.98
174	28.4	15.2	15.4	14.26
175	29.1	14.7	19.8	13.02
176	29.8	15.2	15.7	14.97
177	30.4	14.7	15.1	14.21
178	16.9	15.6	20.9	67.94
179	17.6	16.1	21.4	50.27
180	18.3	15.6	20.2	61.30
181	18.9	16.1	21.4	32.89
182	19.6	15.6	20.2	40.21
183	20.3	16.1	20.6	31.97
184	21.0	15.6	20.9	23.72
185	21.6	16.1	21.4	21.57
186	22.3	15.6	20.1	24.42
187	23.0	16.1	21.4	18.72
188	23.7	15.6	20.9	17.98
189	24.3	16.1	20.6	19.99
190	25.0	15.6	20.9	16.27
191	25.7	16.1	21.4	15.55
192	26.4	15.6	20.1	18.20
193	27.1	16.1	21.4	14.40
194	27.7	15.6	20.0	16.42
195	28.4	16.1	16.2	10.85
196	29.1	15.6	20.8	12.43
197	29.8	16.1	21.2	12.24
198	30.4	15.6	20.7	12.63
199	16.9	16.6	21.1	111.07
200	18.3	16.6	21.1	56.05
201	19.6	16.6	21.9	28.16
202	21.0	16.6	21.1	28.00
203	22.3	16.6	21.9	19.94
204	23.7	16.6	21.9	18.29
205	25.0	16.6	21.1	19.07
206	26.4	16.6	21.8	15.33
207	27.7	16.6	21.8	12.91
208	29.1	16.6	21.7	12.52
209	30.4	16.6	21.6	12.72

1.3.2 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	6.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	18.73 m
Ordinata vertice sinistro inferiore yi	11.86 m
Ascissa vertice destro superiore xs	32.24 m
Ordinata vertice destro superiore ys	21.53 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	29.13	0.15
3	31.64	1.82
4	38.02	2.07
5	48.77	2.46

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	21.3	0.0
3	29.15	0.0
4	48.77	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-4.5
2	17.32	-4.5
3	33.57	-4.5
4	48.77	-4.5

Vertici strato 3

N	X (m)	y (m)
1	0.0	-5.2
2	17.49	-5.2
3	32.06	-5.2
4	48.77	-5.2

Vertici strato 4

N	X (m)	y (m)
1	0.0	-7.5
2	16.61	-7.5
3	31.35	-7.5
4	48.77	-7.5

Vertici strato 5

N	X (m)	y (m)
1	0.0	-10.1
2	15.06	-10.1
3	31.65	-10.1
4	48.77	-10.1

Coefficienti parziali azioni

==========

Sfavorevoli: Permanenti, variabili 1.0 1.0
Favorevoli: Permanenti, variabili 1.0 1.0

==========

Coefficienti parziali per i parametri geotecnici del terreno

==========

Tangente angolo di resistenza al taglio 1.25
Coesione efficace 1.25
Coesione non drenata 1.4
Riduzione parametri geotecnici terreno Si

==========

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	2000	2100.00	rilevato	
2	0.11	0	20	1800	1900	2-C-1	
3	0.05		32	1900	2000	2-G-2	
4	0.11	0	20	1800	1900	2-C-1	
5	0.05		38.7	2000	2100	2-G-3	
6	0.05		38.7	2000	2100	2-G-4	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	31.92	1.93	48.42	2.560207	0.3

Risultati analisi pendio [A2+M2+R2]

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Fs minimo individuato 2.02
Ascissa centro superficie 27.51 m
Ordinata centro superficie 20.08 m
Raggio superficie 20.06 m

==========

xc = 27.512 yc = 20.076 Rc = 20.057 Fs=2.019
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.54	-5.31	0.54	30.68
2	0.54	-3.76	0.54	80.08
3	0.54	-2.22	0.54	113.63
4	0.54	-0.67	0.54	131.39
5	0.54	0.87	0.54	133.39
6	0.54	2.42	0.54	119.64
7	0.5	3.91	0.51	85.19
8	0.58	5.46	0.58	269.73
9	0.54	7.07	0.54	589.11
10	0.54	8.63	0.55	898.15
11	0.54	10.19	0.55	1190.9
12	0.31	11.43	0.31	803.1
13	0.77	13.01	0.79	3494.19
14	0.54	14.94	0.56	2881.66
15	0.54	16.55	0.56	2739.24
16	0.54	18.16	0.57	2578.94
17	0.54	19.8	0.57	2400.27
18	0.54	21.45	0.58	2202.69
19	0.54	23.12	0.59	1985.57
20	0.54	24.81	0.6	1448.2

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**3.31**	**13.3**	**0.0**	**0.0**	**26.01**	**7.49**	**0.0**
2	**11.22**	**45.02**	**3.31**	**13.3**	**69.94**	**20.14**	**0.0**
3	**21.41**	**85.92**	**11.22**	**45.02**	**101.78**	**29.31**	**0.0**
4	**32.05**	**128.62**	**21.41**	**85.92**	**120.24**	**34.62**	**0.0**
5	**41.73**	**167.46**	**32.05**	**128.62**	**124.29**	**35.79**	**0.0**
6	**49.43**	**198.37**	**41.73**	**167.46**	**113.14**	**32.58**	**0.0**
7	**54.26**	**217.75**	**49.43**	**198.37**	**81.5**	**23.47**	**0.0**
8	**67.45**	**270.7**	**54.26**	**217.75**	**260.41**	**74.99**	**0.0**
9	**91.64**	**367.78**	**67.45**	**270.7**	**572.57**	**164.87**	**0.0**
10	**121.83**	**488.92**	**91.64**	**367.78**	**876.31**	**252.33**	**0.0**
11	**153.14**	**614.57**	**121.83**	**488.92**	**1163.52**	**335.03**	**0.0**
12	**169.7**	**681.04**	**153.14**	**614.57**	**784.11**	**225.78**	**0.0**
13	**216.78**	**869.98**	**169.7**	**681.04**	**3401.17**	**979.36**	**0.0**
14	**230.9**	**926.67**	**216.78**	**869.98**	**2785.19**	**801.99**	**0.0**
15	**225.16**	**903.62**	**230.9**	**926.67**	**2624.75**	**755.79**	**0.0**
16	**201.8**	**809.87**	**225.16**	**903.62**	**2443.39**	**703.57**	**0.0**
17	**163.39**	**655.71**	**201.8**	**809.87**	**2242.32**	**645.67**	**0.0**
18	**112.84**	**452.86**	**163.39**	**655.71**	**2023.03**	**582.53**	**0.0**
19	**53.45**	**214.51**	**112.84**	**452.86**	**1787.17**	**514.61**	**0.0**
20	**0.0**	**0.0**	**53.45**	**214.51**	**1273.08**	**366.58**	**0.0**

Numero di superfici esaminate....(221)

N°	Xo	Yo	Ro	Fs
1	18.7	11.9	16.4	31.93
2	19.4	12.3	16.9	12.72
3	20.1	11.9	17.1	7.84
4	20.8	12.3	16.9	6.54
5	21.4	11.9	17.1	5.60
6	22.1	12.3	16.8	4.66
7	22.8	11.9	16.4	4.13
8	23.5	12.3	16.8	3.70
9	24.1	11.9	16.3	3.47
10	24.8	12.3	15.3	3.18
11	25.5	11.9	14.8	2.93
12	26.2	12.3	14.5	2.72
13	26.8	11.9	12.5	2.53
14	27.5	12.3	13.0	2.35
15	28.2	11.9	12.5	2.20
16	28.9	12.3	13.5	2.19
17	29.5	11.9	12.9	2.15
18	30.2	12.3	13.1	2.15
19	30.9	11.9	12.4	2.19
20	31.6	12.3	13.6	2.30
21	32.2	11.9	12.9	2.41
22	18.7	12.8	18.1	11.56
23	19.4	13.3	17.8	10.12
24	20.1	12.8	18.1	7.11
25	20.8	13.3	18.6	5.87
26	21.4	12.8	17.3	5.21
27	22.1	13.3	17.8	4.46
28	22.8	12.8	17.3	4.01
29	23.5	13.3	17.8	3.68
30	24.1	12.8	16.6	3.43
31	24.8	13.3	16.3	3.13
32	25.5	12.8	15.8	2.92
33	26.2	13.3	15.5	2.72
34	26.8	12.8	13.5	2.54
35	27.5	13.3	13.9	2.39
36	28.2	12.8	13.4	2.23
37	28.9	13.3	13.6	2.24
38	29.5	12.8	13.7	2.19
39	30.2	13.3	13.9	2.19
40	30.9	12.8	13.3	2.24
41	31.6	13.3	14.5	2.38
42	32.2	12.8	14.8	2.45

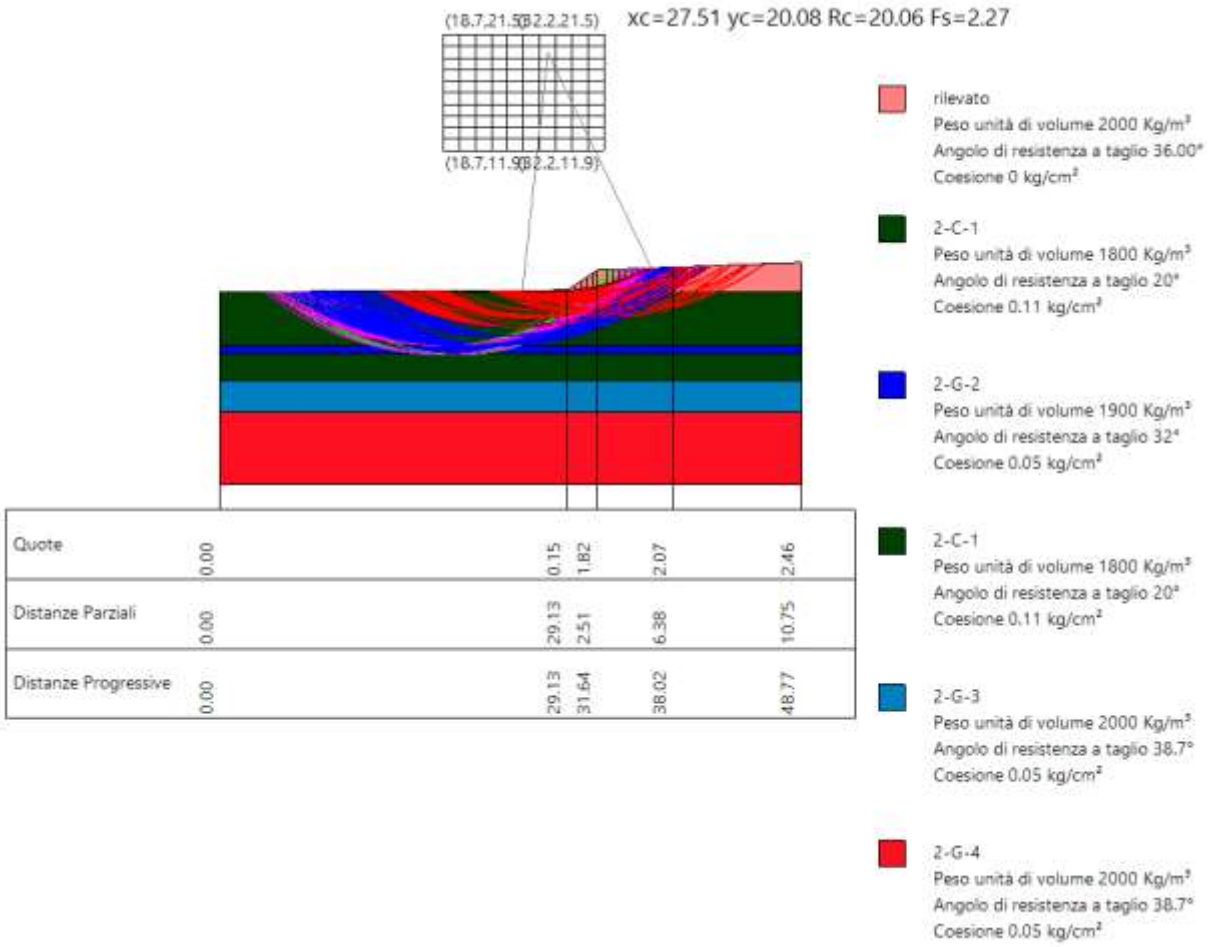
43	18.7	13.8	19.1	9.94
44	19.4	14.3	19.5	7.47
45	20.1	13.8	18.3	7.02
46	20.8	14.3	18.8	5.54
47	21.4	13.8	18.3	4.93
48	22.1	14.3	18.8	4.37
49	22.8	13.8	18.3	3.96
50	23.5	14.3	18.8	3.63
51	24.1	13.8	17.5	3.39
52	24.8	14.3	17.2	3.10
53	25.5	13.8	16.7	2.91
54	26.2	14.3	16.5	2.73
55	26.8	13.8	15.2	2.56
56	27.5	14.3	14.9	2.43
57	28.2	13.8	15.0	2.32
58	28.9	14.3	14.4	2.22
59	29.5	13.8	14.6	2.23
60	30.2	14.3	14.8	2.29
61	30.9	13.8	15.1	2.31
62	31.6	14.3	15.3	2.43
63	32.2	13.8	15.7	2.49
64	18.7	14.8	19.3	10.82
65	19.4	15.2	20.5	6.94
66	20.1	14.8	20.0	6.15
67	20.8	15.2	19.8	5.32
68	21.4	14.8	19.3	4.80
69	22.1	15.2	19.7	4.18
70	22.8	14.8	19.3	3.88
71	23.5	15.2	19.0	3.58
72	24.1	14.8	18.5	3.35
73	24.8	15.2	18.2	3.09
74	25.5	14.8	17.7	2.91
75	26.2	15.2	17.4	2.74
76	26.8	14.8	16.2	2.58
77	27.5	15.2	16.6	2.47
78	28.2	14.8	15.1	2.36
79	28.9	15.2	16.1	2.34
80	29.5	14.8	15.5	2.27
81	30.2	15.2	16.6	2.36
82	30.9	14.8	16.0	2.40
83	31.6	15.2	16.2	2.47
84	32.2	14.8	15.5	2.55
85	18.7	15.7	21.0	7.89
86	19.4	16.2	20.7	6.89
87	20.1	15.7	21.0	5.89
88	20.8	16.2	20.7	5.09

89	21.4	15.7	20.2	4.63
90	22.1	16.2	20.7	4.09
91	22.8	15.7	20.2	3.82
92	23.5	16.2	19.9	3.55
93	24.1	15.7	18.7	3.31
94	24.8	16.2	19.2	3.08
95	25.5	15.7	17.9	2.92
96	26.2	16.2	18.4	2.76
97	26.8	15.7	17.1	2.60
98	27.5	16.2	17.4	2.49
99	28.2	15.7	16.0	2.40
100	28.9	16.2	17.0	2.37
101	29.5	15.7	16.3	2.36
102	30.2	16.2	17.5	2.40
103	30.9	15.7	16.9	2.44
104	31.6	16.2	17.0	2.52
105	32.2	15.7	17.2	2.58
106	18.7	16.7	22.0	7.34
107	19.4	17.2	22.4	6.20
108	20.1	16.7	21.2	5.65
109	20.8	17.2	21.7	4.92
110	21.4	16.7	21.2	4.50
111	22.1	17.2	21.7	4.03
112	22.8	16.7	21.2	3.78
113	23.5	17.2	20.9	3.52
114	24.1	16.7	19.7	3.29
115	24.8	17.2	20.1	3.08
116	25.5	16.7	18.9	2.92
117	26.2	17.2	19.4	2.78
118	26.8	16.7	18.1	2.63
119	27.5	17.2	17.5	2.53
120	28.2	16.7	16.8	2.34
121	28.9	17.2	17.9	2.41
122	29.5	16.7	17.2	2.40
123	30.2	17.2	18.4	2.49
124	30.9	16.7	17.7	2.49
125	31.6	17.2	18.7	2.57
126	32.2	16.7	18.9	2.64
127	18.7	17.7	22.2	7.55
128	19.4	18.1	22.7	5.96
129	20.1	17.7	22.2	5.42
130	20.8	18.1	22.7	4.78
131	21.4	17.7	22.2	4.40
132	22.1	18.1	22.6	3.97
133	22.8	17.7	22.2	3.74
134	23.5	18.1	21.9	3.49

135	24.1	17.7	20.6	3.27
136	24.8	18.1	21.1	3.09
137	25.5	17.7	19.9	2.93
138	26.2	18.1	20.3	2.80
139	26.8	17.7	19.0	2.65
140	27.5	18.1	18.4	2.53
141	28.2	17.7	17.7	2.06
142	28.9	18.1	18.7	2.50
143	29.5	17.7	19.0	2.46
144	30.2	18.1	19.3	2.53
145	30.9	17.7	18.5	2.57
146	31.6	18.1	20.4	2.64
147	32.2	17.7	19.6	2.70
148	18.7	18.6	23.9	6.56
149	19.4	19.1	23.6	5.77
150	20.1	18.6	23.1	5.22
151	20.8	19.1	23.6	4.66
152	21.4	18.6	23.1	4.34
153	22.1	19.1	23.6	3.94
154	22.8	18.6	22.4	3.71
155	23.5	19.1	22.1	3.48
156	24.1	18.6	21.6	3.26
157	24.8	19.1	22.1	3.09
158	25.5	18.6	20.8	2.94
159	26.2	19.1	21.3	2.82
160	26.8	18.6	19.0	2.70
161	27.5	19.1	19.2	2.39
162	28.2	18.6	20.3	2.58
163	28.9	19.1	19.6	2.53
164	29.5	18.6	19.9	2.55
165	30.2	19.1	20.1	2.55
166	30.9	18.6	20.2	2.59
167	31.6	19.1	21.1	2.65
168	32.2	18.6	20.3	2.72
169	18.7	19.6	24.9	6.31
170	19.4	20.1	24.6	5.55
171	20.1	19.6	24.1	5.07
172	20.8	20.1	24.6	4.57
173	21.4	19.6	24.1	4.27
174	22.1	20.1	24.6	3.90
175	22.8	19.6	23.3	3.68
176	23.5	20.1	23.1	3.46
177	24.1	19.6	22.6	3.25
178	24.8	20.1	23.0	3.10
179	25.5	19.6	21.8	2.95
180	26.2	20.1	22.2	2.84

181	26.8	19.6	19.9	2.70
182	27.5	20.1	20.1	2.02
183	28.2	19.6	20.3	2.55
184	28.9	20.1	21.4	2.57
185	29.5	19.6	20.8	2.59
186	30.2	20.1	20.8	2.58
187	30.9	19.6	20.9	2.65
188	31.6	20.1	20.9	2.71
189	32.2	19.6	21.0	2.74
190	18.7	20.6	25.1	6.31
191	19.4	21.0	25.6	5.39
192	20.1	20.6	25.1	4.94
193	20.8	21.0	25.6	4.51
194	21.4	20.6	25.1	4.22
195	22.1	21.0	25.5	3.88
196	22.8	20.6	24.3	3.67
197	23.5	21.0	24.0	3.45
198	24.1	20.6	23.5	3.25
199	24.8	21.0	23.2	3.13
200	25.5	20.6	22.8	2.97
201	26.2	21.0	23.0	2.86
202	26.8	20.6	20.7	2.68
203	27.5	21.0	22.7	2.72
204	28.2	20.6	22.0	2.64
205	28.9	21.0	22.3	2.66
206	29.5	20.6	21.6	2.61
207	30.2	21.0	22.5	2.67
208	30.9	20.6	21.7	2.67
209	31.6	21.0	22.5	2.74
210	32.2	20.6	22.7	2.78
211	18.7	21.5	26.8	5.94
212	20.1	21.5	26.0	4.84
213	21.4	21.5	25.3	4.16
214	22.8	21.5	25.3	3.65
215	24.1	21.5	24.5	3.26
216	25.5	21.5	23.7	2.99
217	26.8	21.5	21.6	2.49
218	28.2	21.5	22.9	2.67
219	29.5	21.5	22.3	2.69
220	30.9	21.5	23.3	2.74
221	32.2	21.5	23.4	2.86

1.3.3 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	6.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.2
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	18.73 m
Ordinata vertice sinistro inferiore yi	11.86 m
Ascissa vertice destro superiore xs	32.24 m
Ordinata vertice destro superiore ys	21.53 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0

Numero di celle lungo y 10.0

==========

Coefficienti sismici [N.T.C.]

Coefficiente azione sismica orizzontale 0.032
Coefficiente azione sismica verticale 0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	29.13	0.15
3	31.64	1.82
4	38.02	2.07
5	48.77	2.46

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	21.3	0.0
3	29.15	0.0
4	48.77	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-4.5
2	17.32	-4.5
3	33.57	-4.5
4	48.77	-4.5

Vertici strato 3

N	X (m)	y (m)
1	0.0	-5.2
2	17.49	-5.2
3	32.06	-5.2
4	48.77	-5.2

Vertici strato 4

N	X (m)	y (m)
1	0.0	-7.5
2	16.61	-7.5
3	31.35	-7.5
4	48.77	-7.5

Vertici strato 5

N	X (m)	y (m)
1	0.0	-10.1
2	15.06	-10.1
3	31.65	-10.1
4	48.77	-10.1

Coefficienti parziali azioni

==========

Sfavorevoli: Permanenti, variabili 1.0 1.0
Favorevoli: Permanenti, variabili 1.0 1.0

==========

Coefficienti parziali per i parametri geotecnici del terreno

==========

Tangente angolo di resistenza al taglio 1.25
Coesione efficace 1.25
Coesione non drenata 1.4
Riduzione parametri geotecnici terreno No

==========

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	2000	2100.00	rilevato	
2	0.11	0	20	1800	1900	2-C-1	
3	0.05		32	1900	2000	2-G-2	
4	0.11	0	20	1800	1900	2-C-1	
5	0.05		38.7	2000	2100	2-G-3	
6	0.05		38.7	2000	2100	2-G-4	

Risultati analisi pendio

==========

Fs minimo individuato 2.27
Ascissa centro superficie 27.51 m
Ordinata centro superficie 20.08 m
Raggio superficie 20.06 m

==========

xc = 27.512 yc = 20.076 Rc = 20.057 Fs=2.271
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.54	-5.31	0.54	30.68
2	0.54	-3.76	0.54	80.08
3	0.54	-2.22	0.54	113.63
4	0.54	-0.67	0.54	131.39
5	0.54	0.87	0.54	133.39
6	0.54	2.42	0.54	119.64
7	0.5	3.91	0.51	85.19
8	0.58	5.46	0.58	269.73
9	0.54	7.07	0.54	589.11
10	0.54	8.63	0.55	898.15
11	0.54	10.19	0.55	1190.9
12	0.31	11.43	0.31	803.1
13	0.77	13.01	0.79	2015.78
14	0.54	14.94	0.56	1260.0
15	0.54	16.55	0.56	1117.58
16	0.54	18.16	0.57	957.28
17	0.54	19.8	0.57	778.61
18	0.54	21.45	0.58	581.03
19	0.54	23.12	0.59	363.91
20	0.54	24.81	0.6	126.53

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**3.27**	**11.72**	**0.0**	**0.0**	**26.78**	**7.14**	**0.0**
2	**10.97**	**39.28**	**3.27**	**11.72**	**71.86**	**19.16**	**0.0**
3	**20.74**	**74.27**	**10.97**	**39.28**	**104.38**	**27.83**	**0.0**
4	**30.76**	**110.12**	**20.74**	**74.27**	**123.1**	**32.82**	**0.0**
5	**39.67**	**142.01**	**30.76**	**110.12**	**127.03**	**33.87**	**0.0**
6	**46.56**	**166.67**	**39.67**	**142.01**	**115.44**	**30.78**	**0.0**
7	**50.73**	**181.61**	**46.56**	**166.67**	**83.03**	**22.14**	**0.0**
8	**61.58**	**220.47**	**50.73**	**181.61**	**264.87**	**70.62**	**0.0**
9	**80.1**	**286.79**	**61.58**	**220.47**	**581.44**	**155.01**	**0.0**
10	**100.85**	**361.07**	**80.1**	**286.79**	**888.51**	**236.88**	**0.0**
11	**118.61**	**424.62**	**100.85**	**361.07**	**1177.88**	**314.02**	**0.0**
12	**125.49**	**449.26**	**118.61**	**424.62**	**792.82**	**211.37**	**0.0**
13	**126.64**	**453.39**	**125.49**	**449.26**	**1980.75**	**528.07**	**0.0**
14	**115.29**	**412.76**	**126.64**	**453.39**	**1226.97**	**327.11**	**0.0**
15	**96.49**	**345.44**	**115.29**	**412.76**	**1077.11**	**287.16**	**0.0**
16	**72.94**	**261.14**	**96.49**	**345.44**	**910.67**	**242.79**	**0.0**
17	**47.75**	**170.96**	**72.94**	**261.14**	**729.03**	**194.36**	**0.0**
18	**24.46**	**87.56**	**47.75**	**170.96**	**533.83**	**142.32**	**0.0**
19	**7.04**	**25.21**	**24.46**	**87.56**	**327.01**	**87.18**	**0.0**
20	**0.0**	**0.0**	**7.04**	**25.21**	**110.81**	**29.54**	**0.0**

Numero di superfici esaminate....(221)

N°	Xo	Yo	Ro	Fs
1	18.7	11.9	16.4	12.30
2	19.4	12.3	16.9	9.11
3	20.1	11.9	17.1	7.80
4	20.8	12.3	16.9	6.79
5	21.4	11.9	16.4	6.25
6	22.1	12.3	16.8	5.56
7	22.8	11.9	16.4	5.09
8	23.5	12.3	16.8	4.71
9	24.1	11.9	15.6	4.49
10	24.8	12.3	16.1	4.20
11	25.5	11.9	14.8	3.96
12	26.2	12.3	14.5	3.72
13	26.8	11.9	14.0	3.52
14	27.5	12.3	13.0	3.27
15	28.2	11.9	12.5	3.03
16	28.9	12.3	12.7	2.94
17	29.5	11.9	12.9	2.98
18	30.2	12.3	13.1	2.91
19	30.9	11.9	12.4	2.94
20	31.6	12.3	12.6	3.08
21	32.2	11.9	12.9	3.25
22	18.7	12.8	18.1	9.20
23	19.4	13.3	17.8	8.39
24	20.1	12.8	17.3	7.40
25	20.8	13.3	17.8	6.47
26	21.4	12.8	17.3	5.95
27	22.1	13.3	17.8	5.40
28	22.8	12.8	17.3	4.98
29	23.5	13.3	17.8	4.64
30	24.1	12.8	16.6	4.44
31	24.8	13.3	17.0	4.17
32	25.5	12.8	15.8	3.95
33	26.2	13.3	15.5	3.72
34	26.8	12.8	15.0	3.53
35	27.5	13.3	13.9	3.31
36	28.2	12.8	13.4	3.08
37	28.9	13.3	13.6	2.98
38	29.5	12.8	13.7	3.03
39	30.2	13.3	13.9	2.97
40	30.9	12.8	13.3	3.00
41	31.6	13.3	13.5	3.12
42	32.2	12.8	14.8	3.28

43	18.7	13.8	19.1	8.61
44	19.4	14.3	19.5	7.62
45	20.1	13.8	18.3	7.02
46	20.8	14.3	18.8	6.20
47	21.4	13.8	18.3	5.76
48	22.1	14.3	18.8	5.28
49	22.8	13.8	18.3	4.89
50	23.5	14.3	18.8	4.59
51	24.1	13.8	17.5	4.39
52	24.8	14.3	18.0	4.14
53	25.5	13.8	16.7	3.93
54	26.2	14.3	16.5	3.73
55	26.8	13.8	16.0	3.54
56	27.5	14.3	14.9	3.34
57	28.2	13.8	14.3	3.14
58	28.9	14.3	14.4	2.89
59	29.5	13.8	14.6	3.01
60	30.2	14.3	14.8	3.03
61	30.9	13.8	14.1	3.06
62	31.6	14.3	14.4	3.22
63	32.2	13.8	15.7	3.31
64	18.7	14.8	19.3	8.65
65	19.4	15.2	19.8	7.27
66	20.1	14.8	19.3	6.70
67	20.8	15.2	19.8	5.99
68	21.4	14.8	19.3	5.62
69	22.1	15.2	19.7	5.07
70	22.8	14.8	19.3	4.82
71	23.5	15.2	19.7	4.56
72	24.1	14.8	18.5	4.35
73	24.8	15.2	18.2	4.12
74	25.5	14.8	17.7	3.93
75	26.2	15.2	17.4	3.74
76	26.8	14.8	16.9	3.57
77	27.5	15.2	15.8	3.39
78	28.2	14.8	15.1	3.19
79	28.9	15.2	16.1	3.22
80	29.5	14.8	15.5	3.06
81	30.2	15.2	15.7	3.10
82	30.9	14.8	15.0	3.13
83	31.6	15.2	16.2	3.29
84	32.2	14.8	15.5	3.33
85	18.7	15.7	21.0	7.83
86	19.4	16.2	20.7	6.97
87	20.1	15.7	20.2	6.44
88	20.8	16.2	20.7	5.83

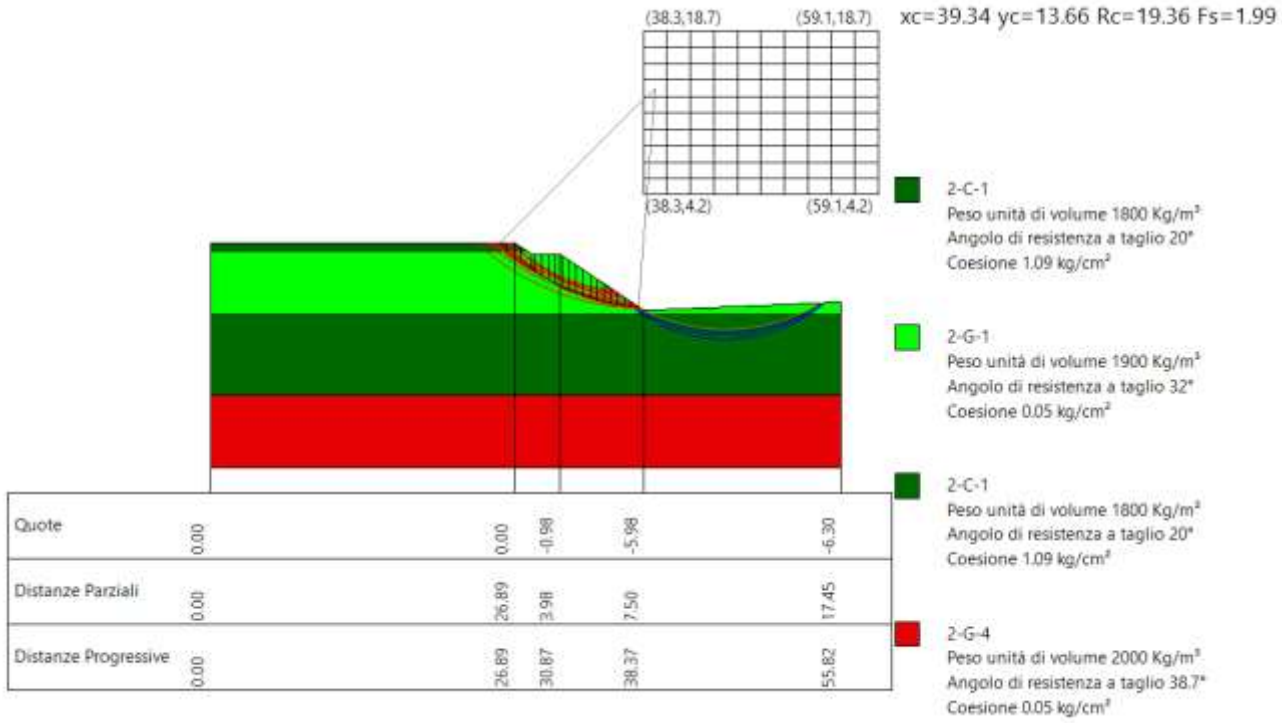
89	21.4	15.7	20.2	5.49
90	22.1	16.2	20.7	5.00
91	22.8	15.7	20.2	4.75
92	23.5	16.2	20.7	4.52
93	24.1	15.7	19.5	4.32
94	24.8	16.2	19.2	4.10
95	25.5	15.7	18.7	3.93
96	26.2	16.2	18.4	3.75
97	26.8	15.7	17.9	3.59
98	27.5	16.2	16.6	3.44
99	28.2	15.7	16.0	3.23
100	28.9	16.2	17.0	3.18
101	29.5	15.7	16.3	3.12
102	30.2	16.2	16.5	3.16
103	30.9	15.7	15.9	3.21
104	31.6	16.2	17.0	3.27
105	32.2	15.7	17.2	3.38
106	18.7	16.7	22.0	7.55
107	19.4	17.2	21.7	6.70
108	20.1	16.7	21.2	6.22
109	20.8	17.2	21.7	5.70
110	21.4	16.7	21.2	5.38
111	22.1	17.2	21.7	4.93
112	22.8	16.7	21.2	4.71
113	23.5	17.2	21.7	4.49
114	24.1	16.7	20.4	4.29
115	24.8	17.2	20.1	4.10
116	25.5	16.7	19.6	3.93
117	26.2	17.2	19.4	3.77
118	26.8	16.7	18.9	3.62
119	27.5	17.2	17.5	3.47
120	28.2	16.7	16.8	3.08
121	28.9	17.2	17.9	3.22
122	29.5	16.7	17.2	3.16
123	30.2	17.2	17.4	3.22
124	30.9	16.7	16.8	3.21
125	31.6	17.2	17.7	3.34
126	32.2	16.7	18.9	3.43
127	18.7	17.7	22.2	7.41
128	19.4	18.1	22.7	6.48
129	20.1	17.7	22.2	6.06
130	20.8	18.1	22.7	5.59
131	21.4	17.7	22.2	5.30
132	22.1	18.1	22.6	4.88
133	22.8	17.7	22.2	4.67
134	23.5	18.1	22.6	4.47

135	24.1	17.7	21.4	4.28
136	24.8	18.1	21.1	4.11
137	25.5	17.7	20.6	3.93
138	26.2	18.1	20.3	3.78
139	26.8	17.7	19.8	3.64
140	27.5	18.1	18.4	3.47
141	28.2	17.7	17.7	2.42
142	28.9	18.1	18.7	3.28
143	29.5	17.7	18.1	3.22
144	30.2	18.1	18.3	3.16
145	30.9	17.7	18.5	3.36
146	31.6	18.1	19.4	3.42
147	32.2	17.7	19.6	3.46
148	18.7	18.6	23.9	7.07
149	19.4	19.1	23.6	6.30
150	20.1	18.6	23.1	5.92
151	20.8	19.1	23.6	5.50
152	21.4	18.6	23.1	5.23
153	22.1	19.1	23.6	4.84
154	22.8	18.6	23.1	4.65
155	23.5	19.1	22.8	4.45
156	24.1	18.6	22.4	4.26
157	24.8	19.1	22.1	4.10
158	25.5	18.6	21.6	3.95
159	26.2	19.1	21.3	3.81
160	26.8	18.6	20.6	3.67
161	27.5	19.1	19.2	3.14
162	28.2	18.6	20.3	3.47
163	28.9	19.1	19.6	3.33
164	29.5	18.6	18.9	3.29
165	30.2	19.1	19.1	2.96
166	30.9	18.6	19.2	3.33
167	31.6	19.1	19.2	3.45
168	32.2	18.6	20.3	3.48
169	18.7	19.6	24.1	6.91
170	19.4	20.1	24.6	6.16
171	20.1	19.6	24.1	5.81
172	20.8	20.1	24.6	5.42
173	21.4	19.6	24.1	5.17
174	22.1	20.1	24.6	4.80
175	22.8	19.6	24.1	4.62
176	23.5	20.1	23.8	4.43
177	24.1	19.6	22.6	4.28
178	24.8	20.1	23.0	4.11
179	25.5	19.6	21.8	3.97
180	26.2	20.1	22.2	3.83

181	26.8	19.6	21.5	3.71
182	27.5	20.1	20.1	2.27
183	28.2	19.6	20.3	3.42
184	28.9	20.1	20.5	3.39
185	29.5	19.6	19.8	3.33
186	30.2	20.1	20.8	3.35
187	30.9	19.6	20.0	3.39
188	31.6	20.1	20.9	3.45
189	32.2	19.6	21.0	3.52
190	18.7	20.6	25.1	6.71
191	19.4	21.0	25.6	6.03
192	20.1	20.6	25.1	5.71
193	20.8	21.0	25.6	5.36
194	21.4	20.6	25.1	5.12
195	22.1	21.0	25.5	4.77
196	22.8	20.6	25.1	4.61
197	23.5	21.0	25.5	4.42
198	24.1	20.6	23.5	4.27
199	24.8	21.0	24.8	4.12
200	25.5	20.6	23.5	3.97
201	26.2	21.0	23.0	3.86
202	26.8	20.6	23.2	3.73
203	27.5	21.0	22.7	3.64
204	28.2	20.6	21.1	3.48
205	28.9	21.0	21.3	3.44
206	29.5	20.6	20.6	3.24
207	30.2	21.0	21.5	3.43
208	30.9	20.6	21.7	3.47
209	31.6	21.0	22.5	3.52
210	32.2	20.6	22.7	3.54
211	18.7	21.5	26.1	6.56
212	20.1	21.5	26.0	5.63
213	21.4	21.5	26.0	5.08
214	22.8	21.5	25.3	4.61
215	24.1	21.5	25.3	4.25
216	25.5	21.5	23.7	4.00
217	26.8	21.5	21.6	3.33
218	28.2	21.5	22.0	3.54
219	29.5	21.5	22.3	3.51
220	30.9	21.5	21.5	3.35
221	32.2	21.5	23.4	3.59

1.4 SEZIONE 38

1.4.1 Fine costruzione



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	38.3 m
Ordinata vertice sinistro inferiore yi	4.25 m
Ascissa vertice destro superiore xs	59.09 m
Ordinata vertice destro superiore ys	18.72 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	26.89	0.0
3	28.37	-0.98
4	30.87	-0.98
5	38.37	-5.98
6	55.12	-5.26
7	55.82	-5.23

Vertici strato 1

N	X (m)	y (m)
1	0.0	-0.7
2	9.38	-0.7
3	19.74	-0.7
4	27.94	-0.7
5	28.37	-0.98
6	30.87	-0.98
7	38.37	-5.98
8	55.12	-5.26
9	55.82	-5.23

Vertici strato 2

N	X (m)	y (m)
1	0.0	-6.3
2	15.68	-6.3
3	28.19	-6.3
4	37.01	-6.3
5	55.82	-6.3

Vertici strato 3

N	X (m)	y (m)
1	0.0	-13.5
2	16.05	-13.5
3	28.85	-13.5
4	51.74	-13.5
5	55.82	-13.5

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	1.09		20	1800	1900	2-C-1	
2	0.05		32	1900	2000	2-G-1	
3	1.09		20	1800	1900	2-C-1	
4	0.05		38.7	2000	2100	2-G-4	

Risultati analisi pendio

Fs minimo individuato	1.99
Ascissa centro superficie	39.34 m
Ordinata centro superficie	13.66 m
Raggio superficie	19.36 m

xc = 39.337 yc = 13.656 Rc = 19.357 Fs=1.99
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.61	43.88	0.85	331.57
2	0.66	41.32	0.88	1067.81
3	0.56	38.95	0.72	1269.99
4	0.91	36.2	1.13	2237.34
5	0.31	33.97	0.37	836.5
6	0.61	32.34	0.72	1997.5
7	0.61	30.22	0.71	2430.05
8	0.61	28.15	0.69	2827.68
9	0.61	26.11	0.68	3192.45
10	0.61	24.11	0.67	3087.25
11	0.61	22.14	0.66	2916.52
12	0.61	20.19	0.65	2717.43
13	0.61	18.27	0.64	2491.09
14	0.61	16.37	0.64	2238.46
15	0.61	14.49	0.63	1960.28
16	0.61	12.63	0.63	1657.3

17	0.61	10.78	0.62	1330.07
18	0.61	8.94	0.62	979.07
19	0.61	7.11	0.62	604.71
20	0.61	5.29	0.61	207.28

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**-2513.5**	**1833.67**	**0.0**	**0.0**	**3321.68**	**4208.76**	**0.0**
2	**-2254.95**	**1645.05**	**-2513.5**	**1833.67**	**483.21**	**298.52**	**0.0**
3	**-1947.57**	**1420.81**	**-2254.95**	**1645.05**	**607.69**	**298.16**	**0.0**
4	**-1364.8**	**995.66**	**-1947.57**	**1420.81**	**1084.06**	**499.94**	**0.0**
5	**-1242.86**	**906.7**	**-1364.8**	**995.66**	**542.9**	**211.79**	**0.0**
6	**-811.15**	**591.76**	**-1242.86**	**906.7**	**1154.38**	**435.72**	**0.0**
7	**-314.64**	**229.54**	**-811.15**	**591.76**	**1488.43**	**516.4**	**0.0**
8	**215.13**	**-156.94**	**-314.64**	**229.54**	**1843.89**	**602.86**	**0.0**
9	**747.28**	**-545.16**	**215.13**	**-156.94**	**2218.0**	**694.34**	**0.0**
10	**1171.45**	**-854.61**	**747.28**	**-545.16**	**2304.43**	**713.82**	**0.0**
11	**1476.53**	**-1077.17**	**1171.45**	**-854.61**	**2335.08**	**719.56**	**0.0**
12	**1661.55**	**-1212.15**	**1476.53**	**-1077.17**	**2330.18**	**716.59**	**0.0**
13	**1728.55**	**-1261.03**	**1661.55**	**-1212.15**	**2286.53**	**704.1**	**0.0**
14	**1682.94**	**-1227.75**	**1728.55**	**-1261.03**	**2200.81**	**681.24**	**0.0**
15	**1534.13**	**-1119.19**	**1682.94**	**-1227.75**	**2069.13**	**646.99**	**0.0**
16	**1296.47**	**-945.81**	**1534.13**	**-1119.19**	**1887.02**	**600.24**	**0.0**
17	**990.38**	**-722.51**	**1296.47**	**-945.81**	**1649.05**	**539.61**	**0.0**
18	**644.11**	**-469.89**	**990.38**	**-722.51**	**1348.5**	**463.4**	**0.0**
19	**296.27**	**-216.14**	**644.11**	**-469.89**	**976.62**	**369.41**	**0.0**
20	**-0.34**	**0.25**	**296.27**	**-216.14**	**521.69**	**254.68**	**0.0**

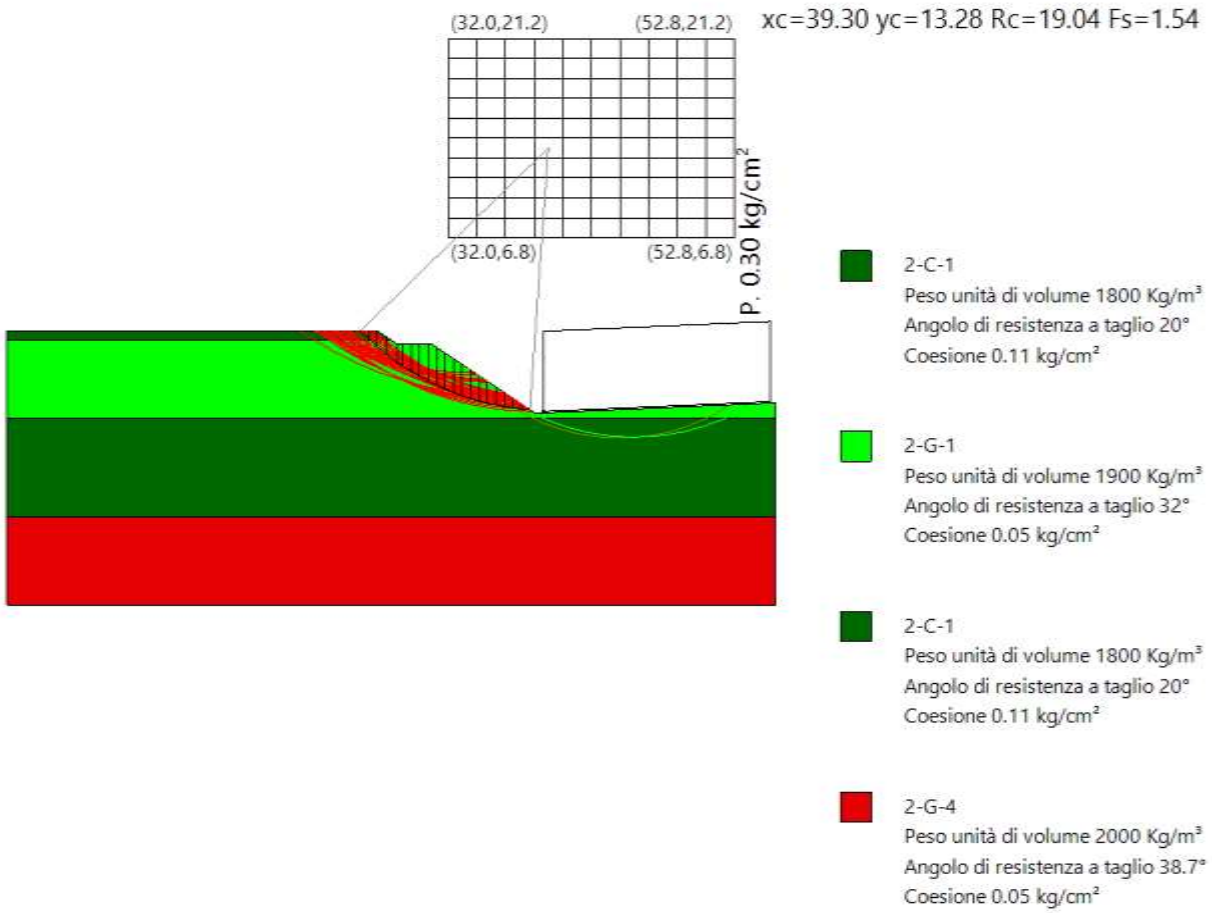
Numero di superfici esaminate....(76)

N°	Xo	Yo	Ro	Fs
1	38.3	4.2	10.4	20.00
2	39.3	5.0	11.2	20.00
3	40.4	4.2	10.4	20.00
4	41.4	5.0	12.4	20.00
5	42.5	4.2	11.5	20.00
6	43.5	5.0	12.7	20.00
7	44.5	4.2	12.6	20.00
8	45.6	5.0	13.5	113.62
9	38.3	5.7	11.9	20.00
10	39.3	6.4	12.6	20.00

11	40.4	5.7	11.9	20.00
12	41.4	6.4	13.7	20.00
13	42.5	5.7	12.6	20.00
14	43.5	6.4	13.8	20.00
15	44.5	5.7	13.7	20.00
16	45.6	6.4	14.6	118.19
17	38.3	7.1	13.3	20.00
18	39.3	7.9	14.1	20.00
19	40.4	7.1	13.3	20.00
20	41.4	7.9	14.8	20.00
21	42.5	7.1	13.8	20.00
22	43.5	7.9	14.9	20.00
23	44.5	7.1	14.8	20.00
24	45.6	7.9	15.7	136.98
25	38.3	8.6	14.8	20.00
26	39.3	9.3	15.5	20.00
27	40.4	8.6	15.9	20.00
28	41.4	9.3	16.0	20.00
29	42.5	8.6	16.0	20.00
30	43.5	9.3	16.1	20.00
31	44.5	8.6	16.0	20.00
32	45.6	9.3	16.9	165.22
33	38.3	10.0	16.2	20.00
34	39.3	10.8	16.9	20.00
35	40.4	10.0	17.0	20.00
36	41.4	10.8	17.2	20.00
37	42.5	10.0	17.2	20.00
38	43.5	10.8	18.3	20.00
39	44.5	10.0	17.2	20.00
40	38.3	11.5	16.4	2.82
41	39.3	12.2	18.1	2.97
42	40.4	11.5	18.2	20.00
43	41.4	12.2	18.4	20.00
44	42.5	11.5	18.4	20.00
45	43.5	12.2	19.5	20.00
46	44.5	11.5	19.3	20.00
47	38.3	12.9	17.8	2.61
48	39.3	13.7	19.4	1.99
49	40.4	12.9	19.5	20.00
50	41.4	13.7	20.7	20.00
51	42.5	12.9	19.7	20.00
52	43.5	13.7	20.8	20.00
53	44.5	12.9	20.5	20.00
54	38.3	14.4	19.1	2.27
55	39.3	15.1	20.6	2.04
56	40.4	14.4	20.7	20.00

57	41.4	15.1	22.0	20.00
58	42.5	14.4	20.9	20.00
59	43.5	15.1	22.0	20.00
60	44.5	14.4	21.8	20.00
61	38.3	15.8	21.6	2.08
62	39.3	16.6	21.9	2.09
63	40.4	15.8	22.0	20.00
64	41.4	16.6	22.3	2.72
65	42.5	15.8	22.2	20.00
66	43.5	16.6	23.3	20.00
67	38.3	17.3	21.8	3.01
68	39.3	18.0	23.2	20.00
69	40.4	17.3	22.3	3.08
70	41.4	18.0	23.6	20.00
71	42.5	17.3	24.4	20.00
72	43.5	18.0	24.6	20.00
73	44.5	17.3	24.4	20.00
74	38.3	18.7	23.1	3.10
75	40.4	18.7	24.6	2.01
76	42.5	18.7	25.7	20.00

1.4.2 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	32.02 m
Ordinata vertice sinistro inferiore yi	6.76 m
Ascissa vertice destro superiore xs	52.81 m
Ordinata vertice destro superiore ys	21.24 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	26.89	0.0
3	28.37	-0.98
4	30.87	-0.98
5	38.37	-5.98
6	55.12	-5.26
7	55.82	-5.23

Vertici strato 1

N	X (m)	y (m)
1	0.0	-0.7
2	9.38	-0.7
3	19.74	-0.7
4	27.94	-0.7
5	28.37	-0.98
6	30.87	-0.98
7	38.37	-5.98
8	55.12	-5.26
9	55.82	-5.23

Vertici strato 2

N	X (m)	y (m)
1	0.0	-6.3
2	15.68	-6.3
3	28.19	-6.3
4	37.01	-6.3
5	55.82	-6.3

Vertici strato 3

N	X (m)	y (m)
1	0.0	-13.5
2	16.05	-13.5
3	28.85	-13.5
4	51.74	-13.5
5	55.82	-13.5

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0.11		20	1800	1900	2-C-1	
2	0.05		32	1900	2000	2-G-1	
3	0.11		20	1800	1900	2-C-1	
4	0.05		38.7	2000	2100	2-G-4	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	38.93	-5.85	55.43	-5.135212	0.3

Risultati analisi pendio

Fs minimo individuato	1.54
Ascissa centro superficie	39.3 m
Ordinata centro superficie	13.28 m
Raggio superficie	19.04 m

xc = 27.512 yc = 20.076 Rc = 20.057 Fs=2.019
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.54	-5.31	0.54	30.68
2	0.54	-3.76	0.54	80.08
3	0.54	-2.22	0.54	113.63
4	0.54	-0.67	0.54	131.39
5	0.54	0.87	0.54	133.39
6	0.54	2.42	0.54	119.64
7	0.5	3.91	0.51	85.19
8	0.58	5.46	0.58	269.73
9	0.54	7.07	0.54	589.11
10	0.54	8.63	0.55	898.15
11	0.54	10.19	0.55	1190.9
12	0.31	11.43	0.31	803.1
13	0.77	13.01	0.79	3494.19
14	0.54	14.94	0.56	2881.66
15	0.54	16.55	0.56	2739.24
16	0.54	18.16	0.57	2578.94
17	0.54	19.8	0.57	2400.27
18	0.54	21.45	0.58	2202.69
19	0.54	23.12	0.59	1985.57
20	0.54	24.81	0.6	1448.2

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**3.31**	**13.3**	**0.0**	**0.0**	**26.01**	**7.49**	**0.0**
2	**11.22**	**45.02**	**3.31**	**13.3**	**69.94**	**20.14**	**0.0**
3	**21.41**	**85.92**	**11.22**	**45.02**	**101.78**	**29.31**	**0.0**
4	**32.05**	**128.62**	**21.41**	**85.92**	**120.24**	**34.62**	**0.0**
5	**41.73**	**167.46**	**32.05**	**128.62**	**124.29**	**35.79**	**0.0**
6	**49.43**	**198.37**	**41.73**	**167.46**	**113.14**	**32.58**	**0.0**
7	**54.26**	**217.75**	**49.43**	**198.37**	**81.5**	**23.47**	**0.0**
8	**67.45**	**270.7**	**54.26**	**217.75**	**260.41**	**74.99**	**0.0**
9	**91.64**	**367.78**	**67.45**	**270.7**	**572.57**	**164.87**	**0.0**
10	**121.83**	**488.92**	**91.64**	**367.78**	**876.31**	**252.33**	**0.0**
11	**153.14**	**614.57**	**121.83**	**488.92**	**1163.52**	**335.03**	**0.0**
12	**169.7**	**681.04**	**153.14**	**614.57**	**784.11**	**225.78**	**0.0**
13	**216.78**	**869.98**	**169.7**	**681.04**	**3401.17**	**979.36**	**0.0**
14	**230.9**	**926.67**	**216.78**	**869.98**	**2785.19**	**801.99**	**0.0**
15	**225.16**	**903.62**	**230.9**	**926.67**	**2624.75**	**755.79**	**0.0**
16	**201.8**	**809.87**	**225.16**	**903.62**	**2443.39**	**703.57**	**0.0**
17	**163.39**	**655.71**	**201.8**	**809.87**	**2242.32**	**645.67**	**0.0**
18	**112.84**	**452.86**	**163.39**	**655.71**	**2023.03**	**582.53**	**0.0**
19	**53.45**	**214.51**	**112.84**	**452.86**	**1787.17**	**514.61**	**0.0**
20	**0.0**	**0.0**	**53.45**	**214.51**	**1273.08**	**366.58**	**0.0**

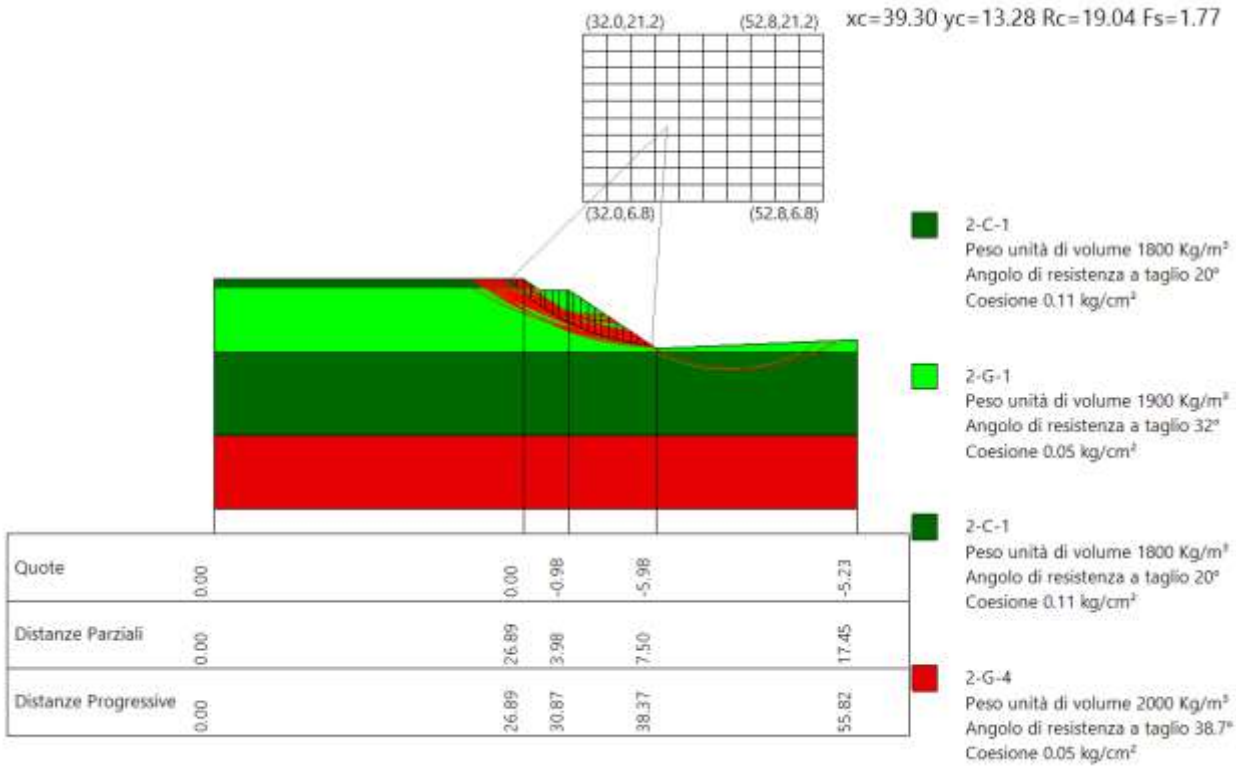
Numero di superfici esaminate....(133)

N°	Xo	Yo	Ro	Fs
1	32.0	6.8	10.5	20.00
2	33.1	7.5	11.2	20.00
3	34.1	6.8	11.7	20.00
4	35.1	7.5	12.4	20.00
5	36.2	6.8	11.7	20.00
6	37.2	7.5	13.7	20.00
7	38.3	6.8	13.0	20.00
8	39.3	7.5	13.7	20.00
9	40.3	6.8	13.0	20.00
10	41.4	7.5	14.5	20.00
11	42.4	6.8	13.5	20.00
12	43.5	7.5	14.7	20.00
13	44.5	6.8	14.5	18.17
14	32.0	8.2	11.9	20.00
15	33.1	8.9	12.6	20.00
16	34.1	8.2	13.2	20.00
17	35.1	8.9	13.9	20.00
18	36.2	8.2	13.2	20.00
19	37.2	8.9	13.9	1.63
20	38.3	8.2	14.4	20.00
21	39.3	8.9	15.1	20.00
22	40.3	8.2	14.4	20.00
23	41.4	8.9	15.7	20.00
24	42.4	8.2	15.7	20.00
25	43.5	8.9	15.8	20.00
26	44.5	8.2	16.6	20.00
27	45.5	8.9	16.6	13.39
28	32.0	9.7	13.3	20.00
29	33.1	10.4	14.1	20.00
30	34.1	9.7	13.4	20.00
31	35.1	10.4	15.3	20.00
32	36.2	9.7	14.6	20.00
33	37.2	10.4	15.3	1.66
34	38.3	9.7	15.8	20.00
35	39.3	10.4	16.6	20.00
36	40.3	9.7	16.7	20.00
37	41.4	10.4	16.9	20.00
38	42.4	9.7	16.9	20.00
39	43.5	10.4	18.0	20.00
40	44.5	9.7	17.8	20.00
41	32.0	11.1	14.5	20.00

42	33.1	11.8	15.5	20.00
43	34.1	11.1	14.8	20.00
44	35.1	11.8	16.8	20.00
45	36.2	11.1	16.1	20.00
46	37.2	11.8	16.8	1.69
47	38.3	11.1	16.1	1.70
48	39.3	11.8	19.0	20.00
49	40.3	11.1	17.9	20.00
50	41.4	11.8	18.1	20.00
51	42.4	11.1	18.1	20.00
52	43.5	11.8	19.2	20.00
53	44.5	11.1	19.0	20.00
54	32.0	12.6	15.8	20.00
55	33.1	13.3	16.9	20.00
56	34.1	12.6	16.3	20.00
57	35.1	13.3	17.0	2.14
58	36.2	12.6	17.5	20.00
59	37.2	13.3	18.2	1.73
60	38.3	12.6	17.5	1.69
61	39.3	13.3	19.0	1.54
62	40.3	12.6	19.2	20.00
63	41.4	13.3	20.4	20.00
64	42.4	12.6	19.3	20.00
65	43.5	13.3	20.5	20.00
66	32.0	14.0	17.1	20.00
67	33.1	14.7	18.1	20.00
68	34.1	14.0	17.7	20.00
69	35.1	14.7	18.4	2.20
70	36.2	14.0	19.0	20.00
71	37.2	14.7	19.7	1.78
72	38.3	14.0	18.8	1.73
73	39.3	14.7	20.3	1.59
74	40.3	14.0	20.4	20.00
75	41.4	14.7	21.7	20.00
76	42.4	14.0	20.6	20.00
77	43.5	14.7	21.7	20.00
78	44.5	14.0	21.5	20.00
79	32.0	15.4	18.4	20.00
80	33.1	16.2	19.4	20.00
81	34.1	15.4	19.2	20.00
82	35.1	16.2	19.9	2.27
83	36.2	15.4	19.2	2.15
84	37.2	16.2	21.0	1.84
85	38.3	15.4	21.3	1.66
86	39.3	16.2	21.6	1.64
87	40.3	15.4	20.6	1.75

88	41.4	16.2	22.0	1.62
89	42.4	15.4	21.9	20.00
90	43.5	16.2	23.0	20.00
91	32.0	16.9	19.6	20.00
92	33.1	17.6	20.7	20.00
93	34.1	16.9	20.5	20.00
94	35.1	17.6	21.3	2.33
95	36.2	16.9	20.6	2.19
96	37.2	17.6	22.4	1.90
97	38.3	16.9	22.6	1.72
98	39.3	17.6	22.9	1.70
99	40.3	16.9	21.9	1.78
100	41.4	17.6	23.3	1.63
101	42.4	16.9	24.1	20.00
102	43.5	17.6	24.3	20.00
103	32.0	18.3	20.9	20.00
104	33.1	19.1	22.0	20.00
105	34.1	18.3	21.7	20.00
106	35.1	19.1	22.8	2.40
107	36.2	18.3	22.0	2.25
108	37.2	19.1	23.7	1.99
109	38.3	18.3	23.9	1.77
110	39.3	19.1	24.2	1.75
111	40.3	18.3	23.3	1.81
112	41.4	19.1	24.6	1.68
113	42.4	18.3	25.4	20.00
114	43.5	19.1	25.6	20.00
115	44.5	18.3	25.4	20.00
116	32.0	19.8	22.2	20.00
117	33.1	20.5	23.2	20.00
118	34.1	19.8	23.0	2.75
119	35.1	20.5	24.1	2.51
120	36.2	19.8	23.4	2.34
121	37.2	20.5	25.0	2.06
122	38.3	19.8	25.2	1.83
123	39.3	20.5	25.5	1.82
124	40.3	19.8	25.6	1.65
125	41.4	20.5	25.9	1.70
126	42.4	19.8	26.7	20.00
127	43.5	20.5	27.7	20.00
128	32.0	21.2	23.5	20.00
129	34.1	21.2	24.3	2.89
130	36.2	21.2	25.9	2.17
131	38.3	21.2	26.5	1.88
132	40.3	21.2	26.9	1.70
133	42.4	21.2	28.0	20.00

1.4.3 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	32.02 m
Ordinata vertice sinistro inferiore yi	6.76 m
Ascissa vertice destro superiore xs	52.81 m
Ordinata vertice destro superiore ys	21.24 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

==========

Coefficiente azione sismica orizzontale 0.032
Coefficiente azione sismica verticale 0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	26.89	0.0
3	28.37	-0.98
4	30.87	-0.98
5	38.37	-5.98
6	55.12	-5.26
7	55.82	-5.23

Vertici strato 1

N	X (m)	y (m)
1	0.0	-0.7
2	9.38	-0.7
3	19.74	-0.7
4	27.94	-0.7
5	28.37	-0.98
6	30.87	-0.98
7	38.37	-5.98
8	55.12	-5.26
9	55.82	-5.23

Vertici strato 2

N	X (m)	y (m)
1	0.0	-6.3
2	15.68	-6.3
3	28.19	-6.3
4	37.01	-6.3
5	55.82	-6.3

Vertici strato 3

N	X (m)	y (m)
1	0.0	-13.5
2	16.05	-13.5
3	28.85	-13.5
4	51.74	-13.5
5	55.82	-13.5

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	No

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0.11		20	1800	1900	2-C-1	
2	0.05		32	1900	2000	2-G-1	
3	0.11		20	1800	1900	2-C-1	
4	0.05		38.7	2000	2100	2-G-4	

Risultati analisi pendio

Fs minimo individuato	1.77
Ascissa centro superficie	39.3 m
Ordinata centro superficie	13.28 m
Raggio superficie	19.04 m

xc = 39.30 yc = 13.278 Rc = 19.038 Fs=1.767
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.62	44.49	0.86	342.49
2	0.62	41.94	0.83	1003.88
3	0.61	39.49	0.79	1379.97
4	0.87	36.68	1.08	2138.45
5	0.37	34.39	0.44	1008.69
6	0.62	32.62	0.73	2077.55
7	0.62	30.45	0.71	2519.02
8	0.62	28.32	0.7	2924.16
9	0.62	26.24	0.69	3279.83
10	0.62	24.19	0.67	3138.81
11	0.62	22.17	0.66	2967.13
12	0.62	20.19	0.66	2766.14
13	0.62	18.22	0.65	2537.0
14	0.62	16.28	0.64	2280.7
15	0.62	14.36	0.64	1998.09
16	0.62	12.46	0.63	1689.88
17	0.62	10.57	0.63	1356.68
18	0.62	8.69	0.62	998.97
19	0.62	6.82	0.62	617.17
20	0.62	4.96	0.62	211.61

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**97.74**	**327.3**	**0.0**	**0.0**	**400.19**	**619.4**	**0.0**
2	**40.58**	**135.89**	**97.74**	**327.3**	**651.85**	**466.27**	**0.0**
3	**-47.92**	**-160.45**	**40.58**	**135.89**	**933.74**	**554.14**	**0.0**
4	**-191.94**	**-642.72**	**-47.92**	**-160.45**	**1529.1**	**845.9**	**0.0**
5	**-219.43**	**-734.76**	**-191.94**	**-642.72**	**798.21**	**407.58**	**0.0**
6	**-319.75**	**-1070.69**	**-219.43**	**-734.76**	**1645.42**	**788.53**	**0.0**
7	**-427.83**	**-1432.62**	**-319.75**	**-1070.69**	**2075.35**	**935.78**	**0.0**
8	**-532.64**	**-1783.57**	**-427.83**	**-1432.62**	**2496.76**	**1080.61**	**0.0**
9	**-623.72**	**-2088.56**	**-532.64**	**-1783.57**	**2889.51**	**1215.81**	**0.0**
10	**-677.03**	**-2267.05**	**-623.72**	**-2088.56**	**2843.4**	**1196.26**	**0.0**
11	**-694.58**	**-2325.82**	**-677.03**	**-2267.05**	**2749.93**	**1160.36**	**0.0**
12	**-679.27**	**-2274.56**	**-694.58**	**-2325.82**	**2610.56**	**1108.57**	**0.0**
13	**-634.81**	**-2125.7**	**-679.27**	**-2274.56**	**2427.24**	**1041.55**	**0.0**
14	**-565.75**	**-1894.43**	**-634.81**	**-2125.7**	**2202.32**	**960.11**	**0.0**
15	**-477.46**	**-1598.81**	**-565.75**	**-1894.43**	**1938.55**	**865.18**	**0.0**
16	**-376.22**	**-1259.78**	**-477.46**	**-1598.81**	**1639.1**	**757.88**	**0.0**
17	**-269.2**	**-901.42**	**-376.22**	**-1259.78**	**1307.56**	**639.46**	**0.0**
18	**-164.58**	**-551.09**	**-269.2**	**-901.42**	**947.98**	**511.33**	**0.0**
19	**-71.6**	**-239.74**	**-164.58**	**-551.09**	**564.91**	**375.11**	**0.0**
20	**-0.68**	**-2.27**	**-71.6**	**-239.74**	**163.48**	**232.58**	**0.0**

Numero di superfici esaminate....(133)

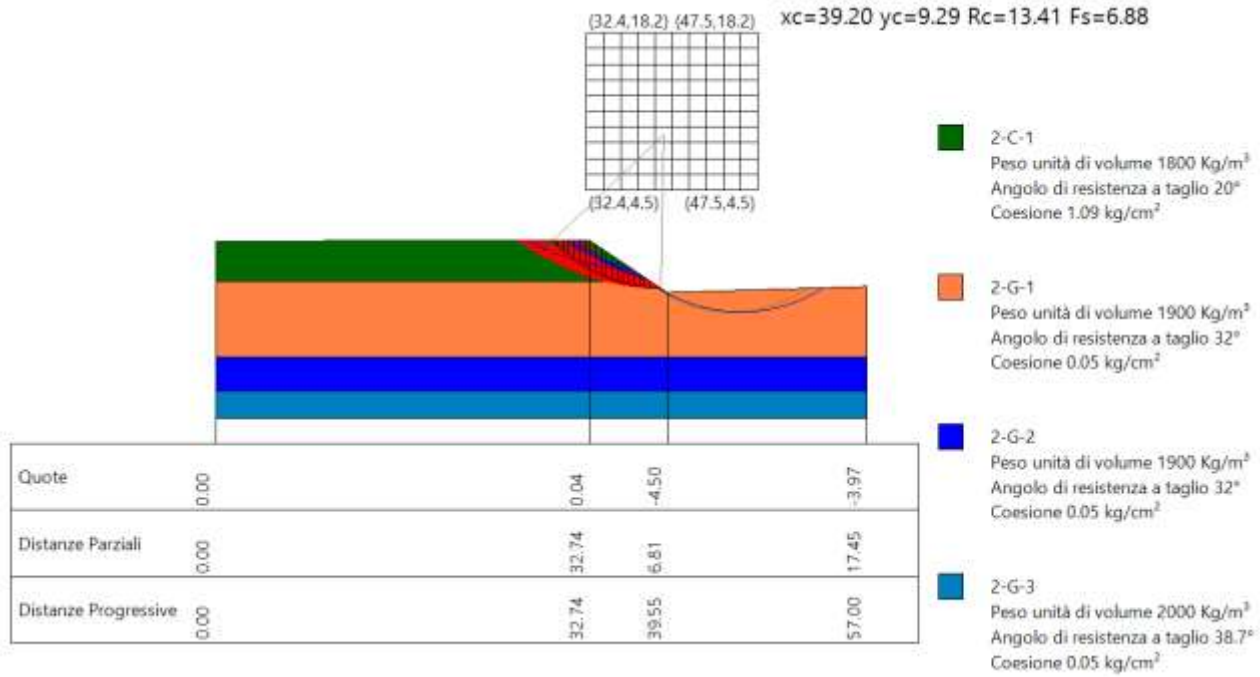
N°	Xo	Yo	Ro	Fs
1	32.0	6.8	10.5	20.00
2	33.1	7.5	11.2	20.00
3	34.1	6.8	11.7	20.00
4	35.1	7.5	12.4	20.00
5	36.2	6.8	11.7	20.00
6	37.2	7.5	13.7	20.00
7	38.3	6.8	13.0	20.00
8	39.3	7.5	13.7	20.00
9	40.3	6.8	13.0	20.00
10	41.4	7.5	14.5	20.00
11	42.4	6.8	13.5	20.00
12	43.5	7.5	14.7	20.00
13	44.5	6.8	14.5	113.80
14	32.0	8.2	11.9	20.00
15	33.1	8.9	12.6	20.00
16	34.1	8.2	13.2	20.00
17	35.1	8.9	13.9	20.00
18	36.2	8.2	13.2	20.00
19	37.2	8.9	13.9	1.86
20	38.3	8.2	14.4	20.00
21	39.3	8.9	15.1	20.00
22	40.3	8.2	14.4	20.00
23	41.4	8.9	15.7	20.00
24	42.4	8.2	15.7	20.00
25	43.5	8.9	15.8	20.00
26	44.5	8.2	15.7	20.00
27	45.5	8.9	16.6	18.73
28	32.0	9.7	13.3	20.00
29	33.1	10.4	14.1	20.00
30	34.1	9.7	13.4	20.00
31	35.1	10.4	15.3	20.00
32	36.2	9.7	14.6	20.00
33	37.2	10.4	15.3	1.89
34	38.3	9.7	15.8	20.00
35	39.3	10.4	16.6	20.00
36	40.3	9.7	16.7	20.00
37	41.4	10.4	16.9	20.00
38	42.4	9.7	16.9	20.00
39	43.5	10.4	18.0	20.00
40	44.5	9.7	16.9	20.00
41	32.0	11.1	14.5	20.00
42	33.1	11.8	15.5	20.00

43	34.1	11.1	14.8	20.00
44	35.1	11.8	16.8	20.00
45	36.2	11.1	16.1	20.00
46	37.2	11.8	16.8	1.93
47	38.3	11.1	16.1	1.95
48	39.3	11.8	19.0	20.00
49	40.3	11.1	17.9	20.00
50	41.4	11.8	18.1	20.00
51	42.4	11.1	18.1	20.00
52	43.5	11.8	19.2	20.00
53	44.5	11.1	19.0	20.00
54	32.0	12.6	15.8	20.00
55	33.1	13.3	16.9	20.00
56	34.1	12.6	16.3	20.00
57	35.1	13.3	17.0	2.41
58	36.2	12.6	17.5	20.00
59	37.2	13.3	18.2	1.97
60	38.3	12.6	17.5	1.93
61	39.3	13.3	19.0	1.77
62	40.3	12.6	19.2	20.00
63	41.4	13.3	20.4	20.00
64	42.4	12.6	19.3	20.00
65	43.5	13.3	20.5	20.00
66	32.0	14.0	17.1	20.00
67	33.1	14.7	18.1	20.00
68	34.1	14.0	17.7	20.00
69	35.1	14.7	18.4	2.47
70	36.2	14.0	19.0	20.00
71	37.2	14.7	19.7	2.02
72	38.3	14.0	18.8	1.97
73	39.3	14.7	20.3	1.82
74	40.3	14.0	20.4	20.00
75	41.4	14.7	21.7	20.00
76	42.4	14.0	20.6	20.00
77	43.5	14.7	21.7	20.00
78	44.5	14.0	21.5	20.00
79	32.0	15.4	18.4	20.00
80	33.1	16.2	19.4	20.00
81	34.1	15.4	19.2	20.00
82	35.1	16.2	19.9	2.53
83	36.2	15.4	19.2	2.42
84	37.2	16.2	21.0	2.08
85	38.3	15.4	21.3	1.89
86	39.3	16.2	21.6	1.88
87	40.3	15.4	20.6	2.02
88	41.4	16.2	22.0	1.86

89	42.4	15.4	21.9	20.00
90	43.5	16.2	23.0	20.00
91	32.0	16.9	19.6	20.00
92	33.1	17.6	20.7	20.00
93	34.1	16.9	20.5	20.00
94	35.1	17.6	21.3	2.59
95	36.2	16.9	20.6	2.47
96	37.2	17.6	22.4	2.15
97	38.3	16.9	22.6	1.94
98	39.3	17.6	22.9	1.93
99	40.3	16.9	21.9	2.05
100	41.4	17.6	23.3	1.88
101	42.4	16.9	24.1	20.00
102	43.5	17.6	24.3	20.00
103	32.0	18.3	20.9	20.00
104	33.1	19.1	22.0	20.00
105	34.1	18.3	21.7	20.00
106	35.1	19.1	22.8	2.66
107	36.2	18.3	22.0	2.53
108	37.2	19.1	23.7	2.24
109	38.3	18.3	23.9	2.00
110	39.3	19.1	24.2	1.99
111	40.3	18.3	23.3	2.08
112	41.4	19.1	24.6	1.93
113	42.4	18.3	25.4	20.00
114	43.5	19.1	25.6	20.00
115	44.5	18.3	25.4	20.00
116	32.0	19.8	22.2	20.00
117	33.1	20.5	23.2	20.00
118	34.1	19.8	23.0	3.01
119	35.1	20.5	24.1	2.78
120	36.2	19.8	23.4	2.62
121	37.2	20.5	25.0	2.31
122	38.3	19.8	25.2	2.06
123	39.3	20.5	25.5	2.07
124	40.3	19.8	25.6	1.88
125	41.4	20.5	25.9	1.95
126	42.4	19.8	26.7	20.00
127	43.5	20.5	27.7	20.00
128	32.0	21.2	23.5	20.00
129	34.1	21.2	24.3	3.16
130	36.2	21.2	25.9	2.41
131	38.3	21.2	26.5	2.12
132	40.3	21.2	26.9	1.93
133	42.4	21.2	28.0	20.00

1.5 SEZIONE 46

1.5.1 Fine costruzione



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	32.44 m
Ordinata vertice sinistro inferiore yi	4.48 m
Ascissa vertice destro superiore xs	47.46 m
Ordinata vertice destro superiore ys	18.23 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	32.74	0.04
3	39.55	-4.5
4	56.37	-3.99
5	57.0	-3.97

Vertici strato 1

N	X (m)	y (m)
1	0.0	-3.5
2	10.1	-3.5
3	20.62	-3.5
4	27.28	-3.5
5	38.05	-3.5
6	39.55	-4.5
7	56.37	-3.99
8	57.0	-3.97

Vertici strato 2

N	X (m)	y (m)
1	0.0	-10.1
2	1.09	-10.1
3	2.28	-10.1
4	40.64	-10.1
5	57.0	-10.1

Vertici strato 3

N	X (m)	y (m)
1	0.0	-13.1
2	15.77	-13.1
3	30.62	-13.1
4	33.48	-13.1
5	50.37	-13.1
6	57.0	-13.1

Coefficienti parziali azioni

==========

Sfavorevoli: Permanenti, variabili 1.0 1.0
Favorevoli: Permanenti, variabili 1.0 1.0

==========

Coefficienti parziali per i parametri geotecnici del terreno

==========

Tangente angolo di resistenza al taglio 1.25
Coesione efficace 1.25
Coesione non drenata 1.4

Riduzione parametri geotecnici terreno Si

==========

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	1.09		20	1800	1900	2-C-1	
2	0.05		32	1900	2000	2-G-1	
3	0.05		32	1900	2000	2-G-2	
4	0.05		38.7	2000	2100	2-G-3	

Risultati analisi pendio

==========

Fs minimo individuato 6.88
Ascissa centro superficie 39.2 m
Ordinata centro superficie 9.29 m
Raggio superficie 13.41 m

==========

xc = 39.201 yc = 9.291 Rc = 13.41 Fs=6.881
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.47	44.93	0.67	207.14
2	0.47	42.14	0.64	591.88
3	0.47	39.46	0.61	941.47
4	0.47	36.88	0.59	1259.91
5	0.47	34.39	0.57	1550.37
6	0.47	31.97	0.56	1815.32
7	0.4	29.79	0.46	1718.89
8	0.55	27.48	0.62	2433.79
9	0.47	25.04	0.52	2028.11
10	0.47	22.83	0.51	1937.94
11	0.47	20.65	0.51	1829.46
12	0.47	18.5	0.5	1703.53
13	0.47	16.37	0.49	1564.44
14	0.47	14.27	0.49	1411.67
15	0.47	12.19	0.49	1242.32
16	0.47	10.12	0.48	1056.8
17	0.47	8.07	0.48	855.43
18	0.47	6.03	0.48	638.5
19	0.47	4.0	0.48	399.4
20	0.47	1.97	0.47	136.92

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	379.97	612.08	0.0	0.0	309.96	861.8	0.0
2	609.61	982.0	379.97	612.08	516.8	832.07	0.0
3	721.03	1161.49	609.61	982.0	754.93	810.11	0.0
4	740.87	1193.44	721.03	1161.49	1011.09	793.89	0.0
5	691.62	1114.11	740.87	1193.44	1275.25	781.99	0.0
6	592.62	954.64	691.62	1114.11	1539.61	773.33	0.0
7	540.53	870.73	592.62	954.64	1495.29	646.94	0.0
8	352.38	567.63	540.53	870.73	2186.18	875.97	0.0
9	289.57	466.46	352.38	567.63	1851.49	741.49	0.0
10	276.45	445.33	289.57	466.46	1790.05	727.6	0.0
11	314.08	505.95	276.45	445.33	1698.13	713.88	0.0
12	402.49	648.36	314.08	505.95	1576.88	700.24	0.0
13	233.17	375.61	402.49	648.36	1586.59	143.98	0.0
14	108.51	174.8	233.17	375.61	1439.42	133.0	0.0
15	24.63	39.67	108.51	174.8	1267.77	120.29	0.0
16	-23.42	-37.73	24.63	39.67	1074.04	106.02	0.0
17	-41.73	-67.23	-23.42	-37.73	860.94	90.38	0.0
18	-37.63	-60.62	-41.73	-67.23	631.59	73.59	0.0
19	-19.81	-31.92	-37.63	-60.62	382.65	55.42	0.0
20	1.01	1.63	-19.81	-31.92	117.18	36.09	0.0

Numero di superfici esaminate....(194)

N°	Xo	Yo	Ro	Fs
1	32.4	4.5	5.9	20.00
2	33.2	5.2	6.8	20.00
3	33.9	4.5	5.8	20.00
4	34.7	5.2	6.5	20.00
5	35.4	4.5	6.5	20.00
6	36.2	5.2	7.9	20.00
7	36.9	4.5	7.2	14.89
8	37.7	5.2	7.9	17.66
9	38.4	4.5	7.9	14.31
10	39.2	5.2	9.3	7.63
11	40.0	4.5	8.6	11.65
12	40.7	5.2	10.0	20.00
13	41.5	4.5	9.3	20.00
14	42.2	5.2	10.7	20.00
15	43.0	4.5	10.0	20.00
16	43.7	5.2	10.7	20.00
17	44.5	4.5	10.7	20.00
18	45.2	5.2	11.4	70.40

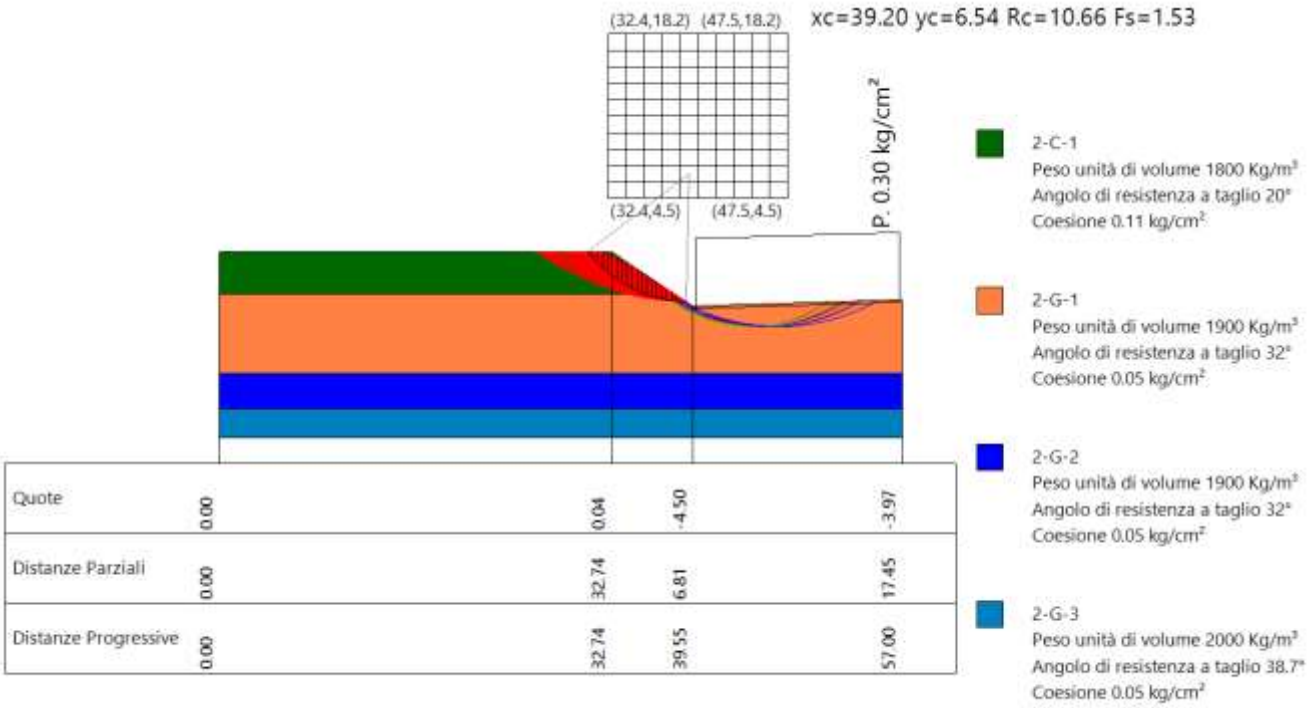
19	32.4	5.9	7.1	20.00
20	33.2	6.5	8.0	20.00
21	33.9	5.9	7.0	20.00
22	34.7	6.5	7.9	20.00
23	35.4	5.9	7.9	20.00
24	36.2	6.5	8.6	19.95
25	36.9	5.9	8.6	14.52
26	37.7	6.5	9.3	16.31
27	38.4	5.9	9.3	12.96
28	39.2	6.5	10.7	7.16
29	40.0	5.9	10.0	9.36
30	40.7	6.5	10.7	13.23
31	41.5	5.9	10.7	20.00
32	42.2	6.5	12.0	20.00
33	43.0	5.9	11.4	20.00
34	43.7	6.5	12.0	20.00
35	44.5	5.9	12.1	20.00
36	45.2	6.5	12.7	20.00
37	32.4	7.2	8.3	20.00
38	33.2	7.9	9.2	20.00
39	33.9	7.2	8.1	20.00
40	34.7	7.9	9.8	20.00
41	35.4	7.2	9.3	20.00
42	36.2	7.9	10.6	20.00
43	36.9	7.2	10.0	14.54
44	37.7	7.9	10.6	15.81
45	38.4	7.2	10.7	12.41
46	39.2	7.9	12.0	6.96
47	40.0	7.2	11.3	8.41
48	40.7	7.9	12.0	10.99
49	41.5	7.2	12.0	20.00
50	42.2	7.9	12.7	20.00
51	43.0	7.2	12.7	20.00
52	43.7	7.9	13.4	20.00
53	44.5	7.2	12.7	20.00
54	45.2	7.9	14.1	20.00
55	46.0	7.2	13.4	50.19
56	32.4	8.6	9.5	20.00
57	33.2	9.3	10.4	20.00
58	33.9	8.6	10.1	20.00
59	34.7	9.3	11.0	20.00
60	35.4	8.6	10.6	20.00
61	36.2	9.3	12.0	20.00
62	36.9	8.6	11.3	14.73
63	37.7	9.3	12.0	15.68
64	38.4	8.6	12.0	12.21

65	39.2	9.3	13.4	6.88
66	40.0	8.6	12.7	7.95
67	40.7	9.3	13.4	9.95
68	41.5	8.6	12.7	15.66
69	42.2	9.3	14.1	20.00
70	43.0	8.6	14.1	20.00
71	43.7	9.3	14.8	20.00
72	44.5	8.6	14.1	20.00
73	45.2	9.3	15.5	20.00
74	46.0	8.6	14.8	20.00
75	32.4	10.0	10.7	20.00
76	33.2	10.7	11.6	20.00
77	33.9	10.0	11.3	20.00
78	34.7	10.7	12.2	20.00
79	35.4	10.0	11.9	20.00
80	36.2	10.7	13.4	20.00
81	36.9	10.0	12.7	15.01
82	37.7	10.7	14.1	11.83
83	38.4	10.0	13.4	12.18
84	39.2	10.7	14.8	6.88
85	40.0	10.0	14.1	7.72
86	40.7	10.7	14.8	8.93
87	41.5	10.0	14.1	13.10
88	42.2	10.7	14.8	19.73
89	43.0	10.0	15.5	20.00
90	43.7	10.7	16.2	20.00
91	44.5	10.0	15.5	20.00
92	46.7	10.7	16.9	20.00
93	32.4	11.4	12.0	20.00
94	33.2	12.0	12.8	20.00
95	33.9	11.4	12.5	20.00
96	34.7	12.0	13.4	20.00
97	35.4	11.4	13.8	20.00
98	36.2	12.0	14.7	20.00
99	36.9	11.4	14.1	15.34
100	37.7	12.0	15.5	12.05
101	38.4	11.4	14.8	12.26
102	39.2	12.0	16.2	6.92
103	40.0	11.4	15.5	7.62
104	40.7	12.0	16.2	8.64
105	41.5	11.4	15.5	11.31
106	42.2	12.0	16.2	15.77
107	43.0	11.4	16.9	20.00
108	43.7	12.0	17.5	20.00
109	44.5	11.4	16.9	20.00
110	45.2	12.0	17.5	20.00

111	46.0	11.4	17.6	20.00
112	32.4	12.7	13.2	20.00
113	33.2	13.4	14.1	20.00
114	33.9	12.7	13.7	20.00
115	34.7	13.4	15.5	20.00
116	35.4	12.7	15.1	20.00
117	36.2	13.4	16.0	20.00
118	36.9	12.7	15.5	15.70
119	37.7	13.4	16.8	12.30
120	38.4	12.7	16.2	12.39
121	39.2	13.4	17.5	7.00
122	40.0	12.7	16.8	7.59
123	40.7	13.4	17.5	8.49
124	41.5	12.7	16.8	10.62
125	42.2	13.4	17.5	13.55
126	43.0	12.7	18.2	20.00
127	43.7	13.4	18.9	20.00
128	44.5	12.7	18.2	20.00
129	45.2	13.4	18.9	20.00
130	46.7	13.4	19.5	20.00
131	32.4	14.1	15.3	20.00
132	33.2	14.8	15.3	20.00
133	33.9	14.1	15.0	20.00
134	34.7	14.8	16.7	20.00
135	35.4	14.1	16.3	20.00
136	36.2	14.8	17.2	19.04
137	36.9	14.1	16.8	16.17
138	37.7	14.8	18.2	12.55
139	38.4	14.1	17.5	12.56
140	39.2	14.8	18.9	7.09
141	40.0	14.1	18.2	7.61
142	40.7	14.8	18.9	8.42
143	41.5	14.1	18.2	10.23
144	42.2	14.8	18.9	12.65
145	43.0	14.1	18.2	18.36
146	43.7	14.8	20.3	20.00
147	44.5	14.1	19.6	20.00
148	45.2	14.8	20.3	20.00
149	46.7	14.8	20.7	20.00
150	32.4	15.5	16.6	20.00
151	33.2	16.2	17.4	20.00
152	33.9	15.5	17.1	20.00
153	34.7	16.2	17.9	20.00
154	35.4	15.5	17.6	20.00
155	36.2	16.2	19.2	20.00
156	36.9	15.5	18.1	17.59

157	37.7	16.2	19.6	12.81
158	38.4	15.5	18.9	12.75
159	39.2	16.2	20.3	7.20
160	40.0	15.5	19.6	7.66
161	40.7	16.2	20.3	8.40
162	41.5	15.5	19.6	9.50
163	42.2	16.2	20.3	20.00
164	43.0	15.5	19.6	16.32
165	43.7	16.2	21.7	20.00
166	44.5	15.5	21.0	20.00
167	45.2	16.2	21.7	20.00
168	32.4	16.9	17.8	20.00
169	33.2	17.5	18.7	20.00
170	33.9	16.9	18.3	20.00
171	34.7	17.5	19.2	20.00
172	35.4	16.9	18.8	20.00
173	36.2	17.5	20.5	20.00
174	36.9	16.9	19.3	19.21
175	37.7	17.5	20.9	13.47
176	38.4	16.9	20.3	12.96
177	39.2	17.5	21.7	7.31
178	40.0	16.9	21.0	7.73
179	40.7	17.5	21.7	8.43
180	41.5	16.9	21.0	9.38
181	42.2	17.5	21.0	19.90
182	43.0	16.9	21.0	14.46
183	43.7	17.5	21.7	18.19
184	44.5	16.9	22.4	20.00
185	45.2	17.5	23.1	20.00
186	32.4	18.2	19.0	20.00
187	33.9	18.2	19.5	20.00
188	35.4	18.2	20.9	20.00
189	36.9	18.2	21.3	20.00
190	38.4	18.2	21.7	13.19
191	40.0	18.2	22.3	7.82
192	41.5	18.2	22.3	9.32
193	43.0	18.2	22.3	13.73
194	44.5	18.2	23.7	20.00

1.5.2 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata
Superficie di forma circolare	

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	32.44 m
Ordinata vertice sinistro inferiore yi	4.48 m
Ascissa vertice destro superiore xs	47.46 m
Ordinata vertice destro superiore ys	18.23 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	32.74	0.04
3	39.55	-4.5
4	56.37	-3.99
5	57.0	-3.97

Vertici strato 1

N	X (m)	y (m)
1	0.0	-3.5
2	10.1	-3.5
3	20.62	-3.5
4	27.28	-3.5
5	38.05	-3.5
6	39.55	-4.5
7	56.37	-3.99
8	57.0	-3.97

Vertici strato 2

N	X (m)	y (m)
1	0.0	-10.1
2	1.09	-10.1
3	2.28	-10.1
4	40.64	-10.1
5	57.0	-10.1

Vertici strato 3

N	X (m)	y (m)
1	0.0	-13.1
2	15.77	-13.1
3	30.62	-13.1
4	33.48	-13.1
5	50.37	-13.1
6	57.0	-13.1

Coefficienti parziali azioni

==========

Sfavorevoli: Permanenti, variabili 1.0 1.0
Favorevoli: Permanenti, variabili 1.0 1.0

==========

Coefficienti parziali per i parametri geotecnici del terreno

==========

Tangente angolo di resistenza al taglio 1.25

Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

==========

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0.11		20	1800	1900	2-C-1	
2	0.05		32	1900	2000	2-G-1	
3	0.05		32	1900	2000	2-G-2	
4	0.05		38.7	2000	2100	2-G-3	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	39.76	-4.69	56.76	-4.172322	0.3

Risultati analisi pendio

==========

Fs minimo individuato	1.53
Ascissa centro superficie	39.2 m
Ordinata centro superficie	6.54 m
Raggio superficie	10.66 m

==========

xc = 39.201 yc = 6.54 Rc = 10.66 Fs=1.528

Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.41	50.67	0.65	191.66
2	0.41	47.3	0.61	541.55
3	0.41	44.13	0.57	853.65
4	0.41	41.12	0.55	1133.91
5	0.34	38.48	0.44	1134.36
6	0.48	35.72	0.59	1728.53
7	0.41	32.81	0.49	1482.46
8	0.41	30.22	0.48	1466.12
9	0.41	27.69	0.46	1431.56
10	0.41	25.22	0.45	1380.08
11	0.41	22.8	0.45	1312.73
12	0.41	20.42	0.44	1230.39
13	0.41	18.08	0.43	1137.62
14	0.41	15.77	0.43	1032.49

15	0.41	13.49	0.42	913.44
16	0.41	11.22	0.42	780.92
17	0.41	8.98	0.42	635.26
18	0.41	6.75	0.41	476.74
19	0.41	4.53	0.41	297.09
20	0.41	2.31	0.41	102.14

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**89.72**	**243.17**	**0.0**	**0.0**	**252.7**	**421.78**	**0.0**
2	**97.22**	**263.49**	**89.72**	**243.17**	**377.12**	**421.02**	**0.0**
3	**45.65**	**123.73**	**97.22**	**263.49**	**552.43**	**435.17**	**0.0**
4	**-47.13**	**-127.72**	**45.65**	**123.73**	**758.7**	**458.92**	**0.0**
5	**-127.43**	**-345.37**	**-47.13**	**-127.72**	**815.39**	**406.54**	**0.0**
6	**-280.98**	**-761.51**	**-127.43**	**-345.37**	**1285.11**	**586.04**	**0.0**
7	**-377.65**	**-1023.51**	**-280.98**	**-761.51**	**1185.22**	**507.6**	**0.0**
8	**-453.3**	**-1228.53**	**-377.65**	**-1023.51**	**1229.08**	**508.24**	**0.0**
9	**-506.53**	**-1372.8**	**-453.3**	**-1228.53**	**1247.69**	**505.18**	**0.0**
10	**-536.75**	**-1454.7**	**-506.53**	**-1372.8**	**1240.95**	**498.22**	**0.0**
11	**-544.05**	**-1474.5**	**-536.75**	**-1454.7**	**1209.21**	**487.29**	**0.0**
12	**-529.16**	**-1434.14**	**-544.05**	**-1474.5**	**1153.17**	**472.43**	**0.0**
13	**-489.2**	**-1325.83**	**-529.16**	**-1434.14**	**1077.07**	**465.59**	**0.0**
14	**-433.51**	**-1174.89**	**-489.2**	**-1325.83**	**981.05**	**432.8**	**0.0**
15	**-365.23**	**-989.85**	**-433.51**	**-1174.89**	**865.02**	**393.68**	**0.0**
16	**-288.2**	**-781.09**	**-365.23**	**-989.85**	**731.06**	**348.9**	**0.0**
17	**-206.98**	**-560.95**	**-288.2**	**-781.09**	**581.6**	**299.24**	**0.0**
18	**-126.9**	**-343.91**	**-206.98**	**-560.95**	**419.41**	**245.6**	**0.0**
19	**-55.03**	**-149.15**	**-126.9**	**-343.91**	**239.89**	**186.45**	**0.0**
20	**0.72**	**1.95**	**-55.03**	**-149.15**	**52.44**	**124.88**	**0.0**

Numero di superfici esaminate....(194)

N°	Xo	Yo	Ro	Fs
1	32.4	4.5	5.9	20.00
2	33.2	5.2	6.8	20.00
3	33.9	4.5	5.8	20.00
4	34.7	5.2	6.5	20.00
5	35.4	4.5	6.5	20.00
6	36.2	5.2	7.2	2.63
7	36.9	4.5	7.2	2.06
8	37.7	5.2	7.9	2.28
9	38.4	4.5	7.9	1.92
10	39.2	5.2	9.3	1.54

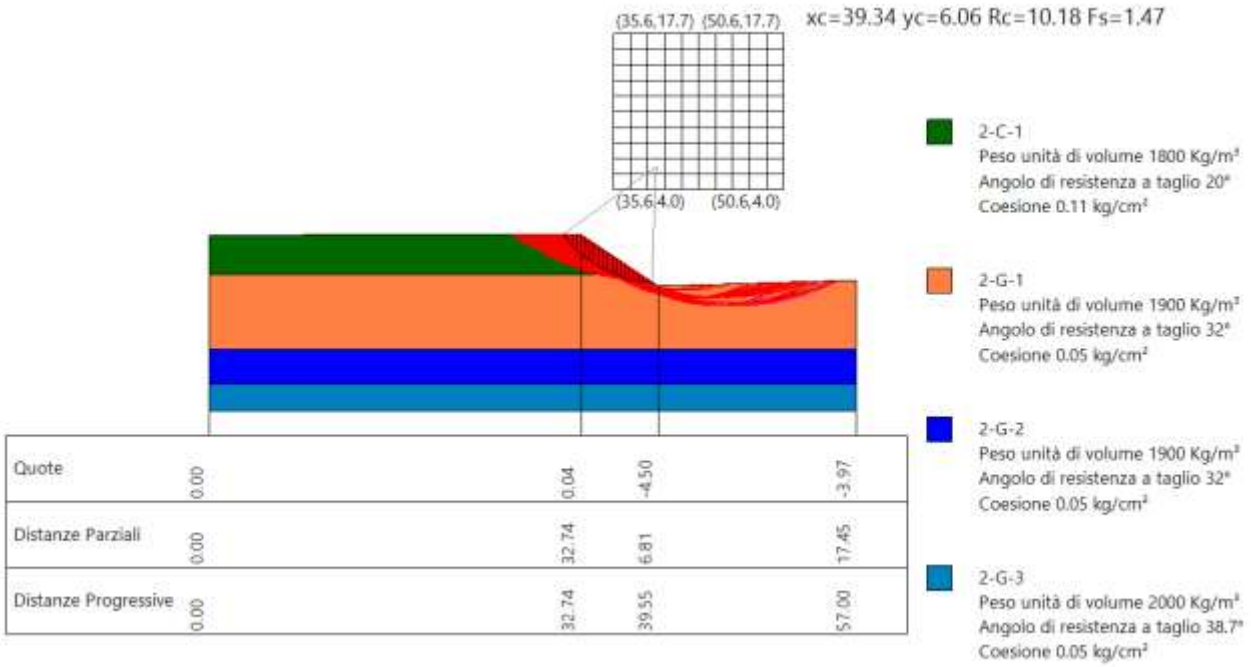
11	40.0	4.5	8.6	1.86
12	40.7	5.2	10.0	20.00
13	41.5	4.5	9.3	20.00
14	42.2	5.2	10.7	20.00
15	43.0	4.5	10.0	20.00
16	43.7	5.2	11.4	20.00
17	44.5	4.5	10.7	26.76
18	45.2	5.2	11.4	20.77
19	32.4	5.9	7.1	20.00
20	33.2	6.5	8.0	20.00
21	33.9	5.9	7.0	20.00
22	34.7	6.5	7.9	20.00
23	35.4	5.9	7.9	20.00
24	36.2	6.5	8.6	2.70
25	36.9	5.9	8.6	2.08
26	37.7	6.5	9.3	2.20
27	38.4	5.9	9.3	1.83
28	39.2	6.5	10.7	1.53
29	40.0	5.9	10.0	1.65
30	40.7	6.5	10.7	1.95
31	41.5	5.9	10.7	20.00
32	42.2	6.5	12.0	20.00
33	43.0	5.9	11.4	20.00
34	43.7	6.5	12.0	20.00
35	44.5	5.9	12.1	98.10
36	45.2	6.5	12.7	31.08
37	32.4	7.2	8.3	20.00
38	33.2	7.9	9.2	20.00
39	33.9	7.2	8.1	20.00
40	34.7	7.9	9.1	4.88
41	35.4	7.2	9.3	20.00
42	36.2	7.9	10.0	2.79
43	36.9	7.2	10.0	2.14
44	37.7	7.9	10.6	2.21
45	38.4	7.2	10.7	1.82
46	39.2	7.9	12.0	1.55
47	40.0	7.2	11.3	1.58
48	40.7	7.9	12.0	1.74
49	41.5	7.2	11.3	2.87
50	42.2	7.9	12.7	20.00
51	43.0	7.2	12.7	20.00
52	43.7	7.9	13.4	20.00
53	44.5	7.2	13.4	20.00
54	45.2	7.9	14.1	158.41
55	46.0	7.2	13.4	22.27
56	32.4	8.6	9.5	20.00

57	33.2	9.3	10.4	20.00
58	33.9	8.6	10.1	20.00
59	34.7	9.3	11.0	20.00
60	35.4	8.6	9.9	4.25
61	36.2	9.3	11.3	2.91
62	36.9	8.6	11.3	2.21
63	37.7	9.3	12.0	2.25
64	38.4	8.6	12.0	1.85
65	39.2	9.3	13.4	1.60
66	40.0	8.6	12.7	1.57
67	40.7	9.3	13.4	1.67
68	41.5	8.6	12.7	2.13
69	42.2	9.3	13.4	3.25
70	43.0	8.6	14.1	20.00
71	43.7	9.3	14.8	20.00
72	44.5	8.6	14.1	20.00
73	45.2	9.3	15.5	20.00
74	46.0	8.6	14.8	33.59
75	32.4	10.0	10.7	20.00
76	33.2	10.7	11.6	20.00
77	33.9	10.0	11.3	20.00
78	34.7	10.7	12.2	20.00
79	35.4	10.0	11.2	4.93
80	36.2	10.7	12.7	3.02
81	36.9	10.0	12.7	2.30
82	37.7	10.7	14.1	1.95
83	38.4	10.0	13.4	1.89
84	39.2	10.7	14.8	1.65
85	40.0	10.0	14.1	1.59
86	40.7	10.7	14.8	1.64
87	41.5	10.0	14.1	1.89
88	42.2	10.7	14.8	2.44
89	43.0	10.0	15.5	20.00
90	43.7	10.7	16.2	20.00
91	44.5	10.0	15.5	20.00
92	46.7	10.7	16.9	34.35
93	32.4	11.4	12.0	20.00
94	33.2	12.0	12.8	20.00
95	33.9	11.4	12.5	20.00
96	34.7	12.0	13.4	20.00
97	35.4	11.4	13.1	3.62
98	36.2	12.0	14.0	3.23
99	36.9	11.4	14.1	2.38
100	37.7	12.0	15.5	2.02
101	38.4	11.4	14.8	1.94
102	39.2	12.0	16.2	1.70

103	40.0	11.4	15.5	1.63
104	40.7	12.0	16.2	1.65
105	41.5	11.4	15.5	1.78
106	42.2	12.0	16.2	2.10
107	43.0	11.4	15.5	3.69
108	43.7	12.0	17.5	20.00
109	44.5	11.4	16.9	20.00
110	45.2	12.0	17.5	20.00
111	46.0	11.4	17.6	20.00
112	32.4	12.7	13.2	20.00
113	33.2	13.4	14.1	20.00
114	33.9	12.7	13.7	20.00
115	34.7	13.4	14.6	5.62
116	35.4	12.7	14.3	4.09
117	36.2	13.4	15.2	3.61
118	36.9	12.7	15.5	2.47
119	37.7	13.4	16.8	2.08
120	38.4	12.7	16.2	2.00
121	39.2	13.4	17.5	1.76
122	40.0	12.7	16.8	1.67
123	40.7	13.4	17.5	1.67
124	41.5	12.7	16.8	1.74
125	42.2	13.4	17.5	1.94
126	43.0	12.7	16.8	2.70
127	43.7	13.4	17.5	4.39
128	44.5	12.7	18.2	20.00
129	45.2	13.4	18.9	20.00
130	46.7	13.4	19.5	20.00
131	32.4	14.1	15.3	20.00
132	33.2	14.8	15.3	20.00
133	33.9	14.1	15.0	20.00
134	34.7	14.8	15.9	6.69
135	35.4	14.1	15.5	4.69
136	36.2	14.8	17.2	2.98
137	36.9	14.1	16.8	2.56
138	37.7	14.8	18.2	2.15
139	38.4	14.1	17.5	2.05
140	39.2	14.8	18.9	1.82
141	40.0	14.1	18.2	1.72
142	40.7	14.8	18.9	1.71
143	41.5	14.1	18.2	1.74
144	42.2	14.8	18.9	1.89
145	43.0	14.1	18.2	2.34
146	43.7	14.8	18.9	3.06
147	44.5	14.1	19.6	20.00
148	45.2	14.8	20.3	20.00

149	46.7	14.8	20.7	20.00
150	32.4	15.5	16.6	20.00
151	33.2	16.2	17.4	20.00
152	33.9	15.5	16.2	11.40
153	34.7	16.2	17.1	8.20
154	35.4	15.5	16.8	5.45
155	36.2	16.2	18.4	3.22
156	36.9	15.5	18.1	2.75
157	37.7	16.2	19.6	2.21
158	38.4	15.5	18.9	2.11
159	39.2	16.2	20.3	1.88
160	40.0	15.5	19.6	1.76
161	40.7	16.2	20.3	1.75
162	41.5	15.5	19.6	1.74
163	42.2	16.2	20.3	1.84
164	43.0	15.5	19.6	2.17
165	43.7	16.2	20.3	2.59
166	44.5	15.5	21.0	20.00
167	45.2	16.2	21.7	20.00
168	32.4	16.9	17.8	20.00
169	33.2	17.5	18.7	20.00
170	33.9	16.9	17.4	15.75
171	34.7	17.5	18.3	10.48
172	35.4	16.9	18.0	6.47
173	36.2	17.5	19.7	3.49
174	36.9	16.9	19.3	2.95
175	37.7	17.5	20.9	2.32
176	38.4	16.9	20.3	2.17
177	39.2	17.5	21.7	1.93
178	40.0	16.9	21.0	1.82
179	40.7	17.5	21.7	1.79
180	41.5	16.9	21.0	1.76
181	42.2	17.5	21.7	1.84
182	43.0	16.9	21.0	2.04
183	43.7	17.5	21.7	2.36
184	44.5	16.9	21.0	3.56
185	45.2	17.5	23.1	20.00
186	32.4	18.2	19.0	20.00
187	33.9	18.2	19.5	20.00
188	35.4	18.2	20.0	4.26
189	36.9	18.2	20.5	3.19
190	38.4	18.2	21.7	2.23
191	40.0	18.2	22.3	1.87
192	41.5	18.2	22.3	1.79
193	43.0	18.2	22.3	2.00
194	44.5	18.2	22.3	2.91

1.5.3 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.2
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	35.59 m
Ordinata vertice sinistro inferiore yi	4.0 m
Ascissa vertice destro superiore xs	50.61 m
Ordinata vertice destro superiore ys	17.75 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

==========

Coefficiente azione sismica orizzontale 0.032
Coefficiente azione sismica verticale 0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	32.74	0.04
3	39.55	-4.5
4	56.37	-3.99
5	57.0	-3.97

Vertici strato 1

N	X (m)	y (m)
1	0.0	-3.5
2	10.1	-3.5
3	20.62	-3.5
4	27.28	-3.5
5	38.05	-3.5
6	39.55	-4.5
7	56.37	-3.99
8	57.0	-3.97

Vertici strato 2

N	X (m)	y (m)
1	0.0	-10.1
2	1.09	-10.1
3	2.28	-10.1
4	40.64	-10.1
5	57.0	-10.1

Vertici strato 3

N	X (m)	y (m)
1	0.0	-13.1
2	15.77	-13.1
3	30.62	-13.1
4	33.48	-13.1
5	50.37	-13.1
6	57.0	-13.1

Coefficienti parziali azioni

==========

Sfavorevoli: Permanenti, variabili 1.0 1.0
Favorevoli: Permanenti, variabili 1.0 1.0

==========

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	No

==========

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0.11		20	1800	1900	2-C-1	
2	0.05		32	1900	2000	2-G-1	
3	0.05		32	1900	2000	2-G-2	
4	0.05		38.7	2000	2100	2-G-3	

Risultati analisi pendio

==========

Fs minimo individuato	1.47
Ascissa centro superficie	39.34 m
Ordinata centro superficie	6.06 m
Raggio superficie	10.18 m

==========

xc = 39.345 yc = 6.059 Rc = 10.178 Fs=1.475

Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.39	51.95	0.64	182.19
2	0.39	48.5	0.59	513.77
3	0.39	45.27	0.56	808.68
4	0.43	42.08	0.58	1182.24
5	0.36	39.17	0.46	1125.7
6	0.39	36.51	0.49	1266.4
7	0.39	33.81	0.47	1276.72
8	0.39	31.19	0.46	1268.47
9	0.39	28.65	0.45	1243.26
10	0.39	26.16	0.44	1202.33
11	0.39	23.73	0.43	1146.67
12	0.39	21.34	0.42	1077.17
13	0.39	19.0	0.41	997.09
14	0.39	16.68	0.41	906.8
15	0.39	14.39	0.4	803.76
16	0.39	12.12	0.4	688.37
17	0.39	9.88	0.4	560.98
18	0.39	7.65	0.4	421.86
19	0.39	5.43	0.39	262.56
20	0.39	3.22	0.39	90.34

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	81.43	275.3	0.0	0.0	276.1	451.68	0.0
2	91.53	309.45	81.43	275.3	352.45	439.79	0.0
3	50.55	170.89	91.53	309.45	490.26	446.66	0.0
4	-43.09	-145.69	50.55	170.89	723.41	506.34	0.0
5	-116.34	-393.31	-43.09	-145.69	764.3	442.77	0.0
6	-197.08	-666.27	-116.34	-393.31	912.62	490.48	0.0
7	-265.71	-898.3	-197.08	-666.27	982.99	495.08	0.0
8	-320.05	-1081.99	-265.71	-898.3	1032.77	496.91	0.0
9	-358.7	-1212.67	-320.05	-1081.99	1060.71	495.48	0.0
10	-380.94	-1287.87	-358.7	-1212.67	1066.24	490.45	0.0
11	-386.6	-1306.99	-380.94	-1287.87	1049.21	481.64	0.0
12	-375.99	-1271.12	-386.6	-1306.99	1009.96	469.01	0.0
13	-350.38	-1184.52	-375.99	-1271.12	951.46	452.93	0.0
14	-313.0	-1058.16	-350.38	-1184.52	874.68	424.31	0.0
15	-266.03	-899.36	-313.0	-1058.16	778.58	389.1	0.0
16	-212.09	-717.02	-266.03	-899.36	664.72	347.84	0.0
17	-154.34	-521.79	-212.09	-717.02	535.03	301.2	0.0
18	-96.47	-326.14	-154.34	-521.79	391.69	249.92	0.0
19	-43.39	-146.68	-96.47	-326.14	228.9	191.95	0.0
20	-0.46	-1.54	-43.39	-146.68	56.76	130.85	0.0

Numero di superfici esaminate....(152)

N°	Xo	Yo	Ro	Fs
1	35.6	4.0	6.0	16.67
2	36.3	4.7	6.7	2.57
3	37.1	4.0	6.7	2.03
4	37.8	4.7	8.1	1.68
5	38.6	4.0	7.4	2.03
6	39.3	4.7	8.8	1.53
7	40.1	4.0	8.8	16.67
8	40.8	4.7	9.5	16.67
9	41.6	4.0	8.8	16.67
10	42.3	4.7	10.2	16.67
11	43.1	4.0	9.5	16.67
12	43.8	4.7	10.2	34.66
13	44.6	4.0	10.2	27.70
14	35.6	5.4	7.4	16.67
15	36.3	6.1	8.1	2.56
16	37.1	5.4	8.1	1.99
17	37.8	6.1	9.5	1.69

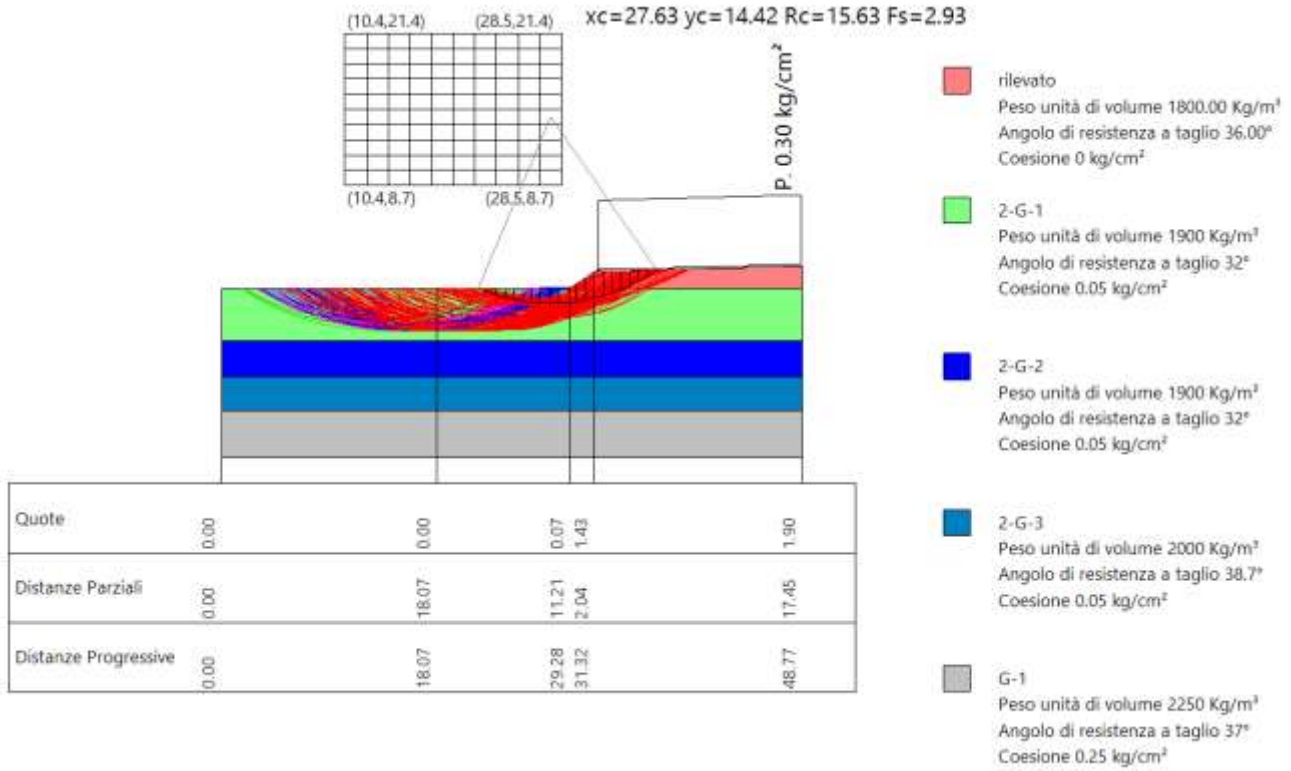
18	38.6	5.4	8.8	1.83
19	39.3	6.1	10.2	1.47
20	40.1	5.4	9.5	1.73
21	40.8	6.1	10.2	16.67
22	41.6	5.4	10.2	16.67
23	42.3	6.1	11.6	16.67
24	43.1	5.4	10.9	16.67
25	43.8	6.1	11.6	16.67
26	35.6	6.7	8.8	16.67
27	36.3	7.4	9.5	2.61
28	37.1	6.7	9.5	2.01
29	37.8	7.4	10.9	1.72
30	38.6	6.7	10.2	1.77
31	39.3	7.4	11.6	1.48
32	40.1	6.7	10.9	1.57
33	40.8	7.4	11.6	1.82
34	41.6	6.7	11.6	16.67
35	42.3	7.4	12.9	16.67
36	43.1	6.7	12.3	16.67
37	43.8	7.4	12.9	16.67
38	44.6	6.7	12.9	16.67
39	45.4	7.4	13.6	16.67
40	35.6	8.1	9.5	3.92
41	36.3	8.8	10.8	2.68
42	37.1	8.1	10.9	2.06
43	37.8	8.8	12.2	1.76
44	38.6	8.1	11.5	1.76
45	39.3	8.8	12.9	1.50
46	40.1	8.1	12.2	1.52
47	40.8	8.8	12.9	1.67
48	41.6	8.1	12.2	2.48
49	42.3	8.8	13.6	16.67
50	43.1	8.1	13.6	16.67
51	43.8	8.8	14.3	16.67
52	44.6	8.1	13.6	16.67
53	45.4	8.8	15.0	16.67
54	46.1	8.1	14.3	19.26
55	35.6	9.5	10.8	4.04
56	36.3	10.2	12.2	2.76
57	37.1	9.5	12.2	2.12
58	37.8	10.2	13.6	1.81
59	38.6	9.5	12.9	1.79
60	39.3	10.2	14.3	1.54
61	40.1	9.5	13.6	1.52
62	40.8	10.2	14.3	1.61
63	41.6	9.5	13.6	1.99

64	42.3	10.2	14.3	2.82
65	43.1	9.5	15.0	16.67
66	43.8	10.2	15.7	16.67
67	44.6	9.5	15.0	16.67
68	45.4	10.2	16.4	16.67
69	46.1	9.5	15.7	100.80
70	35.6	10.9	12.7	3.07
71	36.3	11.6	13.6	2.85
72	37.1	10.9	13.6	2.18
73	37.8	11.6	15.0	1.86
74	38.6	10.9	14.3	1.82
75	39.3	11.6	15.7	1.58
76	40.1	10.9	15.0	1.54
77	40.8	11.6	15.7	1.59
78	41.6	10.9	15.0	1.81
79	42.3	11.6	15.7	2.27
80	43.1	10.9	15.0	6.07
81	43.8	11.6	17.1	16.67
82	44.6	10.9	16.4	16.67
83	45.4	11.6	17.8	16.67
84	46.1	10.9	17.1	16.67
85	46.9	11.6	17.8	44.73
86	35.6	12.2	14.0	3.43
87	36.3	12.9	14.9	3.09
88	37.1	12.2	15.0	2.25
89	37.8	12.9	16.4	1.91
90	38.6	12.2	15.7	1.86
91	39.3	12.9	17.1	1.62
92	40.1	12.2	16.4	1.57
93	40.8	12.9	17.1	1.60
94	41.6	12.2	16.4	1.71
95	42.3	12.9	17.1	2.01
96	43.1	12.2	16.4	3.19
97	43.8	12.9	18.4	16.67
98	44.6	12.2	17.8	16.67
99	45.4	12.9	18.4	16.67
100	46.1	12.2	18.5	16.67
101	35.6	13.6	15.2	3.87
102	36.3	14.3	16.8	2.58
103	37.1	13.6	16.4	2.32
104	37.8	14.3	17.7	1.96
105	38.6	13.6	17.0	1.90
106	39.3	14.3	18.4	1.67
107	40.1	13.6	17.7	1.60
108	40.8	14.3	18.4	1.61
109	41.6	13.6	17.7	1.68

110	42.3	14.3	18.4	1.87
111	43.1	13.6	17.7	2.51
112	43.8	14.3	18.4	3.73
113	44.6	13.6	19.1	16.67
114	45.4	14.3	19.8	16.67
115	46.1	13.6	19.8	16.67
116	35.6	15.0	16.4	4.41
117	36.3	15.7	18.0	2.77
118	37.1	15.0	17.7	2.42
119	37.8	15.7	19.1	2.01
120	38.6	15.0	18.4	1.95
121	39.3	15.7	19.8	1.72
122	40.1	15.0	19.1	1.64
123	40.8	15.7	19.8	1.64
124	41.6	15.0	19.1	1.67
125	42.3	15.7	19.8	1.82
126	43.1	15.0	19.1	2.22
127	43.8	15.7	19.8	2.83
128	44.6	15.0	20.5	16.67
129	45.4	15.7	21.2	16.67
130	35.6	16.4	17.6	5.12
131	36.3	17.1	19.3	2.98
132	37.1	16.4	18.9	2.58
133	37.8	17.1	20.5	2.07
134	38.6	16.4	19.8	1.99
135	39.3	17.1	21.2	1.77
136	40.1	16.4	20.5	1.68
137	40.8	17.1	21.2	1.67
138	41.6	16.4	20.5	1.68
139	42.3	17.1	21.2	1.77
140	43.1	16.4	20.5	2.08
141	43.8	17.1	21.2	2.45
142	44.6	16.4	20.5	4.56
143	45.4	17.1	22.6	16.67
144	46.1	16.4	22.4	16.67
145	35.6	17.7	19.6	3.55
146	37.1	17.7	20.1	2.77
147	38.6	17.7	21.2	2.04
148	40.1	17.7	21.9	1.72
149	41.6	17.7	21.9	1.69
150	43.1	17.7	21.9	2.00
151	44.6	17.7	21.9	3.25
152	46.1	17.7	23.6	16.67

1.6 SEZIONE 49

1.6.1 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	5.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	10.36 m
Ordinata vertice sinistro inferiore yi	8.68 m
Ascissa vertice destro superiore xs	28.54 m
Ordinata vertice destro superiore ys	21.42 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	18.07	0.0
3	29.28	0.07
4	31.32	1.43
5	48.77	1.9

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	29.29	0.0
3	34.84	0.0
4	48.77	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-4.4
2	13.74	-4.4
3	24.78	-4.4
4	48.77	-4.4

Vertici strato 3

N	X (m)	y (m)
1	0.0	-7.4
2	8.73	-7.4
3	26.05	-7.4
4	48.77	-7.4

Vertici strato 4

N	X (m)	y (m)
1	0.0	-10.2
2	12.94	-10.2
3	35.84	-10.2
4	48.77	-10.2

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	1800.00	2100.00	rilevato	
2	0.05		32	1900	2000	2-G-1	
3	0.05		32	1900	2000	2-G-2	
4	0.05		38.7	2000	2100	2-G-3	
5	0.25		37	2250	2350	G-1	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	31.65	1.6	48.65	2.061533	0.3

Risultati analisi pendio

Fs minimo individuato	2.93
Ascissa centro superficie	27.63 m
Ordinata centro superficie	14.42 m
Raggio superficie	15.63 m

xc = 27.634 yc = 14.416 Rc = 15.633 Fs=2.929
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.75	-21.48	0.81	219.78
2	0.75	-18.55	0.79	615.13
3	0.75	-15.67	0.78	950.2
4	0.75	-12.83	0.77	1227.74
5	0.75	-10.03	0.76	1449.88
6	0.75	-7.24	0.76	1618.24
7	0.75	-4.48	0.75	1734.01
8	0.75	-1.73	0.75	1797.96
9	0.75	1.03	0.75	1810.5
10	0.99	4.22	0.99	2318.41
11	0.51	6.98	0.52	1291.98
12	0.75	9.32	0.76	2330.34
13	0.78	12.17	0.79	2911.59
14	0.72	15.0	0.75	3982.68
15	0.75	17.81	0.79	4884.58
16	0.75	20.73	0.8	4538.34
17	0.75	23.7	0.82	4136.86
18	0.75	26.74	0.84	3687.47
19	0.75	29.87	0.87	3169.69
20	0.75	33.09	0.9	2277.28

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**41.14**	**284.63**	**0.0**	**0.0**	**62.02**	**120.69**	**0.0**
2	**111.86**	**773.85**	**41.14**	**284.63**	**360.5**	**169.61**	**0.0**
3	**199.76**	**1381.92**	**111.86**	**773.85**	**666.0**	**220.09**	**0.0**
4	**295.28**	**2042.68**	**199.76**	**1381.92**	**957.18**	**268.46**	**0.0**
5	**391.09**	**2705.47**	**295.28**	**2042.68**	**1217.99**	**311.94**	**0.0**
6	**481.67**	**3332.07**	**391.09**	**2705.47**	**1436.45**	**348.46**	**0.0**
7	**563.0**	**3894.76**	**481.67**	**3332.07**	**1603.68**	**376.5**	**0.0**
8	**632.39**	**4374.74**	**563.0**	**3894.76**	**1713.34**	**394.95**	**0.0**
9	**688.25**	**4761.21**	**632.39**	**4374.74**	**1761.27**	**403.1**	**0.0**
10	**735.71**	**5089.51**	**688.25**	**4761.21**	**2288.95**	**525.96**	**0.0**
11	**759.43**	**5253.62**	**735.71**	**5089.51**	**1278.8**	**288.81**	**0.0**
12	**776.41**	**5371.07**	**759.43**	**5253.62**	**2301.86**	**496.72**	**0.0**
13	**773.14**	**5348.47**	**776.41**	**5371.07**	**2844.62**	**594.08**	**0.0**
14	**735.32**	**5086.81**	**773.14**	**5348.47**	**3815.87**	**753.6**	**0.0**
15	**651.7**	**4508.37**	**735.32**	**5086.81**	**4553.05**	**884.75**	**0.0**
16	**542.67**	**3754.11**	**651.7**	**4508.37**	**4079.62**	**805.88**	**0.0**
17	**414.48**	**2867.32**	**542.67**	**3754.11**	**3548.95**	**704.31**	**0.0**
18	**272.21**	**1883.13**	**414.48**	**2867.32**	**2977.34**	**590.87**	**0.0**
19	**124.84**	**863.65**	**272.21**	**1883.13**	**2368.9**	**470.12**	**0.0**
20	**-0.02**	**-0.16**	**124.84**	**863.65**	**1540.9**	**305.8**	**0.0**

Numero di superfici esaminate....(221)

N°	Xo	Yo	Ro	Fs
1	10.4	8.7	11.7	20.00
2	11.3	9.3	12.3	20.00
3	12.2	8.7	11.7	20.00
4	13.1	9.3	12.3	20.00
5	14.0	8.7	11.7	20.00
6	14.9	9.3	12.8	545.74
7	15.8	8.7	12.2	436.44
8	16.7	9.3	12.3	20.00
9	17.6	8.7	12.2	290.07
10	18.5	9.3	12.3	20.00
11	19.5	8.7	11.7	211.55
12	20.4	9.3	12.3	186.46
13	21.3	8.7	12.2	70.18
14	22.2	9.3	12.3	29.15
15	23.1	8.7	12.2	8.93
16	24.0	9.3	12.8	5.94
17	24.9	8.7	11.6	5.05
18	25.8	9.3	11.7	4.00
19	26.7	8.7	11.1	3.52
20	27.6	9.3	11.7	3.25
21	28.5	8.7	11.1	3.08
22	10.4	10.0	13.0	20.00
23	11.3	10.6	13.1	20.00
24	12.2	10.0	12.5	20.00
25	13.1	10.6	13.1	20.00
26	14.0	10.0	12.5	20.00
27	14.9	10.6	13.1	20.00
28	15.8	10.0	13.0	432.76
29	16.7	10.6	14.1	329.21
30	17.6	10.0	13.4	281.46
31	18.5	10.6	13.1	20.00
32	19.5	10.0	12.9	209.09
33	20.4	10.6	14.1	99.54
34	21.3	10.0	12.9	104.13
35	22.2	10.6	14.1	9.98
36	23.1	10.0	13.4	7.41
37	24.0	10.6	13.5	5.63
38	24.9	10.0	12.9	4.73
39	25.8	10.6	12.5	3.76
40	26.7	10.0	12.4	3.51
41	27.6	10.6	12.5	3.04
42	28.5	10.0	12.3	3.16

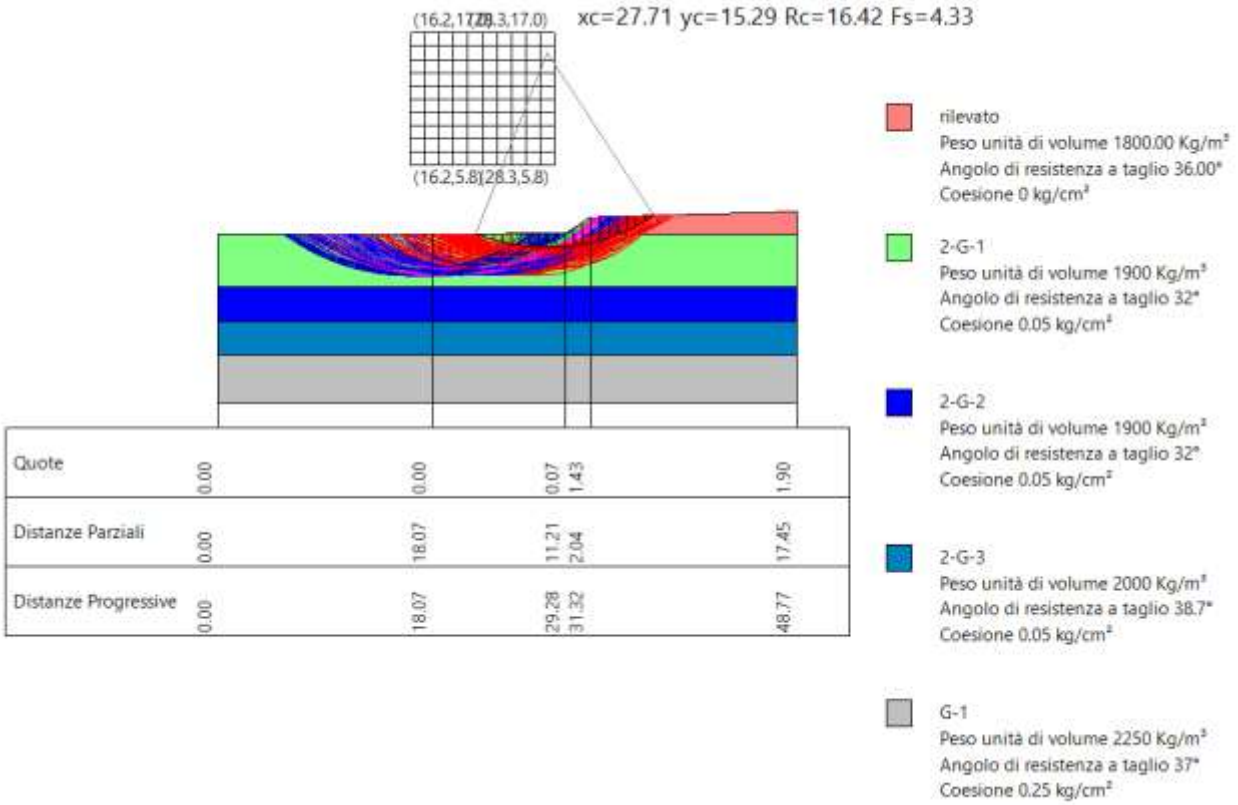
43	10.4	11.2	13.8	20.00
44	11.3	11.9	14.4	20.00
45	12.2	11.2	13.8	20.00
46	13.1	11.9	14.4	20.00
47	14.0	11.2	13.7	20.00
48	14.9	11.9	14.9	515.61
49	15.8	11.2	14.2	411.60
50	16.7	11.9	15.4	318.83
51	17.6	11.2	14.2	276.64
52	18.5	11.9	14.9	235.24
53	19.5	11.2	13.7	204.92
54	20.4	11.9	14.3	181.38
55	21.3	11.2	14.2	39.76
56	22.2	11.9	15.3	8.35
57	23.1	11.2	14.7	6.59
58	24.0	11.9	14.8	5.27
59	24.9	11.2	13.7	4.48
60	25.8	11.9	13.8	3.68
61	26.7	11.2	13.1	3.29
62	27.6	11.9	13.7	3.10
63	28.5	11.2	13.0	2.94
64	10.4	12.5	14.9	20.00
65	11.3	13.1	15.7	20.00
66	12.2	12.5	15.0	20.00
67	13.1	13.1	15.2	20.00
68	14.0	12.5	15.0	20.00
69	14.9	13.1	16.6	452.45
70	15.8	12.5	15.5	20.00
71	16.7	13.1	16.1	318.19
72	17.6	12.5	15.5	271.30
73	18.5	13.1	16.1	232.62
74	19.5	12.5	16.0	152.87
75	20.4	13.1	16.6	20.31
76	21.3	12.5	16.0	11.83
77	22.2	13.1	16.6	7.42
78	23.1	12.5	15.5	6.38
79	24.0	13.1	16.1	5.06
80	24.9	12.5	14.4	4.30
81	25.8	13.1	15.0	3.64
82	26.7	12.5	14.4	3.32
83	27.6	13.1	15.0	3.17
84	28.5	12.5	14.2	2.99
85	10.4	13.8	15.9	20.00
86	11.3	14.4	16.4	20.00
87	12.2	13.8	16.3	20.00
88	13.1	14.4	17.4	813.13

89	14.0	13.8	17.3	20.00
90	14.9	14.4	16.4	20.00
91	15.8	13.8	17.3	363.39
92	16.7	14.4	16.4	20.00
93	17.6	13.8	17.3	264.22
94	18.5	14.4	17.4	230.46
95	19.5	13.8	16.2	203.41
96	20.4	14.4	17.9	14.10
97	21.3	13.8	17.3	9.54
98	22.2	14.4	17.4	7.36
99	23.1	13.8	17.3	5.83
100	24.0	14.4	16.8	4.88
101	24.9	13.8	15.7	4.16
102	25.8	14.4	15.8	3.46
103	26.7	13.8	15.1	3.12
104	27.6	14.4	15.6	2.93
105	28.5	13.8	15.4	3.03
106	10.4	15.1	17.0	20.00
107	11.3	15.7	17.5	20.00
108	12.2	15.1	17.1	20.00
109	13.1	15.7	17.7	20.00
110	14.0	15.1	17.1	20.00
111	14.9	15.7	19.2	416.86
112	15.8	15.1	18.1	368.40
113	16.7	15.7	19.2	297.01
114	17.6	15.1	18.0	263.06
115	18.5	15.7	18.7	228.62
116	19.5	15.1	18.5	27.01
117	20.4	15.7	18.7	16.16
118	21.3	15.1	18.5	8.45
119	22.2	15.7	19.2	6.49
120	23.1	15.1	18.5	5.65
121	24.0	15.7	18.1	4.75
122	24.9	15.1	16.4	4.02
123	25.8	15.7	17.0	3.46
124	26.7	15.1	16.4	3.17
125	27.6	15.7	16.8	2.95
126	28.5	15.1	16.6	3.08
127	10.4	16.3	18.2	20.00
128	11.3	17.0	18.6	20.00
129	12.2	16.3	19.3	1014.77
130	13.1	17.0	20.5	618.28
131	14.0	16.3	18.3	20.00
132	14.9	17.0	20.0	20.00
133	15.8	16.3	19.8	343.45
134	16.7	17.0	20.0	299.27

135	17.6	16.3	19.8	256.81
136	18.5	17.0	20.5	40.80
137	19.5	16.3	19.8	17.38
138	20.4	17.0	20.5	9.72
139	21.3	16.3	19.3	8.61
140	22.2	17.0	20.4	6.24
141	23.1	16.3	19.3	5.46
142	24.0	17.0	18.9	4.62
143	24.9	16.3	17.7	3.94
144	25.8	17.0	18.3	3.48
145	26.7	16.3	17.6	3.20
146	27.6	17.0	18.0	2.97
147	28.5	16.3	17.8	3.12
148	10.4	17.6	19.3	20.00
149	11.3	18.2	20.2	20.00
150	12.2	17.6	19.5	20.00
151	13.1	18.2	19.8	20.00
152	14.0	17.6	19.6	20.00
153	14.9	18.2	21.7	391.63
154	15.8	17.6	21.1	335.56
155	16.7	18.2	21.7	287.18
156	17.6	17.6	20.6	257.03
157	18.5	18.2	21.7	23.31
158	19.5	17.6	20.6	22.77
159	20.4	18.2	21.2	10.31
160	21.3	17.6	21.1	7.25
161	22.2	18.2	21.2	6.12
162	23.1	17.6	20.6	5.35
163	24.0	18.2	20.1	4.53
164	24.9	17.6	19.0	3.89
165	25.8	18.2	19.6	3.51
166	26.7	17.6	18.8	3.21
167	27.6	18.2	19.1	2.99
168	28.5	17.6	19.0	3.17
169	10.4	18.9	20.5	20.00
170	11.3	19.5	21.0	20.00
171	12.2	18.9	20.7	20.00
172	13.1	19.5	21.0	20.00
173	14.0	18.9	21.9	505.44
174	14.9	19.5	22.0	20.00
175	15.8	18.9	20.9	20.00
176	16.7	19.5	22.5	290.49
177	17.6	18.9	22.4	73.59
178	18.5	19.5	22.5	36.40
179	19.5	18.9	22.4	11.44
180	20.4	19.5	22.5	9.18

181	21.3	18.9	22.4	6.94
182	22.2	19.5	22.5	5.93
183	23.1	18.9	21.3	5.22
184	24.0	19.5	20.9	4.44
185	24.9	18.9	19.7	3.73
186	25.8	19.5	20.8	3.51
187	26.7	18.9	20.0	3.21
188	27.6	19.5	20.3	3.02
189	28.5	18.9	20.1	3.21
190	10.4	20.2	21.6	20.00
191	11.3	20.8	22.1	20.00
192	12.2	20.2	22.3	20.00
193	13.1	20.8	23.6	630.85
194	14.0	20.2	21.7	20.00
195	14.9	20.8	23.8	394.54
196	15.8	20.2	23.6	322.66
197	16.7	20.8	24.3	152.38
198	17.6	20.2	23.6	33.19
199	18.5	20.8	24.3	14.02
200	19.5	20.2	23.1	12.92
201	20.4	20.8	24.3	7.77
202	21.3	20.2	23.1	6.91
203	22.2	20.8	23.8	5.81
204	23.1	20.2	22.6	5.13
205	24.0	20.8	22.2	4.36
206	24.9	20.2	21.0	3.70
207	25.8	20.8	22.0	3.50
208	26.7	20.2	21.1	3.22
209	27.6	20.8	21.5	3.04
210	28.5	20.2	21.3	3.25
211	10.4	21.4	22.8	20.00
212	12.2	21.4	23.0	20.00
213	14.0	21.4	22.9	20.00
214	15.8	21.4	24.4	330.14
215	17.6	21.4	24.4	87.56
216	19.5	21.4	24.9	9.40
217	21.3	21.4	24.9	6.53
218	23.1	21.4	23.3	5.03
219	24.9	21.4	22.3	3.68
220	26.7	21.4	22.3	3.23
221	28.5	21.4	22.5	3.29

1.6.2 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	5.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.2
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	16.21 m
Ordinata vertice sinistro inferiore yi	5.78 m
Ascissa vertice destro superiore xs	28.31 m
Ordinata vertice destro superiore ys	16.97 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

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Coefficiente azione sismica orizzontale 0.032
Coefficiente azione sismica verticale 0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	18.07	0.0
3	29.28	0.07
4	31.32	1.43
5	48.77	1.9

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	29.29	0.0
3	34.84	0.0
4	48.77	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-4.4
2	13.74	-4.4
3	24.78	-4.4
4	48.77	-4.4

Vertici strato 3

N	X (m)	y (m)
1	0.0	-7.4
2	8.73	-7.4
3	26.05	-7.4
4	48.77	-7.4

Vertici strato 4

N	X (m)	y (m)
1	0.0	-10.2
2	12.94	-10.2
3	35.84	-10.2
4	48.77	-10.2

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	No

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	1800.00	2100.00	rilevato	
2	0.05		32	1900	2000	2-G-1	
3	0.05		32	1900	2000	2-G-2	
4	0.05		38.7	2000	2100	2-G-3	
5	0.25		37	2250	2350	G-1	

Risultati analisi pendio

Fs minimo individuato	4.33
Ascissa centro superficie	27.71 m
Ordinata centro superficie	15.29 m
Raggio superficie	16.42 m

xc = 27.707 yc = 15.292 Rc = 16.416 Fs=4.328
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.75	-20.13	0.8	205.71
2	0.75	-17.36	0.79	576.14
3	0.75	-14.63	0.78	889.94
4	0.75	-11.93	0.77	1149.39
5	0.75	-9.26	0.76	1356.26
6	0.75	-6.61	0.76	1511.93
7	0.75	-3.97	0.75	1617.37
8	0.75	-1.34	0.75	1673.22
9	0.75	1.28	0.75	1679.81
10	0.83	4.04	0.83	1795.78
11	0.68	6.68	0.68	1659.13
12	0.75	9.2	0.76	2344.32
13	0.61	11.62	0.62	2257.45
14	0.89	14.31	0.92	3356.15
15	0.75	17.3	0.79	2522.6
16	0.75	20.07	0.8	2187.12
17	0.75	22.89	0.82	1804.85
18	0.75	25.77	0.83	1372.5
19	0.75	28.73	0.86	876.23
20	0.75	31.77	0.88	310.75

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**24.61**	**198.31**	**0.0**	**0.0**	**107.14**	**89.99**	**0.0**
2	**67.66**	**545.09**	**24.61**	**198.31**	**419.67**	**126.34**	**0.0**
3	**120.8**	**973.28**	**67.66**	**545.09**	**722.53**	**161.75**	**0.0**
4	**177.58**	**1430.71**	**120.8**	**973.28**	**1000.07**	**194.32**	**0.0**
5	**233.01**	**1877.33**	**177.58**	**1430.71**	**1240.44**	**222.6**	**0.0**
6	**283.4**	**2283.28**	**233.01**	**1877.33**	**1434.73**	**245.51**	**0.0**
7	**326.11**	**2627.43**	**283.4**	**2283.28**	**1576.45**	**262.25**	**0.0**
8	**359.5**	**2896.38**	**326.11**	**2627.43**	**1661.12**	**272.28**	**0.0**
9	**382.76**	**3083.79**	**359.5**	**2896.38**	**1686.0**	**275.27**	**0.0**
10	**395.81**	**3188.93**	**382.76**	**3083.79**	**1810.31**	**297.59**	**0.0**
11	**398.87**	**3213.57**	**395.81**	**3188.93**	**1667.89**	**266.34**	**0.0**
12	**386.59**	**3114.7**	**398.87**	**3213.57**	**2335.52**	**354.35**	**0.0**
13	**363.33**	**2927.26**	**386.59**	**3114.7**	**2217.1**	**326.78**	**0.0**
14	**304.88**	**2456.32**	**363.33**	**2927.26**	**3217.67**	**475.92**	**0.0**
15	**247.09**	**1990.77**	**304.88**	**2456.32**	**2339.83**	**357.36**	**0.0**
16	**185.24**	**1492.41**	**247.09**	**1990.77**	**1950.28**	**311.73**	**0.0**
17	**119.57**	**963.37**	**185.24**	**1492.41**	**1521.59**	**212.87**	**0.0**
18	**60.87**	**490.4**	**119.57**	**963.37**	**1083.89**	**151.64**	**0.0**
19	**17.54**	**141.3**	**60.87**	**490.4**	**637.43**	**89.18**	**0.0**
20	**-0.02**	**-0.16**	**17.54**	**141.3**	**203.65**	**28.49**	**0.0**

Numero di superfici esaminate....(202)

N°	Xo	Yo	Ro	Fs
1	16.8	6.3	9.8	25.03
2	19.2	6.3	9.8	24.07
3	20.4	6.3	9.8	23.64
4	21.7	6.3	9.8	23.27
5	22.9	6.3	9.8	14.63
6	23.5	5.8	9.3	12.43
7	24.1	6.3	9.8	9.18
8	24.7	5.8	9.3	8.45
9	25.3	6.3	9.8	7.21
10	27.1	5.8	9.2	5.92
11	16.8	7.5	11.0	24.13
12	21.0	6.9	10.4	23.04
13	22.3	6.9	10.4	17.63
14	22.9	7.5	10.9	11.66
15	23.5	6.9	10.4	10.29
16	24.1	7.5	10.9	8.39
17	24.7	6.9	10.4	7.69
18	25.3	7.5	10.4	6.70
19	25.9	6.9	9.8	6.21
20	26.5	7.5	10.4	5.70
21	27.1	6.9	9.8	5.43
22	27.7	7.5	10.4	5.20
23	28.3	6.9	9.8	5.07
24	16.2	8.0	11.0	23.92
25	16.8	8.6	11.6	23.39
26	17.4	8.0	11.0	23.46
27	18.0	8.6	11.6	22.94
28	18.6	8.0	11.0	23.00
29	19.2	8.6	11.6	22.51
30	19.8	8.0	11.0	22.57
31	20.4	8.6	11.5	22.12
32	21.0	8.0	11.0	22.19
33	21.7	8.6	11.5	21.42
34	22.3	8.0	11.0	18.17
35	22.9	8.6	11.5	11.47
36	23.5	8.0	11.5	9.14
37	24.1	8.6	11.5	7.98
38	24.7	8.0	11.0	7.24
39	25.3	8.6	11.0	6.36
40	25.9	8.0	11.0	6.05
41	26.5	8.6	11.0	5.35
42	27.1	8.0	11.0	5.40

43	27.7	8.6	11.0	4.84
44	28.3	8.0	10.9	5.07
45	16.2	9.1	12.1	23.33
46	16.8	9.7	12.7	22.88
47	17.4	9.1	12.1	22.90
48	18.0	9.7	12.7	22.46
49	18.6	9.1	12.1	22.48
50	19.2	9.7	12.7	22.06
51	19.8	9.1	12.1	22.08
52	20.4	9.7	12.7	21.69
53	21.0	9.1	12.1	21.72
54	21.7	9.7	13.2	12.81
55	22.3	9.1	12.1	13.57
56	22.9	9.7	12.7	9.98
57	23.5	9.1	12.1	8.84
58	24.1	9.7	12.6	7.48
59	24.7	9.1	12.1	6.92
60	25.3	9.7	12.1	6.13
61	25.9	9.1	11.6	5.71
62	26.5	9.7	12.1	5.32
63	27.1	9.1	11.5	5.06
64	27.7	9.7	12.1	4.89
65	28.3	9.1	11.5	4.74
66	16.2	10.3	13.3	22.86
67	16.8	10.8	13.8	22.46
68	17.4	10.3	13.2	22.46
69	18.0	10.8	14.3	22.07
70	18.6	10.3	13.2	22.06
71	19.2	10.8	13.8	21.70
72	19.8	10.3	13.2	21.69
73	20.4	10.8	14.3	18.04
74	21.0	10.3	13.7	15.06
75	21.7	10.8	14.3	11.36
76	22.3	10.3	13.7	10.04
77	22.9	10.8	14.3	8.68
78	23.5	10.3	13.2	8.22
79	24.1	10.8	13.8	7.19
80	24.7	10.3	12.7	6.67
81	25.3	10.8	12.7	5.96
82	25.9	10.3	12.7	5.63
83	26.5	10.8	12.7	5.02
84	27.1	10.3	12.7	5.07
85	27.7	10.8	12.7	4.57
86	28.3	10.3	12.7	4.79
87	16.2	11.4	14.4	22.47
88	16.8	11.9	14.9	22.11

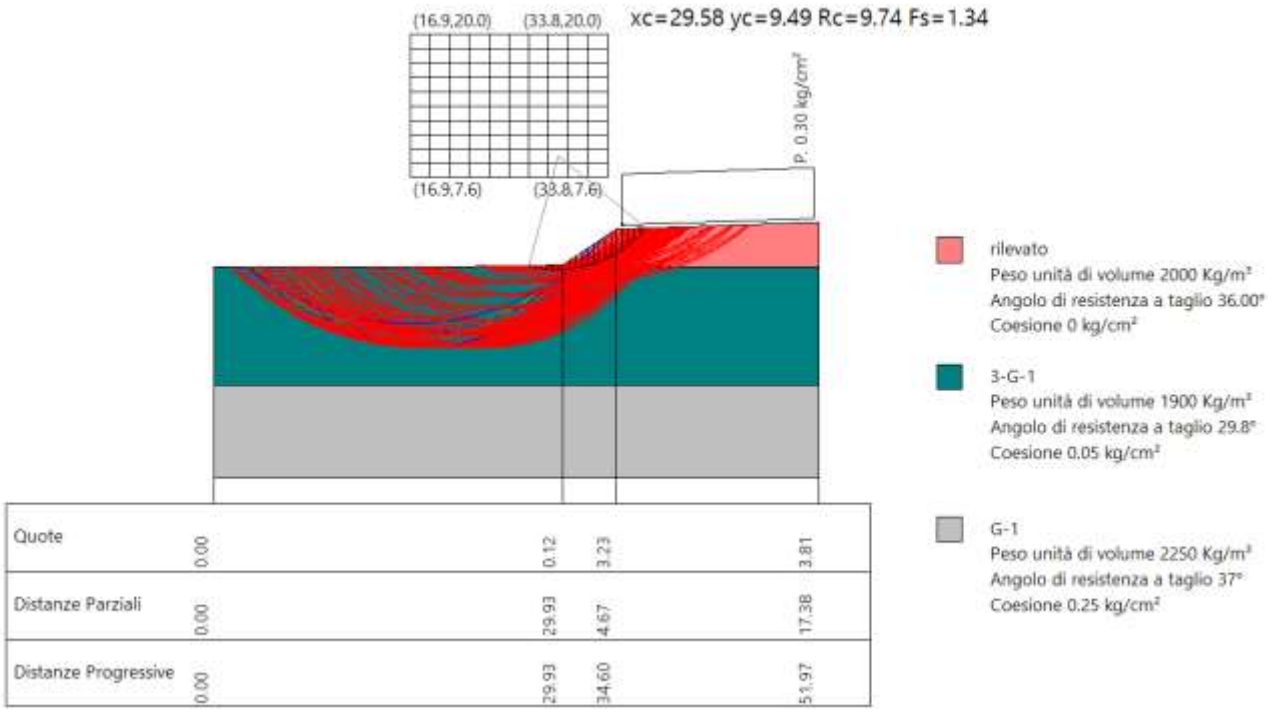
89	17.4	11.4	14.4	22.09
90	18.0	11.9	14.9	21.75
91	18.6	11.4	14.4	21.72
92	19.2	11.9	14.9	21.40
93	19.8	11.4	14.4	21.37
94	20.4	11.9	14.9	20.20
95	21.0	11.4	14.9	12.78
96	21.7	11.9	15.4	10.23
97	22.3	11.4	14.9	9.43
98	22.9	11.9	15.4	8.22
99	23.5	11.4	14.9	7.69
100	24.1	11.9	14.9	6.98
101	24.7	11.4	13.8	6.47
102	25.3	11.9	13.8	5.79
103	25.9	11.4	13.3	5.35
104	26.5	11.9	13.8	5.02
105	27.1	11.4	13.2	4.77
106	27.7	11.9	13.8	4.63
107	28.3	11.4	13.2	4.47
108	16.2	12.5	16.0	22.05
109	16.8	13.1	16.5	21.73
110	17.4	12.5	15.5	21.79
111	18.0	13.1	16.5	21.41
112	18.6	12.5	15.5	21.43
113	19.2	13.1	16.0	21.14
114	19.8	12.5	15.5	21.10
115	20.4	13.1	16.5	12.90
116	21.0	12.5	15.5	13.33
117	21.7	13.1	16.0	10.56
118	22.3	12.5	16.0	8.93
119	22.9	13.1	16.5	7.96
120	23.5	12.5	16.0	7.47
121	24.1	13.1	15.5	6.83
122	24.7	12.5	14.9	6.33
123	25.3	13.1	14.9	5.71
124	25.9	12.5	14.4	5.33
125	26.5	13.1	14.9	5.04
126	27.1	12.5	14.4	4.81
127	27.7	13.1	14.9	4.67
128	28.3	12.5	14.2	4.49
129	16.2	13.6	17.1	21.74
130	16.8	14.2	17.2	21.58
131	17.4	13.6	17.1	21.43
132	18.0	14.2	17.7	21.16
133	18.6	13.6	16.6	21.19
134	19.2	14.2	17.2	20.93

135	19.8	13.6	17.1	14.52
136	20.4	14.2	17.7	11.72
137	21.0	13.6	17.1	10.53
138	21.7	14.2	17.1	9.77
139	22.3	13.6	16.6	8.88
140	22.9	14.2	17.7	7.75
141	23.5	13.6	16.6	7.29
142	24.1	14.2	16.6	6.68
143	24.7	13.6	15.5	6.18
144	25.3	14.2	15.5	5.62
145	25.9	13.6	15.0	5.15
146	26.5	14.2	15.5	4.80
147	27.1	13.6	15.0	4.52
148	27.7	14.2	15.9	4.69
149	28.3	13.6	15.3	4.51
150	16.2	14.7	18.2	21.48
151	16.8	15.3	18.8	21.22
152	17.4	14.7	17.7	21.30
153	18.0	15.3	18.3	21.05
154	18.6	14.7	18.2	20.33
155	19.2	15.3	18.8	14.67
156	19.8	14.7	17.7	16.68
157	20.4	15.3	18.3	12.44
158	21.0	14.7	18.2	9.93
159	21.7	15.3	18.8	8.80
160	22.3	14.7	18.2	8.24
161	22.9	15.3	18.8	7.59
162	23.5	14.7	17.7	7.14
163	24.1	15.3	17.7	6.58
164	24.7	14.7	16.6	6.08
165	25.3	15.3	16.7	5.55
166	25.9	14.7	16.1	5.13
167	26.5	15.3	16.6	4.80
168	27.1	14.7	16.1	4.57
169	27.7	15.3	16.4	4.33
170	28.3	14.7	16.3	4.54
171	16.2	15.9	18.8	21.42
172	16.8	16.4	19.9	21.02
173	17.4	15.9	19.3	20.97
174	18.0	16.4	19.9	20.41
175	18.6	15.9	18.8	20.80
176	19.2	16.4	19.4	17.13
177	19.8	15.9	19.3	12.03
178	20.4	16.4	19.9	10.25
179	21.0	15.9	18.8	10.18
180	21.7	16.4	19.4	8.87

181	22.3	15.9	19.3	8.04
182	22.9	16.4	19.4	7.46
183	23.5	15.9	18.8	7.04
184	24.1	16.4	18.3	6.48
185	24.7	15.9	17.8	6.01
186	25.3	16.4	17.8	5.50
187	25.9	15.9	17.2	5.10
188	26.5	16.4	17.8	4.84
189	27.1	15.9	17.1	4.57
190	27.7	16.4	17.4	4.34
191	28.3	15.9	17.4	4.57
192	16.2	17.0	20.0	21.24
193	17.4	17.0	20.5	20.79
194	18.6	17.0	20.5	14.96
195	19.8	17.0	19.9	12.92
196	21.0	17.0	20.5	9.12
197	22.3	17.0	19.9	7.97
198	23.5	17.0	19.4	6.93
199	24.7	17.0	18.3	5.95
200	25.9	17.0	18.3	5.10
201	27.1	17.0	18.1	4.57
202	28.3	17.0	18.4	4.59

1.7 SEZIONE 64

1.7.1 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	3.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata
Superficie di forma circolare	

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	16.85 m
Ordinata vertice sinistro inferiore yi	7.63 m
Ascissa vertice destro superiore xs	33.82 m
Ordinata vertice destro superiore ys	20.0 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	21.35	0.0
3	29.93	0.12
4	34.6	3.23
5	51.97	3.81

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	25.55	0.0
3	36.42	0.0
4	49.76	0.0
5	51.97	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-10.2
2	11.52	-10.2
3	27.34	-10.2
4	45.78	-10.2
5	51.97	-10.2

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	2000	2100.00	rilevato	
2	0.05		29.8	1900	2000	3-G-1	
3	0.25		37	2250	2350	G-1	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	35.08	3.58	51.58	4.127381	0.3

Risultati analisi pendio

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Fs minimo individuato 1.34
Ascissa centro superficie 29.58 m
Ordinata centro superficie 9.49 m
Raggio superficie 9.74 m

==========

xc = 29.579 yc = 9.487 Rc = 9.737 Fs=1.341

Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.5	-13.46	0.52	67.58
2	0.5	-10.44	0.51	177.15
3	0.5	-7.44	0.51	259.79
4	0.5	-4.47	0.5	317.0
5	0.5	-1.51	0.5	349.21
6	0.35	1.02	0.35	252.14
7	0.65	3.98	0.65	720.08
8	0.5	7.39	0.51	887.97
9	0.5	10.38	0.51	1149.7
10	0.5	13.41	0.52	1384.62
11	0.5	16.47	0.52	1586.65
12	0.5	19.58	0.53	1759.07
13	0.5	22.75	0.54	1900.33
14	0.5	26.0	0.56	2008.29
15	0.5	29.34	0.57	2074.5
16	0.5	32.79	0.6	2024.24
17	0.5	36.39	0.62	3128.23
18	0.5	40.17	0.66	2746.72
19	0.5	44.16	0.7	2306.55
20	0.5	48.46	0.76	1495.39

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**26.79**	**70.83**	**0.0**	**0.0**	**23.18**	**10.04**	**0.0**
2	**153.92**	**406.92**	**26.79**	**70.83**	**-11.69**	**148.39**	**0.0**
3	**287.88**	**761.07**	**153.92**	**406.92**	**78.88**	**178.07**	**0.0**
4	**419.69**	**1109.52**	**287.88**	**761.07**	**157.49**	**204.11**	**0.0**
5	**543.32**	**1436.37**	**419.69**	**1109.52**	**216.91**	**224.0**	**0.0**

6	**642.45**	**1698.43**	**543.32**	**1436.37**	**157.64**	**159.68**	**0.0**
7	**784.75**	**2074.65**	**642.45**	**1698.43**	**602.49**	**400.16**	**0.0**
8	**918.35**	**2427.85**	**784.75**	**2074.65**	**793.52**	**422.15**	**0.0**
9	**1045.46**	**2763.88**	**918.35**	**2427.85**	**1066.41**	**516.6**	**0.0**
10	**1144.65**	**3026.09**	**1045.46**	**2763.88**	**1311.2**	**568.16**	**0.0**
11	**1221.45**	**3229.14**	**1144.65**	**3026.09**	**1505.47**	**652.34**	**0.0**
12	**1267.38**	**3350.56**	**1221.45**	**3229.14**	**1654.78**	**717.04**	**0.0**
13	**1275.89**	**3373.05**	**1267.38**	**3350.56**	**1753.3**	**759.73**	**0.0**
14	**1242.31**	**3284.29**	**1275.89**	**3373.05**	**1796.27**	**778.35**	**0.0**
15	**1164.14**	**3077.62**	**1242.31**	**3284.29**	**1775.32**	**769.27**	**0.0**
16	**1045.26**	**2763.34**	**1164.14**	**3077.62**	**1631.33**	**706.88**	**0.0**
17	**794.63**	**2100.75**	**1045.26**	**2763.34**	**2326.66**	**1008.18**	**0.0**
18	**514.06**	**1359.03**	**794.63**	**2100.75**	**1834.91**	**795.1**	**0.0**
19	**225.14**	**595.19**	**514.06**	**1359.03**	**1329.69**	**576.18**	**0.0**
20	**0.68**	**1.81**	**225.14**	**595.19**	**696.49**	**301.8**	**0.0**

Numero di superfici esaminate....(221)

N°	Xo	Yo	Ro	Fs
1	16.9	7.6	9.2	20.00
2	17.7	8.3	14.1	182.73
3	18.5	7.6	13.5	159.43
4	19.4	8.3	15.2	24.09
5	20.2	7.6	14.6	18.07
6	21.1	8.3	15.2	10.21
7	21.9	7.6	13.5	11.19
8	22.8	8.3	15.2	5.98
9	23.6	7.6	14.5	5.45
10	24.5	8.3	14.1	4.45
11	25.3	7.6	12.4	4.10
12	26.2	8.3	11.9	3.25
13	27.0	7.6	10.1	2.81
14	27.9	8.3	9.6	2.10
15	28.7	7.6	9.0	1.85
16	29.6	8.3	9.6	1.69
17	30.4	7.6	9.0	1.64
18	31.3	8.3	9.6	1.66
19	32.1	7.6	8.9	1.70
20	33.0	8.3	9.5	1.83
21	33.8	7.6	8.7	1.96
22	16.9	8.9	10.5	20.00
23	17.7	9.5	16.4	53.22
24	18.5	8.9	15.8	36.29

25	19.4	9.5	16.4	16.64
26	20.2	8.9	15.8	12.90
27	21.1	9.5	15.3	10.93
28	21.9	8.9	15.8	6.76
29	22.8	9.5	16.4	5.43
30	23.6	8.9	15.8	4.92
31	24.5	9.5	14.2	4.13
32	25.3	8.9	13.6	3.71
33	26.2	9.5	12.0	2.93
34	27.0	8.9	11.4	2.55
35	27.9	9.5	9.8	1.77
36	28.7	8.9	10.2	1.80
37	29.6	9.5	9.7	1.34
38	30.4	8.9	10.2	1.67
39	31.3	9.5	10.8	1.71
40	32.1	8.9	10.2	1.75
41	33.0	9.5	9.5	1.79
42	33.8	8.9	9.8	1.98
43	16.9	10.1	11.7	20.00
44	17.7	10.7	12.3	20.00
45	18.5	10.1	17.0	22.42
46	19.4	10.7	16.6	19.79
47	20.2	10.1	16.0	13.96
48	21.1	10.7	17.6	6.73
49	21.9	10.1	17.0	5.97
50	22.8	10.7	17.6	4.99
51	23.6	10.1	15.9	4.56
52	24.5	10.7	15.5	3.83
53	25.3	10.1	13.7	3.37
54	26.2	10.7	13.2	2.72
55	27.0	10.1	11.5	2.27
56	27.9	10.7	11.0	1.58
57	28.7	10.1	10.4	1.40
58	29.6	10.7	11.0	1.39
59	30.4	10.1	10.3	1.41
60	31.3	10.7	10.9	1.54
61	32.1	10.1	10.3	1.64
62	33.0	10.7	10.6	1.87
63	33.8	10.1	10.9	2.02
64	16.9	11.3	13.0	20.00
65	17.7	12.0	18.9	21.56
66	18.5	11.3	17.2	30.99
67	19.4	12.0	18.9	9.36
68	20.2	11.3	17.2	10.30
69	21.1	12.0	18.9	6.06
70	21.9	11.3	18.3	5.45

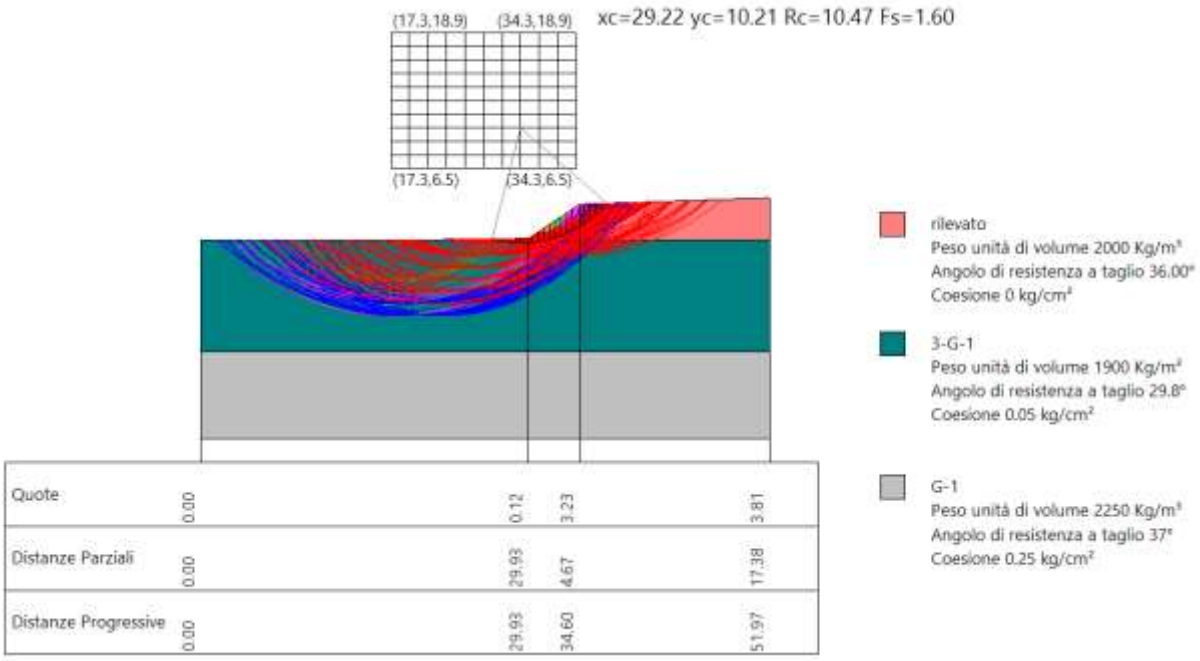
71	22.8	12.0	17.8	4.70
72	23.6	11.3	17.2	4.28
73	24.5	12.0	15.6	3.55
74	25.3	11.3	13.9	3.14
75	26.2	12.0	13.4	2.49
76	27.0	11.3	11.7	2.06
77	27.9	12.0	12.2	1.54
78	28.7	11.3	11.6	1.41
79	29.6	12.0	12.2	1.45
80	30.4	11.3	11.6	1.48
81	31.3	12.0	12.2	1.61
82	32.1	11.3	11.5	1.71
83	33.0	12.0	11.7	1.94
84	33.8	11.3	12.0	2.07
85	16.9	12.6	18.4	112.73
86	17.7	13.2	20.1	15.69
87	18.5	12.6	19.5	11.61
88	19.4	13.2	20.1	8.02
89	20.2	12.6	19.5	6.84
90	21.1	13.2	19.0	5.92
91	21.9	12.6	18.4	5.23
92	22.8	13.2	19.0	4.44
93	23.6	12.6	17.3	3.98
94	24.5	13.2	16.8	3.38
95	25.3	12.6	15.1	2.92
96	26.2	13.2	14.6	2.33
97	27.0	12.6	12.9	1.76
98	27.9	13.2	13.5	1.52
99	28.7	12.6	12.8	1.48
100	29.6	13.2	13.4	1.52
101	30.4	12.6	12.8	1.55
102	31.3	13.2	13.4	1.68
103	32.1	12.6	12.6	1.78
104	33.0	13.2	14.0	1.99
105	33.8	12.6	13.0	2.12
106	16.9	13.8	19.7	56.17
107	17.7	14.4	21.4	11.58
108	18.5	13.8	20.7	9.44
109	19.4	14.4	20.3	8.35
110	20.2	13.8	19.7	7.01
111	21.1	14.4	21.4	5.29
112	21.9	13.8	19.7	4.88
113	22.8	14.4	19.2	4.19
114	23.6	13.8	17.5	3.79
115	24.5	14.4	17.0	3.17
116	25.3	13.8	15.3	2.77

117	26.2	14.4	15.9	2.26
118	27.0	13.8	14.1	1.66
119	27.9	14.4	14.7	1.55
120	28.7	13.8	14.1	1.53
121	29.6	14.4	14.7	1.58
122	30.4	13.8	14.0	1.62
123	31.3	14.4	14.5	1.75
124	32.1	13.8	13.7	1.84
125	33.0	14.4	14.8	2.02
126	33.8	13.8	15.0	2.20
127	16.9	15.1	21.6	19.45
128	17.7	15.7	22.6	9.71
129	18.5	15.1	20.9	10.53
130	19.4	15.7	22.6	6.43
131	20.2	15.1	22.0	5.79
132	21.1	15.7	21.5	5.08
133	21.9	15.1	20.9	4.64
134	22.8	15.7	20.4	4.01
135	23.6	15.1	18.7	3.59
136	24.5	15.7	18.2	3.03
137	25.3	15.1	16.5	2.58
138	26.2	15.7	16.0	1.85
139	27.0	15.1	15.4	1.64
140	27.9	15.7	16.0	1.60
141	28.7	15.1	15.3	1.58
142	29.6	15.7	15.9	1.64
143	30.4	15.1	15.3	1.69
144	31.3	15.7	15.6	1.77
145	32.1	15.1	14.7	1.90
146	33.0	15.7	15.7	2.15
147	33.8	15.1	15.8	2.25
148	16.9	16.3	22.5	17.83
149	17.7	16.9	23.5	9.07
150	18.5	16.3	23.2	7.24
151	19.4	16.9	23.8	6.03
152	20.2	16.3	23.2	5.50
153	21.1	16.9	22.7	4.87
154	21.9	16.3	21.0	4.44
155	22.8	16.9	20.6	3.84
156	23.6	16.3	18.8	3.46
157	24.5	16.9	18.4	2.89
158	25.3	16.3	17.7	2.48
159	26.2	16.9	17.2	1.81
160	27.0	16.3	16.6	1.64
161	27.9	16.9	17.2	1.64
162	28.7	16.3	16.6	1.64

163	29.6	16.9	17.2	1.71
164	30.4	16.3	16.5	1.75
165	31.3	16.9	16.6	1.83
166	32.1	16.3	15.6	1.97
167	33.0	16.9	17.7	2.18
168	33.8	16.3	16.7	2.32
169	16.9	17.5	22.4	39.36
170	17.7	18.1	23.4	11.62
171	18.5	17.5	24.4	6.75
172	19.4	18.1	24.0	6.01
173	20.2	17.5	23.4	5.38
174	21.1	18.1	24.0	4.70
175	21.9	17.5	22.3	4.25
176	22.8	18.1	21.8	3.71
177	23.6	17.5	20.1	3.29
178	24.5	18.1	19.6	2.74
179	25.3	17.5	19.0	2.42
180	26.2	18.1	18.5	1.78
181	27.0	17.5	17.8	1.69
182	27.9	18.1	18.4	1.69
183	28.7	17.5	17.8	1.70
184	29.6	18.1	18.4	1.77
185	30.4	17.5	17.6	1.79
186	31.3	18.1	17.5	1.89
187	32.1	17.5	17.6	2.05
188	33.0	18.1	18.6	2.22
189	33.8	17.5	18.6	2.37
190	16.9	18.8	19.8	20.00
191	17.7	19.4	25.3	8.04
192	18.5	18.8	24.3	7.08
193	19.4	19.4	26.3	5.52
194	20.2	18.8	24.6	5.10
195	21.1	19.4	24.1	4.52
196	21.9	18.8	23.5	4.12
197	22.8	19.4	22.0	3.59
198	23.6	18.8	21.3	3.18
199	24.5	19.4	20.8	2.65
200	25.3	18.8	20.2	2.38
201	26.2	19.4	19.7	1.78
202	27.0	18.8	19.1	1.73
203	27.9	19.4	19.7	1.74
204	28.7	18.8	19.0	1.76
205	29.6	19.4	19.5	1.80
206	30.4	18.8	18.5	1.77
207	31.3	19.4	19.5	2.01
208	32.1	18.8	18.5	2.12

209	33.0	19.4	20.5	2.32
210	33.8	18.8	19.4	2.40
211	16.9	20.0	24.4	29.60
212	18.5	20.0	25.3	6.73
213	20.2	20.0	25.8	4.94
214	21.9	20.0	23.7	3.98
215	23.6	20.0	21.5	3.07
216	25.3	20.0	21.4	2.37
217	27.0	20.0	20.3	1.77
218	28.7	20.0	20.3	1.81
219	30.4	20.0	19.5	1.83
220	32.1	20.0	20.5	2.18
221	33.8	20.0	20.3	2.47

1.7.2 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	3.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.2
Analisi	Condizione drenata
Superficie di forma circolare	

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	17.35 m
Ordinata vertice sinistro inferiore yi	6.5 m
Ascissa vertice destro superiore xs	34.31 m
Ordinata vertice destro superiore ys	18.87 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

==========

Coefficiente azione sismica orizzontale 0.032
Coefficiente azione sismica verticale 0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	21.35	0.0
3	29.93	0.12
4	34.6	3.23
5	51.97	3.81

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	25.55	0.0
3	36.42	0.0
4	49.76	0.0
5	51.97	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-10.2
2	11.52	-10.2
3	27.34	-10.2
4	45.78	-10.2
5	51.97	-10.2

Coefficienti parziali azioni

==========

Sfavorevoli: Permanenti, variabili 1.0 1.0
Favorevoli: Permanenti, variabili 1.0 1.0

==========

Coefficienti parziali per i parametri geotecnici del terreno

==========

Tangente angolo di resistenza al taglio 1.25
Coesione efficace 1.25
Coesione non drenata 1.4
Riduzione parametri geotecnici terreno No

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Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	2000	2100.00	rilevato	
2	0.05		29.8	1900	2000	3-G-1	
3	0.25		37	2250	2350	G-1	

Risultati analisi pendio

==========

Fs minimo individuato	1.6
Ascissa centro superficie	29.22 m
Ordinata centro superficie	10.21 m
Raggio superficie	10.47 m

==========

xc = 29.224 yc = 10.214 Rc = 10.472 Fs=1.597

Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.52	-13.0	0.54	71.27
2	0.52	-10.07	0.53	186.48
3	0.52	-7.16	0.53	273.62
4	0.52	-4.28	0.53	333.88
5	0.52	-1.4	0.53	367.66
6	0.7	1.95	0.7	497.41
7	0.35	4.83	0.35	315.41
8	0.52	7.24	0.53	731.6
9	0.52	10.14	0.53	1018.99
10	0.52	13.08	0.54	1278.12
11	0.52	16.05	0.55	1502.41
12	0.52	19.06	0.56	1695.54
13	0.52	22.13	0.57	1855.92
14	0.52	25.27	0.58	1981.51
15	0.64	28.87	0.73	2545.03
16	0.41	32.19	0.48	1537.49
17	0.52	35.27	0.64	1674.41
18	0.52	38.87	0.67	1276.74
19	0.52	42.67	0.71	820.33
20	0.52	46.71	0.77	294.12

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	20.51	59.86	0.0	0.0	37.61	14.26	0.0
2	119.32	348.21	20.51	59.86	39.89	151.06	0.0
3	223.68	652.75	119.32	348.21	135.4	178.55	0.0
4	326.17	951.83	223.68	652.75	214.57	201.52	0.0
5	421.84	1231.0	326.17	951.83	271.26	218.13	0.0
6	516.86	1508.3	421.84	1231.0	418.99	307.62	0.0
7	587.57	1714.63	516.86	1508.3	265.37	171.38	0.0
8	672.51	1962.52	587.57	1714.63	681.4	341.79	0.0
9	750.8	2190.96	672.51	1962.52	976.54	431.09	0.0
10	799.1	2331.93	750.8	2190.96	1240.48	470.43	0.0
11	826.6	2412.19	799.1	2331.93	1449.43	549.67	0.0
12	825.6	2409.25	826.6	2412.19	1610.5	610.75	0.0
13	790.17	2305.87	825.6	2409.25	1718.2	651.59	0.0
14	716.13	2089.79	790.17	2305.87	1768.22	670.56	0.0
15	569.3	1661.31	716.13	2089.79	2146.87	814.16	0.0
16	452.38	1320.12	569.3	1661.31	1212.93	459.98	0.0
17	297.05	866.84	452.38	1320.12	1223.19	463.87	0.0
18	153.8	448.83	297.05	866.84	833.53	316.1	0.0
19	44.99	131.3	153.8	448.83	459.87	174.4	0.0
20	-0.48	-1.39	44.99	131.3	132.62	50.29	0.0

Numero di superfici esaminate....(221)

N°	Xo	Yo	Ro	Fs
1	17.3	6.5	10.2	23.10
2	18.2	7.1	10.8	21.92
3	19.0	6.5	10.2	21.80
4	19.9	7.1	14.0	13.79
5	20.7	6.5	13.4	11.79
6	21.6	7.1	14.0	8.12
7	22.4	6.5	13.4	7.28
8	23.3	7.1	13.0	6.16
9	24.1	6.5	12.3	5.57
10	25.0	7.1	11.8	4.56
11	25.8	6.5	10.1	4.16
12	26.7	7.1	9.6	3.30
13	27.5	6.5	7.9	2.83
14	28.4	7.1	8.5	2.19
15	29.2	6.5	7.9	2.01
16	30.1	7.1	8.5	1.93
17	30.9	6.5	7.8	1.91
18	31.8	7.1	8.4	2.00
19	32.6	6.5	7.8	2.11
20	33.5	7.1	8.4	2.34
21	34.3	6.5	7.5	2.69
22	17.3	7.7	11.5	22.04
23	18.2	8.4	12.1	21.05
24	19.0	7.7	11.5	20.86
25	19.9	8.4	15.3	10.75
26	20.7	7.7	14.7	9.25
27	21.6	8.4	14.2	7.94
28	22.4	7.7	13.6	6.84
29	23.3	8.4	14.2	5.43
30	24.1	7.7	13.6	5.06
31	25.0	8.4	13.1	4.27
32	25.8	7.7	11.4	3.76
33	26.7	8.4	10.9	3.04
34	27.5	7.7	9.1	2.55
35	28.4	8.4	9.7	2.14
36	29.2	7.7	9.1	2.00
37	30.1	8.4	9.7	1.96
38	30.9	7.7	9.1	1.95
39	31.8	8.4	9.7	2.05
40	32.6	7.7	9.0	2.15
41	33.5	8.4	9.5	2.34
42	34.3	7.7	8.6	2.63

43	17.3	9.0	12.7	21.23
44	18.2	9.6	16.5	14.80
45	19.0	9.0	15.9	12.46
46	19.9	9.6	15.4	11.33
47	20.7	9.0	15.9	7.77
48	21.6	9.6	16.5	6.30
49	22.4	9.0	15.9	5.87
50	23.3	9.6	15.4	5.12
51	24.1	9.0	13.7	4.65
52	25.0	9.6	13.2	3.90
53	25.8	9.0	11.5	3.50
54	26.7	9.6	11.0	2.74
55	27.5	9.0	10.4	2.37
56	28.4	9.6	9.9	1.68
57	29.2	9.0	10.3	2.02
58	30.1	9.6	9.8	1.60
59	30.9	9.0	10.3	2.00
60	31.8	9.6	9.8	1.83
61	32.6	9.0	10.3	2.20
62	33.5	9.6	10.6	2.35
63	34.3	9.0	9.8	2.63
64	17.3	10.2	15.0	20.56
65	18.2	10.8	17.8	11.82
66	19.0	10.2	16.1	13.84
67	19.9	10.8	17.8	7.67
68	20.7	10.2	17.1	6.93
69	21.6	10.8	17.8	5.92
70	22.4	10.2	16.0	5.52
71	23.3	10.8	15.6	4.80
72	24.1	10.2	14.9	4.39
73	25.0	10.8	13.4	3.68
74	25.8	10.2	12.7	3.23
75	26.7	10.8	12.2	2.60
76	27.5	10.2	10.5	1.93
77	28.4	10.8	11.1	1.70
78	29.2	10.2	10.5	1.60
79	30.1	10.8	11.1	1.68
80	30.9	10.2	10.4	1.73
81	31.8	10.8	11.0	1.90
82	32.6	10.2	10.3	2.10
83	33.5	10.8	11.7	2.39
84	34.3	10.2	10.9	2.65
85	17.3	11.5	18.4	14.09
86	18.2	12.1	17.9	13.47
87	19.0	11.5	17.3	10.98
88	19.9	12.1	17.9	7.69

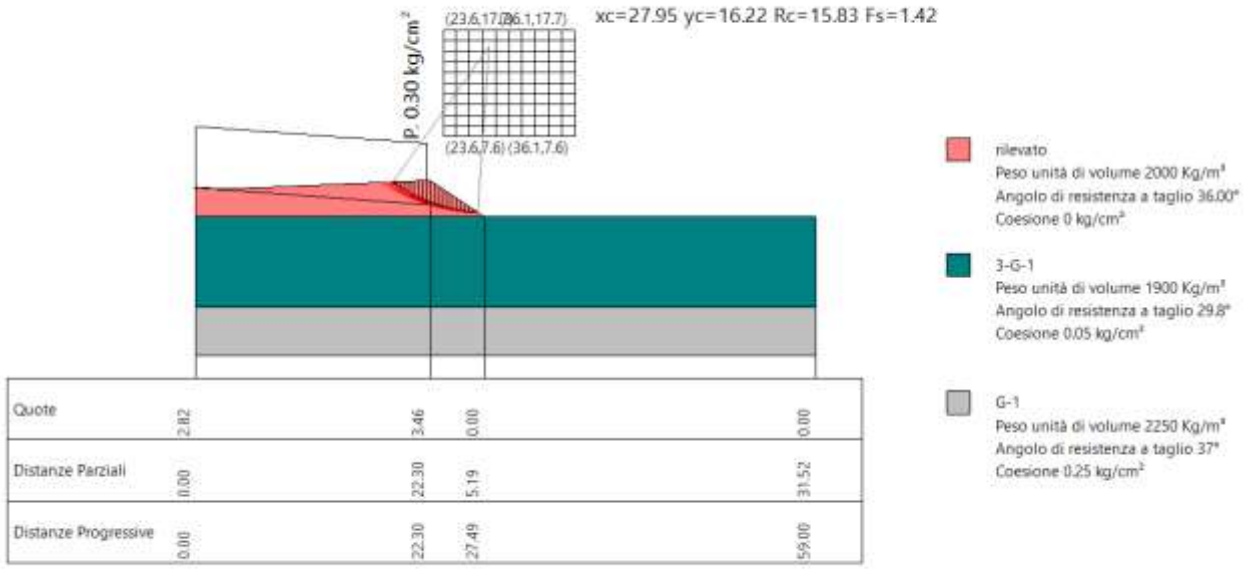
89	20.7	11.5	17.3	6.82
90	21.6	12.1	19.0	5.61
91	22.4	11.5	17.3	5.24
92	23.3	12.1	16.8	4.56
93	24.1	11.5	15.1	4.12
94	25.0	12.1	14.6	3.48
95	25.8	11.5	12.9	3.09
96	26.7	12.1	12.4	2.30
97	27.5	11.5	11.7	1.87
98	28.4	12.1	12.3	1.72
99	29.2	11.5	11.7	1.66
100	30.1	12.1	12.3	1.75
101	30.9	11.5	11.7	1.81
102	31.8	12.1	12.3	1.98
103	32.6	11.5	11.4	2.19
104	33.5	12.1	12.8	2.42
105	34.3	11.5	11.9	2.70
106	17.3	12.7	18.6	16.06
107	18.2	13.3	19.2	10.86
108	19.0	12.7	18.5	8.99
109	19.9	13.3	20.2	6.47
110	20.7	12.7	19.6	6.01
111	21.6	13.3	19.1	5.37
112	22.4	12.7	17.4	4.97
113	23.3	13.3	18.0	4.36
114	24.1	12.7	16.3	3.92
115	25.0	13.3	15.8	3.34
116	25.8	12.7	14.1	2.88
117	26.7	13.3	13.6	2.13
118	27.5	12.7	13.0	1.86
119	28.4	13.3	13.6	1.77
120	29.2	12.7	12.9	1.73
121	30.1	13.3	13.5	1.82
122	30.9	12.7	12.9	1.88
123	31.8	13.3	13.4	2.04
124	32.6	12.7	12.5	2.25
125	33.5	13.3	13.7	2.46
126	34.3	12.7	13.9	2.70
127	17.3	13.9	20.9	9.62
128	18.2	14.5	21.5	7.75
129	19.0	13.9	20.9	7.04
130	19.9	14.5	20.4	6.39
131	20.7	13.9	19.8	5.81
132	21.6	14.5	20.4	5.13
133	22.4	13.9	18.7	4.76
134	23.3	14.5	18.2	4.16

135	24.1	13.9	16.5	3.76
136	25.0	14.5	16.0	3.21
137	25.8	13.9	15.4	2.77
138	26.7	14.5	14.9	2.05
139	27.5	13.9	14.2	1.87
140	28.4	14.5	14.8	1.83
141	29.2	13.9	14.2	1.79
142	30.1	14.5	14.8	1.89
143	30.9	13.9	14.1	1.95
144	31.8	14.5	14.4	2.09
145	32.6	13.9	13.5	2.31
146	33.5	14.5	15.7	2.55
147	34.3	13.9	14.7	2.71
148	17.3	15.2	20.9	11.31
149	18.2	15.8	21.6	8.03
150	19.0	15.2	21.0	7.13
151	19.9	15.8	22.7	5.88
152	20.7	15.2	21.0	5.55
153	21.6	15.8	20.5	4.96
154	22.4	15.2	19.9	4.56
155	23.3	15.8	19.4	4.02
156	24.1	15.2	17.7	3.61
157	25.0	15.8	17.2	3.07
158	25.8	15.2	16.6	2.71
159	26.7	15.8	16.1	2.02
160	27.5	15.2	15.5	1.90
161	28.4	15.8	16.1	1.88
162	29.2	15.2	15.4	1.86
163	30.1	15.8	16.0	1.95
164	30.9	15.2	15.3	2.01
165	31.8	15.8	15.4	2.15
166	32.6	15.2	15.6	2.32
167	33.5	15.8	16.6	2.55
168	34.3	15.2	16.6	2.78
169	17.3	16.4	21.8	10.59
170	18.2	17.0	22.8	7.44
171	19.0	16.4	23.3	6.30
172	19.9	17.0	23.9	5.68
173	20.7	16.4	22.2	5.30
174	21.6	17.0	21.8	4.77
175	22.4	16.4	20.1	4.43
176	23.3	17.0	19.6	3.92
177	24.1	16.4	18.9	3.51
178	25.0	17.0	18.5	2.98
179	25.8	16.4	17.8	2.68
180	26.7	17.0	17.3	2.02

181	27.5	16.4	16.7	1.92
182	28.4	17.0	17.3	1.94
183	29.2	16.4	16.7	1.92
184	30.1	17.0	17.3	2.02
185	30.9	16.4	16.4	2.03
186	31.8	17.0	16.4	2.22
187	32.6	16.4	16.5	2.41
188	33.5	17.0	17.4	2.60
189	34.3	16.4	17.5	2.80
190	17.3	17.6	22.8	9.93
191	18.2	18.3	24.7	6.58
192	19.0	17.6	24.6	6.05
193	19.9	18.3	24.1	5.55
194	20.7	17.6	23.5	5.17
195	21.6	18.3	23.0	4.65
196	22.4	17.6	21.3	4.26
197	23.3	18.3	20.8	3.78
198	24.1	17.6	19.1	3.44
199	25.0	18.3	19.7	2.93
200	25.8	17.6	19.1	2.67
201	26.7	18.3	18.6	2.03
202	27.5	17.6	17.9	1.96
203	28.4	18.3	18.5	1.99
204	29.2	17.6	17.9	2.01
205	30.1	18.3	18.4	2.05
206	30.9	17.6	17.4	2.04
207	31.8	18.3	18.4	2.31
208	32.6	17.6	18.4	2.47
209	33.5	18.3	19.3	2.69
210	34.3	17.6	18.3	2.83
211	17.3	18.9	24.7	7.70
212	19.0	18.9	25.7	5.85
213	20.7	18.9	23.6	5.03
214	22.4	18.9	22.5	4.17
215	24.1	18.9	20.3	3.30
216	25.8	18.9	19.2	2.17
217	27.5	18.9	19.2	2.01
218	29.2	18.9	19.1	2.07
219	30.9	18.9	18.3	2.10
220	32.6	18.9	19.3	2.48
221	34.3	18.9	20.2	2.88

1.8 SEZIONE 82

1.8.1 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	3.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata
Superficie di forma circolare	

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	23.56 m
Ordinata vertice sinistro inferiore yi	7.63 m
Ascissa vertice destro superiore xs	36.1 m
Ordinata vertice destro superiore ys	17.73 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	2.82
2	2.77	2.62
3	22.3	3.46
4	27.49	0.0
5	59.0	0.0

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	4.92	0.0
3	27.49	0.0
4	59.0	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-8.58
2	33.63	-8.58
3	43.74	-8.58
4	59.0	-8.58

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	2000	2100.00	rilevato	
2	0.05		29.8	1900	2000	3-G-1	
3	0.25		37	2250	2350	G-1	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	0.02	2.76	22.02	1.14983	0.3

Risultati analisi pendio

==========

Fs minimo individuato 1.42
Ascissa centro superficie 27.95 m
Ordinata centro superficie 16.22 m
Raggio superficie 15.83 m

==========

xc = 27.947 yc = 16.215 Rc = 15.828 Fs=1.424
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.4	34.48	0.49	1030.03
2	0.4	32.73	0.48	1559.97
3	0.4	31.01	0.47	1775.99
4	0.4	29.32	0.46	1978.86
5	0.4	27.66	0.46	2169.22
6	0.4	26.02	0.45	2347.65
7	0.4	24.41	0.44	2514.67
8	0.4	22.82	0.44	2670.71
9	0.29	21.46	0.31	1160.42
10	0.52	19.91	0.55	2023.31
11	0.4	18.14	0.42	1455.5
12	0.4	16.61	0.42	1340.49
13	0.4	15.09	0.42	1216.05
14	0.4	13.59	0.41	1082.42
15	0.4	12.09	0.41	939.76
16	0.4	10.6	0.41	788.25
17	0.4	9.12	0.41	628.01
18	0.4	7.65	0.41	459.16
19	0.4	6.17	0.41	281.81
20	0.4	4.71	0.4	96.03

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	-79.83	-206.74	0.0	0.0	797.83	325.69	0.0
2	-184.22	-477.1	-79.83	-206.74	1253.97	511.89	0.0
3	-284.43	-736.61	-184.22	-477.1	1474.36	601.86	0.0
4	-375.42	-972.25	-284.43	-736.61	1689.29	689.6	0.0
5	-452.55	-1171.99	-375.42	-972.25	1896.9	774.35	0.0
6	-511.52	-1324.71	-452.55	-1171.99	2095.62	855.47	0.0
7	-548.34	-1420.08	-511.52	-1324.71	2284.01	932.37	0.0
8	-559.3	-1448.44	-548.34	-1420.08	2460.81	1004.55	0.0
9	-553.47	-1433.34	-559.3	-1448.44	1080.04	440.89	0.0
10	-521.6	-1350.8	-553.47	-1433.34	1900.55	775.84	0.0
11	-480.53	-1244.45	-521.6	-1350.8	1377.24	562.21	0.0
12	-427.84	-1107.99	-480.53	-1244.45	1273.06	519.68	0.0
13	-366.29	-948.6	-427.84	-1107.99	1156.17	471.97	0.0
14	-299.0	-774.34	-366.29	-948.6	1027.66	419.51	0.0
15	-229.48	-594.29	-299.0	-774.34	888.65	362.76	0.0
16	-161.59	-418.49	-229.48	-594.29	740.41	302.25	0.0
17	-99.67	-258.11	-161.59	-418.49	584.35	238.54	0.0
18	-48.48	-125.55	-99.67	-258.11	421.99	172.26	0.0
19	-13.31	-34.47	-48.48	-125.55	255.01	104.1	0.0
20	0.0	0.0	-13.31	-34.47	85.27	34.81	0.0

Numero di superfici esaminate....(220)

N°	Xo	Yo	Ro	Fs
1	23.6	7.6	7.4	20.00
2	24.2	8.1	7.9	20.00
3	24.8	7.6	8.1	20.00
4	25.4	8.1	8.6	20.00
5	26.1	7.6	8.1	20.00
6	26.7	8.1	8.6	20.00
7	27.3	7.6	8.1	20.00
8	27.9	8.1	8.6	20.00
9	28.6	7.6	8.1	20.00
10	29.2	8.1	8.6	20.00
11	29.8	7.6	8.0	20.00
12	30.5	8.1	9.4	20.00
13	31.1	7.6	8.9	20.00
14	31.7	8.1	9.4	20.00
15	32.3	7.6	9.7	20.00
16	33.0	8.1	10.2	20.00
17	33.6	7.6	10.5	20.00
18	34.2	8.1	11.0	20.00
19	34.8	7.6	11.4	20.00
20	35.5	8.1	11.9	20.00
21	23.6	8.6	8.3	20.00
22	24.2	9.1	8.9	20.00
23	24.8	8.6	8.3	20.00
24	25.4	9.1	8.8	20.00
25	26.1	8.6	9.1	20.00
26	26.7	9.1	9.6	20.00
27	27.3	8.6	9.1	20.00
28	27.9	9.1	9.6	20.00
29	28.6	8.6	9.1	20.00
30	29.2	9.1	9.6	20.00
31	29.8	8.6	9.1	20.00
32	30.5	9.1	10.4	20.00
33	31.1	8.6	9.9	20.00
34	31.7	9.1	10.4	20.00
35	32.3	8.6	10.7	20.00
36	33.0	9.1	11.2	20.00
37	33.6	8.6	10.7	20.00
38	34.2	9.1	12.0	20.00
39	34.8	8.6	11.5	20.00
40	35.5	9.1	12.9	20.00
41	36.1	8.6	12.4	20.00
42	23.6	9.7	9.2	20.00

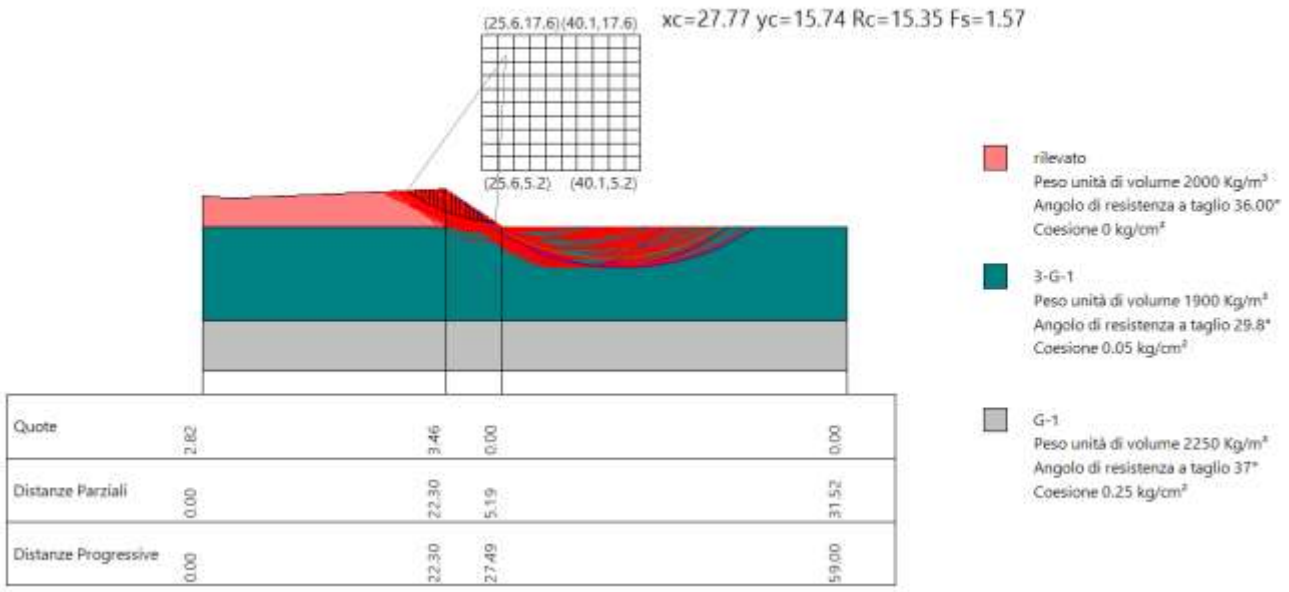
43	24.2	10.2	9.9	20.00
44	24.8	9.7	9.4	20.00
45	25.4	10.2	9.8	20.00
46	26.1	9.7	10.1	20.00
47	26.7	10.2	10.6	20.00
48	27.3	9.7	10.1	20.00
49	27.9	10.2	10.6	20.00
50	28.6	9.7	10.1	20.00
51	29.2	10.2	10.6	20.00
52	29.8	9.7	10.1	20.00
53	30.5	10.2	11.4	20.00
54	31.1	9.7	10.9	20.00
55	31.7	10.2	11.4	20.00
56	32.3	9.7	10.9	20.00
57	33.0	10.2	12.2	20.00
58	33.6	9.7	11.7	20.00
59	34.2	10.2	12.2	20.00
60	34.8	9.7	12.5	20.00
61	35.5	10.2	13.0	20.00
62	36.1	9.7	13.4	20.00
63	23.6	10.7	10.1	20.00
64	24.2	11.2	10.8	20.00
65	24.8	10.7	10.4	20.00
66	25.4	11.2	10.8	20.00
67	26.1	10.7	10.3	20.00
68	26.7	11.2	11.6	20.00
69	27.3	10.7	11.1	20.00
70	27.9	11.2	11.6	20.00
71	28.6	10.7	11.1	20.00
72	29.2	11.2	11.6	20.00
73	29.8	10.7	11.1	20.00
74	30.5	11.2	11.6	20.00
75	31.1	10.7	11.9	20.00
76	31.7	11.2	12.4	20.00
77	32.3	10.7	11.9	20.00
78	33.0	11.2	13.2	20.00
79	33.6	10.7	12.7	20.00
80	34.2	11.2	13.2	20.00
81	34.8	10.7	13.5	20.00
82	35.5	11.2	14.0	20.00
83	36.1	10.7	14.4	20.00
84	23.6	11.7	11.0	20.00
85	24.2	12.2	11.7	20.00
86	24.8	11.7	11.4	20.00
87	25.4	12.2	11.9	20.00
88	26.1	11.7	11.3	20.00

89	26.7	12.2	11.8	20.00
90	27.3	11.7	12.1	20.00
91	27.9	12.2	12.6	20.00
92	28.6	11.7	12.1	20.00
93	29.2	12.2	12.6	20.00
94	29.8	11.7	12.1	20.00
95	30.5	12.2	12.6	20.00
96	31.1	11.7	12.9	20.00
97	31.7	12.2	13.4	20.00
98	32.3	11.7	12.9	20.00
99	33.0	12.2	13.4	20.00
100	33.6	11.7	13.7	20.00
101	34.2	12.2	14.2	20.00
102	34.8	11.7	14.6	20.00
103	35.5	12.2	15.1	20.00
104	36.1	11.7	14.5	20.00
105	23.6	12.7	11.9	20.00
106	24.2	13.2	12.6	20.00
107	24.8	12.7	12.4	20.00
108	25.4	13.2	12.9	20.00
109	26.1	12.7	12.3	20.00
110	26.7	13.2	12.8	20.00
111	27.3	12.7	13.1	20.00
112	27.9	13.2	13.6	20.00
113	28.6	12.7	13.1	20.00
114	29.2	13.2	13.6	20.00
115	29.8	12.7	13.1	20.00
116	30.5	13.2	13.6	20.00
117	31.1	12.7	13.9	20.00
118	31.7	13.2	14.4	20.00
119	32.3	12.7	13.9	20.00
120	33.0	13.2	14.4	20.00
121	33.6	12.7	14.7	20.00
122	34.2	13.2	15.2	20.00
123	34.8	12.7	14.7	20.00
124	35.5	13.2	16.1	20.00
125	36.1	12.7	15.6	20.00
126	23.6	13.7	12.8	20.00
127	24.2	14.2	13.5	20.00
128	24.8	13.7	13.3	20.00
129	25.4	14.2	13.9	20.00
130	26.1	13.7	13.4	20.00
131	26.7	14.2	13.8	20.00
132	27.3	13.7	14.2	20.00
133	27.9	14.2	14.6	20.00
134	28.6	13.7	14.1	20.00

135	29.2	14.2	14.6	20.00
136	29.8	13.7	14.1	20.00
137	30.5	14.2	14.6	20.00
138	31.1	13.7	14.9	20.00
139	31.7	14.2	15.4	20.00
140	32.3	13.7	14.9	20.00
141	33.0	14.2	15.4	20.00
142	33.6	13.7	15.7	20.00
143	34.2	14.2	16.2	20.00
144	34.8	13.7	15.7	20.00
145	35.5	14.2	17.1	20.00
146	36.1	13.7	16.6	20.00
147	23.6	14.7	13.8	20.00
148	24.2	15.2	14.4	20.00
149	24.8	14.7	14.2	20.00
150	25.4	15.2	14.8	20.00
151	26.1	14.7	14.4	20.00
152	26.7	15.2	14.9	20.00
153	27.3	14.7	14.3	1.44
154	27.9	15.2	15.7	20.00
155	28.6	14.7	15.1	20.00
156	29.2	15.2	15.6	20.00
157	29.8	14.7	15.1	20.00
158	30.5	15.2	15.6	20.00
159	31.1	14.7	15.9	20.00
160	31.7	15.2	16.4	20.00
161	32.3	14.7	15.9	20.00
162	33.0	15.2	16.4	20.00
163	33.6	14.7	16.7	20.00
164	34.2	15.2	17.2	20.00
165	34.8	14.7	16.7	20.00
166	35.5	15.2	17.2	20.00
167	36.1	14.7	17.6	20.00
168	23.6	15.7	14.7	20.00
169	24.2	16.2	15.3	20.00
170	24.8	15.7	15.1	20.00
171	25.4	16.2	15.7	20.00
172	26.1	15.7	15.4	20.00
173	26.7	16.2	15.9	20.00
174	27.3	15.7	15.3	1.51
175	27.9	16.2	15.8	1.42
176	28.6	15.7	16.1	20.00
177	29.2	16.2	16.6	20.00
178	29.8	15.7	16.1	20.00
179	30.5	16.2	16.6	20.00
180	31.1	15.7	16.9	20.00

181	31.7	16.2	17.4	20.00
182	32.3	15.7	16.9	20.00
183	33.0	16.2	17.4	20.00
184	33.6	15.7	16.9	20.00
185	34.2	16.2	18.2	20.00
186	34.8	15.7	17.7	20.00
187	35.5	16.2	18.2	20.00
188	36.1	15.7	18.6	20.00
189	23.6	16.7	15.6	20.00
190	24.2	17.2	16.2	20.00
191	24.8	16.7	16.0	20.00
192	25.4	17.2	16.6	20.00
193	26.1	16.7	16.4	20.00
194	26.7	17.2	16.9	20.00
195	27.3	16.7	16.3	1.57
196	27.9	17.2	16.8	1.49
197	28.6	16.7	17.2	20.00
198	29.2	17.2	17.6	20.00
199	29.8	16.7	17.1	20.00
200	30.5	17.2	17.6	20.00
201	31.1	16.7	17.9	20.00
202	31.7	17.2	18.4	20.00
203	32.3	16.7	17.9	20.00
204	33.0	17.2	18.4	20.00
205	33.6	16.7	17.9	20.00
206	34.2	17.2	19.3	20.00
207	34.8	16.7	18.7	20.00
208	35.5	17.2	19.2	20.00
209	36.1	16.7	19.6	20.00
210	23.6	17.7	16.5	20.00
211	24.8	17.7	16.9	20.00
212	26.1	17.7	17.3	20.00
213	27.3	17.7	17.4	1.64
214	28.6	17.7	18.2	20.00
215	29.8	17.7	18.1	20.00
216	31.1	17.7	18.1	20.00
217	32.3	17.7	18.9	20.00
218	33.6	17.7	18.9	20.00
219	34.8	17.7	19.7	20.00
220	36.1	17.7	19.7	20.00

1.8.2 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	3.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.2
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	25.59 m
Ordinata vertice sinistro inferiore yi	5.15 m
Ascissa vertice destro superiore xs	40.1 m
Ordinata vertice destro superiore ys	17.6 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

Coefficiente azione sismica orizzontale	0.032
Coefficiente azione sismica verticale	0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	2.82
2	2.77	2.62
3	22.3	3.46
4	27.49	0.0
5	59.0	0.0

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	4.92	0.0
3	27.49	0.0
4	59.0	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-8.58
2	33.63	-8.58
3	43.74	-8.58
4	59.0	-8.58

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	No

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	2000	2100.00	rilevato	
2	0.05		29.8	1900	2000	3-G-1	
3	0.25		37	2250	2350	G-1	

Risultati analisi pendio

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Fs minimo individuato	1.57
Ascissa centro superficie	27.77 m
Ordinata centro superficie	15.74 m
Raggio superficie	15.35 m

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xc = 27.771 yc = 15.736 Rc = 15.354 Fs=1.57

Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.41	35.02	0.5	124.51
2	0.41	33.19	0.49	361.76
3	0.41	31.4	0.48	584.13
4	0.41	29.64	0.47	792.49
5	0.41	27.91	0.46	987.57
6	0.41	26.21	0.45	1170.02
7	0.41	24.54	0.45	1340.41
8	0.41	22.88	0.44	1499.21
9	0.3	21.47	0.32	1186.27
10	0.52	19.85	0.55	2055.71
11	0.41	18.03	0.43	1496.19
12	0.41	16.44	0.42	1378.73
13	0.41	14.87	0.42	1251.41
14	0.41	13.31	0.42	1114.43
15	0.41	11.76	0.41	968.0
16	0.41	10.21	0.41	812.28
17	0.41	8.68	0.41	647.42
18	0.41	7.15	0.41	473.54
19	0.41	5.62	0.41	290.75
20	0.41	4.1	0.41	99.11

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**-8.12**	**-33.35**	**0.0**	**0.0**	**88.82**	**34.26**	**0.0**
2	**-29.04**	**-119.25**	**-8.12**	**-33.35**	**271.71**	**104.8**	**0.0**
3	**-58.58**	**-240.53**	**-29.04**	**-119.25**	**458.83**	**176.98**	**0.0**
4	**-92.98**	**-381.79**	**-58.58**	**-240.53**	**647.28**	**249.66**	**0.0**
5	**-128.87**	**-529.15**	**-92.98**	**-381.79**	**834.56**	**321.9**	**0.0**
6	**-163.19**	**-670.05**	**-128.87**	**-529.15**	**1018.5**	**392.84**	**0.0**
7	**-193.16**	**-793.12**	**-163.19**	**-670.05**	**1197.22**	**461.78**	**0.0**
8	**-216.26**	**-887.97**	**-193.16**	**-793.12**	**1369.08**	**528.07**	**0.0**
9	**-227.41**	**-933.74**	**-216.26**	**-887.97**	**1101.37**	**424.81**	**0.0**
10	**-232.43**	**-954.36**	**-227.41**	**-933.74**	**1939.89**	**748.23**	**0.0**
11	**-224.18**	**-920.48**	**-232.43**	**-954.36**	**1433.31**	**552.84**	**0.0**

12	**-206.84**	**-849.3**	**-224.18**	**-920.48**	**1334.53**	**514.74**	**0.0**
13	**-182.19**	**-748.06**	**-206.84**	**-849.3**	**1220.72**	**470.84**	**0.0**
14	**-152.18**	**-624.86**	**-182.19**	**-748.06**	**1092.8**	**421.5**	**0.0**
15	**-119.02**	**-488.71**	**-152.18**	**-624.86**	**951.82**	**367.12**	**0.0**
16	**-85.14**	**-349.6**	**-119.02**	**-488.71**	**798.91**	**308.15**	**0.0**
17	**-53.21**	**-218.5**	**-85.14**	**-349.6**	**635.34**	**245.06**	**0.0**
18	**-26.18**	**-107.49**	**-53.21**	**-218.5**	**462.48**	**178.38**	**0.0**
19	**-7.26**	**-29.81**	**-26.18**	**-107.49**	**281.85**	**108.71**	**0.0**
20	**0.0**	**0.0**	**-7.26**	**-29.81**	**95.11**	**36.68**	**0.0**

Numero di superfici esaminate....(170)

N°	Xo	Yo	Ro	Fs
1	25.6	5.2	6.5	16.67
2	26.3	5.8	6.3	16.67
3	27.0	5.2	6.4	16.67
4	27.8	5.8	6.2	16.67
5	28.5	5.2	6.4	16.67
6	29.2	5.8	7.0	16.67
7	29.9	5.2	6.4	16.67
8	30.7	5.8	7.0	16.67
9	31.4	5.2	7.2	16.67
10	32.1	5.8	8.7	16.67
11	32.8	5.2	8.9	16.67
12	33.6	5.8	9.5	16.67
13	34.3	5.2	8.9	29.92
14	35.0	5.8	9.5	25.49
15	25.6	6.4	6.9	16.67
16	26.3	7.0	7.5	16.67
17	27.0	6.4	6.9	16.67
18	27.8	7.0	7.5	16.67
19	28.5	6.4	6.8	16.67
20	29.2	7.0	7.4	16.67
21	29.9	6.4	7.6	16.67
22	30.7	7.0	8.3	16.67
23	31.4	6.4	8.5	16.67
24	32.1	7.0	9.1	16.67
25	32.8	6.4	9.3	16.67
26	33.6	7.0	10.8	16.67
27	34.3	6.4	10.1	59.58
28	35.0	7.0	10.8	32.30
29	25.6	7.6	8.1	16.67
30	26.3	8.3	8.7	16.67
31	27.0	7.6	8.1	16.67
32	27.8	8.3	8.7	16.67
33	28.5	7.6	8.1	16.67

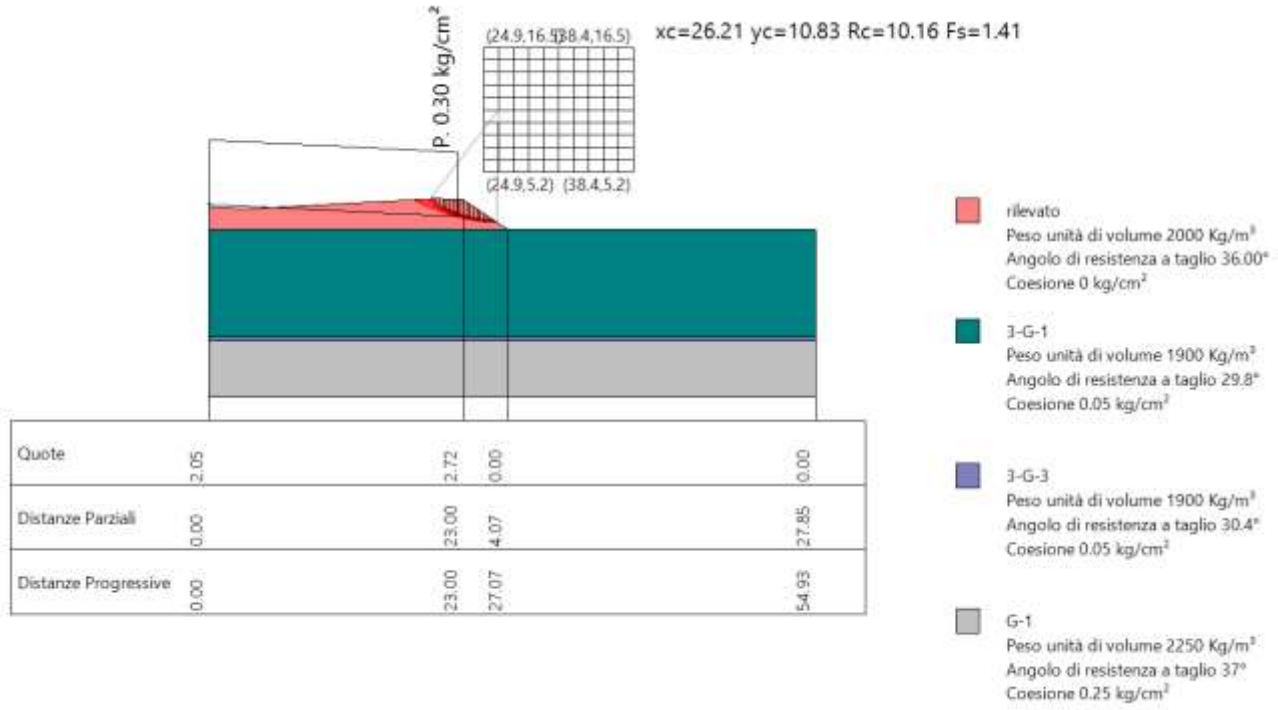
34	29.2	8.3	8.7	16.67
35	29.9	7.6	8.0	16.67
36	30.7	8.3	9.5	16.67
37	31.4	7.6	8.9	16.67
38	32.1	8.3	10.3	16.67
39	32.8	7.6	10.5	16.67
40	33.6	8.3	11.2	16.67
41	34.3	7.6	10.5	29.65
42	35.7	7.6	11.4	25.06
43	25.6	8.9	9.4	16.67
44	26.3	9.5	10.0	16.67
45	27.0	8.9	9.4	16.67
46	27.8	9.5	10.0	16.67
47	28.5	8.9	9.3	16.67
48	29.2	9.5	9.9	16.67
49	29.9	8.9	9.3	16.67
50	30.7	9.5	10.7	16.67
51	31.4	8.9	10.1	16.67
52	32.1	9.5	10.7	16.67
53	32.8	8.9	10.9	16.67
54	33.6	9.5	12.4	16.67
55	34.3	8.9	12.6	16.67
56	35.0	9.5	13.2	16.67
57	35.7	8.9	12.6	32.28
58	36.5	9.5	13.2	23.88
59	25.6	10.1	9.8	16.67
60	26.3	10.8	11.2	16.67
61	27.0	10.1	10.6	16.67
62	27.8	10.8	11.2	16.67
63	28.5	10.1	10.6	16.67
64	29.2	10.8	11.2	16.67
65	29.9	10.1	10.5	16.67
66	30.7	10.8	12.0	16.67
67	31.4	10.1	11.4	16.67
68	32.1	10.8	12.0	16.67
69	32.8	10.1	12.2	16.67
70	33.6	10.8	12.8	16.67
71	34.3	10.1	13.0	16.67
72	35.0	10.8	14.5	16.67
73	25.6	11.4	11.1	16.67
74	26.3	12.0	11.7	16.67
75	27.0	11.4	11.8	16.67
76	27.8	12.0	12.5	16.67
77	28.5	11.4	11.8	16.67
78	29.2	12.0	12.4	16.67
79	29.9	11.4	11.8	16.67

80	30.7	12.0	13.2	16.67
81	31.4	11.4	12.6	16.67
82	32.1	12.0	13.2	16.67
83	32.8	11.4	13.4	16.67
84	33.6	12.0	14.0	16.67
85	34.3	11.4	14.3	16.67
86	35.0	12.0	14.9	16.67
87	35.7	11.4	15.1	16.67
88	37.2	11.4	15.1	23.05
89	25.6	12.6	12.3	16.67
90	26.3	13.2	12.9	16.67
91	27.0	12.6	13.1	16.67
92	27.8	13.2	13.7	16.67
93	28.5	12.6	13.1	16.67
94	29.2	13.2	13.7	16.67
95	29.9	12.6	13.0	16.67
96	30.7	13.2	13.6	16.67
97	31.4	12.6	13.8	16.67
98	32.1	13.2	14.5	16.67
99	32.8	12.6	13.8	16.67
100	33.6	13.2	15.3	16.67
101	34.3	12.6	14.6	16.67
102	35.0	13.2	16.1	16.67
103	35.7	12.6	16.4	16.67
104	36.5	13.2	17.0	16.67
105	37.2	12.6	16.4	30.73
106	37.9	13.2	17.0	22.26
107	25.6	13.9	13.5	16.67
108	26.3	14.5	14.1	16.67
109	27.0	13.9	13.5	1.61
110	27.8	14.5	14.9	16.67
111	28.5	13.9	14.3	16.67
112	29.2	14.5	14.9	16.67
113	29.9	13.9	14.3	16.67
114	30.7	14.5	14.9	16.67
115	31.4	13.9	15.1	16.67
116	32.1	14.5	15.7	16.67
117	32.8	13.9	15.1	16.67
118	33.6	14.5	16.5	16.67
119	34.3	13.9	15.9	16.67
120	35.0	14.5	17.4	16.67
121	35.7	13.9	16.7	16.67
122	36.5	14.5	18.2	16.67
123	37.2	13.9	17.6	74.07
124	25.6	15.1	14.8	16.67
125	26.3	15.7	15.4	16.67

126	27.0	15.1	14.8	1.69
127	27.8	15.7	15.4	1.57
128	28.5	15.1	15.5	16.67
129	29.2	15.7	16.2	16.67
130	29.9	15.1	15.5	16.67
131	30.7	15.7	16.1	16.67
132	31.4	15.1	16.3	16.67
133	32.1	15.7	16.9	16.67
134	32.8	15.1	16.3	16.67
135	33.6	15.7	16.9	16.67
136	34.3	15.1	17.1	16.67
137	35.0	15.7	17.8	16.67
138	35.7	15.1	18.0	16.67
139	36.5	15.7	18.6	16.67
140	37.2	15.1	18.8	16.67
141	38.7	15.1	18.8	21.62
142	25.6	16.4	15.9	16.67
143	26.3	17.0	16.6	16.67
144	27.0	16.4	16.0	1.78
145	27.8	17.0	16.6	1.65
146	28.5	16.4	16.8	16.67
147	29.2	17.0	17.4	16.67
148	29.9	16.4	16.8	16.67
149	30.7	17.0	17.4	16.67
150	31.4	16.4	17.6	16.67
151	32.1	17.0	18.2	16.67
152	32.8	16.4	17.6	16.67
153	33.6	17.0	18.2	16.67
154	34.3	16.4	18.4	16.67
155	35.0	17.0	19.0	16.67
156	35.7	16.4	19.2	16.67
157	36.5	17.0	19.8	16.67
158	37.2	16.4	19.2	31.92
159	37.9	17.0	20.7	16.67
160	38.7	16.4	20.1	26.25
161	25.6	17.6	17.0	16.67
162	27.0	17.6	17.2	1.86
163	28.5	17.6	18.0	16.67
164	29.9	17.6	18.0	16.67
165	31.4	17.6	18.8	16.67
166	32.8	17.6	18.8	16.67
167	34.3	17.6	19.6	16.67
168	35.7	17.6	19.6	16.67
169	37.2	17.6	20.5	223.70
170	38.7	17.6	21.3	48.89

1.9 SEZIONE 94

1.9.1 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	24.86 m
Ordinata vertice sinistro inferiore yi	5.18 m
Ascissa vertice destro superiore xs	38.39 m
Ordinata vertice destro superiore ys	16.48 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	2.05
2	3.47	1.88
3	20.5	2.82
4	23.0	2.72
5	27.07	0.0
6	54.93	0.0

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	27.07	0.0
3	54.93	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-9.7
2	27.07	-9.7
3	54.93	-9.7

Vertici strato 3

N	X (m)	y (m)
1	0.0	-10.0
2	27.07	-10.0
3	54.93	-10.0

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	2000	2100.00	rilevato	
2	0.05		29.8	1900	2000	3-G-1	
3	0.05		30.4	1900	2000	3-G-3	
4	0.25		37	2250	2350	G-1	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	0.03	2.29	22.53	1.19005	0.3

Risultati analisi pendio [A2+M2+R2]

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Fs minimo individuato 1.41
Ascissa centro superficie 26.21 m
Ordinata centro superficie 10.83 m
Raggio superficie 10.16 m
xc = 26.212 yc = 10.832 Rc = 10.163 Fs=1.41
Lambda = 0.00

Nr.	B M	Alfa (°)	Li m	Wi (Kg)
1	0.3	36.61	0.38	685.01
2	0.2	34.87	0.24	712.89
3	0.41	32.82	0.49	1656.68
4	0.3	30.45	0.35	1348.89
5	0.3	28.48	0.35	1445.54
6	0.3	26.56	0.34	1534.08
7	0.3	24.66	0.33	1614.94
8	0.3	22.79	0.33	1688.48
9	0.3	20.95	0.32	1151.98
10	0.27	19.23	0.28	798.93
11	0.34	17.43	0.35	991.86
12	0.3	15.54	0.31	818.54
13	0.3	13.77	0.31	743.94
14	0.3	12.02	0.31	663.34
15	0.3	10.27	0.31	576.86
16	0.3	8.54	0.31	484.61
17	0.3	6.81	0.31	386.68
18	0.3	5.09	0.3	283.14
19	0.3	3.38	0.3	174.02
20	0.3	1.66	0.3	59.39

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	-60.4	-158.22	0.0	0.0	503.98	207.69	0.0
2	-115.92	-303.66	-60.4	-158.22	547.28	225.53	0.0
3	-224.63	-588.43	-115.92	-303.66	1329.26	547.79	0.0
4	-293.76	-769.51	-224.63	-588.43	1130.66	465.94	0.0
5	-350.32	-917.66	-293.76	-769.51	1249.6	514.96	0.0
6	-391.76	-1026.2	-350.32	-917.66	1360.78	560.78	0.0
7	-415.75	-1089.04	-391.76	-1026.2	1463.26	603.01	0.0
8	-420.15	-1100.59	-415.75	-1089.04	1556.26	641.33	0.0
9	-408.91	-1071.13	-420.15	-1100.59	1075.88	443.37	0.0
10	-391.66	-1025.94	-408.91	-1071.13	752.96	310.3	0.0
11	-357.59	-936.71	-391.66	-1025.94	940.56	387.61	0.0
12	-318.21	-833.55	-357.59	-936.71	778.31	320.74	0.0
13	-272.48	-713.77	-318.21	-833.55	706.65	291.21	0.0
14	-222.61	-583.13	-272.48	-713.77	627.22	258.48	0.0
15	-171.08	-448.14	-222.61	-583.13	540.98	222.94	0.0
16	-120.7	-316.16	-171.08	-448.14	449.01	185.04	0.0
17	-74.62	-195.47	-120.7	-316.16	352.52	145.27	0.0
18	-36.4	-95.35	-74.62	-195.47	252.83	104.19	0.0
19	-10.03	-26.27	-36.4	-95.35	151.47	62.42	0.0
20	0.0	0.0	-10.03	-26.27	50.1	20.64	0.0

Numero di superfici esaminate....(190)

N°	Xo	Yo	Ro	Fs
1	24.9	5.2	5.4	20.00
2	25.5	5.7	5.9	20.00
3	26.2	5.2	5.3	20.00
4	26.9	5.7	5.9	20.00
5	27.6	5.2	6.1	20.00
6	28.2	5.7	6.7	20.00
7	28.9	5.2	6.1	20.00
8	29.6	5.7	6.6	20.00
9	30.3	5.2	6.9	20.00
10	30.9	5.7	7.4	20.00
11	31.6	5.2	7.7	20.00
12	32.3	5.7	8.3	20.00
13	33.0	5.2	8.6	20.00
14	33.7	5.7	9.1	20.00
15	34.3	5.2	9.4	20.00
16	35.0	5.7	10.0	20.00
17	24.9	6.3	6.5	20.00
18	25.5	6.9	7.1	20.00
19	26.2	6.3	6.5	20.00
20	26.9	6.9	7.0	20.00
21	27.6	6.3	6.4	20.00
22	28.2	6.9	7.8	20.00
23	28.9	6.3	7.2	20.00
24	29.6	6.9	7.8	20.00
25	30.3	6.3	7.2	20.00
26	30.9	6.9	8.6	20.00
27	31.6	6.3	8.0	20.00
28	32.3	6.9	9.4	20.00
29	33.0	6.3	8.8	20.00
30	33.7	6.9	10.2	20.00
31	34.3	6.3	9.7	20.00
32	35.0	6.9	11.1	20.00
33	24.9	7.4	6.8	20.00
34	25.5	8.0	8.2	20.00
35	26.2	7.4	7.6	20.00
36	26.9	8.0	8.1	20.00
37	27.6	7.4	7.6	20.00
38	28.2	8.0	8.1	20.00
39	28.9	7.4	8.3	20.00
40	29.6	8.0	8.9	20.00
41	30.3	7.4	8.3	20.00

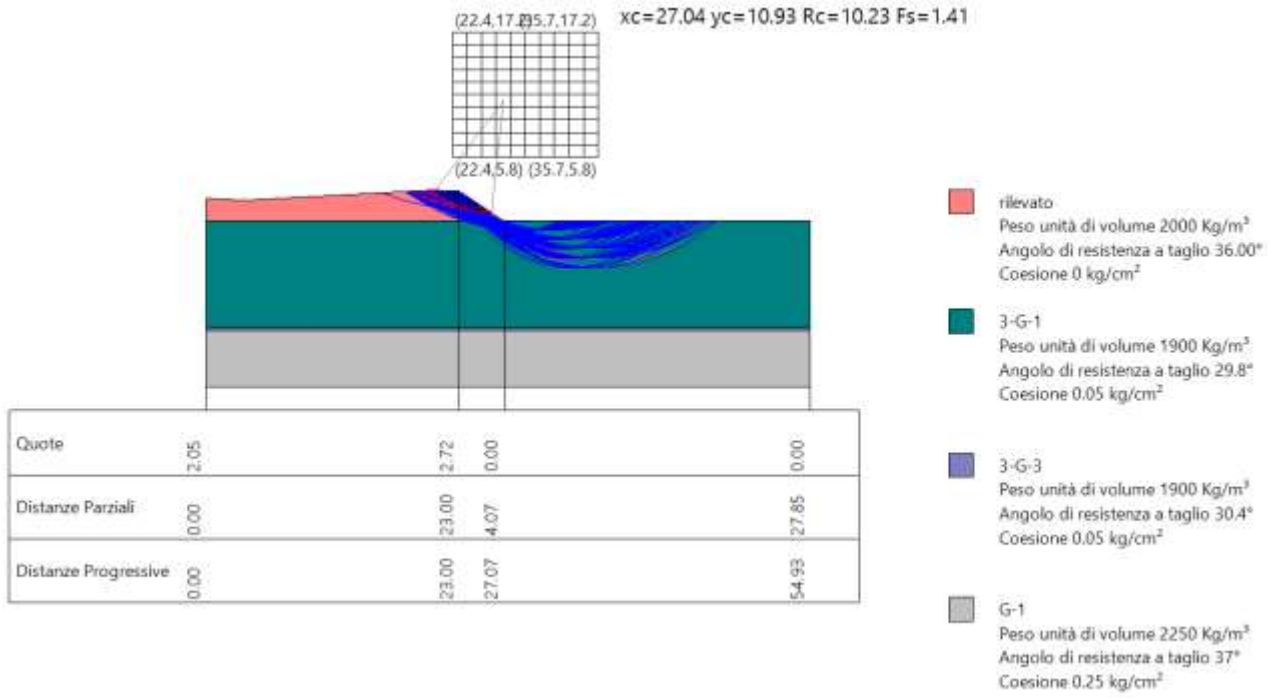
42	30.9	8.0	9.7	20.00
43	31.6	7.4	9.1	20.00
44	32.3	8.0	9.7	20.00
45	33.0	7.4	10.0	20.00
46	33.7	8.0	10.5	20.00
47	34.3	7.4	10.8	20.00
48	35.0	8.0	11.4	20.00
49	24.9	8.6	8.0	20.00
50	25.5	9.1	8.5	20.00
51	26.2	8.6	8.7	20.00
52	26.9	9.1	9.3	20.00
53	27.6	8.6	8.7	20.00
54	28.2	9.1	9.2	20.00
55	28.9	8.6	9.5	20.00
56	29.6	9.1	10.0	20.00
57	30.3	8.6	9.4	20.00
58	30.9	9.1	10.0	20.00
59	31.6	8.6	10.3	20.00
60	32.3	9.1	10.8	20.00
61	33.0	8.6	11.1	20.00
62	33.7	9.1	11.6	20.00
63	34.3	8.6	11.9	20.00
64	35.0	9.1	12.5	20.00
65	36.4	9.1	13.4	20.00
66	24.9	9.7	9.1	20.00
67	25.5	10.3	9.6	20.00
68	26.2	9.7	9.9	20.00
69	26.9	10.3	10.4	20.00
70	27.6	9.7	9.8	20.00
71	28.2	10.3	10.4	20.00
72	28.9	9.7	10.6	20.00
73	29.6	10.3	11.2	20.00
74	30.3	9.7	10.6	20.00
75	30.9	10.3	11.1	20.00
76	31.6	9.7	11.4	20.00
77	32.3	10.3	11.9	20.00
78	33.0	9.7	11.4	20.00
79	33.7	10.3	12.8	20.00
80	34.3	9.7	12.2	20.00
81	35.0	10.3	13.6	20.00
82	35.7	9.7	13.0	20.00
83	24.9	10.8	10.2	20.00
84	25.5	11.4	10.8	20.00
85	26.2	10.8	10.2	1.41
86	26.9	11.4	11.5	20.00
87	27.6	10.8	10.9	20.00

88	28.2	11.4	11.5	20.00
89	28.9	10.8	11.7	20.00
90	29.6	11.4	12.3	20.00
91	30.3	10.8	11.7	20.00
92	30.9	11.4	12.2	20.00
93	31.6	10.8	12.5	20.00
94	32.3	11.4	13.1	20.00
95	33.0	10.8	12.5	20.00
96	33.7	11.4	13.9	20.00
97	34.3	10.8	13.3	20.00
98	35.0	11.4	14.8	20.00
99	35.7	10.8	14.2	20.00
100	36.4	11.4	14.7	20.00
101	37.7	11.4	15.6	20.00
102	24.9	12.0	11.2	20.00
103	25.5	12.5	11.9	20.00
104	26.2	12.0	11.3	1.51
105	26.9	12.5	12.7	20.00
106	27.6	12.0	12.1	20.00
107	28.2	12.5	12.6	20.00
108	28.9	12.0	12.9	20.00
109	29.6	12.5	13.4	20.00
110	30.3	12.0	12.8	20.00
111	30.9	12.5	13.4	20.00
112	31.6	12.0	13.6	20.00
113	32.3	12.5	14.2	20.00
114	33.0	12.0	13.6	20.00
115	33.7	12.5	14.2	20.00
116	34.3	12.0	14.5	20.00
117	35.0	12.5	15.0	20.00
118	35.7	12.0	15.3	20.00
119	36.4	12.5	15.9	20.00
120	37.7	12.5	16.7	20.00
121	24.9	13.1	12.2	20.00
122	25.5	13.7	13.0	20.00
123	26.2	13.1	12.4	1.61
124	26.9	13.7	13.0	1.49
125	27.6	13.1	13.2	20.00
126	28.2	13.7	13.7	20.00
127	28.9	13.1	14.0	20.00
128	29.6	13.7	14.5	20.00
129	30.3	13.1	14.0	20.00
130	30.9	13.7	14.5	20.00
131	31.6	13.1	13.9	20.00
132	32.3	13.7	15.3	20.00
133	33.0	13.1	14.7	20.00

134	33.7	13.7	15.3	20.00
135	34.3	13.1	15.6	20.00
136	35.0	13.7	16.1	20.00
137	35.7	13.1	16.4	20.00
138	36.4	13.7	17.0	20.00
139	37.0	13.1	17.3	20.00
140	24.9	14.2	13.2	20.00
141	25.5	14.8	14.0	20.00
142	26.2	14.2	13.6	1.71
143	26.9	14.8	14.1	1.59
144	27.6	14.2	14.3	20.00
145	28.2	14.8	14.9	20.00
146	28.9	14.2	15.1	20.00
147	29.6	14.8	15.7	20.00
148	30.3	14.2	15.1	20.00
149	30.9	14.8	15.6	20.00
150	31.6	14.2	15.1	20.00
151	32.3	14.8	16.5	20.00
152	33.0	14.2	15.9	20.00
153	33.7	14.8	16.4	20.00
154	34.3	14.2	16.7	20.00
155	35.0	14.8	17.3	20.00
156	35.7	14.2	16.7	20.00
157	36.4	14.8	18.1	20.00
158	37.0	14.2	17.6	20.00
159	37.7	14.8	19.0	20.00
160	24.9	15.4	14.2	20.00
161	25.5	15.9	15.0	2.05
162	26.2	15.4	14.7	1.80
163	26.9	15.9	15.2	1.68
164	27.6	15.4	15.5	20.00
165	28.2	15.9	16.0	20.00
166	28.9	15.4	16.3	20.00
167	29.6	15.9	16.8	20.00
168	30.3	15.4	16.2	20.00
169	30.9	15.9	16.8	20.00
170	31.6	15.4	16.2	20.00
171	32.3	15.9	17.6	20.00
172	33.0	15.4	17.0	20.00
173	33.7	15.9	17.6	20.00
174	34.3	15.4	17.8	20.00
175	35.0	15.9	18.4	20.00
176	35.7	15.4	17.8	20.00
177	36.4	15.9	19.3	20.00
178	37.0	15.4	18.7	20.00
179	37.7	15.9	19.2	20.00

180	38.4	15.4	19.6	20.00
181	24.9	16.5	15.2	20.00
182	26.2	16.5	15.7	1.89
183	27.6	16.5	15.8	1.56
184	28.9	16.5	17.4	20.00
185	30.3	16.5	17.3	20.00
186	31.6	16.5	17.3	20.00
187	33.0	16.5	18.1	20.00
188	34.3	16.5	18.1	20.00
189	35.7	16.5	19.0	20.00
190	37.0	16.5	19.8	20.00

1.9.2 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.2
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	22.4 m
Ordinata vertice sinistro inferiore yi	5.8 m
Ascissa vertice destro superiore xs	35.66 m
Ordinata vertice destro superiore ys	17.21 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

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Coefficiente azione sismica orizzontale 0.032
Coefficiente azione sismica verticale 0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	2.05
2	3.47	1.88
3	20.5	2.82
4	23.0	2.72
5	27.07	0.0
6	54.93	0.0

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	27.07	0.0
3	54.93	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-9.7
2	27.07	-9.7
3	54.93	-9.7

Vertici strato 3

N	X (m)	y (m)
1	0.0	-10.0
2	27.07	-10.0
3	54.93	-10.0

Coefficienti parziali azioni

==========

Sfavorevoli: Permanenti, variabili 1.0 1.0
Favorevoli: Permanenti, variabili 1.0 1.0

==========

Coefficienti parziali per i parametri geotecnici del terreno

==========

Tangente angolo di resistenza al taglio 1.25
Coesione efficace 1.25
Coesione non drenata 1.4
Riduzione parametri geotecnici terreno No

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Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	2000	2100.00	rilevato	
2	0.05		29.8	1900	2000	3-G-1	
3	0.05		30.4	1900	2000	3-G-3	
4	0.25		37	2250	2350	G-1	

Risultati analisi pendio

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Fs minimo individuato	1.41
Ascissa centro superficie	27.04 m
Ordinata centro superficie	10.93 m
Raggio superficie	10.23 m

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xc = 27.038 yc = 10.93 Rc = 10.229 Fs=1.409

Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.26	36.5	0.32	46.39
2	0.26	34.74	0.31	134.53
3	0.26	33.02	0.3	216.81
4	0.26	31.33	0.3	293.57
5	0.26	29.67	0.29	365.1
6	0.26	28.04	0.29	431.68
7	0.26	26.43	0.29	493.52
8	0.26	24.84	0.28	550.84
9	0.13	23.65	0.14	303.06
10	0.38	22.11	0.41	863.2
11	0.26	20.2	0.27	534.97
12	0.26	18.68	0.27	494.07
13	0.26	17.18	0.27	449.35
14	0.26	15.69	0.27	400.89
15	0.26	14.21	0.26	348.8
16	0.26	12.73	0.26	293.13
17	0.26	11.27	0.26	233.96
18	0.26	9.82	0.26	171.34
19	0.26	8.37	0.26	105.32
20	0.26	6.93	0.26	35.94

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	-3.44	-11.77	0.0	0.0	32.77	14.08	0.0
2	-12.29	-42.07	-3.44	-11.77	99.88	42.91	0.0
3	-24.78	-84.78	-12.29	-42.07	168.11	72.23	0.0
4	-39.29	-134.45	-24.78	-84.78	236.47	101.59	0.0
5	-54.41	-186.17	-39.29	-134.45	304.06	130.63	0.0
6	-68.82	-235.5	-54.41	-186.17	370.16	159.03	0.0
7	-81.37	-278.43	-68.82	-235.5	434.12	186.51	0.0
8	-90.99	-311.34	-81.37	-278.43	495.36	212.82	0.0
9	-94.45	-323.19	-90.99	-311.34	276.57	118.82	0.0
10	-97.42	-333.35	-94.45	-323.19	801.08	344.17	0.0
11	-93.89	-321.29	-97.42	-333.35	505.05	216.99	0.0
12	-86.62	-296.38	-93.89	-321.29	471.55	202.59	0.0
13	-76.3	-261.09	-86.62	-296.38	432.5	185.81	0.0
14	-63.76	-218.17	-76.3	-261.09	388.2	166.78	0.0
15	-49.89	-170.71	-63.76	-218.17	339.0	145.65	0.0
16	-35.71	-122.18	-49.89	-170.71	285.29	122.57	0.0
17	-22.33	-76.4	-35.71	-122.18	227.48	97.73	0.0
18	-10.99	-37.61	-22.33	-76.4	166.04	71.34	0.0
19	-3.05	-10.44	-10.99	-37.61	101.47	43.6	0.0
20	0.0	0.0	-3.05	-10.44	34.34	14.75	0.0

Numero di superfici esaminate....(218)

N°	Xo	Yo	Ro	Fs
1	22.4	5.8	4.8	16.67
2	23.1	6.4	5.6	16.67
3	23.7	5.8	5.2	16.67
4	24.4	6.4	5.8	16.67
5	25.0	5.8	5.2	16.67
6	25.7	6.4	6.5	16.67
7	26.4	5.8	5.9	16.67
8	27.0	6.4	6.5	16.67
9	27.7	5.8	5.9	16.67
10	28.4	6.4	7.3	16.67
11	29.0	5.8	6.7	16.67
12	29.7	6.4	7.3	16.67
13	30.4	5.8	7.5	16.67
14	31.0	6.4	8.1	16.67
15	31.7	5.8	8.3	16.67
16	32.3	6.4	9.8	16.67
17	33.0	5.8	10.0	16.67

18	33.7	6.4	10.6	16.67
19	34.3	5.8	10.0	42.56
20	35.0	6.4	10.6	29.44
21	22.4	6.9	5.8	16.67
22	23.1	7.5	6.6	16.67
23	23.7	6.9	6.3	16.67
24	24.4	7.5	6.9	16.67
25	25.0	6.9	6.3	16.67
26	25.7	7.5	6.9	16.67
27	26.4	6.9	7.1	16.67
28	27.0	7.5	7.6	16.67
29	27.7	6.9	7.0	16.67
30	28.4	7.5	8.4	16.67
31	29.0	6.9	7.8	16.67
32	29.7	7.5	8.4	16.67
33	30.4	6.9	7.8	16.67
34	31.0	7.5	9.2	16.67
35	31.7	6.9	9.5	16.67
36	32.3	7.5	10.0	16.67
37	33.0	6.9	10.3	16.67
38	33.7	7.5	10.9	16.67
39	34.3	6.9	11.2	16.67
40	35.7	6.9	11.2	26.28
41	22.4	8.1	6.8	16.67
42	23.1	8.6	7.6	16.67
43	23.7	8.1	7.4	16.67
44	24.4	8.6	8.1	16.67
45	25.0	8.1	7.5	16.67
46	25.7	8.6	8.0	16.67
47	26.4	8.1	8.2	16.67
48	27.0	8.6	8.8	16.67
49	27.7	8.1	8.2	16.67
50	28.4	8.6	9.6	16.67
51	29.0	8.1	9.0	16.67
52	29.7	8.6	9.5	16.67
53	30.4	8.1	8.9	16.67
54	31.0	8.6	10.3	16.67
55	31.7	8.1	9.8	16.67
56	32.3	8.6	11.2	16.67
57	33.0	8.1	11.5	16.67
58	33.7	8.6	12.0	16.67
59	34.3	8.1	11.4	43.88
60	35.0	8.6	12.9	16.67
61	22.4	9.2	7.8	16.67
62	23.1	9.8	8.6	16.67
63	23.7	9.2	8.4	16.67

64	24.4	9.8	9.1	16.67
65	25.0	9.2	8.6	16.67
66	25.7	9.8	9.1	16.67
67	26.4	9.2	8.5	1.44
68	27.0	9.8	9.9	16.67
69	27.7	9.2	9.3	16.67
70	28.4	9.8	9.9	16.67
71	29.0	9.2	10.1	16.67
72	29.7	9.8	10.7	16.67
73	30.4	9.2	10.1	16.67
74	31.0	9.8	10.6	16.67
75	31.7	9.2	10.9	16.67
76	32.3	9.8	11.5	16.67
77	33.0	9.2	11.7	16.67
78	33.7	9.8	13.2	16.67
79	34.3	9.2	12.6	16.67
80	35.0	9.8	13.1	44.51
81	35.7	9.2	13.4	55.15
82	22.4	10.4	8.9	16.67
83	23.1	10.9	9.6	16.67
84	23.7	10.4	9.4	16.67
85	24.4	10.9	10.1	16.67
86	25.0	10.4	9.7	16.67
87	25.7	10.9	10.3	16.67
88	26.4	10.4	9.7	1.55
89	27.0	10.9	10.2	1.41
90	27.7	10.4	10.5	16.67
91	28.4	10.9	11.0	16.67
92	29.0	10.4	11.3	16.67
93	29.7	10.9	11.8	16.67
94	30.4	10.4	11.2	16.67
95	31.0	10.9	11.8	16.67
96	31.7	10.4	12.0	16.67
97	32.3	10.9	12.6	16.67
98	33.0	10.4	12.9	16.67
99	33.7	10.9	13.4	16.67
100	34.3	10.4	13.7	16.67
101	35.0	10.9	14.3	16.67
102	35.7	10.4	13.7	25.61
103	22.4	11.5	9.9	16.67
104	23.1	12.1	10.6	16.67
105	23.7	11.5	10.4	16.67
106	24.4	12.1	11.1	16.67
107	25.0	11.5	10.9	16.67
108	25.7	12.1	11.4	16.67
109	26.4	11.5	10.8	1.65

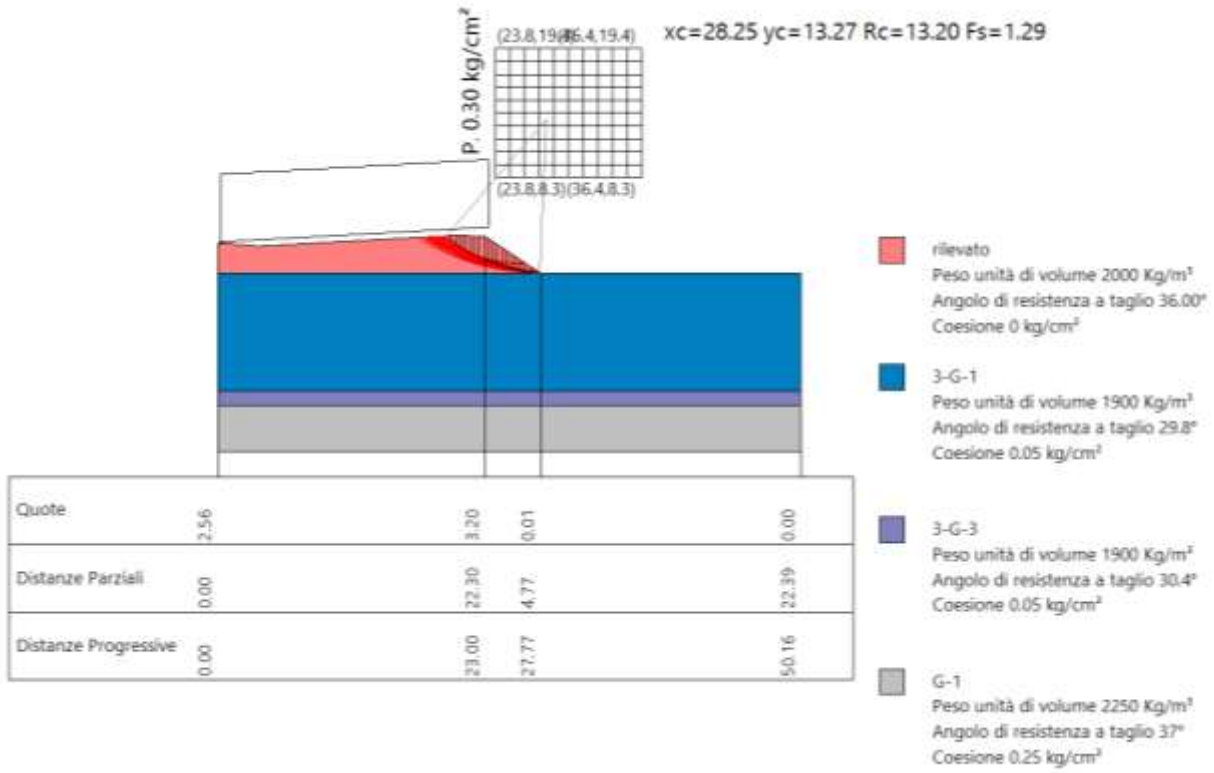
110	27.0	12.1	11.4	1.51
111	27.7	11.5	11.6	16.67
112	28.4	12.1	12.2	16.67
113	29.0	11.5	12.4	16.67
114	29.7	12.1	13.0	16.67
115	30.4	11.5	12.4	16.67
116	31.0	12.1	12.9	16.67
117	31.7	11.5	13.2	16.67
118	32.3	12.1	13.7	16.67
119	33.0	11.5	13.2	16.67
120	33.7	12.1	14.6	16.67
121	34.3	11.5	14.9	16.67
122	35.0	12.1	15.4	16.67
123	35.7	11.5	15.7	16.67
124	22.4	12.6	10.9	16.67
125	23.1	13.2	11.6	16.67
126	23.7	12.6	11.4	16.67
127	24.4	13.2	12.1	16.67
128	25.0	12.6	11.9	16.67
129	25.7	13.2	12.6	16.67
130	26.4	12.6	12.0	1.75
131	27.0	13.2	12.5	1.61
132	27.7	12.6	12.7	16.67
133	28.4	13.2	13.3	16.67
134	29.0	12.6	13.5	16.67
135	29.7	13.2	14.1	16.67
136	30.4	12.6	13.5	16.67
137	31.0	13.2	14.1	16.67
138	31.7	12.6	13.5	16.67
139	32.3	13.2	14.9	16.67
140	33.0	12.6	14.3	16.67
141	33.7	13.2	15.7	16.67
142	34.3	12.6	15.1	16.67
143	35.0	13.2	16.6	16.67
144	35.7	12.6	16.0	16.67
145	22.4	13.8	11.9	16.67
146	23.1	14.4	12.6	16.67
147	23.7	13.8	12.4	16.67
148	24.4	14.4	13.2	16.67
149	25.0	13.8	12.9	16.67
150	25.7	14.4	13.7	16.67
151	26.4	13.8	13.1	1.85
152	27.0	14.4	13.6	1.70
153	27.7	13.8	13.1	1.48
154	28.4	14.4	14.4	16.67
155	29.0	13.8	14.7	16.67

156	29.7	14.4	15.2	16.67
157	30.4	13.8	14.6	16.67
158	31.0	14.4	15.2	16.67
159	31.7	13.8	14.6	16.67
160	32.3	14.4	16.0	16.67
161	33.0	13.8	15.4	16.67
162	33.7	14.4	16.0	16.67
163	34.3	13.8	16.3	16.67
164	35.0	14.4	16.8	16.67
165	35.7	13.8	17.1	16.67
166	22.4	14.9	12.9	16.67
167	23.1	15.5	13.6	16.67
168	23.7	14.9	13.4	16.67
169	24.4	15.5	14.2	16.67
170	25.0	14.9	13.9	16.67
171	25.7	15.5	14.7	2.21
172	26.4	14.9	14.2	1.94
173	27.0	15.5	14.8	1.79
174	27.7	14.9	14.2	1.57
175	28.4	15.5	15.6	16.67
176	29.0	14.9	15.8	16.67
177	29.7	15.5	16.4	16.67
178	30.4	14.9	15.8	16.67
179	31.0	15.5	16.3	16.67
180	31.7	14.9	15.7	16.67
181	32.3	15.5	17.2	16.67
182	33.0	14.9	16.6	16.67
183	33.7	15.5	17.1	16.67
184	34.3	14.9	17.4	16.67
185	35.0	15.5	18.0	16.67
186	35.7	14.9	18.3	16.67
187	22.4	16.1	13.9	16.67
188	23.1	16.6	14.7	16.67
189	23.7	16.1	14.4	16.67
190	24.4	16.6	15.2	16.67
191	25.0	16.1	14.9	16.67
192	25.7	16.6	15.7	2.30
193	26.4	16.1	15.4	2.04
194	27.0	16.6	15.9	1.88
195	27.7	16.1	15.3	1.66
196	28.4	16.6	15.9	1.54
197	29.0	16.1	17.0	16.67
198	29.7	16.6	17.5	16.67
199	30.4	16.1	16.9	16.67
200	31.0	16.6	17.5	16.67
201	31.7	16.1	16.9	16.67

202	32.3	16.6	18.3	16.67
203	33.0	16.1	17.7	16.67
204	33.7	16.6	18.3	16.67
205	34.3	16.1	17.7	16.67
206	35.0	16.6	19.1	16.67
207	35.7	16.1	18.5	16.67
208	22.4	17.2	16.0	16.67
209	23.7	17.2	15.4	16.67
210	25.0	17.2	15.9	2.65
211	26.4	17.2	16.4	2.12
212	27.7	17.2	16.5	1.74
213	29.0	17.2	18.1	16.67
214	30.4	17.2	18.1	16.67
215	31.7	17.2	18.0	16.67
216	33.0	17.2	18.9	16.67
217	34.3	17.2	18.8	16.67
218	35.7	17.2	19.7	16.67

1.10 SEZIONE 110

1.10.1 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	23.84 m
Ordinata vertice sinistro inferiore yi	8.28 m
Ascissa vertice destro superiore xs	36.43 m
Ordinata vertice destro superiore ys	19.38 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	2.56
2	0.7	2.6
3	3.47	2.36
4	20.5	3.3
5	23.0	3.2
6	27.77	0.01
7	50.16	0.0

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	11.9	0.0
3	27.55	0.0
4	50.16	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-10.1
2	26.32	-10.1
3	39.79	-10.1
4	50.16	-10.1

Vertici strato 3

N	X (m)	y (m)
1	0.0	-11.3
2	27.77	-11.3
3	50.16	-11.3

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	2000		rilevato	
2	0.05		29.8	1900		3-G-1	
3	0.05		30.4	1900		3-G-3	
4	0.25		37	2250		G-1	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	0.24	2.73	23.24	3.99859	0.3

Risultati analisi pendio [A2+M2+R2]

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Fs minimo individuato 1.29
Ascissa centro superficie 28.25 m
Ordinata centro superficie 13.27 m
Raggio superficie 13.2 m

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xc = 28.249 yc = 13.274 Rc = 13.202 Fs=1.289
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.4	39.48	0.52	1045.21
2	0.44	37.15	0.55	1800.14
3	0.36	34.99	0.44	1673.51
4	0.4	33.0	0.48	2060.94
5	0.4	30.95	0.47	2248.39
6	0.4	28.95	0.46	2420.4
7	0.4	26.98	0.45	2577.87
8	0.54	24.72	0.59	3694.16
9	0.26	22.81	0.28	1770.75
10	0.4	21.26	0.43	1536.59
11	0.4	19.41	0.42	1441.58
12	0.4	17.57	0.42	1334.96
13	0.4	15.76	0.42	1217.09
14	0.4	13.96	0.41	1088.32
15	0.4	12.18	0.41	948.88
16	0.4	10.4	0.41	799.02
17	0.4	8.64	0.41	638.93
18	0.4	6.89	0.4	468.75
19	0.4	5.14	0.4	288.64
20	0.4	3.39	0.4	98.66

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	-108.19	-254.59	0.0	0.0	728.46	328.54	0.0
2	-267.51	-629.48	-108.19	-254.59	1335.52	602.33	0.0
3	-392.08	-922.6	-267.51	-629.48	1304.97	588.55	0.0
4	-518.31	-1219.64	-392.08	-922.6	1672.43	754.27	0.0
5	-624.89	-1470.44	-518.31	-1219.64	1890.58	852.66	0.0
6	-706.13	-1661.59	-624.89	-1470.44	2096.57	945.56	0.0
7	-756.84	-1780.92	-706.13	-1661.59	2288.39	1032.08	0.0
8	-768.87	-1809.22	-756.84	-1780.92	3354.84	1513.05	0.0
9	-749.42	-1763.45	-768.87	-1809.22	1632.07	736.07	0.0
10	-714.25	-1680.69	-749.42	-1763.45	1429.24	644.59	0.0
11	-660.12	-1553.32	-714.25	-1680.69	1350.93	609.28	0.0
12	-589.96	-1388.23	-660.12	-1553.32	1255.61	566.29	0.0
13	-507.25	-1193.61	-589.96	-1388.23	1144.6	516.22	0.0
14	-416.02	-978.94	-507.25	-1193.61	1019.43	459.77	0.0
15	-320.91	-755.14	-416.02	-978.94	881.77	397.68	0.0
16	-227.22	-534.68	-320.91	-755.14	733.54	330.83	0.0
17	-140.98	-331.74	-227.22	-534.68	576.9	260.18	0.0
18	-69.02	-162.4	-140.98	-331.74	414.23	186.82	0.0
19	-19.09	-44.92	-69.02	-162.4	248.27	111.97	0.0
20	0.0	0.0	-19.09	-44.92	82.09	37.02	0.0

Numero di superfici esaminate....(212)

N°	Xo	Yo	Ro	Fs
1	23.8	8.3	8.3	20.00
2	24.5	8.8	8.9	20.00
3	25.1	8.3	8.3	20.00
4	25.7	8.8	8.8	20.00
5	26.4	8.3	9.1	20.00
6	27.0	8.8	9.6	20.00
7	27.6	8.3	9.0	20.00
8	28.2	8.8	9.6	20.00
9	28.9	8.3	9.0	20.00
10	29.5	8.8	9.5	20.00
11	30.1	8.3	9.0	20.00
12	30.8	8.8	9.5	20.00
13	31.4	8.3	9.8	20.00
14	32.0	8.8	10.3	20.00
15	32.7	8.3	9.8	20.00

16	33.3	8.8	11.1	20.00
17	33.9	8.3	10.6	20.00
18	34.5	8.8	11.1	20.00
19	35.8	8.8	12.0	20.00
20	23.8	9.4	8.7	20.00
21	24.5	9.9	9.2	20.00
22	25.1	9.4	9.4	20.00
23	25.7	9.9	9.9	20.00
24	26.4	9.4	9.4	20.00
25	27.0	9.9	9.9	20.00
26	27.6	9.4	10.1	20.00
27	28.2	9.9	10.7	20.00
28	28.9	9.4	10.1	20.00
29	29.5	9.9	10.7	20.00
30	30.1	9.4	10.1	20.00
31	30.8	9.9	10.6	20.00
32	31.4	9.4	10.1	20.00
33	32.0	9.9	11.4	20.00
34	32.7	9.4	10.9	20.00
35	33.3	9.9	11.4	20.00
36	33.9	9.4	11.7	20.00
37	34.5	9.9	12.2	20.00
38	35.2	9.4	12.5	20.00
39	23.8	10.5	9.7	20.00
40	24.5	11.1	10.3	20.00
41	25.1	10.5	10.5	20.00
42	25.7	11.1	11.1	20.00
43	26.4	10.5	10.5	20.00
44	27.0	11.1	11.0	20.00
45	27.6	10.5	11.3	20.00
46	28.2	11.1	11.8	20.00
47	28.9	10.5	11.2	20.00
48	29.5	11.1	11.8	20.00
49	30.1	10.5	11.2	20.00
50	30.8	11.1	11.7	20.00
51	31.4	10.5	11.2	20.00
52	32.0	11.1	12.5	20.00
53	32.7	10.5	12.0	20.00
54	33.3	11.1	12.5	20.00
55	33.9	10.5	12.8	20.00
56	34.5	11.1	13.3	20.00
57	23.8	11.6	10.7	20.00
58	24.5	12.2	11.4	20.00
59	25.1	11.6	10.8	20.00
60	25.7	12.2	12.2	20.00
61	26.4	11.6	11.6	20.00

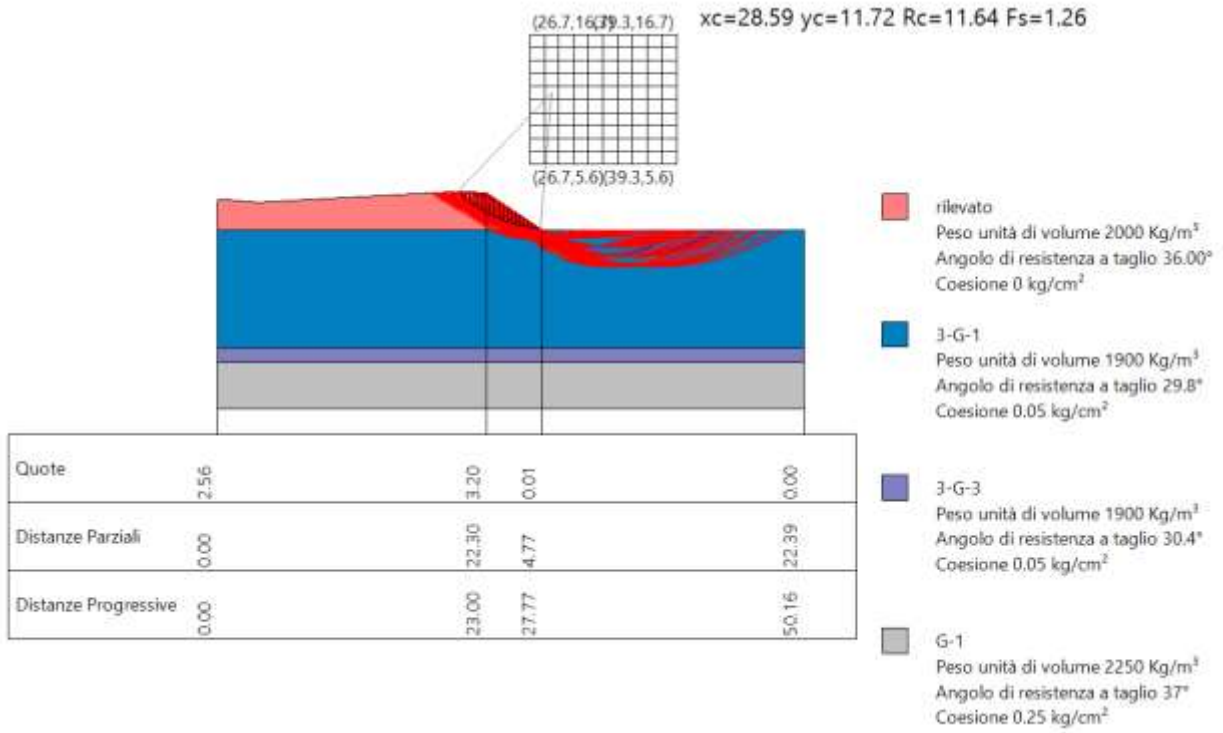
62	27.0	12.2	12.1	20.00
63	27.6	11.6	11.6	1.29
64	28.2	12.2	12.9	20.00
65	28.9	11.6	12.3	20.00
66	29.5	12.2	12.9	20.00
67	30.1	11.6	12.3	20.00
68	30.8	12.2	12.8	20.00
69	31.4	11.6	12.3	20.00
70	32.0	12.2	13.7	20.00
71	32.7	11.6	13.1	20.00
72	33.3	12.2	13.6	20.00
73	33.9	11.6	13.9	20.00
74	34.5	12.2	14.5	20.00
75	35.2	11.6	13.9	20.00
76	35.8	12.2	15.3	20.00
77	36.4	11.6	14.7	20.00
78	23.8	12.7	11.7	20.00
79	24.5	13.3	12.4	20.00
80	25.1	12.7	11.9	20.00
81	25.7	13.3	12.5	20.00
82	26.4	12.7	12.7	20.00
83	27.0	13.3	13.2	20.00
84	27.6	12.7	12.7	1.37
85	28.2	13.3	13.2	1.29
86	28.9	12.7	13.4	20.00
87	29.5	13.3	14.0	20.00
88	30.1	12.7	13.4	20.00
89	30.8	13.3	14.0	20.00
90	31.4	12.7	13.4	20.00
91	32.0	13.3	13.9	20.00
92	32.7	12.7	14.2	20.00
93	33.3	13.3	14.7	20.00
94	33.9	12.7	14.2	20.00
95	34.5	13.3	15.6	20.00
96	35.2	12.7	15.0	20.00
97	35.8	13.3	15.6	20.00
98	23.8	13.8	12.7	20.00
99	24.5	14.4	13.4	20.00
100	25.1	13.8	13.0	20.00
101	25.7	14.4	13.6	20.00
102	26.4	13.8	13.8	20.00
103	27.0	14.4	14.3	20.00
104	27.6	13.8	13.8	1.45
105	28.2	14.4	14.3	1.36
106	28.9	13.8	14.6	20.00
107	29.5	14.4	15.1	20.00

108	30.1	13.8	14.5	20.00
109	30.8	14.4	15.1	20.00
110	31.4	13.8	14.5	20.00
111	32.0	14.4	15.0	20.00
112	32.7	13.8	15.3	20.00
113	33.3	14.4	15.9	20.00
114	33.9	13.8	15.3	20.00
115	34.5	14.4	16.7	20.00
116	35.2	13.8	16.1	20.00
117	35.8	14.4	16.7	20.00
118	36.4	13.8	17.0	20.00
119	23.8	14.9	13.7	20.00
120	24.5	15.5	14.4	20.00
121	25.1	14.9	14.1	20.00
122	25.7	15.5	14.7	20.00
123	26.4	14.9	14.1	1.74
124	27.0	15.5	15.5	20.00
125	27.6	14.9	14.9	1.52
126	28.2	15.5	15.4	1.44
127	28.9	14.9	15.7	20.00
128	29.5	15.5	16.2	20.00
129	30.1	14.9	15.6	20.00
130	30.8	15.5	16.2	20.00
131	31.4	14.9	15.6	20.00
132	32.0	15.5	16.1	20.00
133	32.7	14.9	16.4	20.00
134	33.3	15.5	17.0	20.00
135	33.9	14.9	16.4	20.00
136	34.5	15.5	16.9	20.00
137	35.2	14.9	17.2	20.00
138	35.8	15.5	17.8	20.00
139	23.8	16.0	14.7	20.00
140	24.5	16.6	15.4	20.00
141	25.1	16.0	15.1	20.00
142	25.7	16.6	15.8	20.00
143	26.4	16.0	15.2	1.83
144	27.0	16.6	16.6	20.00
145	27.6	16.0	16.0	1.60
146	28.2	16.6	16.5	1.51
147	28.9	16.0	16.0	1.36
148	29.5	16.6	17.3	20.00
149	30.1	16.0	16.7	20.00
150	30.8	16.6	17.3	20.00
151	31.4	16.0	16.7	20.00
152	32.0	16.6	17.3	20.00
153	32.7	16.0	17.5	20.00

154	33.3	16.6	18.1	20.00
155	33.9	16.0	17.5	20.00
156	34.5	16.6	18.1	20.00
157	35.2	16.0	18.3	20.00
158	35.8	16.6	18.9	20.00
159	36.4	16.0	18.3	20.00
160	23.8	17.2	15.7	20.00
161	24.5	17.7	16.4	20.00
162	25.1	17.2	16.1	20.00
163	25.7	17.7	16.8	20.00
164	26.4	17.2	16.3	1.92
165	27.0	17.7	16.9	1.80
166	27.6	17.2	17.1	1.67
167	28.2	17.7	17.6	1.58
168	28.9	17.2	17.1	1.43
169	29.5	17.7	18.4	20.00
170	30.1	17.2	17.9	20.00
171	30.8	17.7	18.4	20.00
172	31.4	17.2	17.8	20.00
173	32.0	17.7	18.4	20.00
174	32.7	17.2	18.6	20.00
175	33.3	17.7	19.2	20.00
176	33.9	17.2	18.6	20.00
177	34.5	17.7	19.2	20.00
178	35.2	17.2	19.4	20.00
179	35.8	17.7	20.0	20.00
180	36.4	17.2	19.4	20.00
181	23.8	18.3	16.7	20.00
182	24.5	18.8	17.4	20.00
183	25.1	18.3	17.1	20.00
184	25.7	18.8	17.8	20.00
185	26.4	18.3	17.4	2.00
186	27.0	18.8	18.0	1.88
187	27.6	18.3	18.2	1.74
188	28.2	18.8	18.7	1.65
189	28.9	18.3	18.2	1.50
190	29.5	18.8	18.7	1.43
191	30.1	18.3	19.0	20.00
192	30.8	18.8	19.5	20.00
193	31.4	18.3	18.9	20.00
194	32.0	18.8	19.5	20.00
195	32.7	18.3	18.9	20.00
196	33.3	18.8	20.3	20.00
197	33.9	18.3	19.7	20.00
198	34.5	18.8	20.3	20.00
199	35.2	18.3	19.7	20.00

200	35.8	18.8	21.1	20.00
201	36.4	18.3	20.5	20.00
202	23.8	19.4	17.7	20.00
203	25.1	19.4	18.1	20.00
204	26.4	19.4	18.5	2.09
205	27.6	19.4	19.3	1.81
206	28.9	19.4	19.3	1.57
207	30.1	19.4	20.1	20.00
208	31.4	19.4	20.0	20.00
209	32.7	19.4	20.0	20.00
210	33.9	19.4	20.8	20.00
211	35.2	19.4	20.8	20.00
212	36.4	19.4	21.7	20.00

1.10.2 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.2
Analisi	Condizione drenata
Superficie di forma circolare	

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	26.7 m
Ordinata vertice sinistro inferiore yi	5.62 m
Ascissa vertice destro superiore xs	39.29 m
Ordinata vertice destro superiore ys	16.72 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

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Coefficiente azione sismica orizzontale 0.032
Coefficiente azione sismica verticale 0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	2.56
2	0.7	2.6
3	3.47	2.36
4	20.5	3.3
5	23.0	3.2
6	27.77	0.01
7	50.16	0.0

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	11.9	0.0
3	27.55	0.0
4	50.16	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-10.1
2	26.32	-10.1
3	39.79	-10.1
4	50.16	-10.1

Vertici strato 3

N	X (m)	y (m)
1	0.0	-11.3
2	27.77	-11.3
3	50.16	-11.3

Coefficienti parziali azioni

==========

Sfavorevoli: Permanenti, variabili 1.0 1.0
Favorevoli: Permanenti, variabili 1.0 1.0

==========

Coefficienti parziali per i parametri geotecnici del terreno

==========

Tangente angolo di resistenza al taglio 1.25
Coesione efficace 1.25

Coesione non drenata 1.4
Riduzione parametri geotecnici terreno No
==========

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	2000		rilevato	
2	0.05		29.8	1900		3-G-1	
3	0.05		30.4	1900		3-G-3	
4	0.25		37	2250		G-1	

Risultati analisi pendio
==========

Fs minimo individuato 1.26
Ascissa centro superficie 28.59 m
Ordinata centro superficie 11.72 m
Raggio superficie 11.64 m
xc = 28.589 yc = 11.724 Rc = 11.644 Fs=1.262
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.35	42.44	0.48	111.23
2	0.35	40.13	0.46	319.84
3	0.35	37.89	0.45	511.56
4	0.35	35.73	0.43	687.9
5	0.35	33.61	0.42	850.12
6	0.35	31.55	0.41	999.26
7	0.33	29.61	0.38	1046.69
8	0.38	27.63	0.43	1261.09
9	0.35	25.62	0.39	1130.59
10	0.35	23.7	0.39	1078.88
11	0.35	21.82	0.38	1017.34
12	0.35	19.96	0.38	946.38
13	0.35	18.13	0.37	866.31
14	0.35	16.31	0.37	777.45
15	0.35	14.51	0.36	680.05
16	0.35	12.72	0.36	574.34
17	0.35	10.94	0.36	460.49
18	0.35	9.18	0.36	338.66
19	0.35	7.43	0.36	208.99
20	0.35	5.68	0.35	71.58

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	-12.14	-34.05	0.0	0.0	66.97	32.12	0.0
2	-42.92	-120.42	-12.14	-34.05	209.73	100.58	0.0
3	-85.74	-240.55	-42.92	-120.42	360.1	172.7	0.0
4	-134.85	-378.35	-85.74	-240.55	513.95	246.48	0.0
5	-185.25	-519.74	-134.85	-378.35	667.94	320.33	0.0
6	-232.48	-652.27	-185.25	-519.74	819.34	392.94	0.0
7	-269.92	-757.29	-232.48	-652.27	888.67	426.19	0.0
8	-299.95	-841.57	-269.92	-757.29	1103.94	529.43	0.0
9	-312.81	-877.63	-299.95	-841.57	1016.14	487.32	0.0
10	-312.03	-875.45	-312.81	-877.63	989.94	474.76	0.0
11	-298.85	-838.48	-312.03	-875.45	948.97	455.1	0.0
12	-274.84	-771.11	-298.85	-838.48	893.84	428.67	0.0
13	-241.9	-678.68	-274.84	-771.11	825.31	395.8	0.0
14	-202.28	-567.52	-241.9	-678.68	744.31	356.95	0.0
15	-158.59	-444.94	-202.28	-567.52	651.86	312.62	0.0
16	-113.84	-319.41	-158.59	-444.94	549.15	263.36	0.0
17	-71.47	-200.51	-113.84	-319.41	437.51	209.82	0.0
18	-35.34	-99.16	-71.47	-200.51	318.45	152.72	0.0
19	-9.87	-27.68	-35.34	-99.16	193.67	92.88	0.0
20	0.0	0.0	-9.87	-27.68	65.07	31.2	0.0

Numero di superfici esaminate....(161)

N°	Xo	Yo	Ro	Fs
1	26.7	5.6	6.4	16.67
2	27.3	6.2	6.9	16.67
3	28.0	5.6	6.4	16.67
4	28.6	6.2	6.9	16.67
5	29.2	5.6	6.3	16.67
6	29.8	6.2	6.9	16.67
7	30.5	5.6	6.3	16.67
8	31.1	6.2	7.7	16.67
9	31.7	5.6	7.9	16.67
10	32.4	6.2	8.5	16.67
11	33.0	5.6	8.8	16.67
12	33.6	6.2	9.3	381.65
13	26.7	6.7	7.5	16.67
14	27.3	7.3	8.0	16.67

15	28.0	6.7	7.5	16.67
16	28.6	7.3	8.0	16.67
17	29.2	6.7	7.5	16.67
18	29.8	7.3	8.0	16.67
19	30.5	6.7	7.4	16.67
20	31.1	7.3	8.8	16.67
21	31.7	6.7	8.2	16.67
22	32.4	7.3	9.6	16.67
23	33.0	6.7	9.0	269.96
24	33.6	7.3	10.4	16.67
25	34.3	6.7	9.9	43.85
26	34.9	7.3	10.4	27.36
27	26.7	7.8	7.8	16.67
28	27.3	8.4	9.2	16.67
29	28.0	7.8	8.6	16.67
30	28.6	8.4	9.1	16.67
31	29.2	7.8	8.6	16.67
32	29.8	8.4	9.1	16.67
33	30.5	7.8	8.5	16.67
34	31.1	8.4	9.1	16.67
35	31.7	7.8	9.3	16.67
36	32.4	8.4	9.9	16.67
37	33.0	7.8	10.2	16.67
38	33.6	8.4	11.5	16.67
39	34.3	7.8	11.0	16.67
40	26.7	8.9	8.9	16.67
41	27.3	9.5	9.5	16.67
42	28.0	8.9	9.7	16.67
43	28.6	9.5	10.2	16.67
44	29.2	8.9	9.7	16.67
45	29.8	9.5	10.2	16.67
46	30.5	8.9	9.6	16.67
47	31.1	9.5	10.2	16.67
48	31.7	8.9	10.4	16.67
49	32.4	9.5	11.0	16.67
50	33.0	8.9	11.3	16.67
51	33.6	9.5	11.8	16.67
52	34.3	8.9	11.2	30.91
53	34.9	9.5	12.6	16.67
54	26.7	10.1	10.0	16.67
55	27.3	10.6	10.6	16.67
56	28.0	10.1	10.0	1.27
57	28.6	10.6	11.3	16.67
58	29.2	10.1	10.8	16.67
59	29.8	10.6	11.3	16.67
60	30.5	10.1	10.8	16.67

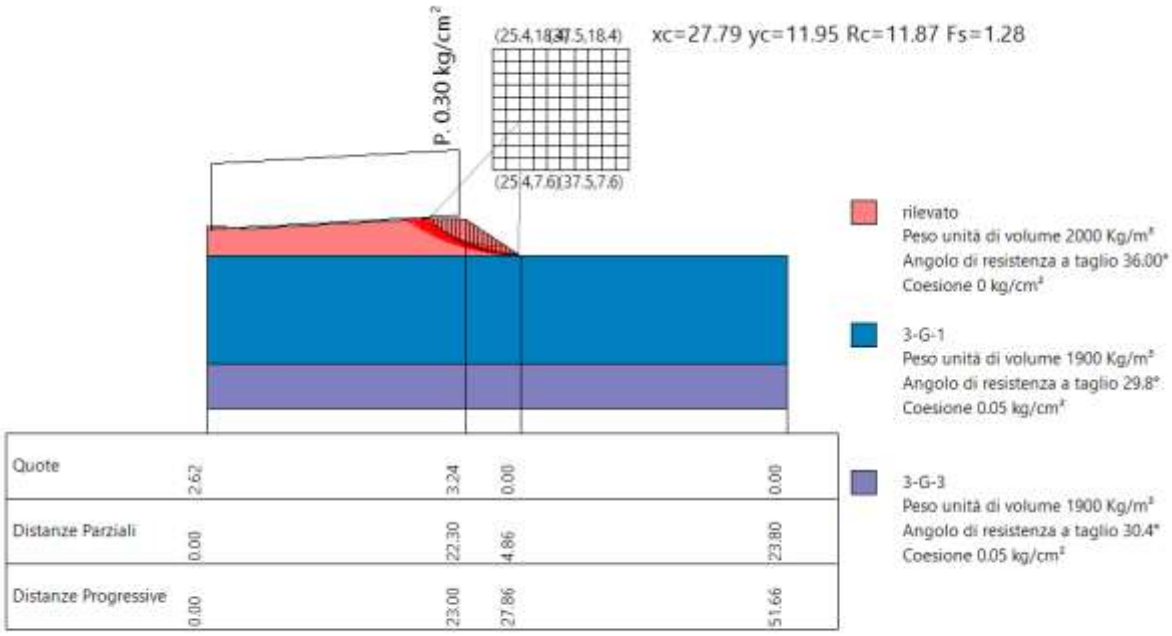
61	31.1	10.6	11.3	16.67
62	31.7	10.1	11.6	16.67
63	32.4	10.6	12.1	16.67
64	33.0	10.1	11.5	16.67
65	33.6	10.6	12.9	16.67
66	34.3	10.1	13.2	16.67
67	34.9	10.6	13.8	16.67
68	35.5	10.1	13.2	50.48
69	36.1	10.6	13.7	27.17
70	26.7	11.2	11.1	16.67
71	27.3	11.7	11.7	16.67
72	28.0	11.2	11.1	1.35
73	28.6	11.7	11.6	1.26
74	29.2	11.2	11.9	16.67
75	29.8	11.7	12.4	16.67
76	30.5	11.2	11.9	16.67
77	31.1	11.7	12.4	16.67
78	31.7	11.2	12.7	16.67
79	32.4	11.7	13.2	16.67
80	33.0	11.2	12.6	16.67
81	33.6	11.7	14.0	16.67
82	34.3	11.2	13.5	16.67
83	34.9	11.7	14.0	82.54
84	26.7	12.3	12.3	16.67
85	27.3	12.8	12.8	16.67
86	28.0	12.3	12.2	1.43
87	28.6	12.8	12.8	1.34
88	29.2	12.3	13.0	16.67
89	29.8	12.8	13.5	16.67
90	30.5	12.3	13.0	16.67
91	31.1	12.8	13.5	16.67
92	31.7	12.3	12.9	16.67
93	32.4	12.8	14.3	16.67
94	33.0	12.3	13.8	16.67
95	33.6	12.8	14.3	16.67
96	34.3	12.3	14.6	16.67
97	34.9	12.8	15.1	16.67
98	35.5	12.3	15.4	16.67
99	36.1	12.8	16.0	16.67
100	36.8	12.3	15.4	25.90
101	26.7	13.4	12.6	1.72
102	27.3	13.9	13.9	16.67
103	28.0	13.4	13.3	1.50
104	28.6	13.9	13.9	1.41
105	29.2	13.4	14.1	16.67
106	29.8	13.9	14.6	16.67

107	30.5	13.4	14.1	16.67
108	31.1	13.9	14.6	16.67
109	31.7	13.4	14.1	16.67
110	32.4	13.9	15.4	16.67
111	33.0	13.4	14.9	16.67
112	33.6	13.9	15.4	16.67
113	34.3	13.4	15.7	16.67
114	34.9	13.9	16.2	16.67
115	35.5	13.4	16.5	16.67
116	36.1	13.9	17.1	16.67
117	36.8	13.4	16.5	42.64
118	26.7	14.5	13.7	1.80
119	27.3	15.1	14.2	1.67
120	28.0	14.5	14.4	1.58
121	28.6	15.1	15.0	1.48
122	29.2	14.5	14.4	1.33
123	29.8	15.1	15.8	16.67
124	30.5	14.5	15.2	16.67
125	31.1	15.1	15.7	16.67
126	31.7	14.5	15.2	16.67
127	32.4	15.1	16.5	16.67
128	33.0	14.5	16.0	16.67
129	33.6	15.1	16.5	16.67
130	34.3	14.5	16.0	16.67
131	34.9	15.1	17.3	16.67
132	35.5	14.5	16.8	16.67
133	36.1	15.1	18.2	16.67
134	37.4	15.1	18.2	37.40
135	26.7	15.6	14.8	1.89
136	27.3	16.2	15.3	1.76
137	28.0	15.6	15.5	1.65
138	28.6	16.2	16.1	1.55
139	29.2	15.6	15.5	1.40
140	29.8	16.2	16.0	1.32
141	30.5	15.6	16.3	16.67
142	31.1	16.2	16.8	16.67
143	31.7	15.6	16.3	16.67
144	32.4	16.2	16.8	16.67
145	33.0	15.6	17.1	16.67
146	33.6	16.2	17.6	16.67
147	34.3	15.6	17.1	16.67
148	34.9	16.2	18.5	16.67
149	35.5	15.6	17.9	16.67
150	36.1	16.2	18.4	16.67
151	38.0	15.6	18.7	22.48
152	26.7	16.7	15.9	1.97

153	28.0	16.7	16.7	1.72
154	29.2	16.7	16.6	1.46
155	30.5	16.7	17.4	16.67
156	31.7	16.7	17.4	16.67
157	33.0	16.7	18.2	16.67
158	34.3	16.7	18.2	16.67
159	35.5	16.7	19.0	16.67
160	36.8	16.7	19.8	16.67
161	38.0	16.7	19.8	28.96

1.11 SEZIONE 128

1.11.1 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	3.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	25.35 m
Ordinata vertice sinistro inferiore yi	7.64 m
Ascissa vertice destro superiore xs	37.53 m
Ordinata vertice destro superiore ys	18.41 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	2.62
2	0.7	2.66
3	3.55	2.41
4	20.5	3.34
5	23.0	3.24
6	27.86	0.0
7	51.66	0.0

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	23.0	0.0
3	27.86	0.0
4	51.66	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-9.6
2	23.0	-9.6
3	27.86	-9.6
4	51.66	-9.6

Coefficienti parziali azioni

==========

Sfavorevoli: Permanenti, variabili 1.0 1.0
Favorevoli: Permanenti, variabili 1.0 1.0

==========

Coefficienti parziali per i parametri geotecnici del terreno

==========

Tangente angolo di resistenza al taglio 1.25
Coesione efficace 1.25
Coesione non drenata 1.4
Riduzione parametri geotecnici terreno Si

==========

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	2000		rilevato	
2	0.05		29.8	1900		3-G-1	
3	0.05		30.4	1900		3-G-3	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	0.35	2.39	22.35	3.603426	0.3

Risultati analisi pendio [A2+M2+R2]

==========

Fs minimo individuato	1.28
Ascissa centro superficie	27.79 m
Ordinata centro superficie	11.95 m
Raggio superficie	11.87 m

==========

xc = 27.79 yc = 11.949 Rc = 11.867 Fs=1.285

Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.4	41.88	0.54	1068.99
2	0.43	39.24	0.55	1774.44
3	0.38	36.76	0.47	1816.64
4	0.4	34.43	0.49	2145.58
5	0.4	32.1	0.48	2346.19
6	0.4	29.83	0.47	2528.57
7	0.4	27.61	0.46	2262.84
8	0.51	25.16	0.56	2071.04
9	0.3	23.02	0.33	1272.41
10	0.4	21.18	0.43	1633.07
11	0.4	19.11	0.43	1535.39
12	0.4	17.06	0.42	1424.59
13	0.4	15.03	0.42	1301.09
14	0.4	13.02	0.41	1165.3
15	0.4	11.03	0.41	1017.53
16	0.4	9.05	0.41	858.04
17	0.4	7.08	0.41	687.04
18	0.4	5.12	0.41	504.71
19	0.4	3.17	0.4	311.17
20	0.4	1.22	0.4	106.49

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	-127.38	-297.52	0.0	0.0	692.19	313.14	0.0
2	-308.77	-721.2	-127.38	-297.52	1246.91	564.1	0.0
3	-465.27	-1086.73	-308.77	-721.2	1362.05	616.19	0.0
4	-617.2	-1441.59	-465.27	-1086.73	1694.27	766.48	0.0
5	-746.55	-1743.72	-617.2	-1441.59	1936.45	876.04	0.0
6	-846.45	-1977.05	-746.55	-1743.72	2164.16	979.05	0.0
7	-900.41	-2103.09	-846.45	-1977.05	1994.61	902.35	0.0
8	-912.95	-2132.38	-900.41	-2103.09	1873.49	847.56	0.0
9	-900.24	-2102.68	-912.95	-2132.38	1171.01	529.76	0.0
10	-860.73	-2010.42	-900.24	-2102.68	1519.22	687.29	0.0
11	-798.06	-1864.03	-860.73	-2010.42	1439.5	651.22	0.0
12	-715.59	-1671.41	-798.06	-1864.03	1339.58	606.02	0.0
13	-617.36	-1441.97	-715.59	-1671.41	1221.21	552.47	0.0
14	-508.12	-1186.82	-617.36	-1441.97	1086.39	491.48	0.0
15	-393.42	-918.91	-508.12	-1186.82	937.4	424.08	0.0
16	-279.66	-653.19	-393.42	-918.91	776.81	351.43	0.0
17	-174.24	-406.98	-279.66	-653.19	607.55	274.85	0.0
18	-85.69	-200.14	-174.24	-406.98	432.96	195.87	0.0
19	-23.83	-55.65	-85.69	-200.14	256.91	116.23	0.0
20	0.0	0.0	-23.83	-55.65	83.83	37.93	0.0

Numero di superfici esaminate....(198)

N°	Xo	Yo	Ro	Fs
1	25.4	7.6	7.6	20.00
2	26.0	8.2	8.2	20.00
3	26.6	7.6	8.4	20.00
4	27.2	8.2	8.9	20.00
5	27.8	7.6	8.4	20.00
6	28.4	8.2	8.9	20.00
7	29.0	7.6	8.4	20.00
8	29.6	8.2	8.9	20.00
9	30.2	7.6	8.3	20.00
10	30.8	8.2	8.9	20.00
11	31.4	7.6	9.1	20.00
12	32.1	8.2	9.7	20.00
13	32.7	7.6	9.1	20.00
14	33.3	8.2	10.5	20.00
15	33.9	7.6	9.9	20.00
16	34.5	8.2	11.3	20.00
17	25.4	8.7	8.7	20.00
18	26.0	9.3	9.2	20.00

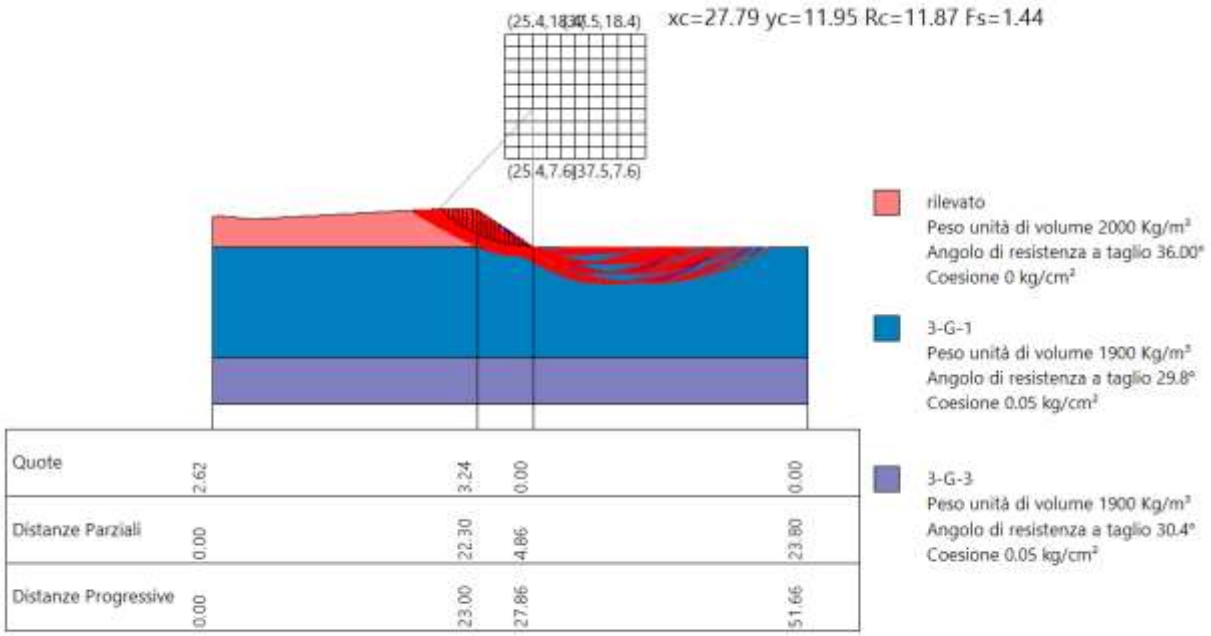
19	26.6	8.7	9.5	20.00
20	27.2	9.3	10.0	20.00
21	27.8	8.7	9.5	20.00
22	28.4	9.3	10.0	20.00
23	29.0	8.7	9.4	20.00
24	29.6	9.3	10.0	20.00
25	30.2	8.7	9.4	20.00
26	30.8	9.3	9.9	20.00
27	31.4	8.7	10.2	20.00
28	32.1	9.3	10.7	20.00
29	32.7	8.7	10.2	20.00
30	33.3	9.3	11.6	20.00
31	33.9	8.7	11.0	20.00
32	34.5	9.3	11.6	20.00
33	35.7	9.3	12.4	20.00
34	25.4	9.8	9.8	20.00
35	26.0	10.3	10.3	20.00
36	26.6	9.8	9.8	20.00
37	27.2	10.3	10.3	20.00
38	27.8	9.8	10.5	20.00
39	28.4	10.3	11.1	20.00
40	29.0	9.8	10.5	20.00
41	29.6	10.3	11.0	20.00
42	30.2	9.8	10.5	20.00
43	30.8	10.3	11.0	20.00
44	31.4	9.8	10.5	20.00
45	32.1	10.3	11.8	20.00
46	32.7	9.8	11.3	20.00
47	33.3	10.3	11.8	20.00
48	33.9	9.8	12.1	20.00
49	34.5	10.3	12.6	20.00
50	35.1	9.8	12.9	20.00
51	35.7	10.3	13.5	20.00
52	25.4	10.9	10.9	20.00
53	26.0	11.4	11.4	20.00
54	26.6	10.9	10.8	20.00
55	27.2	11.4	11.3	20.00
56	27.8	10.9	11.6	20.00
57	28.4	11.4	12.1	20.00
58	29.0	10.9	11.6	20.00
59	29.6	11.4	12.1	20.00
60	30.2	10.9	11.6	20.00
61	30.8	11.4	12.1	20.00
62	31.4	10.9	11.5	20.00
63	32.1	11.4	12.9	20.00
64	32.7	10.9	12.3	20.00

65	33.3	11.4	12.9	20.00
66	33.9	10.9	13.2	20.00
67	34.5	11.4	13.7	20.00
68	35.1	10.9	13.2	20.00
69	25.4	11.9	11.1	20.00
70	26.0	12.5	12.5	20.00
71	26.6	11.9	11.9	20.00
72	27.2	12.5	12.4	20.00
73	27.8	11.9	11.9	1.28
74	28.4	12.5	13.2	20.00
75	29.0	11.9	12.7	20.00
76	29.6	12.5	13.2	20.00
77	30.2	11.9	12.6	20.00
78	30.8	12.5	13.2	20.00
79	31.4	11.9	12.6	20.00
80	32.1	12.5	14.0	20.00
81	32.7	11.9	13.4	20.00
82	33.3	12.5	13.9	20.00
83	33.9	11.9	13.4	20.00
84	34.5	12.5	14.8	20.00
85	35.1	11.9	14.2	20.00
86	35.7	12.5	14.8	20.00
87	36.9	12.5	15.6	20.00
88	25.4	13.0	12.2	20.00
89	26.0	13.6	12.7	20.00
90	26.6	13.0	13.0	20.00
91	27.2	13.6	13.5	20.00
92	27.8	13.0	12.9	1.36
93	28.4	13.6	14.3	20.00
94	29.0	13.0	13.7	20.00
95	29.6	13.6	14.3	20.00
96	30.2	13.0	13.7	20.00
97	30.8	13.6	14.2	20.00
98	31.4	13.0	13.7	20.00
99	32.1	13.6	14.2	20.00
100	32.7	13.0	14.5	20.00
101	33.3	13.6	15.0	20.00
102	33.9	13.0	14.5	20.00
103	34.5	13.6	15.9	20.00
104	35.1	13.0	15.3	20.00
105	35.7	13.6	15.8	20.00
106	36.3	13.0	16.2	20.00
107	36.9	13.6	16.7	20.00
108	25.4	14.1	13.3	20.00
109	26.0	14.6	13.8	20.00
110	26.6	14.1	14.1	20.00

111	27.2	14.6	14.6	20.00
112	27.8	14.1	14.0	1.42
113	28.4	14.6	14.5	1.35
114	29.0	14.1	14.8	20.00
115	29.6	14.6	15.3	20.00
116	30.2	14.1	14.8	20.00
117	30.8	14.6	15.3	20.00
118	31.4	14.1	14.8	20.00
119	32.1	14.6	15.3	20.00
120	32.7	14.1	15.6	20.00
121	33.3	14.6	16.1	20.00
122	33.9	14.1	15.6	20.00
123	34.5	14.6	16.1	20.00
124	35.1	14.1	16.4	20.00
125	35.7	14.6	16.9	20.00
126	36.3	14.1	17.2	20.00
127	36.9	14.6	17.8	20.00
128	25.4	15.2	14.4	20.00
129	26.0	15.7	14.9	20.00
130	26.6	15.2	15.1	20.00
131	27.2	15.7	15.6	20.00
132	27.8	15.2	15.1	1.49
133	28.4	15.7	15.6	1.42
134	29.0	15.2	15.9	20.00
135	29.6	15.7	16.4	20.00
136	30.2	15.2	15.9	20.00
137	30.8	15.7	16.4	20.00
138	31.4	15.2	15.8	20.00
139	32.1	15.7	16.4	20.00
140	32.7	15.2	16.6	20.00
141	33.3	15.7	17.2	20.00
142	33.9	15.2	16.6	20.00
143	34.5	15.7	17.2	20.00
144	35.1	15.2	17.5	20.00
145	35.7	15.7	18.0	20.00
146	36.3	15.2	17.4	20.00
147	37.5	15.2	18.3	20.00
148	25.4	16.3	15.4	20.00
149	26.0	16.8	15.9	20.00
150	26.6	16.3	15.4	1.76
151	27.2	16.8	16.7	20.00
152	27.8	16.3	16.2	1.56
153	28.4	16.8	16.7	1.48
154	29.0	16.3	16.1	1.35
155	29.6	16.8	17.5	20.00
156	30.2	16.3	16.9	20.00

157	30.8	16.8	17.5	20.00
158	31.4	16.3	16.9	20.00
159	32.1	16.8	17.4	20.00
160	32.7	16.3	17.7	20.00
161	33.3	16.8	18.2	20.00
162	33.9	16.3	17.7	20.00
163	34.5	16.8	18.2	20.00
164	35.1	16.3	18.5	20.00
165	35.7	16.8	19.1	20.00
166	36.3	16.3	18.5	20.00
167	37.5	16.3	19.4	20.00
168	25.4	17.3	16.3	20.00
169	26.0	17.9	17.0	20.00
170	26.6	17.3	16.5	1.84
171	27.2	17.9	17.8	20.00
172	27.8	17.3	17.2	1.63
173	28.4	17.9	17.8	1.55
174	29.0	17.3	17.2	1.41
175	29.6	17.9	18.6	20.00
176	30.2	17.3	18.0	20.00
177	30.8	17.9	18.5	20.00
178	31.4	17.3	18.0	20.00
179	32.1	17.9	18.5	20.00
180	32.7	17.3	18.8	20.00
181	33.3	17.9	19.3	20.00
182	33.9	17.3	18.8	20.00
183	34.5	17.9	19.3	20.00
184	35.1	17.3	19.6	20.00
185	35.7	17.9	20.1	20.00
186	36.3	17.3	19.6	20.00
187	36.9	17.9	20.1	20.00
188	25.4	18.4	17.3	20.00
189	26.6	18.4	17.5	1.91
190	27.8	18.4	18.3	1.70
191	29.0	18.4	18.3	1.48
192	30.2	18.4	19.1	20.00
193	31.4	18.4	19.1	20.00
194	32.7	18.4	19.0	20.00
195	33.9	18.4	19.9	20.00
196	35.1	18.4	19.8	20.00
197	36.3	18.4	20.7	20.00
198	37.5	18.4	21.5	20.00

1.11.2 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	3.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.2
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	25.35 m
Ordinata vertice sinistro inferiore yi	7.64 m
Ascissa vertice destro superiore xs	37.53 m
Ordinata vertice destro superiore ys	18.41 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

Coefficiente azione sismica orizzontale	0.032
Coefficiente azione sismica verticale	0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	2.62
2	0.7	2.66
3	3.55	2.41
4	20.5	3.34
5	23.0	3.24
6	27.86	0.0
7	51.66	0.0

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	23.0	0.0
3	27.86	0.0
4	51.66	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-9.6
2	23.0	-9.6
3	27.86	-9.6
4	51.66	-9.6

Coefficienti parziali azioni

==========

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

==========

Coefficienti parziali per i parametri geotecnici del terreno

==========

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	No

==========

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	2000		rilevato	
2	0.05		29.8	1900		3-G-1	
3	0.05		30.4	1900		3-G-3	

Risultati analisi pendio

==========

Fs minimo individuato	1.44
Ascissa centro superficie	27.79 m
Ordinata centro superficie	11.95 m
Raggio superficie	11.87 m

==========

xc = 27.79 yc = 11.949 Rc = 11.867 Fs=1.441

Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.4	41.88	0.54	158.32
2	0.43	39.24	0.55	491.41
3	0.38	36.76	0.47	678.32
4	0.4	34.43	0.49	934.91
5	0.4	32.1	0.48	1135.52
6	0.4	29.83	0.47	1317.89
7	0.4	27.61	0.46	1483.28
8	0.51	25.16	0.56	2071.04
9	0.3	23.02	0.33	1272.41
10	0.4	21.18	0.43	1633.07
11	0.4	19.11	0.43	1535.39
12	0.4	17.06	0.42	1424.59
13	0.4	15.03	0.42	1301.09
14	0.4	13.02	0.41	1165.3
15	0.4	11.03	0.41	1017.53
16	0.4	9.05	0.41	858.04
17	0.4	7.08	0.41	687.04
18	0.4	5.12	0.41	504.71
19	0.4	3.17	0.4	311.17
20	0.4	1.22	0.4	106.49

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**-16.63**	**-54.97**	**0.0**	**0.0**	**92.07**	**38.69**	**0.0**
2	**-61.92**	**-204.69**	**-16.63**	**-54.97**	**317.15**	**133.27**	**0.0**
3	**-116.24**	**-384.29**	**-61.92**	**-204.69**	**475.19**	**199.67**	**0.0**
4	**-180.49**	**-596.68**	**-116.24**	**-384.29**	**699.4**	**293.89**	**0.0**
5	**-245.47**	**-811.52**	**-180.49**	**-596.68**	**898.85**	**377.69**	**0.0**
6	**-305.97**	**-1011.52**	**-245.47**	**-811.52**	**1093.6**	**459.53**	**0.0**
7	**-357.42**	**-1181.6**	**-305.97**	**-1011.52**	**1280.2**	**537.94**	**0.0**
8	**-403.19**	**-1332.9**	**-357.42**	**-1181.6**	**1853.52**	**778.84**	**0.0**
9	**-417.03**	**-1378.66**	**-403.19**	**-1332.9**	**1168.77**	**491.11**	**0.0**

10	**-418.76**	**-1384.39**	**-417.03**	**-1378.66**	**1527.73**	**641.95**	**0.0**
11	**-402.94**	**-1332.07**	**-418.76**	**-1384.39**	**1460.1**	**613.53**	**0.0**
12	**-371.82**	**-1229.19**	**-402.94**	**-1332.07**	**1370.76**	**575.99**	**0.0**
13	**-328.11**	**-1084.69**	**-371.82**	**-1229.19**	**1261.15**	**529.93**	**0.0**
14	**-274.95**	**-908.95**	**-328.11**	**-1084.69**	**1132.9**	**476.04**	**0.0**
15	**-215.96**	**-713.96**	**-274.95**	**-908.95**	**987.89**	**415.11**	**0.0**
16	**-155.29**	**-513.38**	**-215.96**	**-713.96**	**828.23**	**348.02**	**0.0**
17	**-97.65**	**-322.81**	**-155.29**	**-513.38**	**656.29**	**275.77**	**0.0**
18	**-48.37**	**-159.91**	**-97.65**	**-322.81**	**474.76**	**199.49**	**0.0**
19	**-13.53**	**-44.72**	**-48.37**	**-159.91**	**286.69**	**120.47**	**0.0**
20	**0.0**	**0.0**	**-13.53**	**-44.72**	**95.53**	**40.14**	**0.0**

Numero di superfici esaminate....(198)

N°	Xo	Yo	Ro	Fs
1	25.4	7.6	7.6	16.67
2	26.0	8.2	8.2	16.67
3	26.6	7.6	8.4	16.67
4	27.2	8.2	8.9	16.67
5	27.8	7.6	8.4	16.67
6	28.4	8.2	8.9	16.67
7	29.0	7.6	8.4	16.67
8	29.6	8.2	8.9	16.67
9	30.2	7.6	8.3	16.67
10	30.8	8.2	8.9	16.67
11	31.4	7.6	9.1	16.67
12	32.1	8.2	9.7	16.67
13	32.7	7.6	10.0	16.67
14	33.3	8.2	10.5	16.67
15	33.9	7.6	10.8	16.67
16	34.5	8.2	11.3	16.67
17	25.4	8.7	8.7	16.67
18	26.0	9.3	9.2	16.67
19	26.6	8.7	9.5	16.67
20	27.2	9.3	10.0	16.67
21	27.8	8.7	9.5	16.67
22	28.4	9.3	10.0	16.67
23	29.0	8.7	9.4	16.67
24	29.6	9.3	10.0	16.67
25	30.2	8.7	9.4	16.67
26	30.8	9.3	9.9	16.67
27	31.4	8.7	10.2	16.67
28	32.1	9.3	10.7	16.67
29	32.7	8.7	10.2	16.67
30	33.3	9.3	11.6	16.67

31	33.9	8.7	11.0	102.73
32	34.5	9.3	11.6	27.95
33	35.7	9.3	12.4	26.71
34	25.4	9.8	9.8	16.67
35	26.0	10.3	10.3	16.67
36	26.6	9.8	9.8	16.67
37	27.2	10.3	10.3	16.67
38	27.8	9.8	10.5	16.67
39	28.4	10.3	11.1	16.67
40	29.0	9.8	10.5	16.67
41	29.6	10.3	11.0	16.67
42	30.2	9.8	10.5	16.67
43	30.8	10.3	11.0	16.67
44	31.4	9.8	10.5	16.67
45	32.1	10.3	11.8	16.67
46	32.7	9.8	11.3	16.67
47	33.3	10.3	12.6	16.67
48	33.9	9.8	12.1	16.67
49	34.5	10.3	13.5	16.67
50	35.1	9.8	12.9	16.67
51	35.7	10.3	13.5	47.44
52	25.4	10.9	10.9	16.67
53	26.0	11.4	11.4	16.67
54	26.6	10.9	10.8	16.67
55	27.2	11.4	11.3	16.67
56	27.8	10.9	11.6	16.67
57	28.4	11.4	12.1	16.67
58	29.0	10.9	11.6	16.67
59	29.6	11.4	12.1	16.67
60	30.2	10.9	11.6	16.67
61	30.8	11.4	12.1	16.67
62	31.4	10.9	11.5	16.67
63	32.1	11.4	12.9	16.67
64	32.7	10.9	12.3	16.67
65	33.3	11.4	12.9	16.67
66	33.9	10.9	13.2	16.67
67	34.5	11.4	13.7	16.67
68	35.1	10.9	14.0	16.67
69	25.4	11.9	11.1	16.67
70	26.0	12.5	12.5	16.67
71	26.6	11.9	11.9	16.67
72	27.2	12.5	12.4	16.67
73	27.8	11.9	11.9	1.44
74	28.4	12.5	13.2	16.67
75	29.0	11.9	12.7	16.67
76	29.6	12.5	13.2	16.67

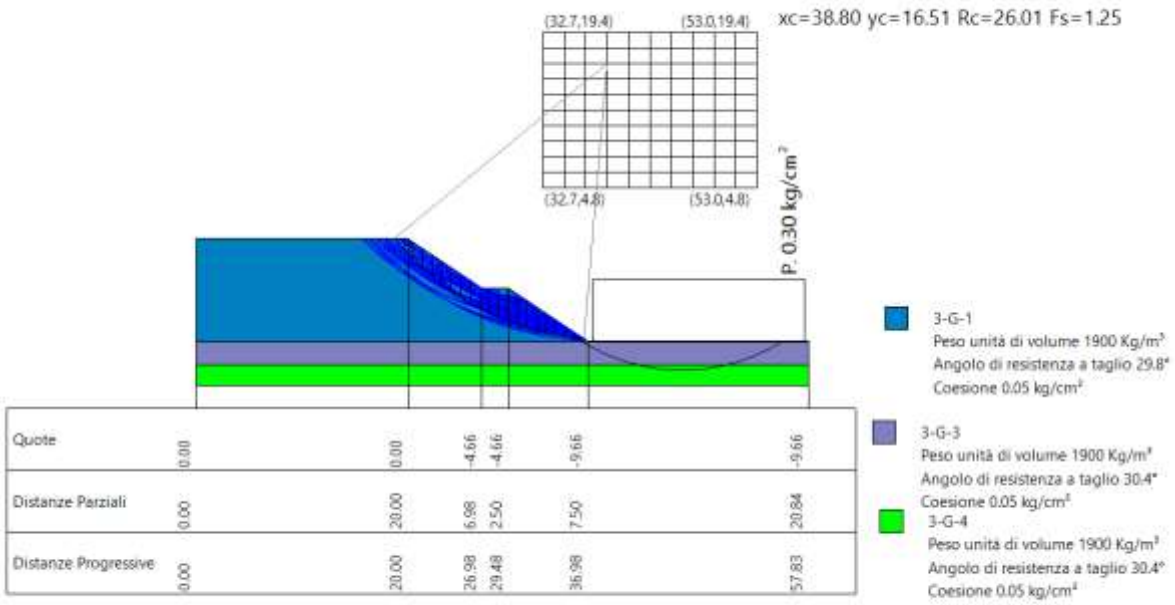
77	30.2	11.9	12.6	16.67
78	30.8	12.5	13.2	16.67
79	31.4	11.9	12.6	16.67
80	32.1	12.5	14.0	16.67
81	32.7	11.9	13.4	16.67
82	33.3	12.5	13.9	16.67
83	33.9	11.9	14.2	16.67
84	34.5	12.5	14.8	16.67
85	35.1	11.9	15.1	16.67
86	35.7	12.5	14.8	22.91
87	36.9	12.5	15.6	25.26
88	25.4	13.0	12.2	16.67
89	26.0	13.6	12.7	16.67
90	26.6	13.0	13.0	16.67
91	27.2	13.6	13.5	16.67
92	27.8	13.0	12.9	1.51
93	28.4	13.6	14.3	16.67
94	29.0	13.0	13.7	16.67
95	29.6	13.6	14.3	16.67
96	30.2	13.0	13.7	16.67
97	30.8	13.6	14.2	16.67
98	31.4	13.0	13.7	16.67
99	32.1	13.6	14.2	16.67
100	32.7	13.0	14.5	16.67
101	33.3	13.6	15.0	16.67
102	33.9	13.0	14.5	16.67
103	34.5	13.6	15.9	16.67
104	35.1	13.0	15.3	16.67
105	35.7	13.6	16.7	16.67
106	36.3	13.0	16.2	16.67
107	36.9	13.6	16.7	40.19
108	25.4	14.1	13.3	16.67
109	26.0	14.6	13.8	16.67
110	26.6	14.1	14.1	16.67
111	27.2	14.6	14.6	16.67
112	27.8	14.1	14.0	1.59
113	28.4	14.6	14.5	1.49
114	29.0	14.1	14.8	16.67
115	29.6	14.6	15.3	16.67
116	30.2	14.1	14.8	16.67
117	30.8	14.6	15.3	16.67
118	31.4	14.1	14.8	16.67
119	32.1	14.6	15.3	16.67
120	32.7	14.1	15.6	16.67
121	33.3	14.6	16.1	16.67
122	33.9	14.1	15.6	16.67

123	34.5	14.6	16.1	16.67
124	35.1	14.1	16.4	16.67
125	35.7	14.6	16.9	16.67
126	36.3	14.1	17.2	16.67
127	36.9	14.6	17.8	16.67
128	25.4	15.2	14.4	16.67
129	26.0	15.7	14.9	16.67
130	26.6	15.2	15.1	16.67
131	27.2	15.7	15.6	16.67
132	27.8	15.2	15.1	1.66
133	28.4	15.7	15.6	1.56
134	29.0	15.2	15.9	16.67
135	29.6	15.7	16.4	16.67
136	30.2	15.2	15.9	16.67
137	30.8	15.7	16.4	16.67
138	31.4	15.2	15.8	16.67
139	32.1	15.7	16.4	16.67
140	32.7	15.2	16.6	16.67
141	33.3	15.7	17.2	16.67
142	33.9	15.2	16.6	16.67
143	34.5	15.7	17.2	16.67
144	35.1	15.2	17.5	16.67
145	35.7	15.7	18.0	16.67
146	36.3	15.2	17.4	30.09
147	37.5	15.2	18.3	35.56
148	25.4	16.3	15.4	16.67
149	26.0	16.8	15.9	16.67
150	26.6	16.3	15.4	1.97
151	27.2	16.8	16.7	16.67
152	27.8	16.3	16.2	1.73
153	28.4	16.8	16.7	1.63
154	29.0	16.3	16.1	1.48
155	29.6	16.8	17.5	16.67
156	30.2	16.3	16.9	16.67
157	30.8	16.8	17.5	16.67
158	31.4	16.3	16.9	16.67
159	32.1	16.8	17.4	16.67
160	32.7	16.3	17.7	16.67
161	33.3	16.8	18.2	16.67
162	33.9	16.3	17.7	16.67
163	34.5	16.8	18.2	16.67
164	35.1	16.3	18.5	16.67
165	35.7	16.8	19.1	16.67
166	36.3	16.3	19.4	16.67
167	37.5	16.3	19.4	145.03
168	25.4	17.3	16.3	16.67

169	26.0	17.9	17.0	16.67
170	26.6	17.3	16.5	2.05
171	27.2	17.9	17.8	16.67
172	27.8	17.3	17.2	1.79
173	28.4	17.9	17.8	1.69
174	29.0	17.3	17.2	1.54
175	29.6	17.9	18.6	16.67
176	30.2	17.3	18.0	16.67
177	30.8	17.9	18.5	16.67
178	31.4	17.3	18.0	16.67
179	32.1	17.9	18.5	16.67
180	32.7	17.3	18.8	16.67
181	33.3	17.9	19.3	16.67
182	33.9	17.3	18.8	16.67
183	34.5	17.9	19.3	16.67
184	35.1	17.3	19.6	16.67
185	35.7	17.9	20.1	16.67
186	36.3	17.3	19.6	16.67
187	36.9	17.9	21.0	16.67
188	25.4	18.4	17.3	16.67
189	26.6	18.4	17.5	2.12
190	27.8	18.4	18.3	1.86
191	29.0	18.4	18.3	1.60
192	30.2	18.4	19.1	16.67
193	31.4	18.4	19.1	16.67
194	32.7	18.4	19.0	16.67
195	33.9	18.4	19.9	16.67
196	35.1	18.4	19.8	16.67
197	36.3	18.4	20.7	16.67
198	37.5	18.4	21.5	16.67

1.12 SEZIONE 157

1.12.1 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Lat./Long.	45.611/9.398 °
Calcolo eseguito secondo	NTC 2018
Numero di strati	3.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata
Superficie di forma circolare	

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	32.72 m
Ordinata vertice sinistro inferiore yi	4.77 m
Ascissa vertice destro superiore xs	52.98 m
Ordinata vertice destro superiore ys	19.45 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

==========

Dati generali

Tipo opera: 2 - Opere ordinarie
Classe d'uso: Classe IV
Vita nominale: 100.0 [anni]
Vita di riferimento: 200.0 [anni]

Parametri sismici su sito di riferimento

Categoria sottosuolo: B
Categoria topografica: T1

S.L. Stato limite	TR Tempo ritorno [anni]	ag [m/s²]	F0 [-]	TC* [sec]
S.L.O.	120.0	0.402	2.553	0.236
S.L.D.	201.0	0.49	2.546	0.254
S.L.V.	1898.0	1.079	2.557	0.299
S.L.C.	2475.0	1.187	2.553	0.302

Coefficienti sismici orizzontali e verticali

Opera: Stabilità dei pendii e Fondazioni

S.L. Stato limite	amax [m/s²]	beta [-]	kh [-]	kv [sec]
S.L.O.	0.4824	0.2	0.0098	0.0049
S.L.D.	0.588	0.2	0.012	0.006
S.L.V.	1.2948	0.24	0.0317	0.0158
S.L.C.	1.4244	0.24	0.0349	0.0174

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	20.0	0.0
3	26.98	-4.66
4	29.48	-4.66
5	36.98	-9.66
6	57.83	-9.66

Vertici strato 1

N	X (m)	y (m)
1	0.0	-9.8
2	29.89	-9.8
3	57.83	-9.8

Vertici strato 2

N	X (m)	y (m)
1	0.0	-11.9
2	29.0	-11.9
3	57.83	-11.9

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0.05		29.8	1900	2000	3-G-1	
2	0.05		30.4	1900	2000	3-G-3	
3	0.05		30.4	1900	2000	3-G-4	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	37.46	-9.66	57.46	-9.66	0.3

Risultati analisi pendio

Fs minimo individuato	1.25
Ascissa centro superficie	38.8 m
Ordinata centro superficie	16.51 m
Raggio superficie	26.01 m

xc = 38.80 yc = 16.51 Rc = 26.015 Fs=1.251
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.9	49.1	1.37	904.45
2	0.9	46.17	1.29	2531.75
3	0.9	43.38	1.23	3027.75
4	0.9	40.72	1.18	3386.42
5	0.9	38.17	1.14	3624.08
6	0.9	35.69	1.1	3753.37
7	0.9	33.3	1.07	3784.36
8	0.9	30.97	1.05	3725.2
9	1.12	28.42	1.27	4439.64
10	0.67	26.19	0.75	2794.35
11	0.9	24.28	0.98	4342.67
12	0.9	22.13	0.97	4996.81
13	0.9	20.01	0.95	5113.21
14	0.9	17.92	0.94	4620.18
15	0.9	15.86	0.93	4066.08
16	0.9	13.82	0.92	3452.86
17	0.9	11.79	0.92	2782.21
18	0.9	9.78	0.91	2055.46
19	0.9	7.79	0.9	1273.76
20	0.9	5.8	0.9	437.96

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**-11.82**	**-24.58**	**0.0**	**0.0**	**581.34**	**650.68**	**0.0**
2	**-325.45**	**-676.41**	**-11.82**	**-24.58**	**1500.35**	**963.38**	**0.0**
3	**-683.8**	**-1421.22**	**-325.45**	**-676.41**	**1949.3**	**1108.34**	**0.0**
4	**-1048.06**	**-2178.28**	**-683.8**	**-1421.22**	**2348.59**	**1238.4**	**0.0**
5	**-1389.53**	**-2888.01**	**-1048.06**	**-2178.28**	**2679.27**	**1345.88**	**0.0**
6	**-1687.54**	**-3507.38**	**-1389.53**	**-2888.01**	**2928.88**	**1425.68**	**0.0**
7	**-1927.82**	**-4006.79**	**-1687.54**	**-3507.38**	**3089.71**	**1474.59**	**0.0**
8	**-2101.57**	**-4367.91**	**-1927.82**	**-4006.79**	**3157.43**	**1490.73**	**0.0**
9	**-2253.7**	**-4684.09**	**-2101.57**	**-4367.91**	**3888.1**	**1830.56**	**0.0**
10	**-2251.69**	**-4679.92**	**-2253.7**	**-4684.09**	**2507.56**	**1158.86**	**0.0**
11	**-2260.93**	**-4699.13**	**-2251.69**	**-4679.92**	**3959.17**	**1764.55**	**0.0**
12	**-2206.44**	**-4585.87**	**-2260.93**	**-4699.13**	**4620.94**	**2001.92**	**0.0**
13	**-2064.05**	**-4289.93**	**-2206.44**	**-4585.87**	**4771.95**	**2052.86**	**0.0**
14	**-1838.63**	**-3821.41**	**-2064.05**	**-4289.93**	**4325.65**	**1885.6**	**0.0**
15	**-1547.67**	**-3216.68**	**-1838.63**	**-3821.41**	**3796.66**	**1688.57**	**0.0**
16	**-1212.37**	**-2519.79**	**-1547.67**	**-3216.68**	**3193.78**	**1464.95**	**0.0**
17	**-857.92**	**-1783.09**	**-1212.37**	**-2519.79**	**2527.08**	**1218.39**	**0.0**
18	**-513.88**	**-1068.04**	**-857.92**	**-1783.09**	**1808.04**	**953.07**	**0.0**
19	**-214.68**	**-446.19**	**-513.88**	**-1068.04**	**1049.82**	**673.8**	**0.0**
20	**-0.25**	**-0.51**	**-214.68**	**-446.19**	**267.4**	**386.02**	**0.0**

Numero di superfici esaminate....(139)

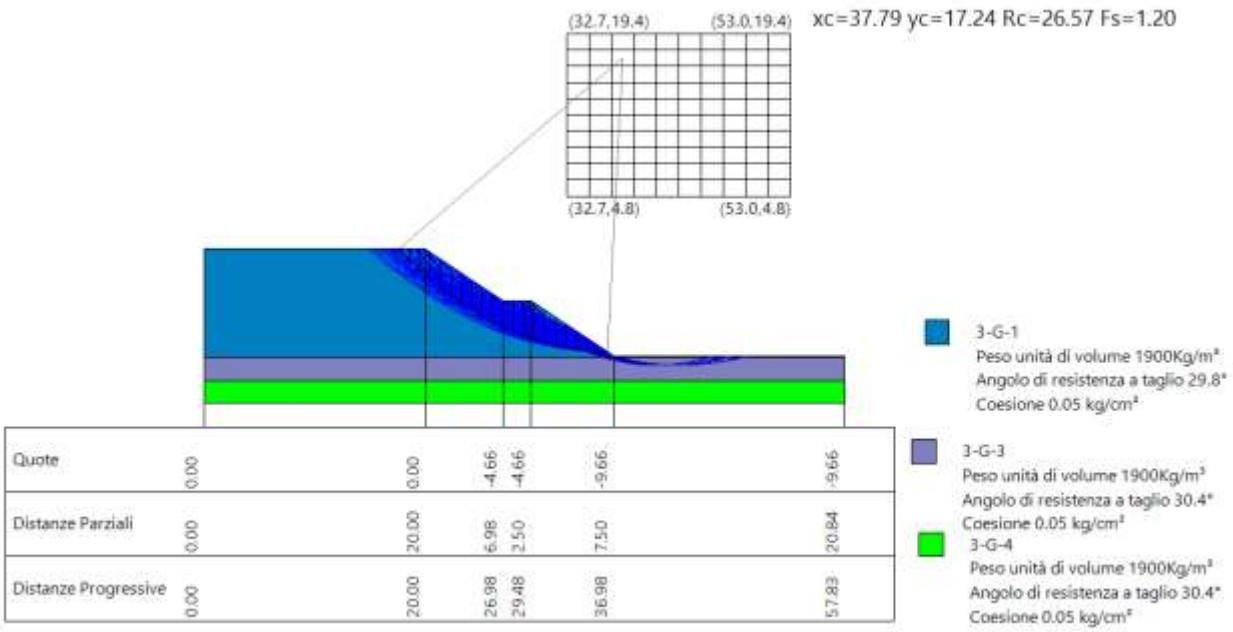
N°	Xo	Yo	Ro	Fs
1	32.7	4.8	11.9	20.00
2	33.7	5.5	12.4	2.23
3	34.7	4.8	13.7	20.00
4	35.8	5.5	14.0	1.55
5	36.8	4.8	13.1	1.51
6	37.8	5.5	15.3	20.00
7	38.8	4.8	14.3	1.31
8	39.8	5.5	14.5	2.37
9	40.8	4.8	15.3	20.00
10	41.8	5.5	17.1	20.00
11	42.9	4.8	16.0	20.00
12	43.9	5.5	17.6	20.00
13	44.9	4.8	17.9	20.00
14	45.9	5.5	17.9	295.31
15	32.7	6.2	13.3	20.00
16	33.7	7.0	13.7	2.40
17	34.7	6.2	14.9	20.00
18	35.8	7.0	15.2	1.60
19	36.8	6.2	14.3	1.62
20	37.8	7.0	16.5	1.39
21	38.8	6.2	15.5	1.37
22	39.8	7.0	17.5	20.00
23	40.8	6.2	16.5	20.00
24	41.8	7.0	18.2	20.00
25	42.9	6.2	17.2	20.00
26	43.9	7.0	18.8	20.00
27	44.9	6.2	19.1	20.00
28	45.9	7.0	19.1	20.00
29	32.7	7.7	14.5	1.64
30	33.7	8.4	14.9	2.48
31	34.7	7.7	16.2	20.00
32	35.8	8.4	16.5	1.63
33	36.8	7.7	15.5	1.74
34	37.8	8.4	17.7	1.43
35	38.8	7.7	16.7	1.44
36	39.8	8.4	18.7	20.00
37	40.8	7.7	19.3	20.00
38	41.8	8.4	19.4	20.00
39	42.9	7.7	18.4	20.00
40	43.9	8.4	20.0	20.00
41	44.9	7.7	20.3	20.00
42	32.7	9.2	15.8	1.57

43	33.7	9.9	16.2	2.44
44	34.7	9.2	17.4	1.39
45	35.8	9.9	17.7	1.65
46	36.8	9.2	18.7	1.31
47	37.8	9.9	19.0	1.46
48	38.8	9.2	18.0	1.52
49	39.8	9.9	19.9	20.00
50	40.8	9.2	20.5	20.00
51	41.8	9.9	20.7	20.00
52	42.9	9.2	21.1	20.00
53	43.9	9.9	21.2	20.00
54	44.9	9.2	21.5	20.00
55	45.9	9.9	21.6	20.00
56	32.7	10.6	17.1	1.52
57	33.7	11.4	17.6	2.30
58	34.7	10.6	18.7	1.37
59	35.8	11.4	19.0	1.64
60	36.8	10.6	19.9	1.30
61	37.8	11.4	20.2	1.48
62	38.8	10.6	19.2	1.60
63	39.8	11.4	22.8	20.00
64	40.8	10.6	20.1	1.46
65	41.8	11.4	21.9	20.00
66	42.9	10.6	22.3	20.00
67	43.9	11.4	22.5	20.00
68	45.9	11.4	22.9	20.00
69	32.7	12.1	18.4	1.50
70	33.7	12.8	18.9	2.10
71	34.7	12.1	20.0	1.36
72	35.8	12.8	20.3	1.60
73	36.8	12.1	21.2	1.29
74	37.8	12.8	21.5	1.48
75	38.8	12.1	20.5	1.69
76	39.8	12.8	22.4	1.43
77	40.8	12.1	21.4	1.51
78	41.8	12.8	23.2	20.00
79	42.9	12.1	23.6	20.00
80	43.9	12.8	23.7	20.00
81	44.9	12.1	24.0	20.00
82	45.9	12.8	24.2	20.00
83	32.7	13.6	19.8	1.49
84	33.7	14.3	20.2	1.92
85	34.7	13.6	21.2	1.36
86	35.8	14.3	23.4	1.28
87	36.8	13.6	22.5	1.29
88	37.8	14.3	22.8	1.46

89	38.8	13.6	21.8	1.93
90	39.8	14.3	23.7	1.44
91	40.8	13.6	22.7	1.58
92	41.8	14.3	24.5	20.00
93	42.9	13.6	24.8	20.00
94	43.9	14.3	25.0	20.00
95	44.9	13.6	25.3	20.00
96	32.7	15.0	21.1	1.50
97	33.7	15.8	23.5	1.38
98	34.7	15.0	22.5	1.37
99	35.8	15.8	24.7	1.29
100	36.8	15.0	23.7	1.29
101	37.8	15.8	24.1	1.43
102	38.8	15.0	23.1	2.07
103	39.8	15.8	25.0	1.44
104	40.8	15.0	24.0	1.64
105	41.8	15.8	27.2	20.00
106	42.9	15.0	26.1	20.00
107	43.9	15.8	26.4	20.00
108	32.7	16.5	22.4	1.51
109	33.7	17.2	24.8	1.40
110	34.7	16.5	23.9	1.38
111	35.8	17.2	26.0	1.31
112	36.8	16.5	25.0	1.30
113	37.8	17.2	25.4	1.41
114	38.8	16.5	26.0	1.25
115	39.8	17.2	26.3	1.42
116	40.8	16.5	25.3	1.82
117	41.8	17.2	28.5	20.00
118	42.9	16.5	26.1	1.63
119	44.9	16.5	27.9	20.00
120	32.7	18.0	23.8	1.54
121	33.7	18.7	26.1	1.43
122	34.7	18.0	25.2	1.40
123	35.8	18.7	27.3	1.33
124	36.8	18.0	26.4	1.31
125	37.8	18.7	28.3	1.26
126	38.8	18.0	27.3	1.26
127	39.8	18.7	27.6	1.38
128	40.8	18.0	26.7	1.96
129	41.8	18.7	29.8	20.00
130	42.9	18.0	27.4	1.66
131	43.9	18.7	30.3	20.00
132	44.9	18.0	29.3	20.00
133	32.7	19.4	25.0	1.58
134	34.7	19.4	26.5	1.43

135	36.8	19.4	27.7	1.33
136	38.8	19.4	28.6	1.27
137	40.8	19.4	28.0	1.97
138	42.9	19.4	28.7	1.70
139	44.9	19.4	30.6	20.00

1.12.2 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Lat./Long.	45.611/9.398 °
Calcolo eseguito secondo	NTC 2018
Numero di strati	3.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.2
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	32.72 m
Ordinata vertice sinistro inferiore yi	4.77 m
Ascissa vertice destro superiore xs	52.98 m
Ordinata vertice destro superiore ys	19.45 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

==========

Dati generali

Tipo opera: 2 - Opere ordinarie
Classe d'uso: Classe IV
Vita nominale: 100.0 [anni]
Vita di riferimento: 200.0 [anni]

Parametri sismici su sito di riferimento

Categoria sottosuolo: B
Categoria topografica: T1

S.L. Stato limite	TR Tempo ritorno [anni]	ag [m/s²]	F0 [-]	TC* [sec]
S.L.O.	120.0	0.402	2.553	0.236
S.L.D.	201.0	0.49	2.546	0.254
S.L.V.	1898.0	1.079	2.557	0.299
S.L.C.	2475.0	1.187	2.553	0.302

Coefficienti sismici orizzontali e verticali

Opera: Stabilità dei pendii e Fondazioni

S.L. Stato limite	amax [m/s²]	beta [-]	kh [-]	kv [sec]
S.L.O.	0.4824	0.2	0.0098	0.0049
S.L.D.	0.588	0.2	0.012	0.006
S.L.V.	1.2948	0.24	0.0317	0.0158
S.L.C.	1.4244	0.24	0.0349	0.0174

Coefficiente azione sismica orizzontale 0.032
Coefficiente azione sismica verticale 0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	20.0	0.0
3	26.98	-4.66
4	29.48	-4.66
5	36.98	-9.66
6	57.83	-9.66

Vertici strato 1

N	X (m)	y (m)
1	0.0	-9.8
2	29.89	-9.8
3	57.83	-9.8

Vertici strato 2

N	X (m)	y (m)
1	0.0	-11.9
2	29.0	-11.9
3	57.83	-11.9

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	No

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0.05		29.8	1900	2000	3-G-1	
2	0.05		30.4	1900	2000	3-G-3	
3	0.05		30.4	1900	2000	3-G-4	

Risultati analisi pendio [0]

Fs minimo individuato	1.2
Ascissa centro superficie	37.79 m
Ordinata centro superficie	17.24 m
Raggio superficie	26.57 m

xc = 37.787 yc = 17.244 Rc = 26.568 Fs=1.203
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.94	48.01	1.41	963.59
2	0.94	45.05	1.33	2744.64
3	0.94	42.24	1.27	4355.13
4	0.94	39.55	1.22	4771.26
5	0.94	36.96	1.18	4976.31
6	0.94	34.45	1.14	5063.67
7	0.94	32.02	1.11	5043.96
8	0.94	29.65	1.09	4925.78
9	0.94	27.33	1.06	4716.15
10	0.92	25.09	1.02	4322.24
11	0.96	22.87	1.05	4733.26
12	0.94	20.65	1.01	5307.97
13	0.94	18.49	0.99	5908.47
14	0.94	16.36	0.98	5456.46
15	0.94	14.25	0.97	4792.38
16	0.94	12.16	0.96	4062.42
17	0.94	10.09	0.96	3268.24
18	0.94	8.03	0.95	2411.2
19	0.94	5.98	0.95	1492.38
20	0.94	3.94	0.95	512.58

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**-3.38**	**-8.27**	**0.0**	**0.0**	**628.14**	**737.17**	**0.0**
2	**-290.71**	**-711.26**	**-3.38**	**-8.27**	**1613.32**	**1102.0**	**0.0**
3	**-774.34**	**-1894.49**	**-290.71**	**-711.26**	**2744.89**	**1529.62**	**0.0**
4	**-1245.85**	**-3048.09**	**-774.34**	**-1894.49**	**3269.91**	**1720.25**	**0.0**
5	**-1668.81**	**-4082.89**	**-1245.85**	**-3048.09**	**3660.37**	**1860.27**	**0.0**
6	**-2025.93**	**-4956.62**	**-1668.81**	**-4082.89**	**3951.02**	**1962.9**	**0.0**
7	**-2306.01**	**-5641.86**	**-2025.93**	**-4956.62**	**4133.76**	**2024.51**	**0.0**
8	**-2502.97**	**-6123.75**	**-2306.01**	**-5641.86**	**4204.24**	**2043.07**	**0.0**
9	**-2615.22**	**-6398.37**	**-2502.97**	**-6123.75**	**4160.97**	**2017.76**	**0.0**
10	**-2642.33**	**-6464.7**	**-2615.22**	**-6398.37**	**3914.76**	**1904.74**	**0.0**
11	**-2612.13**	**-6390.82**	**-2642.33**	**-6464.7**	**4373.12**	**2096.92**	**0.0**
12	**-2510.42**	**-6141.98**	**-2612.13**	**-6390.82**	**4979.11**	**2323.61**	**0.0**
13	**-2317.68**	**-5670.41**	**-2510.42**	**-6141.98**	**5599.9**	**2565.17**	**0.0**
14	**-2039.55**	**-4989.93**	**-2317.68**	**-5670.41**	**5194.94**	**2400.57**	**0.0**
15	**-1697.16**	**-4152.24**	**-2039.55**	**-4989.93**	**4555.84**	**2143.69**	**0.0**
16	**-1314.03**	**-3214.9**	**-1697.16**	**-4152.24**	**3830.35**	**1853.1**	**0.0**
17	**-917.85**	**-2245.61**	**-1314.03**	**-3214.9**	**3030.6**	**1533.55**	**0.0**
18	**-540.86**	**-1323.27**	**-917.85**	**-2245.61**	**2170.51**	**1190.55**	**0.0**
19	**-220.48**	**-539.42**	**-540.86**	**-1323.27**	**1266.03**	**830.39**	**0.0**
20	**0.01**	**0.03**	**-220.48**	**-539.42**	**335.5**	**460.33**	**0.0**

Numero di superfici esaminate....(113)

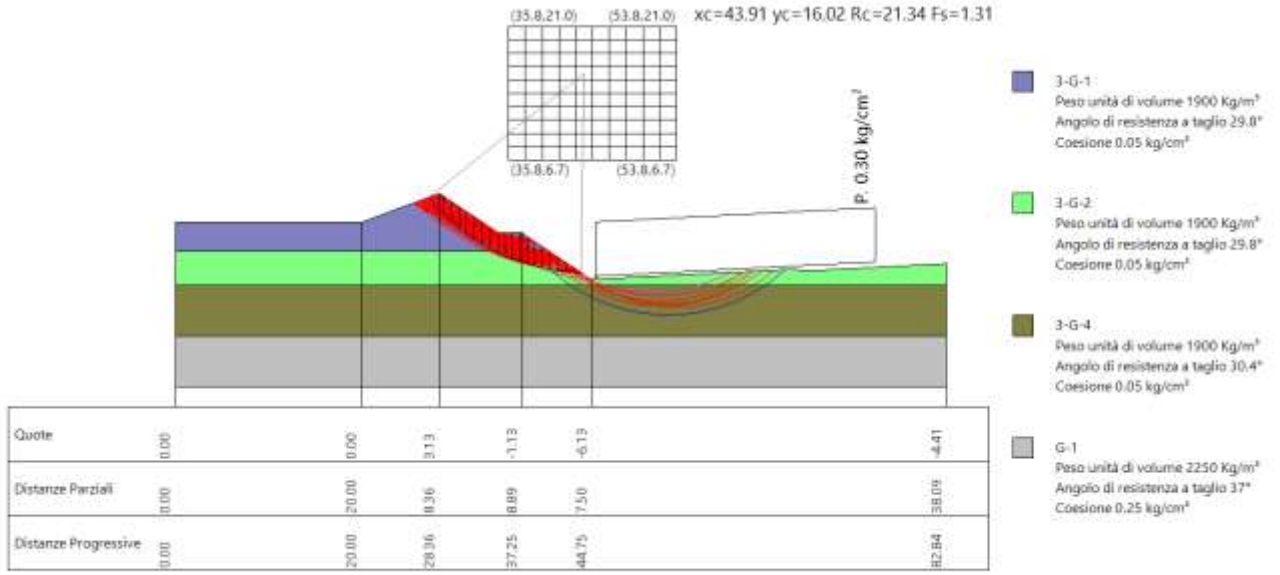
N°	Xo	Yo	Ro	Fs
1	32.7	4.8	11.8	16.67
2	33.7	5.5	12.5	2.00
3	34.7	4.8	12.9	1.53
4	35.8	5.5	13.7	1.55
5	36.8	4.8	14.1	1.34
6	37.8	5.5	14.8	1.30
7	38.8	4.8	14.1	1.32
8	39.8	5.5	14.8	1.56
9	40.8	4.8	15.3	16.67
10	41.8	5.5	16.0	16.67
11	32.7	6.2	13.2	1.64
12	33.7	7.0	14.0	1.86
13	34.7	6.2	14.4	1.48
14	35.8	7.0	15.1	1.56
15	36.8	6.2	15.6	1.34
16	37.8	7.0	16.3	1.36
17	38.8	6.2	15.6	1.32
18	39.8	7.0	16.3	1.42
19	40.8	6.2	16.7	16.67
20	41.8	7.0	17.5	16.67
21	32.7	7.7	14.7	1.50
22	33.7	8.4	15.4	1.68
23	34.7	7.7	15.9	1.42
24	35.8	8.4	16.6	1.51
25	36.8	7.7	17.0	1.32
26	37.8	8.4	17.8	1.36
27	38.8	7.7	17.0	1.34
28	39.8	8.4	17.8	1.38
29	40.8	7.7	17.0	1.89
30	41.8	8.4	18.9	16.67
31	32.7	9.2	16.2	1.40
32	33.7	9.9	16.9	1.53
33	34.7	9.2	17.3	1.35
34	35.8	9.9	18.1	1.43
35	36.8	9.2	18.5	1.29
36	37.8	9.9	19.2	1.33
37	38.8	9.2	18.5	1.39
38	39.8	9.9	19.2	1.38
39	40.8	9.2	18.5	1.58
40	41.8	9.9	20.4	16.67
41	32.7	10.6	17.6	1.35
42	33.7	11.4	18.4	1.42

43	34.7	10.6	18.8	1.29
44	35.8	11.4	19.5	1.36
45	36.8	10.6	20.0	1.25
46	37.8	11.4	20.7	1.29
47	38.8	10.6	20.0	1.39
48	39.8	11.4	20.7	1.44
49	40.8	10.6	20.0	1.48
50	41.8	11.4	20.7	1.86
51	42.9	10.6	21.1	16.67
52	32.7	12.1	19.1	1.34
53	33.7	12.8	19.8	1.37
54	34.7	12.1	20.3	1.27
55	35.8	12.8	21.0	1.30
56	36.8	12.1	21.4	1.22
57	37.8	12.8	22.2	1.24
58	38.8	12.1	21.4	1.36
59	39.8	12.8	22.2	1.45
60	40.8	12.1	21.4	1.45
61	41.8	12.8	22.2	1.64
62	42.9	12.1	22.6	16.67
63	32.7	13.6	20.6	1.34
64	33.7	14.3	21.3	1.35
65	34.7	13.6	21.7	1.26
66	35.8	14.3	22.5	1.27
67	36.8	13.6	22.9	1.20
68	37.8	14.3	23.6	1.22
69	38.8	13.6	22.9	1.31
70	39.8	14.3	23.6	1.41
71	40.8	13.6	22.9	1.46
72	41.8	14.3	23.6	1.56
73	42.9	13.6	24.1	16.67
74	32.7	15.0	22.0	1.35
75	33.7	15.8	22.8	1.35
76	34.7	15.0	23.2	1.27
77	35.8	15.8	23.9	1.27
78	36.8	15.0	24.4	1.20
79	37.8	15.8	25.1	1.20
80	38.8	15.0	24.4	1.26
81	39.8	15.8	25.1	1.35
82	40.8	15.0	24.4	1.53
83	41.8	15.8	25.1	1.53
84	42.9	15.0	24.4	1.92
85	32.7	16.5	23.5	1.37
86	33.7	17.2	24.2	1.36
87	34.7	16.5	24.7	1.28
88	35.8	17.2	25.4	1.27

89	36.8	16.5	25.8	1.21
90	37.8	17.2	26.6	1.20
91	38.8	16.5	25.8	1.22
92	39.8	17.2	26.6	1.28
93	40.8	16.5	25.8	1.49
94	41.8	17.2	26.6	1.63
95	42.9	16.5	25.8	1.73
96	32.7	18.0	25.0	1.39
97	33.7	18.7	25.7	1.37
98	34.7	18.0	26.1	1.30
99	35.8	18.7	26.9	1.28
100	36.8	18.0	27.3	1.23
101	37.8	18.7	28.0	1.21
102	38.8	18.0	27.3	1.21
103	39.8	18.7	28.0	1.24
104	40.8	18.0	27.3	1.41
105	41.8	18.7	28.0	1.61
106	42.9	18.0	27.3	1.65
107	43.9	18.7	28.0	2.03
108	32.7	19.4	26.4	1.42
109	34.7	19.4	27.6	1.32
110	36.8	19.4	28.8	1.24
111	38.8	19.4	28.8	1.21
112	40.8	19.4	28.8	1.32
113	42.9	19.4	28.8	1.62

1.13 SEZIONE 186

1.13.1 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	35.8 m
Ordinata vertice sinistro inferiore yi	6.71 m
Ascissa vertice destro superiore xs	53.82 m
Ordinata vertice destro superiore ys	21.03 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	20.0	0.0
3	28.36	3.13
4	34.75	-1.13
5	37.25	-1.13
6	44.75	-6.13
7	65.7	-5.05
8	68.53	-5.17
9	82.84	-4.41

Vertici strato 1

N	X (m)	y (m)
1	0.0	-3.07
2	7.77	-3.07
3	28.36	-3.07
4	40.16	-3.07
5	44.75	-6.13
6	65.7	-5.05
7	68.53	-5.17
8	82.84	-4.41

Vertici strato 2

N	X (m)	y (m)
1	0.0	-6.77
2	15.13	-6.77
3	28.36	-6.77
4	82.84	-6.77

Vertici strato 3

N	X (m)	y (m)
1	0.0	-12.17
2	13.22	-12.17
3	28.36	-12.17
4	82.84	-12.17

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0.05		29.8	1900	2100.00	3-G-1	
2	0.05		29.8	1900		3-G-2	
3	0.05		30.4	1900		3-G-4	
4	0.25		37	2250		G-1	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	45.16	-5.77	75.16	-4.228803	0.3

Risultati analisi pendio [A2+M2+R2]

Fs minimo individuato	1.31
Ascissa centro superficie	43.91 m
Ordinata centro superficie	16.02 m
Raggio superficie	21.34 m

xc = 43.909 yc = 16.017 Rc = 21.337 Fs=1.31
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	1.13	49.09	1.73	1910.89
2	0.5	45.81	0.72	1730.75
3	0.81	43.34	1.12	3144.78
4	0.81	40.4	1.07	3433.89
5	0.81	37.58	1.03	3613.63
6	0.81	34.87	0.99	3696.34
7	0.81	32.24	0.96	3691.62
8	0.81	29.69	0.94	3607.19
9	1.0	26.93	1.12	4189.28
10	0.63	24.49	0.7	2737.7

11	0.81	22.37	0.88	4006.47
12	0.81	20.02	0.87	4495.79
13	0.81	17.71	0.86	4750.1
14	0.81	15.43	0.85	4284.15
15	0.81	13.17	0.84	3764.33
16	0.81	10.93	0.83	3192.25
17	0.81	8.71	0.82	2569.27
18	0.81	6.5	0.82	1896.33
19	0.81	4.3	0.82	1174.23
20	0.81	2.11	0.82	403.5

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**-248.45**	**-539.49**	**0.0**	**0.0**	**1006.42**	**878.53**	**0.0**
2	**-431.08**	**-936.06**	**-248.45**	**-539.49**	**1049.4**	**585.86**	**0.0**
3	**-832.55**	**-1807.82**	**-431.08**	**-936.06**	**1980.83**	**1034.59**	**0.0**
4	**-1222.09**	**-2653.67**	**-832.55**	**-1807.82**	**2363.55**	**1153.01**	**0.0**
5	**-1575.23**	**-3420.48**	**-1222.09**	**-2653.67**	**2675.98**	**1249.48**	**0.0**
6	**-1874.98**	**-4071.38**	**-1575.23**	**-3420.48**	**2906.66**	**1319.43**	**0.0**
7	**-2110.32**	**-4582.39**	**-1874.98**	**-4071.38**	**3048.96**	**1360.09**	**0.0**
8	**-2275.12**	**-4940.25**	**-2110.32**	**-4582.39**	**3099.73**	**1370.08**	**0.0**
9	**-2404.04**	**-5220.19**	**-2275.12**	**-4940.25**	**3723.34**	**1642.81**	**0.0**
10	**-2400.05**	**-5211.51**	**-2404.04**	**-5220.19**	**2491.36**	**1083.61**	**0.0**
11	**-2383.29**	**-5175.12**	**-2400.05**	**-5211.51**	**3703.28**	**1563.76**	**0.0**
12	**-2295.9**	**-4985.36**	**-2383.29**	**-5175.12**	**4206.9**	**1735.6**	**0.0**
13	**-2120.51**	**-4604.52**	**-2295.9**	**-4985.36**	**4473.77**	**1825.27**	**0.0**
14	**-1867.64**	**-4055.44**	**-2120.51**	**-4604.52**	**4032.11**	**1667.78**	**0.0**
15	**-1555.16**	**-3376.9**	**-1867.64**	**-4055.44**	**3515.66**	**1484.63**	**0.0**
16	**-1204.58**	**-2615.65**	**-1555.16**	**-3376.9**	**2934.47**	**1279.31**	**0.0**
17	**-841.43**	**-1827.11**	**-1204.58**	**-2615.65**	**2300.06**	**1055.82**	**0.0**
18	**-495.77**	**-1076.52**	**-841.43**	**-1827.11**	**1625.65**	**818.74**	**0.0**
19	**-202.82**	**-440.41**	**-495.77**	**-1076.52**	**926.49**	**573.39**	**0.0**
20	**-3.87**	**-8.4**	**-202.82**	**-440.41**	**220.29**	**325.95**	**0.0**

Numero di superfici esaminate....(203)

N°	Xo	Yo	Ro	Fs
1	35.8	6.7	9.5	20.00
2	36.7	7.4	10.1	20.00
3	37.6	6.7	9.2	20.00
4	38.5	7.4	9.8	20.00
5	39.4	6.7	9.4	20.00
6	40.3	7.4	11.5	20.00
7	41.2	6.7	11.5	20.00
8	42.1	7.4	11.7	1.70
9	43.0	6.7	11.7	1.52
10	43.9	7.4	12.0	1.53
11	44.8	6.7	12.0	1.38
12	45.7	7.4	14.0	20.00
13	46.6	6.7	13.7	20.00
14	47.5	7.4	14.1	20.00
15	48.4	6.7	13.9	20.00
16	49.3	7.4	14.3	20.00
17	50.2	6.7	15.5	20.00
18	51.1	7.4	16.0	132.63
19	52.0	6.7	15.7	19.35
20	52.9	7.4	16.2	12.26
21	53.8	6.7	15.8	11.69
22	35.8	8.1	9.2	1.45
23	36.7	8.9	11.5	20.00
24	37.6	8.1	10.6	20.00
25	38.5	8.9	11.1	20.00
26	39.4	8.1	12.2	20.00
27	40.3	8.9	12.8	20.00
28	41.2	8.1	11.9	1.84
29	42.1	8.9	12.5	2.02
30	43.0	8.1	14.0	20.00
31	43.9	8.9	14.4	1.45
32	44.8	8.1	14.2	1.37
33	45.7	8.9	14.6	1.36
34	46.6	8.1	16.2	20.00
35	47.5	8.9	14.7	1.51
36	48.4	8.1	16.3	20.00
37	49.3	8.9	16.8	20.00
38	50.2	8.1	16.4	20.00
39	51.1	8.9	18.7	20.00
40	52.0	8.1	16.5	17.97
41	52.9	8.9	18.8	109.94
42	35.8	9.6	10.5	1.39

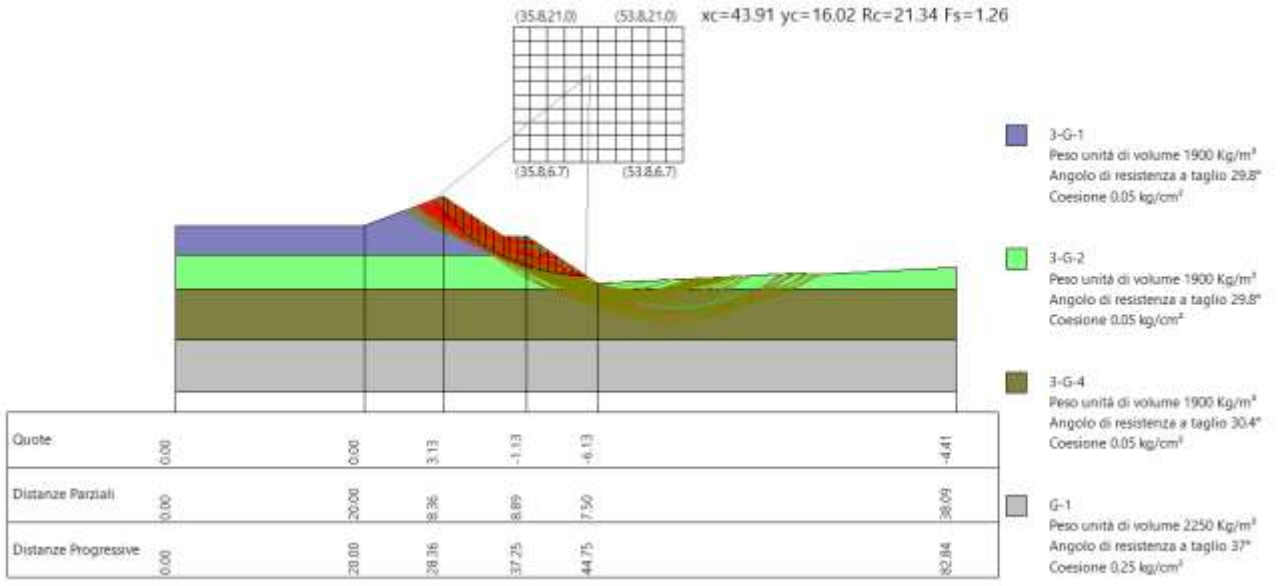
43	36.7	10.3	12.8	20.00
44	37.6	9.6	12.0	20.00
45	38.5	10.3	12.5	20.00
46	39.4	9.6	11.7	3.98
47	40.3	10.3	14.2	20.00
48	41.2	9.6	13.3	1.74
49	42.1	10.3	13.9	2.05
50	43.0	9.6	15.1	20.00
51	43.9	10.3	15.7	1.44
52	44.8	9.6	14.9	1.47
53	45.7	10.3	15.5	1.46
54	46.6	9.6	14.9	1.51
55	47.5	10.3	17.5	20.00
56	48.4	9.6	17.2	20.00
57	49.3	10.3	17.7	20.00
58	50.2	9.6	17.3	20.00
59	51.1	10.3	17.8	64.06
60	52.0	9.6	17.4	15.60
61	52.9	10.3	19.9	20.00
62	35.8	11.0	11.9	1.42
63	36.7	11.7	14.2	20.00
64	37.6	11.0	13.4	20.00
65	38.5	11.7	13.9	20.00
66	39.4	11.0	13.1	2.85
67	40.3	11.7	15.6	20.00
68	41.2	11.0	14.7	1.63
69	42.1	11.7	15.3	1.93
70	43.0	11.0	16.5	20.00
71	43.9	11.7	17.1	1.40
72	44.8	11.0	16.3	1.50
73	45.7	11.7	16.9	1.52
74	46.6	11.0	16.1	1.60
75	47.5	11.7	18.9	20.00
76	48.4	11.0	18.2	20.00
77	49.3	11.7	18.8	20.00
78	50.2	11.0	18.2	20.00
79	52.0	11.0	20.5	20.00
80	52.9	11.7	21.1	20.00
81	35.8	12.4	13.3	1.48
82	36.7	13.2	15.6	20.00
83	37.6	12.4	14.8	20.00
84	38.5	13.2	15.3	1.59
85	39.4	12.4	14.5	2.21
86	40.3	13.2	16.9	20.00
87	41.2	12.4	16.1	1.52
88	42.1	13.2	16.7	1.78

89	43.0	12.4	17.9	20.00
90	43.9	13.2	18.5	1.36
91	44.8	12.4	17.7	1.48
92	45.7	13.2	18.3	1.59
93	46.6	12.4	17.5	1.58
94	47.5	13.2	20.4	20.00
95	48.4	12.4	19.6	20.00
96	49.3	13.2	20.2	20.00
97	50.2	12.4	19.5	20.00
98	51.1	13.2	22.4	20.00
99	35.8	13.9	14.7	1.56
100	36.7	14.6	15.2	1.61
101	37.6	13.9	16.2	20.00
102	38.5	14.6	16.7	1.60
103	39.4	13.9	15.8	1.87
104	40.3	14.6	18.3	20.00
105	41.2	13.9	17.5	1.46
106	42.1	14.6	18.1	1.62
107	43.0	13.9	17.3	2.46
108	43.9	14.6	19.9	1.32
109	44.8	13.9	19.1	1.44
110	45.7	14.6	19.7	1.57
111	46.6	13.9	18.9	1.60
112	47.5	14.6	21.8	20.00
113	48.4	13.9	21.0	20.00
114	49.3	14.6	21.6	20.00
115	50.2	13.9	20.9	20.00
116	52.0	13.9	23.1	20.00
117	53.8	13.9	23.1	20.00
118	35.8	15.3	16.0	1.65
119	36.7	16.0	16.5	1.66
120	37.6	15.3	17.5	20.00
121	38.5	16.0	18.1	1.62
122	39.4	15.3	17.2	1.74
123	40.3	16.0	19.7	20.00
124	41.2	15.3	18.9	1.45
125	42.1	16.0	19.5	1.53
126	43.0	15.3	18.7	2.16
127	43.9	16.0	21.3	1.31
128	44.8	15.3	20.5	1.38
129	45.7	16.0	21.1	1.52
130	46.6	15.3	20.4	1.69
131	47.5	16.0	21.0	1.77
132	48.4	15.3	22.4	20.00
133	49.3	16.0	23.1	20.00
134	50.2	15.3	22.3	20.00

135	52.0	15.3	24.5	20.00
136	52.9	16.0	25.2	20.00
137	35.8	16.7	17.4	1.74
138	36.7	17.4	17.9	1.73
139	37.6	16.7	18.9	20.00
140	38.5	17.4	19.5	1.66
141	39.4	16.7	18.6	1.70
142	40.3	17.4	19.2	1.69
143	41.2	16.7	20.3	1.46
144	42.1	17.4	20.9	1.50
145	43.0	16.7	20.1	1.88
146	43.9	17.4	22.7	1.32
147	44.8	16.7	21.9	1.34
148	45.7	17.4	22.6	1.44
149	46.6	16.7	21.8	1.73
150	47.5	17.4	22.4	1.77
151	48.4	16.7	23.8	20.00
152	49.3	17.4	24.5	20.00
153	50.2	16.7	23.7	20.00
154	51.1	17.4	26.7	20.00
155	35.8	18.2	18.8	1.84
156	36.7	18.9	19.3	1.81
157	37.6	18.2	20.3	20.00
158	38.5	18.9	20.9	1.71
159	39.4	18.2	20.0	1.70
160	40.3	18.9	20.5	1.59
161	41.2	18.2	21.7	1.48
162	42.1	18.9	22.3	1.50
163	43.0	18.2	21.5	1.69
164	43.9	18.9	24.1	1.34
165	44.8	18.2	23.4	1.33
166	45.7	18.9	24.0	1.38
167	46.6	18.2	23.2	1.66
168	47.5	18.9	23.8	1.94
169	48.4	18.2	25.2	20.00
170	49.3	18.9	25.9	20.00
171	50.2	18.2	25.1	20.00
172	51.1	18.9	28.1	20.00
173	53.8	18.2	27.3	20.00
174	35.8	19.6	20.2	1.93
175	36.7	20.3	20.7	1.89
176	37.6	19.6	21.7	20.00
177	38.5	20.3	22.2	1.77
178	39.4	19.6	21.4	1.72
179	40.3	20.3	21.9	1.57
180	41.2	19.6	23.1	1.52

181	42.1	20.3	23.7	1.51
182	43.0	19.6	22.9	1.61
183	43.9	20.3	25.6	1.36
184	44.8	19.6	24.8	1.33
185	45.7	20.3	25.4	1.36
186	46.6	19.6	24.6	1.57
187	47.5	20.3	25.2	1.95
188	48.4	19.6	26.7	20.00
189	49.3	20.3	27.3	20.00
190	50.2	19.6	26.5	20.00
191	52.0	19.6	28.8	20.00
192	52.9	20.3	29.5	20.00
193	53.8	19.6	28.8	20.00
194	35.8	21.0	21.6	2.03
195	37.6	21.0	23.1	20.00
196	39.4	21.0	22.8	1.76
197	41.2	21.0	24.5	1.56
198	43.0	21.0	24.2	1.58
199	44.8	21.0	26.2	1.34
200	46.6	21.0	26.0	1.46
201	48.4	21.0	28.1	20.00
202	50.2	21.0	27.9	20.00
203	52.0	21.0	30.2	20.00

1.13.2 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.2
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	35.8 m
Ordinata vertice sinistro inferiore yi	6.71 m
Ascissa vertice destro superiore xs	53.82 m
Ordinata vertice destro superiore ys	21.03 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

Coefficiente azione sismica orizzontale	0.032
Coefficiente azione sismica verticale	0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	20.0	0.0
3	28.36	3.13
4	34.75	-1.13
5	37.25	-1.13
6	44.75	-6.13
7	65.7	-5.05
8	68.53	-5.17
9	82.84	-4.41

Vertici strato 1

N	X (m)	y (m)
1	0.0	-3.07
2	7.77	-3.07
3	28.36	-3.07
4	40.16	-3.07
5	44.75	-6.13
6	65.7	-5.05
7	68.53	-5.17
8	82.84	-4.41

Vertici strato 2

N	X (m)	y (m)
1	0.0	-6.77
2	15.13	-6.77
3	28.36	-6.77
4	82.84	-6.77

Vertici strato 3

N	X (m)	y (m)
1	0.0	-12.17
2	13.22	-12.17
3	28.36	-12.17
4	82.84	-12.17

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

==========

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	No

==========

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0.05		29.8	1900	2100.00	3-G-1	
2	0.05		29.8	1900		3-G-2	
3	0.05		30.4	1900		3-G-4	
4	0.25		37	2250		G-1	

Risultati analisi pendio

==========

Fs minimo individuato	1.26
Ascissa centro superficie	43.91 m
Ordinata centro superficie	16.02 m
Raggio superficie	21.34 m

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xc = 43.909 yc = 16.017 Rc = 21.337 Fs=1.256

Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	1.13	49.09	1.73	1910.89
2	0.5	45.81	0.72	1730.75
3	0.81	43.34	1.12	3144.78
4	0.81	40.4	1.07	3433.89
5	0.81	37.58	1.03	3613.63
6	0.81	34.87	0.99	3696.34
7	0.81	32.24	0.96	3691.62
8	0.81	29.69	0.94	3607.19
9	1.0	26.93	1.12	4189.28
10	0.63	24.49	0.7	2737.7
11	0.81	22.37	0.88	4006.47
12	0.81	20.02	0.87	4495.79
13	0.81	17.71	0.86	4750.1
14	0.81	15.43	0.85	4284.15
15	0.81	13.17	0.84	3764.33
16	0.81	10.93	0.83	3192.25
17	0.81	8.71	0.82	2569.27
18	0.81	6.5	0.82	1896.33
19	0.81	4.3	0.82	1174.23
20	0.81	2.11	0.82	403.5

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	-226.58	-545.66	0.0	0.0	961.25	937.61	0.0
2	-391.97	-943.95	-226.58	-545.66	1015.73	623.91	0.0
3	-763.95	-1839.78	-391.97	-943.95	1910.4	1097.62	0.0
4	-1125.53	-2710.57	-763.95	-1839.78	2296.72	1227.68	0.0
5	-1453.74	-3500.97	-1125.53	-2710.57	2617.13	1335.56	0.0
6	-1732.57	-4172.48	-1453.74	-3500.97	2858.62	1415.68	0.0
7	-1951.63	-4700.02	-1732.57	-4172.48	3013.31	1464.58	0.0
8	-2105.11	-5069.64	-1951.63	-4700.02	3077.05	1480.37	0.0
9	-2226.5	-5361.98	-2105.11	-5069.64	3710.07	1780.34	0.0
10	-2221.83	-5350.73	-2226.5	-5361.98	2495.36	1179.18	0.0
11	-2207.91	-5317.22	-2221.83	-5350.73	3715.3	1704.04	0.0
12	-2129.62	-5128.67	-2207.91	-5317.22	4233.36	1896.28	0.0
13	-1970.47	-4745.39	-2129.62	-5128.67	4516.14	1999.78	0.0
14	-1738.8	-4187.47	-1970.47	-4745.39	4084.5	1832.43	0.0
15	-1451.07	-3494.54	-1738.8	-4187.47	3574.25	1635.74	0.0
16	-1127.09	-2714.33	-1451.07	-3494.54	2994.96	1413.33	0.0
17	-790.34	-1903.34	-1127.09	-2714.33	2357.74	1169.37	0.0
18	-468.42	-1128.07	-790.34	-1903.34	1675.31	908.66	0.0
19	-193.66	-466.38	-468.42	-1128.07	962.46	636.82	0.0
20	-3.87	-9.32	-193.66	-466.38	236.35	360.34	0.0

Numero di superfici esaminate....(203)

N°	Xo	Yo	Ro	Fs
1	35.8	6.7	9.5	16.67
2	36.7	7.4	10.1	16.67
3	37.6	6.7	9.2	16.67
4	38.5	7.4	9.8	16.67
5	39.4	6.7	9.4	16.67
6	40.3	7.4	11.5	16.67
7	41.2	6.7	11.5	16.67
8	42.1	7.4	11.7	1.61
9	43.0	6.7	11.7	1.44
10	43.9	7.4	13.8	16.67
11	44.8	6.7	12.0	1.33
12	45.7	7.4	14.0	16.67
13	46.6	6.7	13.7	16.67
14	47.5	7.4	14.1	16.67
15	48.4	6.7	13.9	16.67
16	49.3	7.4	14.3	16.67
17	50.2	6.7	15.5	16.67
18	51.1	7.4	16.0	16.67
19	52.0	6.7	17.0	16.67

20	52.9	7.4	16.2	11.03
21	53.8	6.7	15.8	8.60
22	35.8	8.1	10.9	16.67
23	36.7	8.9	11.5	16.67
24	37.6	8.1	10.6	16.67
25	38.5	8.9	11.1	16.67
26	39.4	8.1	12.2	16.67
27	40.3	8.9	12.8	16.67
28	41.2	8.1	11.9	1.74
29	42.1	8.9	12.5	1.91
30	43.0	8.1	14.0	16.67
31	43.9	8.9	14.4	1.38
32	44.8	8.1	14.2	1.31
33	45.7	8.9	14.6	1.31
34	46.6	8.1	16.2	16.67
35	47.5	8.9	16.7	16.67
36	48.4	8.1	16.3	16.67
37	49.3	8.9	16.8	16.67
38	50.2	8.1	16.4	16.67
39	51.1	8.9	16.9	16.67
40	52.0	8.1	18.1	16.67
41	52.9	8.9	18.8	16.67
42	35.8	9.6	12.3	16.67
43	36.7	10.3	12.8	16.67
44	37.6	9.6	12.0	16.67
45	38.5	10.3	12.5	16.67
46	39.4	9.6	11.7	3.72
47	40.3	10.3	14.2	16.67
48	41.2	9.6	13.3	1.65
49	42.1	10.3	13.9	1.94
50	43.0	9.6	15.1	16.67
51	43.9	10.3	15.7	1.38
52	44.8	9.6	14.9	1.41
53	45.7	10.3	15.5	1.41
54	46.6	9.6	17.0	16.67
55	47.5	10.3	17.5	16.67
56	48.4	9.6	17.2	16.67
57	49.3	10.3	17.7	16.67
58	50.2	9.6	17.3	16.67
59	51.1	10.3	17.8	16.67
60	52.0	9.6	17.4	16.18
61	52.9	10.3	19.9	16.67
62	35.8	11.0	11.9	1.37
63	36.7	11.7	14.2	16.67
64	37.6	11.0	13.4	16.67
65	38.5	11.7	13.9	16.67

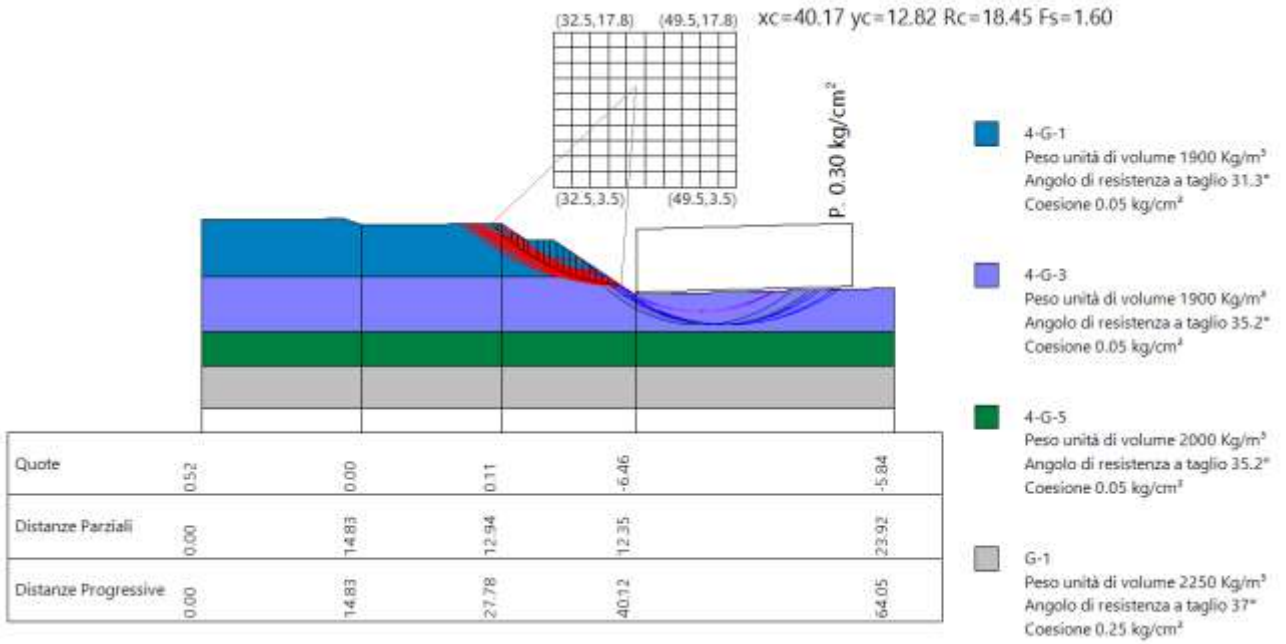
66	39.4	11.0	13.1	2.71
67	40.3	11.7	15.6	16.67
68	41.2	11.0	14.7	1.55
69	42.1	11.7	15.3	1.84
70	43.0	11.0	16.5	16.67
71	43.9	11.7	17.1	1.34
72	44.8	11.0	16.3	1.44
73	45.7	11.7	16.9	1.45
74	46.6	11.0	18.3	16.67
75	47.5	11.7	18.9	16.67
76	48.4	11.0	18.2	16.67
77	49.3	11.7	18.8	16.67
78	50.2	11.0	18.2	16.67
79	52.0	11.0	20.5	16.67
80	52.9	11.7	21.1	16.67
81	35.8	12.4	13.3	1.42
82	36.7	13.2	15.6	16.67
83	37.6	12.4	14.8	16.67
84	38.5	13.2	15.3	1.53
85	39.4	12.4	14.5	2.13
86	40.3	13.2	16.9	16.67
87	41.2	12.4	16.1	1.45
88	42.1	13.2	16.7	1.70
89	43.0	12.4	17.9	16.67
90	43.9	13.2	18.5	1.30
91	44.8	12.4	17.7	1.42
92	45.7	13.2	18.3	1.52
93	46.6	12.4	19.7	16.67
94	47.5	13.2	20.4	16.67
95	48.4	12.4	19.6	16.67
96	49.3	13.2	20.2	16.67
97	50.2	12.4	19.5	16.67
98	51.1	13.2	22.4	16.67
99	35.8	13.9	14.7	1.49
100	36.7	14.6	17.0	16.67
101	37.6	13.9	16.2	16.67
102	38.5	14.6	16.7	1.53
103	39.4	13.9	15.8	1.80
104	40.3	14.6	18.3	16.67
105	41.2	13.9	17.5	1.40
106	42.1	14.6	18.1	1.55
107	43.0	13.9	17.3	2.33
108	43.9	14.6	19.9	1.27
109	44.8	13.9	19.1	1.38
110	45.7	14.6	19.7	1.50
111	46.6	13.9	18.9	1.54

112	47.5	14.6	21.8	16.67
113	48.4	13.9	21.0	16.67
114	49.3	14.6	21.6	16.67
115	50.2	13.9	20.9	16.67
116	52.0	13.9	23.1	16.67
117	53.8	13.9	23.1	16.67
118	35.8	15.3	16.0	1.57
119	36.7	16.0	18.4	16.67
120	37.6	15.3	17.5	16.67
121	38.5	16.0	18.1	1.55
122	39.4	15.3	17.2	1.68
123	40.3	16.0	19.7	16.67
124	41.2	15.3	18.9	1.39
125	42.1	16.0	19.5	1.47
126	43.0	15.3	18.7	2.06
127	43.9	16.0	21.3	1.26
128	44.8	15.3	20.5	1.33
129	45.7	16.0	21.1	1.45
130	46.6	15.3	20.4	1.62
131	47.5	16.0	23.2	16.67
132	48.4	15.3	22.4	16.67
133	49.3	16.0	23.1	16.67
134	50.2	15.3	22.3	16.67
135	52.0	15.3	24.5	16.67
136	52.9	16.0	25.2	16.67
137	35.8	16.7	17.4	1.65
138	36.7	17.4	19.8	16.67
139	37.6	16.7	18.9	16.67
140	38.5	17.4	19.5	1.58
141	39.4	16.7	18.6	1.64
142	40.3	17.4	21.1	16.67
143	41.2	16.7	20.3	1.40
144	42.1	17.4	20.9	1.44
145	43.0	16.7	20.1	1.80
146	43.9	17.4	22.7	1.26
147	44.8	16.7	21.9	1.29
148	45.7	17.4	22.6	1.39
149	46.6	16.7	21.8	1.66
150	47.5	17.4	24.6	16.67
151	48.4	16.7	23.8	16.67
152	49.3	17.4	24.5	16.67
153	50.2	16.7	23.7	16.67
154	51.1	17.4	26.7	16.67
155	35.8	18.2	18.8	1.73
156	36.7	18.9	21.2	16.67
157	37.6	18.2	20.3	16.67

158	38.5	18.9	20.9	1.62
159	39.4	18.2	20.0	1.63
160	40.3	18.9	22.5	16.67
161	41.2	18.2	21.7	1.41
162	42.1	18.9	22.3	1.43
163	43.0	18.2	21.5	1.62
164	43.9	18.9	24.1	1.28
165	44.8	18.2	23.4	1.27
166	45.7	18.9	24.0	1.33
167	46.6	18.2	23.2	1.59
168	47.5	18.9	23.8	1.86
169	48.4	18.2	25.2	16.67
170	49.3	18.9	25.9	16.67
171	50.2	18.2	25.1	16.67
172	51.1	18.9	28.1	16.67
173	53.8	18.2	27.3	16.67
174	35.8	19.6	20.2	1.81
175	36.7	20.3	22.6	16.67
176	37.6	19.6	21.7	16.67
177	38.5	20.3	22.2	1.67
178	39.4	19.6	21.4	1.65
179	40.3	20.3	23.9	16.67
180	41.2	19.6	23.1	1.44
181	42.1	20.3	23.7	1.44
182	43.0	19.6	22.9	1.54
183	43.9	20.3	25.6	1.30
184	44.8	19.6	24.8	1.27
185	45.7	20.3	25.4	1.30
186	46.6	19.6	24.6	1.50
187	47.5	20.3	25.2	16.67
188	48.4	19.6	26.7	16.67
189	49.3	20.3	27.3	16.67
190	50.2	19.6	26.5	16.67
191	52.0	19.6	28.8	16.67
192	52.9	20.3	29.5	16.67
193	53.8	19.6	28.8	16.67
194	35.8	21.0	21.6	1.90
195	37.6	21.0	23.1	16.67
196	39.4	21.0	22.8	1.67
197	41.2	21.0	24.5	1.48
198	43.0	21.0	24.2	1.51
199	44.8	21.0	26.2	1.29
200	46.6	21.0	26.0	1.41
201	48.4	21.0	28.1	16.67
202	50.2	21.0	27.9	16.67
203	52.0	21.0	30.2	16.67

1.14 SEZIONE 226

1.14.1 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

==========

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata

Superficie di forma circolare

==========

Maglia dei Centri

==========

Ascissa vertice sinistro inferiore xi	32.53 m
Ordinata vertice sinistro inferiore yi	3.51 m
Ascissa vertice destro superiore xs	49.51 m
Ordinata vertice destro superiore ys	17.83 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

==========

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.52
2	10.37	0.52
3	13.13	0.62
4	13.25	0.52
5	14.83	0.0
6	27.78	0.11
7	30.12	-1.46
8	32.62	-1.46
9	40.12	-6.46
10	60.37	-5.91
11	60.99	-5.9
12	64.05	-5.84

Vertici strato 1

N	X (m)	y (m)
1	0.0	-4.8
2	14.83	-4.8
3	37.64	-4.8
4	40.12	-6.46
5	60.37	-5.91
6	60.99	-5.9
7	64.05	-5.84

Vertici strato 2

N	X (m)	y (m)
1	0.0	-9.9
2	14.83	-9.9
3	64.05	-9.9

Vertici strato 3

N	X (m)	y (m)
1	0.0	-13.0
2	14.83	-13.0
3	40.12	-13.0
4	64.05	-13.0

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0.05		31.3	1900	2100.00	4-G-1	
2	0.05		35.2	1900		4-G-3	
3	0.05		35.2	2000		4-G-5	
4	0.25		37	2250		G-1	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	40.27	-6.2	60.27	-5.662954	0.3

Risultati analisi pendio [A2+M2+R2]

Fs minimo individuato	1.6
Ascissa centro superficie	40.17 m
Ordinata centro superficie	12.82 m
Raggio superficie	18.45 m

xc = 40.172 yc = 12.82 Rc = 18.448 Fs=1.599
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.6	45.09	0.85	353.32
2	0.37	42.99	0.5	541.27
3	0.83	40.52	1.1	1646.54
4	0.6	37.64	0.76	1301.83
5	0.6	35.32	0.73	1351.31
6	0.32	33.59	0.38	717.73
7	0.88	31.39	1.03	2468.67
8	0.6	28.72	0.68	2164.73
9	0.6	26.62	0.67	2522.84
10	0.6	24.55	0.66	2849.86
11	0.6	22.52	0.65	2781.57
12	0.6	20.52	0.64	2595.51
13	0.6	18.54	0.63	2382.4
14	0.6	16.59	0.63	2143.26
15	0.6	14.66	0.62	1878.87
16	0.6	12.74	0.61	1589.96
17	0.6	10.84	0.61	1277.11
18	0.6	8.95	0.61	940.83
19	0.6	7.07	0.6	581.5
20	0.6	5.19	0.6	199.46

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**13.85**	**33.92**	**0.0**	**0.0**	**263.7**	**292.64**	**0.0**
2	**-1.96**	**-4.81**	**13.85**	**33.92**	**381.04**	**240.74**	**0.0**
3	**-179.77**	**-440.44**	**-1.96**	**-4.81**	**1103.91**	**610.24**	**0.0**
4	**-285.36**	**-699.15**	**-179.77**	**-440.44**	**956.58**	**480.36**	**0.0**
5	**-380.3**	**-931.76**	**-285.36**	**-699.15**	**1045.6**	**501.86**	**0.0**
6	**-393.07**	**-963.05**	**-380.3**	**-931.76**	**591.22**	**274.76**	**0.0**
7	**-564.27**	**-1382.48**	**-393.07**	**-963.05**	**2034.97**	**877.76**	**0.0**
8	**-671.55**	**-1645.34**	**-564.27**	**-1382.48**	**1866.12**	**738.65**	**0.0**
9	**-773.98**	**-1896.3**	**-671.55**	**-1645.34**	**2234.54**	**847.46**	**0.0**
10	**-860.25**	**-2107.66**	**-773.98**	**-1896.3**	**2582.76**	**950.51**	**0.0**
11	**-906.11**	**-2220.04**	**-860.25**	**-2107.66**	**2568.73**	**943.71**	**0.0**
12	**-910.05**	**-2229.68**	**-906.11**	**-2220.04**	**2431.12**	**899.63**	**0.0**
13	**-876.24**	**-2146.84**	**-910.05**	**-2229.68**	**2253.0**	**843.5**	**0.0**
14	**-770.26**	**-1887.2**	**-876.24**	**-2146.84**	**2026.61**	**871.71**	**0.0**
15	**-641.86**	**-1572.59**	**-770.26**	**-1887.2**	**1773.11**	**780.77**	**0.0**
16	**-499.21**	**-1223.09**	**-641.86**	**-1572.59**	**1488.75**	**679.16**	**0.0**
17	**-351.82**	**-861.97**	**-499.21**	**-1223.09**	**1177.47**	**568.24**	**0.0**
18	**-210.6**	**-515.98**	**-351.82**	**-861.97**	**843.69**	**449.57**	**0.0**
19	**-88.01**	**-215.62**	**-210.6**	**-515.98**	**492.37**	**324.89**	**0.0**
20	**1.77**	**4.33**	**-88.01**	**-215.62**	**129.14**	**196.18**	**0.0**

Numero di superfici esaminate....(206)

N°	Xo	Yo	Ro	Fs
1	32.5	3.5	8.1	20.00
2	33.4	4.2	8.8	20.00
3	34.2	3.5	9.2	20.00
4	35.1	4.2	9.9	20.00
5	35.9	3.5	9.2	20.00
6	36.8	4.2	9.9	20.00
7	37.6	3.5	10.4	20.00
8	38.5	4.2	11.1	20.00
9	39.3	3.5	10.4	20.00
10	40.2	4.2	11.1	20.00
11	41.0	3.5	10.3	20.00
12	41.9	4.2	11.0	20.00
13	42.7	3.5	10.3	20.00
14	43.6	4.2	12.2	20.00
15	44.4	3.5	11.5	20.00
16	45.3	4.2	13.5	20.00
17	46.1	3.5	12.7	88.05
18	47.8	3.5	12.7	26.06
19	32.5	4.9	9.5	20.00
20	33.4	5.7	10.2	20.00
21	34.2	4.9	9.5	20.00
22	35.1	5.7	10.2	20.00
23	35.9	4.9	10.6	20.00
24	36.8	5.7	11.3	20.00
25	37.6	4.9	10.6	20.00
26	38.5	5.7	12.5	20.00
27	39.3	4.9	11.8	20.00
28	40.2	5.7	12.5	20.00
29	41.0	4.9	11.8	20.00
30	41.9	5.7	12.5	20.00
31	42.7	4.9	11.7	20.00
32	43.6	5.7	13.7	20.00
33	44.4	4.9	13.0	20.00
34	45.3	5.7	13.7	20.00
35	46.1	4.9	12.9	30.47
36	47.0	5.7	14.9	127.29
37	47.8	4.9	14.2	27.04
38	32.5	6.4	10.9	20.00
39	33.4	7.1	11.6	20.00
40	34.2	6.4	10.9	20.00
41	35.1	7.1	11.6	20.00
42	35.9	6.4	10.9	20.00

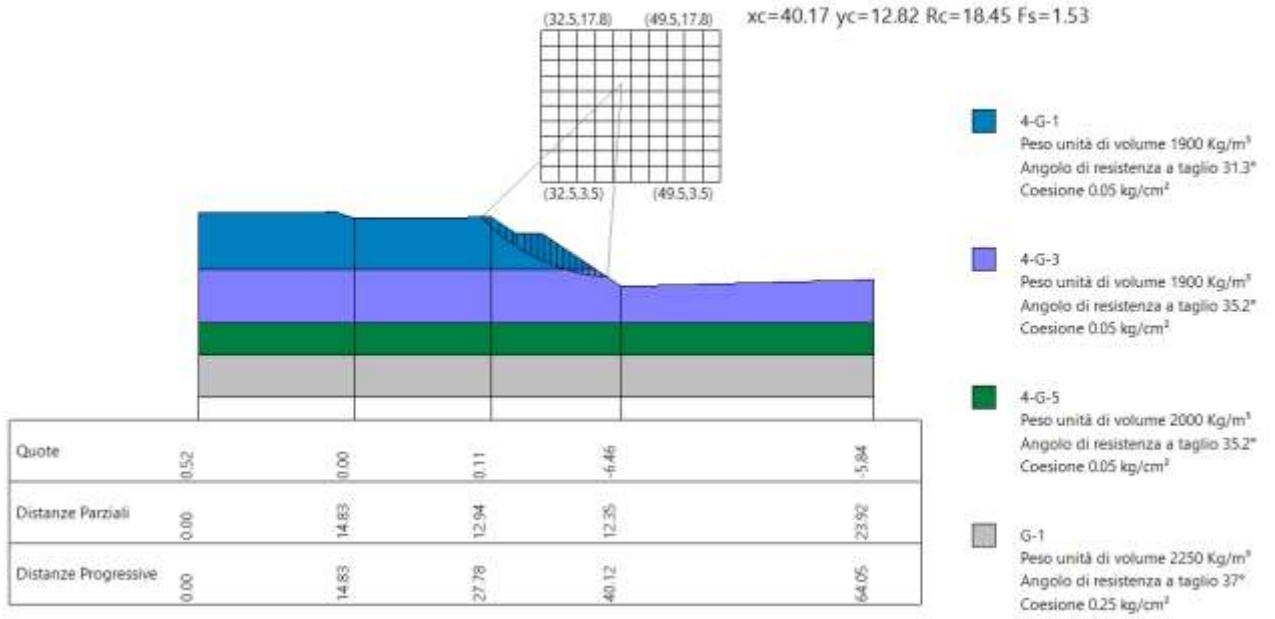
43	36.8	7.1	12.8	20.00
44	37.6	6.4	12.0	20.00
45	38.5	7.1	12.7	20.00
46	39.3	6.4	13.2	20.00
47	40.2	7.1	13.9	20.00
48	41.0	6.4	13.2	20.00
49	41.9	7.1	13.9	20.00
50	42.7	6.4	13.2	20.00
51	43.6	7.1	15.1	20.00
52	44.4	6.4	14.4	20.00
53	45.3	7.1	15.1	20.00
54	46.1	6.4	14.4	64.94
55	47.0	7.1	16.3	20.00
56	47.8	6.4	15.6	39.10
57	48.7	7.1	16.3	28.05
58	32.5	7.8	11.2	20.00
59	33.4	8.5	11.9	20.00
60	34.2	7.8	12.3	20.00
61	35.1	8.5	13.0	20.00
62	35.9	7.8	12.3	20.00
63	36.8	8.5	13.0	20.00
64	37.6	7.8	13.5	20.00
65	38.5	8.5	14.2	20.00
66	39.3	7.8	13.4	1.60
67	40.2	8.5	15.4	20.00
68	41.0	7.8	14.6	20.00
69	41.9	8.5	15.3	20.00
70	42.7	7.8	14.6	20.00
71	43.6	8.5	16.5	20.00
72	44.4	7.8	15.8	20.00
73	45.3	8.5	16.5	20.00
74	46.1	7.8	15.8	20.00
75	47.0	8.5	17.7	20.00
76	48.7	8.5	17.7	39.90
77	32.5	9.2	12.6	20.00
78	33.4	10.0	13.3	20.00
79	34.2	9.2	13.8	20.00
80	35.1	10.0	14.5	20.00
81	35.9	9.2	13.7	20.00
82	36.8	10.0	14.4	20.00
83	37.6	9.2	14.9	20.00
84	38.5	10.0	15.6	20.00
85	39.3	9.2	14.9	1.61
86	40.2	10.0	15.6	1.62
87	41.0	9.2	16.1	20.00
88	41.9	10.0	16.8	20.00

89	42.7	9.2	16.0	20.00
90	43.6	10.0	18.0	20.00
91	44.4	9.2	17.3	20.00
92	45.3	10.0	18.0	20.00
93	46.1	9.2	17.2	20.00
94	47.0	10.0	17.9	20.00
95	47.8	9.2	18.5	20.00
96	32.5	10.7	14.1	20.00
97	33.4	11.4	14.8	20.00
98	34.2	10.7	14.0	20.00
99	35.1	11.4	15.9	20.00
100	35.9	10.7	15.2	20.00
101	36.8	11.4	15.9	20.00
102	37.6	10.7	15.1	1.77
103	38.5	11.4	17.0	20.00
104	39.3	10.7	16.3	1.60
105	40.2	11.4	17.0	1.61
106	41.0	10.7	17.5	20.00
107	41.9	11.4	18.2	20.00
108	42.7	10.7	17.5	20.00
109	43.6	11.4	18.2	20.00
110	44.4	10.7	18.7	20.00
111	45.3	11.4	19.4	20.00
112	46.1	10.7	18.7	20.00
113	47.0	11.4	19.4	20.00
114	47.8	10.7	19.9	20.00
115	48.7	11.4	20.6	20.00
116	32.5	12.1	15.5	20.00
117	33.4	12.8	16.2	20.00
118	34.2	12.1	15.4	20.00
119	35.1	12.8	16.1	20.00
120	35.9	12.1	16.6	20.00
121	36.8	12.8	17.3	20.00
122	37.6	12.1	16.6	1.78
123	38.5	12.8	17.3	1.81
124	39.3	12.1	17.7	1.62
125	40.2	12.8	18.4	1.60
126	41.0	12.1	17.7	1.65
127	41.9	12.8	19.6	20.00
128	42.7	12.1	18.9	20.00
129	43.6	12.8	19.6	20.00
130	44.4	12.1	20.1	20.00
131	45.3	12.8	20.8	20.00
132	46.1	12.1	20.1	20.00
133	47.0	12.8	20.8	20.00
134	47.8	12.1	21.3	20.00

135	48.7	12.8	22.0	20.00
136	49.5	12.1	21.3	20.00
137	32.5	13.5	16.9	20.00
138	33.4	14.3	17.6	20.00
139	34.2	13.5	16.9	20.00
140	35.1	14.3	17.6	20.00
141	35.9	13.5	18.0	20.00
142	36.8	14.3	18.7	20.00
143	37.6	13.5	18.0	1.80
144	38.5	14.3	18.7	1.81
145	39.3	13.5	19.2	1.65
146	40.2	14.3	19.9	1.61
147	41.0	13.5	19.2	1.63
148	41.9	14.3	19.9	1.69
149	42.7	13.5	20.3	20.00
150	43.6	14.3	21.1	20.00
151	44.4	13.5	21.5	20.00
152	45.3	14.3	22.3	20.00
153	46.1	13.5	21.5	20.00
154	47.0	14.3	22.2	20.00
155	47.8	13.5	21.5	20.00
156	32.5	15.0	18.3	20.00
157	33.4	15.7	19.0	20.00
158	34.2	15.0	18.3	20.00
159	35.1	15.7	19.0	20.00
160	35.9	15.0	18.3	2.25
161	36.8	15.7	20.2	20.00
162	37.6	15.0	19.4	1.84
163	38.5	15.7	20.1	1.82
164	39.3	15.0	20.6	1.68
165	40.2	15.7	21.3	1.64
166	41.0	15.0	20.6	1.61
167	41.9	15.7	21.3	1.65
168	42.7	15.0	21.8	20.00
169	43.6	15.7	22.5	20.00
170	44.4	15.0	23.0	20.00
171	45.3	15.7	23.7	20.00
172	46.1	15.0	23.0	20.00
173	47.0	15.7	23.7	20.00
174	47.8	15.0	23.0	20.00
175	48.7	15.7	24.9	20.00
176	32.5	16.4	19.6	20.00
177	33.4	17.1	20.5	20.00
178	34.2	16.4	19.7	20.00
179	35.1	17.1	20.4	20.00
180	35.9	16.4	19.7	2.29

181	36.8	17.1	21.6	20.00
182	37.6	16.4	20.9	1.88
183	38.5	17.1	21.6	1.85
184	39.3	16.4	22.0	1.72
185	40.2	17.1	22.7	1.67
186	41.0	16.4	22.0	1.62
187	41.9	17.1	22.7	1.63
188	42.7	16.4	23.2	20.00
189	43.6	17.1	23.9	20.00
190	44.4	16.4	24.4	20.00
191	45.3	17.1	25.1	20.00
192	46.1	16.4	24.4	20.00
193	47.0	17.1	25.1	20.00
194	47.8	16.4	24.4	20.00
195	48.7	17.1	25.1	20.00
196	49.5	16.4	25.4	20.00
197	32.5	17.8	20.9	20.00
198	34.2	17.8	21.2	20.00
199	35.9	17.8	21.1	2.34
200	37.6	17.8	22.3	1.93
201	39.3	17.8	23.5	1.77
202	41.0	17.8	23.4	1.64
203	42.7	17.8	23.4	1.72
204	44.4	17.8	25.8	20.00
205	46.1	17.8	25.8	20.00
206	47.8	17.8	25.8	20.00

1.14.2 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.2
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	32.53 m
Ordinata vertice sinistro inferiore yi	3.51 m
Ascissa vertice destro superiore xs	49.51 m
Ordinata vertice destro superiore ys	17.83 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

==========

Coefficiente azione sismica orizzontale 0.032
Coefficiente azione sismica verticale 0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.52
2	10.37	0.52
3	13.13	0.62
4	13.25	0.52
5	14.83	0.0
6	27.78	0.11
7	30.12	-1.46
8	32.62	-1.46
9	40.12	-6.46
10	60.37	-5.91
11	60.99	-5.9
12	64.05	-5.84

Vertici strato 1

N	X (m)	y (m)
1	0.0	-4.8
2	14.83	-4.8
3	37.64	-4.8
4	40.12	-6.46
5	60.37	-5.91
6	60.99	-5.9
7	64.05	-5.84

Vertici strato 2

N	X (m)	y (m)
1	0.0	-9.9
2	14.83	-9.9
3	64.05	-9.9

Vertici strato 3

N	X (m)	y (m)
1	0.0	-13.0
2	14.83	-13.0
3	40.12	-13.0
4	64.05	-13.0

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	No

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0.05		31.3	1900	2100.00	4-G-1	
2	0.05		35.2	1900		4-G-3	
3	0.05		35.2	2000		4-G-5	
4	0.25		37	2250		G-1	

Risultati analisi pendio

Fs minimo individuato	1.53
Ascissa centro superficie	40.17 m
Ordinata centro superficie	12.82 m
Raggio superficie	18.45 m

xc = 40.172 yc = 12.82 Rc = 18.448 Fs=1.527
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.6	45.09	0.85	353.32
2	0.37	42.99	0.5	541.27
3	0.83	40.52	1.1	1646.54
4	0.6	37.64	0.76	1301.83
5	0.6	35.32	0.73	1351.31
6	0.32	33.59	0.38	717.73
7	0.88	31.39	1.03	2468.67
8	0.6	28.72	0.68	2164.73
9	0.6	26.62	0.67	2522.84
10	0.6	24.55	0.66	2849.86
11	0.6	22.52	0.65	2781.57
12	0.6	20.52	0.64	2595.51
13	0.6	18.54	0.63	2382.4
14	0.6	16.59	0.63	2143.26
15	0.6	14.66	0.62	1878.87
16	0.6	12.74	0.61	1589.96
17	0.6	10.84	0.61	1277.11
18	0.6	8.95	0.61	940.83
19	0.6	7.07	0.6	581.5
20	0.6	5.19	0.6	199.46

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**15.77**	**46.15**	**0.0**	**0.0**	**266.98**	**320.25**	**0.0**
2	**5.12**	**14.98**	**15.77**	**46.15**	**376.95**	**261.2**	**0.0**
3	**-148.92**	**-435.89**	**5.12**	**14.98**	**1061.74**	**651.55**	**0.0**
4	**-239.46**	**-700.92**	**-148.92**	**-435.89**	**931.86**	**515.69**	**0.0**
5	**-320.89**	**-939.24**	**-239.46**	**-700.92**	**1023.9**	**540.14**	**0.0**
6	**-329.77**	**-965.24**	**-320.89**	**-939.24**	**587.77**	**298.51**	**0.0**
7	**-479.57**	**-1403.73**	**-329.77**	**-965.24**	**1999.36**	**945.48**	**0.0**
8	**-573.4**	**-1678.35**	**-479.57**	**-1403.73**	**1845.74**	**798.83**	**0.0**
9	**-663.78**	**-1942.91**	**-573.4**	**-1678.35**	**2217.59**	**918.63**	**0.0**
10	**-740.91**	**-2168.68**	**-663.78**	**-1942.91**	**2572.04**	**1033.08**	**0.0**
11	**-783.1**	**-2292.17**	**-740.91**	**-2168.68**	**2568.09**	**1029.01**	**0.0**
12	**-788.84**	**-2308.95**	**-783.1**	**-2292.17**	**2440.08**	**984.12**	**0.0**
13	**-761.73**	**-2229.61**	**-788.84**	**-2308.95**	**2270.14**	**925.62**	**0.0**
14	**-670.1**	**-1961.41**	**-761.73**	**-2229.61**	**2056.08**	**962.04**	**0.0**
15	**-559.06**	**-1636.38**	**-670.1**	**-1961.41**	**1806.41**	**864.34**	**0.0**
16	**-435.61**	**-1275.06**	**-559.06**	**-1636.38**	**1523.69**	**754.15**	**0.0**
17	**-307.88**	**-901.18**	**-435.61**	**-1275.06**	**1211.56**	**632.86**	**0.0**
18	**-185.14**	**-541.91**	**-307.88**	**-901.18**	**874.19**	**502.05**	**0.0**
19	**-77.95**	**-228.15**	**-185.14**	**-541.91**	**516.24**	**363.52**	**0.0**
20	**1.71**	**5.01**	**-77.95**	**-228.15**	**143.01**	**219.29**	**0.0**

Numero di superfici esaminate....(206)

N°	Xo	Yo	Ro	Fs
1	32.5	3.5	8.1	16.67
2	33.4	4.2	8.8	16.67
3	34.2	3.5	9.2	16.67
4	35.1	4.2	9.9	16.67
5	35.9	3.5	9.2	16.67
6	36.8	4.2	9.9	16.67
7	37.6	3.5	10.4	16.67
8	38.5	4.2	11.1	16.67
9	39.3	3.5	10.4	16.67
10	40.2	4.2	11.1	16.67
11	41.0	3.5	10.3	16.67
12	41.9	4.2	11.0	16.67
13	42.7	3.5	10.3	16.67
14	43.6	4.2	12.2	16.67
15	44.4	3.5	11.5	16.67
16	45.3	4.2	12.2	16.67
17	46.1	3.5	12.7	16.67
18	47.8	3.5	12.7	15.26
19	32.5	4.9	9.5	16.67
20	33.4	5.7	10.2	16.67
21	34.2	4.9	9.5	16.67
22	35.1	5.7	10.2	16.67
23	35.9	4.9	10.6	16.67
24	36.8	5.7	11.3	16.67
25	37.6	4.9	10.6	16.67
26	38.5	5.7	12.5	16.67
27	39.3	4.9	11.8	16.67
28	40.2	5.7	12.5	16.67
29	41.0	4.9	11.8	16.67
30	41.9	5.7	12.5	16.67
31	42.7	4.9	11.7	16.67
32	43.6	5.7	13.7	16.67
33	44.4	4.9	13.0	16.67
34	45.3	5.7	13.7	16.67
35	46.1	4.9	12.9	20.31
36	47.0	5.7	14.9	16.67
37	47.8	4.9	14.2	20.59
38	32.5	6.4	10.9	16.67
39	33.4	7.1	11.6	16.67
40	34.2	6.4	10.9	16.67
41	35.1	7.1	11.6	16.67
42	35.9	6.4	10.9	16.67

43	36.8	7.1	12.8	16.67
44	37.6	6.4	12.0	16.67
45	38.5	7.1	12.7	16.67
46	39.3	6.4	13.2	16.67
47	40.2	7.1	13.9	16.67
48	41.0	6.4	13.2	16.67
49	41.9	7.1	13.9	16.67
50	42.7	6.4	13.2	16.67
51	43.6	7.1	15.1	16.67
52	44.4	6.4	14.4	16.67
53	45.3	7.1	15.1	16.67
54	46.1	6.4	14.4	251.63
55	47.0	7.1	16.3	16.67
56	47.8	6.4	15.6	46.54
57	48.7	7.1	16.3	18.29
58	32.5	7.8	11.2	16.67
59	33.4	8.5	11.9	16.67
60	34.2	7.8	12.3	16.67
61	35.1	8.5	13.0	16.67
62	35.9	7.8	12.3	16.67
63	36.8	8.5	13.0	16.67
64	37.6	7.8	13.5	16.67
65	38.5	8.5	14.2	16.67
66	39.3	7.8	13.4	1.53
67	40.2	8.5	15.4	16.67
68	41.0	7.8	14.6	16.67
69	41.9	8.5	15.3	16.67
70	42.7	7.8	14.6	16.67
71	43.6	8.5	16.5	16.67
72	44.4	7.8	15.8	16.67
73	45.3	8.5	16.5	16.67
74	46.1	7.8	15.8	16.67
75	47.0	8.5	17.7	16.67
76	48.7	8.5	17.7	33.87
77	32.5	9.2	12.6	16.67
78	33.4	10.0	13.3	16.67
79	34.2	9.2	13.8	16.67
80	35.1	10.0	14.5	16.67
81	35.9	9.2	13.7	16.67
82	36.8	10.0	14.4	16.67
83	37.6	9.2	14.9	16.67
84	38.5	10.0	15.6	16.67
85	39.3	9.2	14.9	1.54
86	40.2	10.0	15.6	1.55
87	41.0	9.2	16.1	16.67
88	41.9	10.0	16.8	16.67

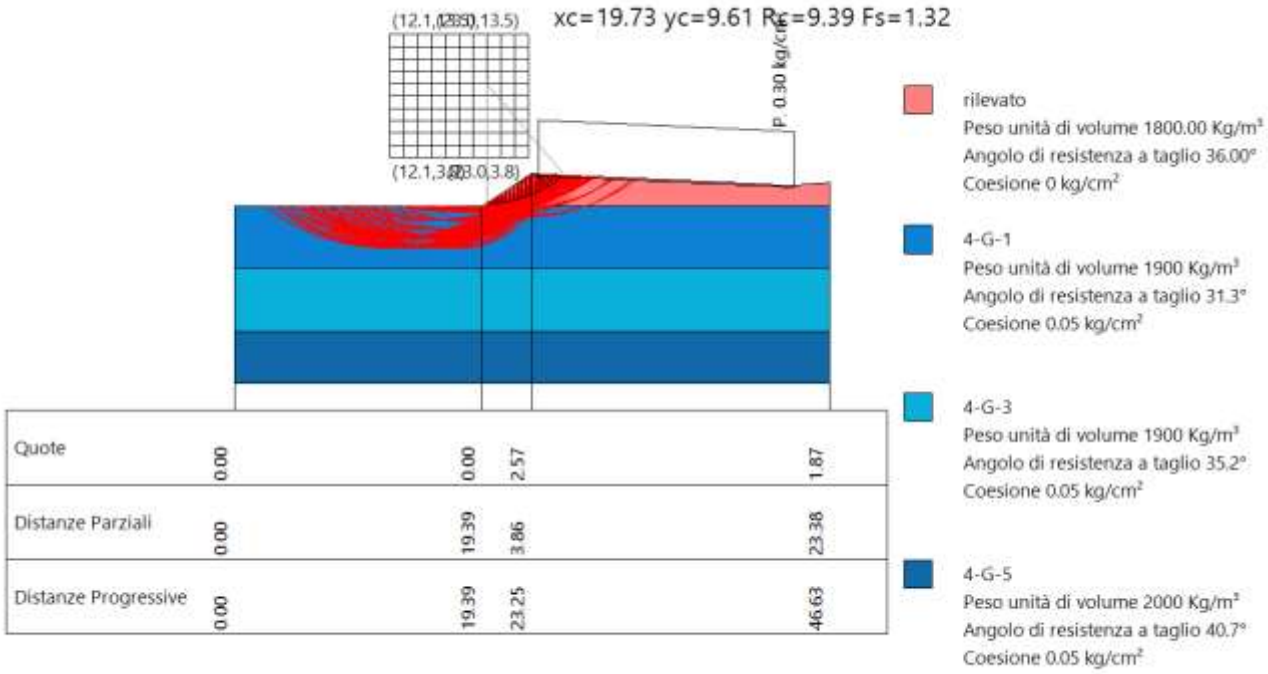
89	42.7	9.2	16.0	16.67
90	43.6	10.0	18.0	16.67
91	44.4	9.2	17.3	16.67
92	45.3	10.0	18.0	16.67
93	46.1	9.2	17.2	16.67
94	47.0	10.0	17.9	16.67
95	47.8	9.2	18.5	16.67
96	32.5	10.7	14.1	16.67
97	33.4	11.4	14.8	16.67
98	34.2	10.7	14.0	16.67
99	35.1	11.4	15.9	16.67
100	35.9	10.7	15.2	16.67
101	36.8	11.4	15.9	16.67
102	37.6	10.7	15.1	1.68
103	38.5	11.4	17.0	16.67
104	39.3	10.7	16.3	1.53
105	40.2	11.4	17.0	1.54
106	41.0	10.7	17.5	16.67
107	41.9	11.4	18.2	16.67
108	42.7	10.7	17.5	16.67
109	43.6	11.4	18.2	16.67
110	44.4	10.7	18.7	16.67
111	45.3	11.4	19.4	16.67
112	46.1	10.7	18.7	16.67
113	47.0	11.4	19.4	16.67
114	47.8	10.7	19.9	16.67
115	48.7	11.4	20.6	16.67
116	32.5	12.1	15.5	16.67
117	33.4	12.8	16.2	16.67
118	34.2	12.1	15.4	16.67
119	35.1	12.8	16.1	16.67
120	35.9	12.1	16.6	16.67
121	36.8	12.8	17.3	16.67
122	37.6	12.1	16.6	1.68
123	38.5	12.8	17.3	1.72
124	39.3	12.1	17.7	1.54
125	40.2	12.8	18.4	1.53
126	41.0	12.1	17.7	1.58
127	41.9	12.8	19.6	16.67
128	42.7	12.1	18.9	16.67
129	43.6	12.8	19.6	16.67
130	44.4	12.1	20.1	16.67
131	45.3	12.8	20.8	16.67
132	46.1	12.1	20.1	16.67
133	47.0	12.8	20.8	16.67
134	47.8	12.1	21.3	16.67

135	48.7	12.8	22.0	16.67
136	49.5	12.1	21.3	114.58
137	32.5	13.5	16.9	16.67
138	33.4	14.3	17.6	16.67
139	34.2	13.5	16.9	16.67
140	35.1	14.3	17.6	16.67
141	35.9	13.5	18.0	16.67
142	36.8	14.3	18.7	16.67
143	37.6	13.5	18.0	1.70
144	38.5	14.3	18.7	1.71
145	39.3	13.5	19.2	1.56
146	40.2	14.3	19.9	1.54
147	41.0	13.5	19.2	1.56
148	41.9	14.3	19.9	1.62
149	42.7	13.5	20.3	16.67
150	43.6	14.3	21.1	16.67
151	44.4	13.5	21.5	16.67
152	45.3	14.3	22.3	16.67
153	46.1	13.5	21.5	16.67
154	47.0	14.3	22.2	16.67
155	47.8	13.5	21.5	16.67
156	32.5	15.0	18.3	16.67
157	33.4	15.7	19.0	16.67
158	34.2	15.0	18.3	16.67
159	35.1	15.7	19.0	16.67
160	35.9	15.0	18.3	2.11
161	36.8	15.7	20.2	16.67
162	37.6	15.0	19.4	1.73
163	38.5	15.7	20.1	1.73
164	39.3	15.0	20.6	1.60
165	40.2	15.7	21.3	1.56
166	41.0	15.0	20.6	1.54
167	41.9	15.7	21.3	1.58
168	42.7	15.0	21.8	16.67
169	43.6	15.7	22.5	16.67
170	44.4	15.0	23.0	16.67
171	45.3	15.7	23.7	16.67
172	46.1	15.0	23.0	16.67
173	47.0	15.7	23.7	16.67
174	47.8	15.0	23.0	16.67
175	48.7	15.7	24.9	16.67
176	32.5	16.4	19.6	16.67
177	33.4	17.1	20.5	16.67
178	34.2	16.4	19.7	16.67
179	35.1	17.1	20.4	16.67
180	35.9	16.4	19.7	2.14

181	36.8	17.1	21.6	16.67
182	37.6	16.4	20.9	1.77
183	38.5	17.1	21.6	1.75
184	39.3	16.4	22.0	1.63
185	40.2	17.1	22.7	1.59
186	41.0	16.4	22.0	1.55
187	41.9	17.1	22.7	1.56
188	42.7	16.4	23.2	16.67
189	43.6	17.1	23.9	16.67
190	44.4	16.4	24.4	16.67
191	45.3	17.1	25.1	16.67
192	46.1	16.4	24.4	16.67
193	47.0	17.1	25.1	16.67
194	47.8	16.4	24.4	16.67
195	48.7	17.1	25.1	16.67
196	49.5	16.4	25.4	16.67
197	32.5	17.8	20.9	16.67
198	34.2	17.8	21.2	16.67
199	35.9	17.8	21.1	2.18
200	37.6	17.8	22.3	1.81
201	39.3	17.8	23.5	1.67
202	41.0	17.8	23.4	1.56
203	42.7	17.8	23.4	1.65
204	44.4	17.8	25.8	16.67
205	46.1	17.8	25.8	16.67
206	47.8	17.8	25.8	16.67

1.15 SEZIONE 290

1.15.1 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	12.13 m
Ordinata vertice sinistro inferiore yi	3.82 m
Ascissa vertice destro superiore xs	22.99 m
Ordinata vertice destro superiore ys	13.48 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	19.39	0.0
3	23.25	2.57
4	40.0	1.82
5	43.39	1.62
6	46.63	1.87

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	19.39	0.0
3	23.25	0.0
4	46.63	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-4.8
2	19.39	-4.8
3	23.25	-4.8
4	43.39	-4.8
5	46.63	-4.8

Vertici strato 3

N	X (m)	y (m)
1	0.0	-9.8
2	19.39	-9.8
3	23.25	-9.8
4	46.63	-9.8

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	1800.00	2100.00	rilevato	
2	0.05		31.3	1900		4-G-1	
3	0.05		35.2	1900		4-G-3	
4	0.05		40.7	2000		4-G-5	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	23.79	2.39	43.79	1.494958	0.3

Risultati analisi pendio

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Fs minimo individuato 1.32
Ascissa centro superficie 19.73 m
Ordinata centro superficie 9.61 m
Raggio superficie 9.39 m

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xc = 19.733 yc = 9.614 Rc = 9.389 Fs=1.323
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.3	0.91	0.3	54.78
2	0.3	2.77	0.3	160.32
3	0.3	4.63	0.3	260.44
4	0.3	6.49	0.31	355.13
5	0.3	8.36	0.31	444.33
6	0.3	10.24	0.31	527.96
7	0.3	12.13	0.31	605.95
8	0.3	14.04	0.31	678.16
9	0.3	15.96	0.32	744.49
10	0.3	17.9	0.32	804.75
11	0.3	19.86	0.32	858.76
12	0.18	21.42	0.19	518.86
13	0.43	23.44	0.47	1215.3
14	0.3	25.9	0.34	1341.71
15	0.3	27.99	0.34	1573.44
16	0.3	30.11	0.35	1473.65
17	0.3	32.28	0.36	1365.55
18	0.3	34.5	0.37	1248.51
19	0.3	36.78	0.38	1121.87
20	0.3	39.14	0.39	684.72

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	11.16	27.72	0.0	0.0	44.06	19.35	0.0
2	40.36	100.25	11.16	27.72	134.46	59.05	0.0
3	82.51	204.92	40.36	100.25	226.03	99.27	0.0
4	133.14	330.68	82.51	204.92	316.76	139.12	0.0
5	188.34	467.78	133.14	330.68	404.93	177.84	0.0
6	244.69	607.72	188.34	467.78	488.99	214.76	0.0
7	299.16	743.01	244.69	607.72	567.59	249.28	0.0
8	349.12	867.11	299.16	743.01	639.54	280.88	0.0
9	392.29	974.32	349.12	867.11	703.77	309.09	0.0
10	426.68	1059.73	392.29	974.32	759.32	333.49	0.0
11	450.61	1119.16	426.68	1059.73	805.37	353.71	0.0
12	459.09	1140.23	450.61	1119.16	482.81	212.05	0.0
13	461.45	1146.08	459.09	1140.23	1115.21	489.79	0.0
14	441.07	1095.48	461.45	1146.08	1203.12	528.4	0.0
15	395.1	981.3	441.07	1095.48	1376.47	604.53	0.0
16	331.45	823.22	395.1	981.3	1250.6	549.25	0.0
17	253.36	629.27	331.45	823.22	1116.99	490.57	0.0
18	164.39	408.3	253.36	629.27	977.1	429.13	0.0
19	68.47	170.06	164.39	408.3	832.67	365.7	0.0
20	0.0	0.0	68.47	170.06	476.87	209.44	0.0

Numero di superfici esaminate....(211)

N°	Xo	Yo	Ro	Fs
1	13.8	4.3	7.6	134.52
2	14.8	4.3	6.8	48.32
3	15.4	3.8	7.1	13.16
4	15.9	4.3	7.6	7.53
5	16.5	3.8	6.4	7.69
6	17.0	4.3	7.6	4.52
7	17.6	3.8	7.1	4.14
8	18.1	4.3	6.9	3.20
9	18.6	3.8	5.0	2.74
10	19.2	4.3	4.8	1.90
11	19.7	3.8	4.3	1.80
12	20.3	4.3	4.8	1.48
13	20.8	3.8	4.3	1.50
14	21.4	4.3	4.8	1.57
15	21.9	3.8	4.4	1.71
16	22.4	4.3	4.9	1.92
17	23.0	3.8	4.4	2.20
18	13.2	4.8	8.0	529.76

19	13.8	5.3	7.8	20.00
20	14.3	4.8	8.0	24.09
21	14.8	5.3	7.8	20.01
22	15.4	4.8	8.1	8.93
23	15.9	5.3	8.5	5.97
24	16.5	4.8	7.3	5.77
25	17.0	5.3	8.5	3.85
26	17.6	4.8	7.4	3.50
27	18.1	5.3	5.7	2.69
28	18.6	4.8	5.2	2.11
29	19.2	5.3	5.7	1.65
30	19.7	4.8	5.3	1.53
31	20.3	5.3	5.8	1.48
32	20.8	4.8	5.3	1.50
33	21.4	5.3	5.8	1.61
34	21.9	4.8	5.3	1.74
35	22.4	5.3	5.1	1.80
36	23.0	4.8	4.7	2.07
37	12.7	6.2	9.5	218.90
38	13.8	6.2	9.5	20.01
39	14.3	5.8	9.0	14.23
40	14.8	6.2	9.5	8.13
41	15.4	5.8	9.0	7.20
42	15.9	6.2	8.8	5.65
43	16.5	5.8	9.0	4.21
44	17.0	6.2	8.8	3.40
45	17.6	5.8	7.6	3.04
46	18.1	6.2	6.7	2.29
47	18.6	5.8	6.2	1.94
48	19.2	6.2	6.7	1.55
49	19.7	5.8	6.2	1.49
50	20.3	6.2	6.7	1.52
51	20.8	5.8	6.3	1.55
52	21.4	6.2	6.1	1.46
53	21.9	5.8	5.6	1.61
54	22.4	6.2	6.1	1.88
55	23.0	5.8	5.6	2.12
56	12.1	6.7	10.0	20.00
57	13.2	6.7	9.2	20.00
58	13.8	7.2	9.7	31.08
59	14.3	6.7	10.0	9.94
60	14.8	7.2	9.7	8.32
61	15.4	6.7	10.0	5.49
62	15.9	7.2	10.5	4.14
63	16.5	6.7	9.3	3.79
64	17.0	7.2	9.0	3.05

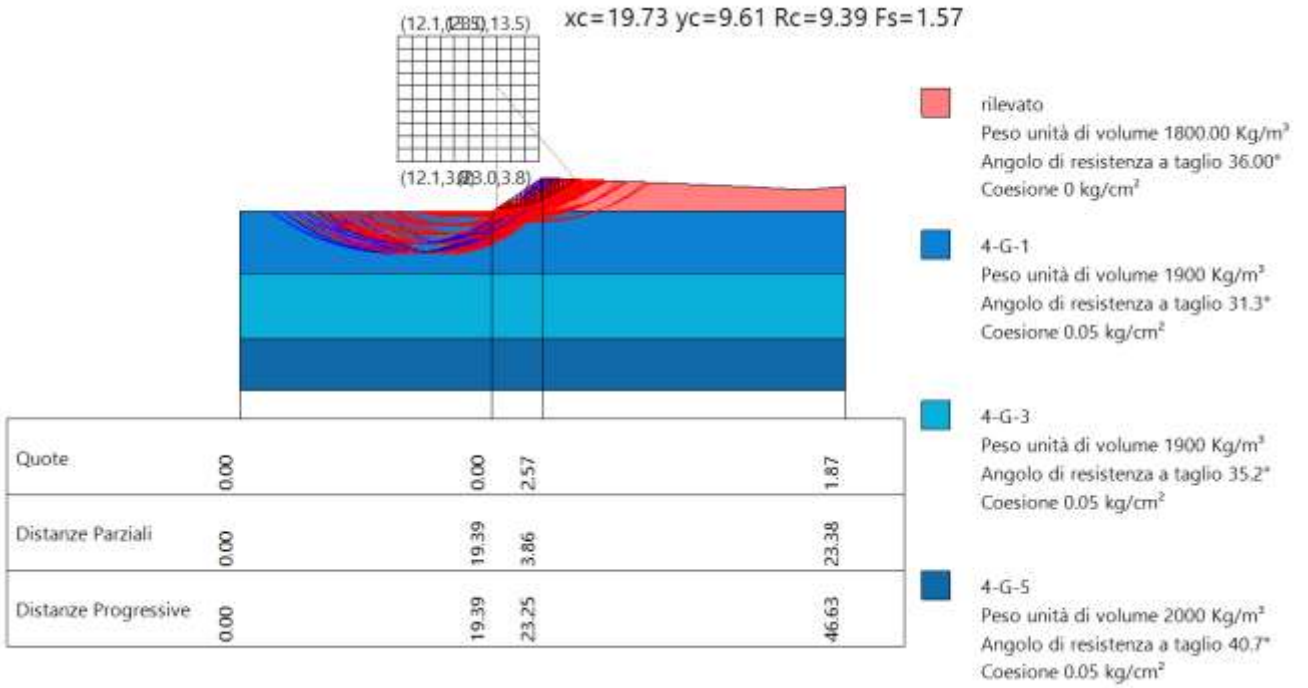
65	17.6	6.7	7.8	2.71
66	18.1	7.2	7.6	1.96
67	18.6	6.7	7.2	1.69
68	19.2	7.2	7.7	1.55
69	19.7	6.7	7.2	1.51
70	20.3	7.2	7.7	1.58
71	20.8	6.7	7.2	1.62
72	21.4	7.2	7.0	1.55
73	21.9	6.7	6.6	1.70
74	22.4	7.2	7.1	1.97
75	23.0	6.7	6.4	2.19
76	12.7	8.2	10.7	20.00
77	13.2	7.7	10.2	79.27
78	13.8	8.2	11.4	9.46
79	14.3	7.7	10.9	7.84
80	14.8	8.2	11.4	5.17
81	15.4	7.7	11.0	4.59
82	15.9	8.2	10.7	3.82
83	16.5	7.7	10.2	3.42
84	17.0	8.2	9.3	2.79
85	17.6	7.7	8.8	2.39
86	18.1	8.2	8.6	1.78
87	18.6	7.7	8.1	1.63
88	19.2	8.2	8.6	1.58
89	19.7	7.7	8.2	1.57
90	20.3	8.2	8.0	1.33
91	20.8	7.7	7.5	1.43
92	21.4	8.2	8.0	1.64
93	21.9	7.7	7.5	1.79
94	22.4	8.2	7.9	2.06
95	23.0	7.7	7.3	2.28
96	12.1	8.6	11.9	49.89
97	12.7	9.1	11.6	80.05
98	13.2	8.6	11.9	12.12
99	13.8	9.1	11.7	11.05
100	14.3	8.6	11.2	8.21
101	14.8	9.1	11.7	5.24
102	15.4	8.6	11.2	4.35
103	15.9	9.1	11.7	3.52
104	16.5	8.6	10.5	3.14
105	17.0	9.1	10.2	2.53
106	17.6	8.6	9.1	2.08
107	18.1	9.1	9.6	1.73
108	18.6	8.6	9.1	1.63
109	19.2	9.1	9.6	1.63
110	19.7	8.6	9.1	1.63

111	20.3	9.1	8.9	1.41
112	20.8	8.6	8.5	1.52
113	21.4	9.1	9.0	1.73
114	21.9	8.6	8.5	1.88
115	22.4	9.1	8.8	2.14
116	23.0	8.6	8.2	2.38
117	12.1	9.6	12.1	20.00
118	12.7	10.1	13.4	11.81
119	13.2	9.6	12.1	16.56
120	13.8	10.1	13.4	5.97
121	14.3	9.6	12.9	5.18
122	14.8	10.1	13.4	4.28
123	15.4	9.6	12.2	3.93
124	15.9	10.1	11.9	3.30
125	16.5	9.6	11.4	2.94
126	17.0	10.1	10.5	2.21
127	17.6	9.6	10.0	1.87
128	18.1	10.1	10.5	1.73
129	18.6	9.6	10.1	1.66
130	19.2	10.1	10.6	1.69
131	19.7	9.6	9.4	1.32
132	20.3	10.1	9.9	1.50
133	20.8	9.6	9.4	1.61
134	21.4	10.1	9.9	1.82
135	21.9	9.6	9.4	1.97
136	22.4	10.1	9.7	2.24
137	23.0	9.6	9.8	2.46
138	12.1	10.6	13.8	15.81
139	12.7	11.1	13.6	16.96
140	13.2	10.6	13.8	7.22
141	13.8	11.1	13.6	6.54
142	14.3	10.6	13.1	5.22
143	14.8	11.1	14.3	4.07
144	15.4	10.6	13.1	3.67
145	15.9	11.1	12.9	3.11
146	16.5	10.6	11.7	2.71
147	17.0	11.1	11.5	2.02
148	17.6	10.6	11.0	1.82
149	18.1	11.1	11.5	1.75
150	18.6	10.6	11.0	1.71
151	19.2	11.1	11.5	1.76
152	19.7	10.6	10.4	1.41
153	20.3	11.1	10.9	1.59
154	20.8	10.6	10.4	1.70
155	21.4	11.1	10.2	1.87
156	21.9	10.6	10.3	2.06

157	22.4	11.1	10.5	2.34
158	23.0	10.6	10.7	2.56
159	12.1	11.5	14.0	33.11
160	12.7	12.0	15.3	7.30
161	13.2	11.5	14.1	8.66
162	13.8	12.0	15.3	4.89
163	14.3	11.5	14.8	4.42
164	14.8	12.0	14.6	3.85
165	15.4	11.5	13.4	3.49
166	15.9	12.0	13.1	2.92
167	16.5	11.5	11.9	2.45
168	17.0	12.0	12.4	1.95
169	17.6	11.5	12.0	1.81
170	18.1	12.0	12.5	1.79
171	18.6	11.5	12.0	1.76
172	19.2	12.0	11.8	1.40
173	19.7	11.5	11.3	1.49
174	20.3	12.0	11.8	1.67
175	20.8	11.5	11.4	1.78
176	21.4	12.0	11.8	2.00
177	21.9	11.5	11.1	2.15
178	22.4	12.0	12.2	2.44
179	23.0	11.5	12.4	2.63
180	12.1	12.5	15.8	9.07
181	12.7	13.0	15.5	8.95
182	13.2	12.5	15.8	5.49
183	13.8	13.0	15.5	4.87
184	14.3	12.5	15.0	4.29
185	14.8	13.0	15.5	3.71
186	15.4	12.5	14.3	3.30
187	15.9	13.0	14.1	2.76
188	16.5	12.5	12.9	2.21
189	17.0	13.0	13.4	1.92
190	17.6	12.5	12.9	1.83
191	18.1	13.0	13.4	1.84
192	18.6	12.5	13.0	1.82
193	19.2	13.0	12.7	1.48
194	19.7	12.5	12.3	1.57
195	20.3	13.0	12.8	1.75
196	20.8	12.5	12.3	1.87
197	21.4	13.0	12.6	2.08
198	21.9	12.5	12.0	2.24
199	22.4	13.0	13.1	2.52
200	23.0	12.5	13.3	2.70
201	12.1	13.5	16.7	7.51
202	13.2	13.5	16.7	5.10

203	14.3	13.5	16.0	4.06
204	15.4	13.5	14.6	3.18
205	16.5	13.5	13.9	2.09
206	17.6	13.5	13.9	1.86
207	18.6	13.5	13.2	1.40
208	19.7	13.5	13.2	1.65
209	20.8	13.5	13.2	1.95
210	21.9	13.5	12.9	2.34
211	23.0	13.5	14.2	2.76

1.15.2 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.2
Analisi	Condizione drenata
Superficie di forma circolare	

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	12.13 m
Ordinata vertice sinistro inferiore yi	3.82 m
Ascissa vertice destro superiore xs	22.99 m
Ordinata vertice destro superiore ys	13.48 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

Coefficiente azione sismica orizzontale 0.032
Coefficiente azione sismica verticale 0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	19.39	0.0
3	23.25	2.57
4	40.0	1.82
5	43.39	1.62
6	46.63	1.87

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	19.39	0.0
3	23.25	0.0
4	46.63	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-4.8
2	19.39	-4.8
3	23.25	-4.8
4	43.39	-4.8
5	46.63	-4.8

Vertici strato 3

N	X (m)	y (m)
1	0.0	-9.8
2	19.39	-9.8
3	23.25	-9.8
4	46.63	-9.8

Coefficienti parziali azioni

==========

Sfavorevoli: Permanenti, variabili 1.0 1.0
Favorevoli: Permanenti, variabili 1.0 1.0

==========

Coefficienti parziali per i parametri geotecnici del terreno

==========

Tangente angolo di resistenza al taglio 1.25
Coesione efficace 1.25
Coesione non drenata 1.4
Riduzione parametri geotecnici terreno No

==========

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	1800.00	2100.00	rilevato	
2	0.05		31.3	1900		4-G-1	
3	0.05		35.2	1900		4-G-3	
4	0.05		40.7	2000		4-G-5	

Risultati analisi pendio

==========

Fs minimo individuato 1.57
Ascissa centro superficie 19.73 m
Ordinata centro superficie 9.61 m
Raggio superficie 9.39 m

==========

xc = 19.733 yc = 9.614 Rc = 9.389 Fs=1.569
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.3	0.91	0.3	54.78
2	0.3	2.77	0.3	160.32
3	0.3	4.63	0.3	260.44
4	0.3	6.49	0.31	355.13
5	0.3	8.36	0.31	444.33
6	0.3	10.24	0.31	527.96
7	0.3	12.13	0.31	605.95
8	0.3	14.04	0.31	678.16
9	0.3	15.96	0.32	744.49
10	0.3	17.9	0.32	804.75
11	0.3	19.86	0.32	858.76
12	0.18	21.42	0.19	518.86
13	0.43	23.44	0.47	1215.3
14	0.3	25.9	0.34	753.51
15	0.3	27.99	0.34	661.55
16	0.3	30.11	0.35	561.77
17	0.3	32.28	0.36	453.66
18	0.3	34.5	0.37	336.63
19	0.3	36.78	0.38	209.98
20	0.3	39.14	0.39	72.83

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	9.96	22.37	0.0	0.0	46.03	17.76	0.0
2	35.45	79.64	9.96	22.37	139.74	53.91	0.0
3	71.28	160.13	35.45	79.64	233.85	90.22	0.0
4	112.91	253.63	71.28	160.13	326.43	125.93	0.0
5	156.36	351.26	112.91	253.63	415.77	160.4	0.0
6	198.2	445.24	156.36	351.26	500.4	193.05	0.0
7	235.41	528.82	198.2	445.24	579.0	223.38	0.0
8	265.38	596.14	235.41	528.82	650.43	250.93	0.0
9	285.86	642.16	265.38	596.14	713.65	275.33	0.0
10	294.96	662.6	285.86	642.16	767.76	296.2	0.0
11	291.08	653.89	294.96	662.6	811.96	313.25	0.0
12	282.38	634.33	291.08	653.89	485.64	187.36	0.0
13	243.32	546.61	282.38	634.33	1118.36	431.46	0.0
14	205.35	461.3	243.32	546.61	675.01	260.42	0.0
15	162.1	364.15	205.35	461.3	576.21	222.3	0.0
16	116.99	262.82	162.1	364.15	472.92	182.45	0.0
17	73.78	165.74	116.99	262.82	366.64	141.45	0.0
18	36.64	82.32	73.78	165.74	259.12	99.97	0.0
19	10.28	23.08	36.64	82.32	152.49	58.83	0.0
20	0.0	0.0	10.28	23.08	49.32	19.03	0.0

Numero di superfici esaminate....(211)

N°	Xo	Yo	Ro	Fs
1	13.8	4.3	7.6	23.67
2	14.8	4.3	6.8	18.12
3	15.4	3.8	7.1	9.47
4	15.9	4.3	7.6	6.22
5	16.5	3.8	6.4	6.33
6	17.0	4.3	6.9	4.43
7	17.6	3.8	6.4	4.05
8	18.1	4.3	5.4	3.00
9	18.6	3.8	5.0	2.60
10	19.2	4.3	4.8	1.85
11	19.7	3.8	4.3	1.72
12	20.3	4.3	4.8	1.75
13	20.8	3.8	4.3	1.82
14	21.4	4.3	4.8	2.05
15	21.9	3.8	4.4	2.34
16	22.4	4.3	4.9	2.75
17	23.0	3.8	4.4	3.38
18	13.2	4.8	8.0	26.53

19	13.8	5.3	8.5	16.25
20	14.3	4.8	8.0	13.30
21	14.8	5.3	7.8	11.79
22	15.4	4.8	8.1	7.04
23	15.9	5.3	8.5	5.28
24	16.5	4.8	7.3	4.97
25	17.0	5.3	7.1	3.92
26	17.6	4.8	6.6	3.48
27	18.1	5.3	5.7	2.56
28	18.6	4.8	5.2	2.04
29	19.2	5.3	5.7	1.79
30	19.7	4.8	5.3	1.74
31	20.3	5.3	5.8	1.82
32	20.8	4.8	5.3	1.89
33	21.4	5.3	5.8	2.11
34	21.9	4.8	5.3	2.37
35	22.4	5.3	5.1	2.57
36	23.0	4.8	4.7	3.17
37	12.7	6.2	9.5	23.37
38	13.8	6.2	9.5	11.66
39	14.3	5.8	9.0	9.60
40	14.8	6.2	9.5	6.45
41	15.4	5.8	9.0	5.79
42	15.9	6.2	8.8	4.84
43	16.5	5.8	8.3	4.41
44	17.0	6.2	8.1	3.53
45	17.6	5.8	6.9	3.03
46	18.1	6.2	6.7	2.20
47	18.6	5.8	6.2	1.92
48	19.2	6.2	6.7	1.82
49	19.7	5.8	6.2	1.79
50	20.3	6.2	6.7	1.90
51	20.8	5.8	6.3	1.98
52	21.4	6.2	6.1	1.90
53	21.9	5.8	5.6	2.18
54	22.4	6.2	6.1	2.63
55	23.0	5.8	5.6	3.15
56	12.1	6.7	10.0	25.92
57	13.2	6.7	10.0	14.26
58	13.8	7.2	9.7	14.23
59	14.3	6.7	10.0	7.45
60	14.8	7.2	9.7	6.49
61	15.4	6.7	10.0	5.25
62	15.9	7.2	9.7	4.39
63	16.5	6.7	8.5	4.02
64	17.0	7.2	8.3	3.24

65	17.6	6.7	7.1	2.79
66	18.1	7.2	7.6	2.08
67	18.6	6.7	7.2	1.91
68	19.2	7.2	7.7	1.89
69	19.7	6.7	7.2	1.87
70	20.3	7.2	7.7	1.99
71	20.8	6.7	7.2	2.07
72	21.4	7.2	7.0	2.00
73	21.9	6.7	6.6	2.27
74	22.4	7.2	7.1	2.71
75	23.0	6.7	6.4	3.18
76	12.7	8.2	11.4	13.09
77	13.2	7.7	10.2	19.27
78	13.8	8.2	11.4	7.10
79	14.3	7.7	10.9	6.33
80	14.8	8.2	11.4	5.22
81	15.4	7.7	11.0	4.86
82	15.9	8.2	10.7	4.17
83	16.5	7.7	9.5	3.70
84	17.0	8.2	9.3	3.01
85	17.6	7.7	8.1	2.44
86	18.1	8.2	8.6	2.06
87	18.6	7.7	8.1	1.94
88	19.2	8.2	8.6	1.96
89	19.7	7.7	8.2	1.96
90	20.3	8.2	8.0	1.61
91	20.8	7.7	7.5	1.79
92	21.4	8.2	8.0	2.10
93	21.9	7.7	7.5	2.36
94	22.4	8.2	7.9	2.78
95	23.0	7.7	8.0	3.24
96	12.1	8.6	11.9	16.63
97	12.7	9.1	11.6	18.78
98	13.2	8.6	11.9	8.38
99	13.8	9.1	11.7	7.84
100	14.3	8.6	11.2	6.37
101	14.8	9.1	11.7	5.08
102	15.4	8.6	11.2	4.55
103	15.9	9.1	11.0	3.88
104	16.5	8.6	9.8	3.51
105	17.0	9.1	9.5	2.67
106	17.6	8.6	9.1	2.29
107	18.1	9.1	9.6	2.08
108	18.6	8.6	9.1	2.00
109	19.2	9.1	9.6	2.03
110	19.7	8.6	9.1	2.04

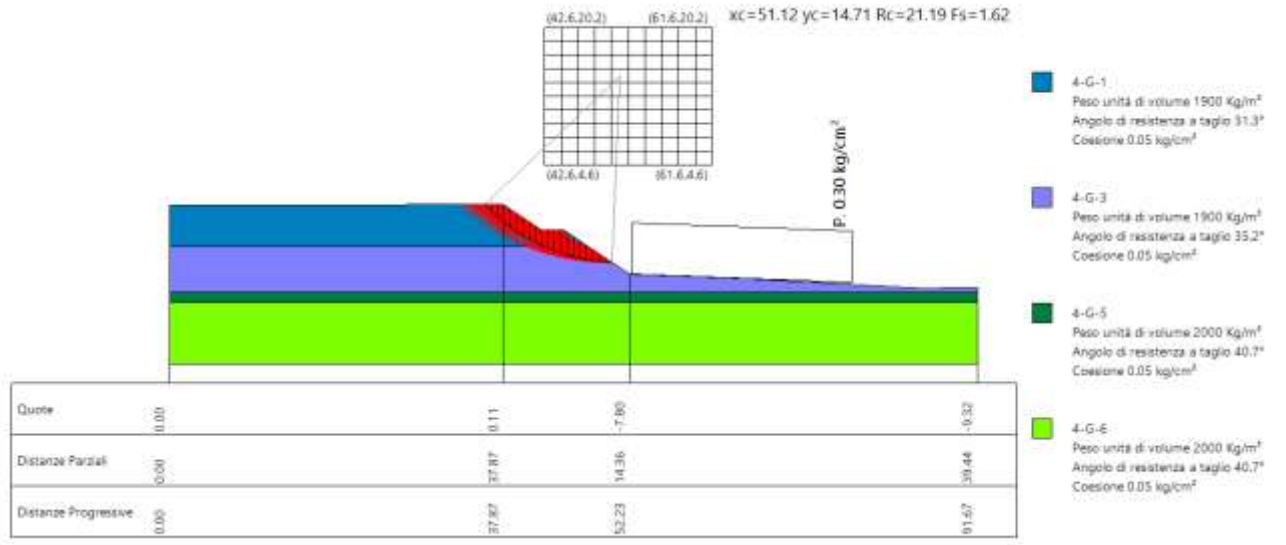
111	20.3	9.1	8.9	1.71
112	20.8	8.6	8.5	1.89
113	21.4	9.1	9.0	2.19
114	21.9	8.6	8.5	2.45
115	22.4	9.1	8.8	2.86
116	23.0	8.6	8.9	3.28
117	12.1	9.6	12.1	23.69
118	12.7	10.1	13.4	8.16
119	13.2	9.6	12.1	10.08
120	13.8	10.1	13.4	5.82
121	14.3	9.6	12.9	5.35
122	14.8	10.1	12.6	4.73
123	15.4	9.6	12.2	4.35
124	15.9	10.1	11.9	3.74
125	16.5	9.6	10.7	3.26
126	17.0	10.1	10.5	2.48
127	17.6	9.6	10.0	2.20
128	18.1	10.1	10.5	2.12
129	18.6	9.6	10.1	2.06
130	19.2	10.1	10.6	2.11
131	19.7	9.6	9.4	1.57
132	20.3	10.1	9.9	1.81
133	20.8	9.6	9.4	1.98
134	21.4	10.1	9.9	2.28
135	21.9	9.6	9.4	2.54
136	22.4	10.1	9.7	2.95
137	23.0	9.6	9.8	3.34
138	12.1	10.6	13.8	9.76
139	12.7	11.1	13.6	10.14
140	13.2	10.6	13.8	6.47
141	13.8	11.1	13.6	5.93
142	14.3	10.6	13.1	5.21
143	14.8	11.1	13.6	4.56
144	15.4	10.6	12.4	4.13
145	15.9	11.1	12.2	3.56
146	16.5	10.6	11.7	3.15
147	17.0	11.1	11.5	2.41
148	17.6	10.6	11.0	2.21
149	18.1	11.1	11.5	2.17
150	18.6	10.6	11.0	2.12
151	19.2	11.1	11.5	2.19
152	19.7	10.6	10.4	1.66
153	20.3	11.1	10.9	1.90
154	20.8	10.6	10.4	2.08
155	21.4	11.1	10.2	2.33
156	21.9	10.6	10.3	2.62

157	22.4	11.1	10.5	3.05
158	23.0	10.6	10.7	3.39
159	12.1	11.5	14.0	13.98
160	12.7	12.0	15.3	6.65
161	13.2	11.5	14.1	6.80
162	13.8	12.0	15.3	5.31
163	14.3	11.5	14.1	4.94
164	14.8	12.0	14.6	4.42
165	15.4	11.5	13.4	3.97
166	15.9	12.0	13.1	3.42
167	16.5	11.5	11.9	2.78
168	17.0	12.0	12.4	2.38
169	17.6	11.5	12.0	2.23
170	18.1	12.0	12.5	2.23
171	18.6	11.5	12.0	2.19
172	19.2	12.0	11.8	1.62
173	19.7	11.5	11.3	1.75
174	20.3	12.0	11.8	1.99
175	20.8	11.5	11.4	2.16
176	21.4	12.0	11.8	2.45
177	21.9	11.5	11.1	2.71
178	22.4	12.0	12.2	3.11
179	23.0	11.5	12.4	3.45
180	12.1	12.5	15.8	7.47
181	12.7	13.0	15.5	7.14
182	13.2	12.5	15.8	5.74
183	13.8	13.0	15.5	5.20
184	14.3	12.5	15.0	4.77
185	14.8	13.0	14.8	4.24
186	15.4	12.5	14.3	3.88
187	15.9	13.0	14.1	3.34
188	16.5	12.5	12.9	2.66
189	17.0	13.0	13.4	2.39
190	17.6	12.5	12.9	2.27
191	18.1	13.0	13.4	2.29
192	18.6	12.5	13.0	2.26
193	19.2	13.0	12.7	1.71
194	19.7	12.5	12.3	1.84
195	20.3	13.0	12.8	2.07
196	20.8	12.5	12.3	2.25
197	21.4	13.0	12.6	2.54
198	21.9	12.5	12.0	2.80
199	22.4	13.0	13.1	3.17
200	23.0	12.5	13.3	3.50
201	12.1	13.5	16.7	6.87
202	13.2	13.5	16.7	5.52

203	14.3	13.5	16.0	4.64
204	15.4	13.5	14.6	3.73
205	16.5	13.5	13.9	2.60
206	17.6	13.5	13.9	2.32
207	18.6	13.5	13.2	1.59
208	19.7	13.5	13.2	1.92
209	20.8	13.5	13.2	2.33
210	21.9	13.5	12.9	2.90
211	23.0	13.5	14.2	3.56

1.16 SEZIONE 338

1.16.1 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata
Superficie di forma circolare	

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	42.57 m
Ordinata vertice sinistro inferiore yi	4.61 m
Ascissa vertice destro superiore xs	61.56 m
Ordinata vertice destro superiore ys	20.15 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	37.87	0.11
3	42.23	-2.8
4	44.73	-2.8
5	52.23	-7.8
6	65.71	-8.3
7	85.48	-9.41
8	91.67	-9.32

Vertici strato 1

N	X (m)	y (m)
1	0.0	-4.7
2	37.87	-4.7
3	44.73	-4.7
4	47.58	-4.7
5	52.23	-7.8
6	65.71	-8.3
7	85.48	-9.41
8	91.67	-9.32

Vertici strato 2

N	X (m)	y (m)
1	0.0	-9.8
2	37.87	-9.8
3	42.23	-9.8
4	91.67	-9.8

Vertici strato 3

N	X (m)	y (m)
1	0.0	-11.0
2	37.87	-11.0
3	42.23	-11.0
4	91.67	-11.0

Coefficienti parziali azioni

==========

Sfavorevoli: Permanenti, variabili 1.0 1.0
Favorevoli: Permanenti, variabili 1.0 1.0

==========

Coefficienti parziali per i parametri geotecnici del terreno

==========

Tangente angolo di resistenza al taglio 1.25

Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

==========

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0.05		31.3	1900	2100.00	4-G-1	
2	0.05		35.2	1900		4-G-3	
3	0.05		40.7	2000		4-G-5	
4	0.05		40.7	2000		4-G-6	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	52.5	-7.78	77.5	-8.721733	0.3

Risultati analisi pendio

==========

Fs minimo individuato	1.62
Ascissa centro superficie	51.12 m
Ordinata centro superficie	14.71 m
Raggio superficie	21.19 m

==========

xc = 51.118 yc = 14.711 Rc = 21.187 Fs=1.618

Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.72	45.03	1.02	509.39
2	0.72	42.33	0.98	1457.98
3	0.65	39.86	0.85	2058.7
4	0.79	37.36	1.0	2977.55
5	0.72	34.82	0.88	2776.38
6	0.72	32.47	0.86	2775.13
7	0.72	30.19	0.84	2717.55
8	0.72	27.95	0.82	2607.64
9	0.68	25.83	0.75	2297.73
10	0.77	23.68	0.84	2768.28
11	0.72	21.5	0.78	3027.47
12	0.72	19.41	0.77	3396.99
13	0.72	17.35	0.76	3658.7
14	0.72	15.32	0.75	3288.4

15	0.72	13.3	0.74	2880.46
16	0.72	11.3	0.74	2435.83
17	0.72	9.32	0.73	1955.38
18	0.72	7.34	0.73	1439.76
19	0.72	5.38	0.73	889.49
20	0.72	3.42	0.72	305.0

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**0.22**	**0.51**	**0.0**	**0.0**	**360.22**	**361.01**	**0.0**
2	**-154.53**	**-367.11**	**0.22**	**0.51**	**944.8**	**525.66**	**0.0**
3	**-381.71**	**-906.85**	**-154.53**	**-367.11**	**1408.85**	**633.5**	**0.0**
4	**-705.36**	**-1675.75**	**-381.71**	**-906.85**	**2157.32**	**895.41**	**0.0**
5	**-959.78**	**-2280.19**	**-705.36**	**-1675.75**	**2142.95**	**861.93**	**0.0**
6	**-1174.8**	**-2791.03**	**-959.78**	**-2280.19**	**2248.3**	**887.76**	**0.0**
7	**-1345.56**	**-3196.7**	**-1174.8**	**-2791.03**	**2292.64**	**896.01**	**0.0**
8	**-1469.75**	**-3491.75**	**-1345.56**	**-3196.7**	**2274.86**	**886.23**	**0.0**
9	**-1538.91**	**-3656.05**	**-1469.75**	**-3491.75**	**2058.82**	**804.84**	**0.0**
10	**-1598.58**	**-3797.81**	**-1538.91**	**-3656.05**	**2532.91**	**969.11**	**0.0**
11	**-1573.03**	**-3737.1**	**-1598.58**	**-3797.81**	**2815.36**	**1174.16**	**0.0**
12	**-1502.31**	**-3569.09**	**-1573.03**	**-3737.1**	**3193.04**	**1303.34**	**0.0**
13	**-1375.6**	**-3268.06**	**-1502.31**	**-3569.09**	**3461.03**	**1394.59**	**0.0**
14	**-1202.08**	**-2855.82**	**-1375.6**	**-3268.06**	**3113.14**	**1271.28**	**0.0**
15	**-993.65**	**-2360.66**	**-1202.08**	**-2855.82**	**2714.28**	**1130.47**	**0.0**
16	**-764.28**	**-1815.74**	**-993.65**	**-2360.66**	**2270.46**	**974.24**	**0.0**
17	**-530.14**	**-1259.46**	**-764.28**	**-1815.74**	**1788.58**	**804.98**	**0.0**
18	**-309.86**	**-736.15**	**-530.14**	**-1259.46**	**1276.36**	**625.36**	**0.0**
19	**-124.87**	**-296.66**	**-309.86**	**-736.15**	**742.58**	**438.45**	**0.0**
20	**0.32**	**0.77**	**-124.87**	**-296.66**	**197.21**	**247.71**	**0.0**

Numero di superfici esaminate....(221)

N°	Xo	Yo	Ro	Fs
1	42.6	4.6	7.8	20.00
2	43.5	5.4	8.6	20.00
3	44.5	4.6	7.8	20.00
4	45.4	5.4	10.2	20.00
5	46.4	4.6	9.4	20.00
6	47.3	5.4	10.2	20.00
7	48.3	4.6	9.4	2.22
8	49.2	5.4	10.2	2.20
9	50.2	4.6	11.1	1.76
10	51.1	5.4	11.9	1.67
11	52.1	4.6	11.1	1.66
12	53.0	5.4	11.9	2.07
13	54.0	4.6	12.7	20.00
14	54.9	5.4	13.5	20.00
15	55.9	4.6	14.4	20.00
16	56.8	5.4	15.2	20.00
17	57.8	4.6	14.4	20.00
18	58.7	5.4	15.2	20.00
19	59.7	4.6	14.4	20.00
20	60.6	5.4	15.2	20.00
21	61.6	4.6	14.4	20.00
22	42.6	6.2	9.3	20.00
23	43.5	6.9	10.1	20.00
24	44.5	6.2	9.3	20.00
25	45.4	6.9	11.8	20.00
26	46.4	6.2	11.0	20.00
27	47.3	6.9	11.8	20.00
28	48.3	6.2	11.0	2.44
29	49.2	6.9	11.8	2.29
30	50.2	6.2	12.6	1.80
31	51.1	6.9	13.4	1.78
32	52.1	6.2	12.6	1.65
33	53.0	6.9	13.4	1.77
34	54.0	6.2	14.3	20.00
35	54.9	6.9	15.1	20.00
36	55.9	6.2	15.9	20.00
37	56.8	6.9	16.7	20.00
38	57.8	6.2	15.9	20.00
39	58.7	6.9	16.7	20.00
40	59.7	6.2	15.9	20.00
41	60.6	6.9	16.7	20.00
42	61.6	6.2	15.9	20.00

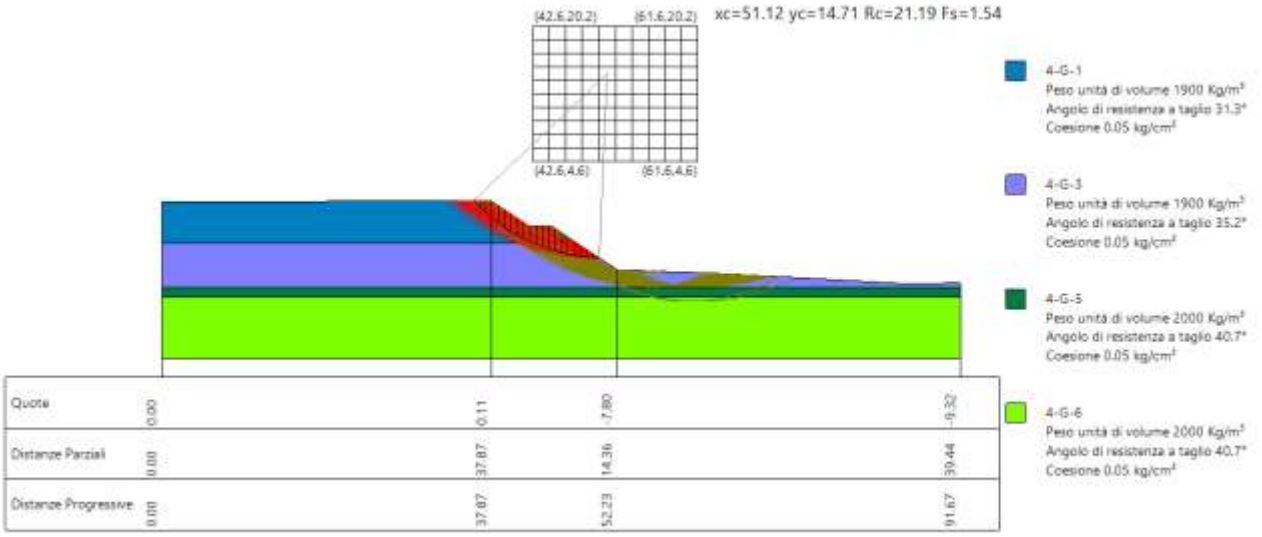
43	42.6	7.7	10.9	20.00
44	43.5	8.5	11.7	20.00
45	44.5	7.7	10.9	20.00
46	45.4	8.5	11.7	1.95
47	46.4	7.7	12.5	20.00
48	47.3	8.5	13.3	20.00
49	48.3	7.7	12.5	2.27
50	49.2	8.5	13.3	2.64
51	50.2	7.7	14.2	1.74
52	51.1	8.5	15.0	1.80
53	52.1	7.7	14.2	1.70
54	53.0	8.5	15.0	1.72
55	54.0	7.7	14.2	2.53
56	54.9	8.5	16.6	20.00
57	55.9	7.7	17.5	20.00
58	56.8	8.5	18.3	20.00
59	57.8	7.7	17.5	20.00
60	58.7	8.5	18.3	20.00
61	59.7	7.7	17.5	20.00
62	60.6	8.5	19.9	20.00
63	61.6	7.7	17.5	20.00
64	42.6	9.3	12.2	20.00
65	43.5	10.0	13.2	20.00
66	44.5	9.3	12.4	20.00
67	45.4	10.0	13.2	1.77
68	46.4	9.3	14.1	20.00
69	47.3	10.0	14.9	20.00
70	48.3	9.3	14.1	1.98
71	49.2	10.0	14.9	2.43
72	50.2	9.3	15.7	1.66
73	51.1	10.0	16.5	1.73
74	52.1	9.3	15.7	1.81
75	53.0	10.0	16.5	1.76
76	54.0	9.3	15.7	1.96
77	54.9	10.0	18.2	20.00
78	55.9	9.3	19.1	20.00
79	56.8	10.0	19.8	20.00
80	57.8	9.3	19.0	20.00
81	58.7	10.0	19.8	20.00
82	59.7	9.3	19.0	20.00
83	60.6	10.0	19.8	20.00
84	61.6	9.3	19.0	20.00
85	42.6	10.8	13.6	2.02
86	43.5	11.6	14.7	20.00
87	44.5	10.8	14.0	20.00
88	45.4	11.6	14.8	2.21

89	46.4	10.8	14.0	2.37
90	47.3	11.6	16.4	20.00
91	48.3	10.8	15.7	1.84
92	49.2	11.6	16.4	2.06
93	50.2	10.8	17.3	1.63
94	51.1	11.6	18.1	1.65
95	52.1	10.8	17.3	1.81
96	53.0	11.6	18.1	1.86
97	54.0	10.8	17.3	1.85
98	54.9	11.6	18.1	2.30
99	55.9	10.8	20.6	20.00
100	56.8	11.6	21.4	20.00
101	57.8	10.8	20.6	20.00
102	58.7	11.6	21.4	20.00
103	59.7	10.8	20.6	20.00
104	60.6	11.6	21.4	20.00
105	61.6	10.8	20.6	20.00
106	42.6	12.4	14.9	2.18
107	43.5	13.2	16.0	2.00
108	44.5	12.4	15.6	20.00
109	45.4	13.2	16.3	2.18
110	46.4	12.4	15.6	1.99
111	47.3	13.2	18.0	20.00
112	48.3	12.4	17.2	1.79
113	49.2	13.2	18.0	1.89
114	50.2	12.4	18.9	1.63
115	51.1	13.2	19.6	1.63
116	52.1	12.4	18.9	1.74
117	53.0	13.2	19.6	1.88
118	54.0	12.4	18.9	1.83
119	54.9	13.2	19.6	2.02
120	55.9	12.4	20.5	20.00
121	56.8	13.2	22.9	20.00
122	57.8	12.4	22.2	20.00
123	58.7	13.2	22.9	20.00
124	59.7	12.4	22.2	20.00
125	60.6	13.2	22.9	20.00
126	61.6	12.4	23.8	20.00
127	42.6	13.9	16.2	2.37
128	43.5	14.7	17.3	2.16
129	44.5	13.9	17.1	20.00
130	45.4	14.7	17.9	2.19
131	46.4	13.9	17.1	1.90
132	47.3	14.7	17.9	2.35
133	48.3	13.9	18.8	1.79
134	49.2	14.7	19.5	1.82

135	50.2	13.9	20.4	1.64
136	51.1	14.7	21.2	1.62
137	52.1	13.9	20.4	1.66
138	53.0	14.7	21.2	1.78
139	54.0	13.9	20.4	1.87
140	54.9	14.7	21.2	1.95
141	55.9	13.9	22.1	20.00
142	56.8	14.7	24.5	20.00
143	57.8	13.9	23.7	20.00
144	58.7	14.7	24.5	20.00
145	59.7	13.9	23.7	20.00
146	60.6	14.7	24.5	20.00
147	61.6	13.9	23.7	20.00
148	42.6	15.5	17.6	2.58
149	43.5	16.3	18.7	2.33
150	44.5	15.5	18.4	20.00
151	45.4	16.3	19.4	2.23
152	46.4	15.5	18.7	1.89
153	47.3	16.3	19.4	2.12
154	48.3	15.5	20.3	1.80
155	49.2	16.3	21.1	1.81
156	50.2	15.5	22.0	1.67
157	51.1	16.3	22.7	1.64
158	52.1	15.5	22.0	1.63
159	53.0	16.3	22.7	1.69
160	54.0	15.5	22.0	1.99
161	54.9	16.3	22.7	1.95
162	55.9	15.5	22.0	2.33
163	56.8	16.3	26.0	20.00
164	57.8	15.5	25.3	20.00
165	58.7	16.3	26.0	20.00
166	59.7	15.5	25.3	20.00
167	60.6	16.3	26.0	20.00
168	61.6	15.5	25.3	20.00
169	42.6	17.0	18.9	2.84
170	43.5	17.8	20.0	2.54
171	44.5	17.0	19.8	2.15
172	45.4	17.8	20.9	2.31
173	46.4	17.0	20.2	1.92
174	47.3	17.8	21.0	2.04
175	48.3	17.0	21.9	1.83
176	49.2	17.8	22.6	1.82
177	50.2	17.0	23.5	1.71
178	51.1	17.8	24.3	1.66
179	52.1	17.0	23.5	1.63
180	53.0	17.8	24.3	1.65

181	54.0	17.0	23.5	1.85
182	54.9	17.8	24.3	2.17
183	55.9	17.0	23.5	2.13
184	56.8	17.8	27.6	20.00
185	57.8	17.0	26.8	20.00
186	58.7	17.8	27.6	20.00
187	59.7	17.0	26.8	20.00
188	60.6	17.8	27.6	20.00
189	61.6	17.0	26.8	20.00
190	42.6	18.6	20.3	3.16
191	43.5	19.4	21.4	2.79
192	44.5	18.6	21.1	2.32
193	45.4	19.4	22.2	2.15
194	46.4	18.6	21.8	1.97
195	47.3	19.4	22.5	2.04
196	48.3	18.6	23.4	1.87
197	49.2	19.4	24.2	1.84
198	50.2	18.6	25.1	1.75
199	51.1	19.4	25.9	1.70
200	52.1	18.6	25.1	1.64
201	53.0	19.4	25.8	1.64
202	54.0	18.6	25.1	1.73
203	54.9	19.4	25.8	1.99
204	55.9	18.6	25.1	2.07
205	56.8	19.4	25.8	2.45
206	57.8	18.6	28.4	20.00
207	58.7	19.4	29.2	20.00
208	59.7	18.6	28.4	20.00
209	60.6	19.4	29.2	20.00
210	61.6	18.6	28.4	20.00
211	42.6	20.2	21.6	3.56
212	44.5	20.2	22.5	2.52
213	46.4	20.2	23.3	2.02
214	48.3	20.2	25.0	1.91
215	50.2	20.2	26.6	1.79
216	52.1	20.2	26.6	1.67
217	54.0	20.2	26.6	1.68
218	55.9	20.2	26.6	2.06
219	57.8	20.2	29.9	20.00
220	59.7	20.2	29.9	20.00
221	61.6	20.2	29.9	20.00

1.16.2 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.2
Analisi	Condizione drenata
Superficie di forma circolare	

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	42.57 m
Ordinata vertice sinistro inferiore yi	4.61 m
Ascissa vertice destro superiore xs	61.56 m
Ordinata vertice destro superiore ys	20.15 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

Coefficiente azione sismica orizzontale	0.032
Coefficiente azione sismica verticale	0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	37.87	0.11
3	42.23	-2.8
4	44.73	-2.8
5	52.23	-7.8
6	65.71	-8.3
7	85.48	-9.41
8	91.67	-9.32

Vertici strato 1

N	X (m)	y (m)
1	0.0	-4.7
2	37.87	-4.7
3	44.73	-4.7
4	47.58	-4.7
5	52.23	-7.8
6	65.71	-8.3
7	85.48	-9.41
8	91.67	-9.32

Vertici strato 2

N	X (m)	y (m)
1	0.0	-9.8
2	37.87	-9.8
3	42.23	-9.8
4	91.67	-9.8

Vertici strato 3

N	X (m)	y (m)
1	0.0	-11.0
2	37.87	-11.0
3	42.23	-11.0
4	91.67	-11.0

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	No

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0.05		31.3	1900	2100.00	4-G-1	
2	0.05		35.2	1900		4-G-3	
3	0.05		40.7	2000		4-G-5	
4	0.05		40.7	2000		4-G-6	

Risultati analisi pendio

Fs minimo individuato	1.54
Ascissa centro superficie	51.12 m
Ordinata centro superficie	14.71 m
Raggio superficie	21.19 m

xc = 51.118 yc = 14.711 Rc = 21.187 Fs=1.544
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.72	45.03	1.02	509.39
2	0.72	42.33	0.98	1457.98
3	0.65	39.86	0.85	2058.7
4	0.79	37.36	1.0	2977.55
5	0.72	34.82	0.88	2776.38
6	0.72	32.47	0.86	2775.13
7	0.72	30.19	0.84	2717.55
8	0.72	27.95	0.82	2607.64
9	0.68	25.83	0.75	2297.73
10	0.77	23.68	0.84	2768.28
11	0.72	21.5	0.78	3027.47
12	0.72	19.41	0.77	3396.99
13	0.72	17.35	0.76	3658.7
14	0.72	15.32	0.75	3288.4
15	0.72	13.3	0.74	2880.46

16	0.72	11.3	0.74	2435.83
17	0.72	9.32	0.73	1955.38
18	0.72	7.34	0.73	1439.76
19	0.72	5.38	0.73	889.49
20	0.72	3.42	0.72	305.0

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**4.77**	**12.77**	**0.0**	**0.0**	**359.91**	**393.78**	**0.0**
2	**-135.02**	**-361.24**	**4.77**	**12.77**	**915.28**	**563.83**	**0.0**
3	**-342.75**	**-917.0**	**-135.02**	**-361.24**	**1366.71**	**677.36**	**0.0**
4	**-641.04**	**-1715.06**	**-342.75**	**-917.0**	**2099.52**	**957.97**	**0.0**
5	**-875.51**	**-2342.36**	**-641.04**	**-1715.06**	**2099.25**	**926.08**	**0.0**
6	**-1073.97**	**-2873.31**	**-875.51**	**-2342.36**	**2213.3**	**957.11**	**0.0**
7	**-1231.84**	**-3295.7**	**-1073.97**	**-2873.31**	**2266.96**	**969.17**	**0.0**
8	**-1346.95**	**-3603.65**	**-1231.84**	**-3295.7**	**2258.52**	**961.56**	**0.0**
9	**-1411.08**	**-3775.24**	**-1346.95**	**-3603.65**	**2052.18**	**875.94**	**0.0**
10	**-1467.76**	**-3926.88**	**-1411.08**	**-3775.24**	**2531.18**	**1056.79**	**0.0**
11	**-1444.1**	**-3863.58**	**-1467.76**	**-3926.88**	**2827.64**	**1285.74**	**0.0**
12	**-1379.78**	**-3691.49**	**-1444.1**	**-3863.58**	**3215.57**	**1430.58**	**0.0**
13	**-1264.83**	**-3383.95**	**-1379.78**	**-3691.49**	**3495.15**	**1534.55**	**0.0**
14	**-1106.81**	**-2961.18**	**-1264.83**	**-3383.95**	**3153.82**	**1402.51**	**0.0**
15	**-916.55**	**-2452.15**	**-1106.81**	**-2961.18**	**2758.79**	**1250.34**	**0.0**
16	**-706.7**	**-1890.72**	**-916.55**	**-2452.15**	**2315.79**	**1080.19**	**0.0**
17	**-491.94**	**-1316.14**	**-706.7**	**-1890.72**	**1831.42**	**894.58**	**0.0**
18	**-289.15**	**-773.59**	**-491.94**	**-1316.14**	**1313.11**	**696.29**	**0.0**
19	**-117.68**	**-314.85**	**-289.15**	**-773.59**	**769.35**	**488.56**	**0.0**
20	**0.32**	**0.86**	**-117.68**	**-314.85**	**209.77**	**275.05**	**0.0**

Numero di superfici esaminate....(221)

N°	Xo	Yo	Ro	Fs
1	42.6	4.6	7.8	16.67
2	43.5	5.4	8.6	16.67
3	44.5	4.6	7.8	16.67
4	45.4	5.4	10.2	16.67
5	46.4	4.6	9.4	16.67
6	47.3	5.4	10.2	16.67
7	48.3	4.6	9.4	2.09
8	49.2	5.4	10.2	2.10
9	50.2	4.6	11.1	1.68
10	51.1	5.4	11.9	1.60
11	52.1	4.6	11.1	1.61
12	53.0	5.4	11.9	2.02
13	54.0	4.6	12.7	16.67
14	54.9	5.4	13.5	16.67
15	55.9	4.6	14.4	16.67
16	56.8	5.4	15.2	16.67
17	57.8	4.6	14.4	16.67
18	58.7	5.4	15.2	16.67
19	59.7	4.6	14.4	16.67
20	60.6	5.4	15.2	16.67
21	61.6	4.6	14.4	16.67
22	42.6	6.2	9.3	16.67
23	43.5	6.9	10.1	16.67
24	44.5	6.2	9.3	16.67
25	45.4	6.9	11.8	16.67
26	46.4	6.2	11.0	16.67
27	47.3	6.9	11.8	16.67
28	48.3	6.2	11.0	2.29
29	49.2	6.9	11.8	2.17
30	50.2	6.2	12.6	1.71
31	51.1	6.9	13.4	1.70
32	52.1	6.2	12.6	1.59
33	53.0	6.9	13.4	1.72
34	54.0	6.2	14.3	16.67
35	54.9	6.9	15.1	16.67
36	55.9	6.2	15.9	16.67
37	56.8	6.9	16.7	16.67
38	57.8	6.2	15.9	16.67
39	58.7	6.9	16.7	16.67
40	59.7	6.2	15.9	16.67
41	60.6	6.9	16.7	16.67
42	61.6	6.2	15.9	16.67

43	42.6	7.7	10.9	16.67
44	43.5	8.5	11.7	16.67
45	44.5	7.7	10.9	16.67
46	45.4	8.5	11.7	1.90
47	46.4	7.7	12.5	16.67
48	47.3	8.5	13.3	16.67
49	48.3	7.7	12.5	2.14
50	49.2	8.5	13.3	16.67
51	50.2	7.7	14.2	1.66
52	51.1	8.5	15.0	1.71
53	52.1	7.7	14.2	1.64
54	53.0	8.5	15.0	1.66
55	54.0	7.7	14.2	2.47
56	54.9	8.5	16.6	16.67
57	55.9	7.7	17.5	16.67
58	56.8	8.5	18.3	16.67
59	57.8	7.7	17.5	16.67
60	58.7	8.5	18.3	16.67
61	59.7	7.7	17.5	16.67
62	60.6	8.5	19.9	16.67
63	61.6	7.7	17.5	16.67
64	42.6	9.3	12.2	16.67
65	43.5	10.0	13.2	16.67
66	44.5	9.3	12.4	16.67
67	45.4	10.0	13.2	1.71
68	46.4	9.3	14.1	16.67
69	47.3	10.0	14.9	16.67
70	48.3	9.3	14.1	1.88
71	49.2	10.0	14.9	2.30
72	50.2	9.3	15.7	1.58
73	51.1	10.0	16.5	1.66
74	52.1	9.3	15.7	1.73
75	53.0	10.0	16.5	1.69
76	54.0	9.3	15.7	1.90
77	54.9	10.0	18.2	16.67
78	55.9	9.3	19.1	16.67
79	56.8	10.0	19.8	16.67
80	57.8	9.3	19.0	16.67
81	58.7	10.0	19.8	16.67
82	59.7	9.3	19.0	16.67
83	60.6	10.0	19.8	16.67
84	61.6	9.3	19.0	16.67
85	42.6	10.8	13.6	1.90
86	43.5	11.6	14.7	16.67
87	44.5	10.8	14.0	16.67
88	45.4	11.6	14.8	2.11

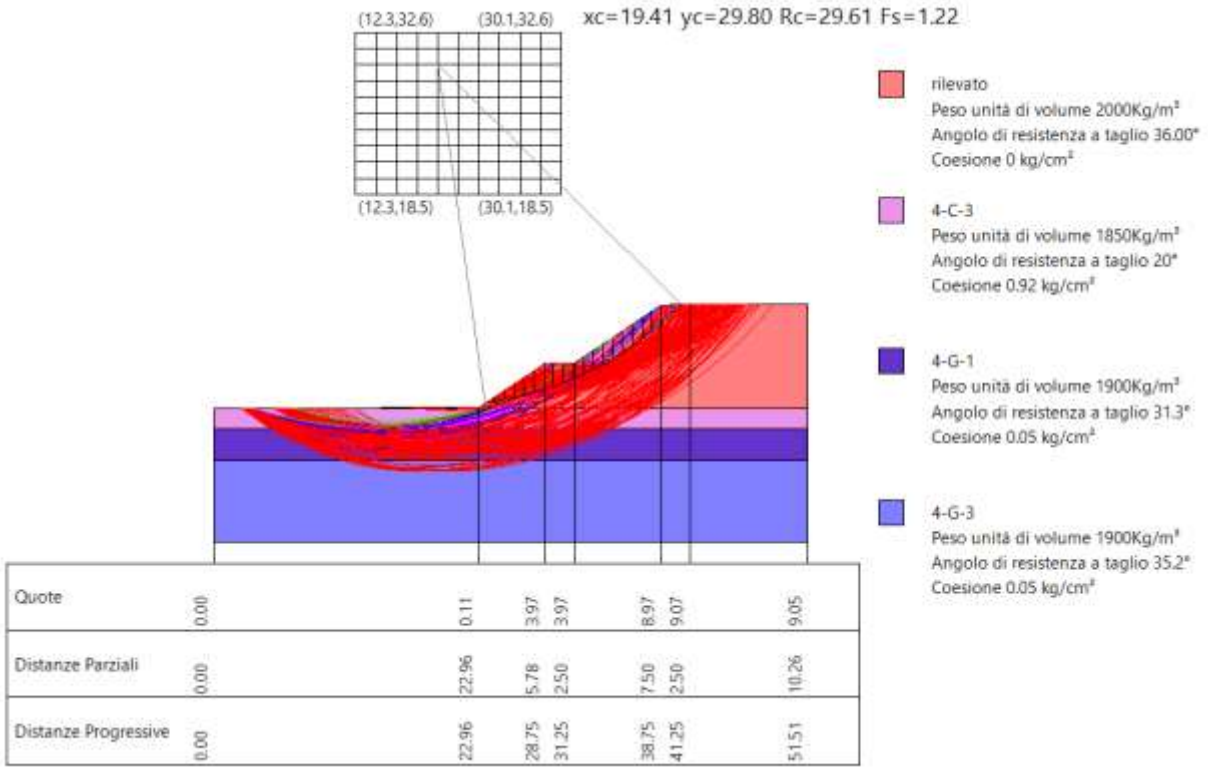
89	46.4	10.8	14.0	2.30
90	47.3	11.6	16.4	16.67
91	48.3	10.8	15.7	1.75
92	49.2	11.6	16.4	1.96
93	50.2	10.8	17.3	1.55
94	51.1	11.6	18.1	1.58
95	52.1	10.8	17.3	1.73
96	53.0	11.6	18.1	1.78
97	54.0	10.8	17.3	1.78
98	54.9	11.6	18.1	2.23
99	55.9	10.8	20.6	16.67
100	56.8	11.6	21.4	16.67
101	57.8	10.8	20.6	16.67
102	58.7	11.6	21.4	16.67
103	59.7	10.8	20.6	16.67
104	60.6	11.6	21.4	16.67
105	61.6	10.8	20.6	16.67
106	42.6	12.4	14.9	2.04
107	43.5	13.2	16.0	1.89
108	44.5	12.4	15.6	16.67
109	45.4	13.2	16.3	2.07
110	46.4	12.4	15.6	1.92
111	47.3	13.2	18.0	16.67
112	48.3	12.4	17.2	1.70
113	49.2	13.2	18.0	1.80
114	50.2	12.4	18.9	1.55
115	51.1	13.2	19.6	1.56
116	52.1	12.4	18.9	1.66
117	53.0	13.2	19.6	1.80
118	54.0	12.4	18.9	1.76
119	54.9	13.2	19.6	1.95
120	55.9	12.4	20.5	16.67
121	56.8	13.2	22.9	16.67
122	57.8	12.4	22.2	16.67
123	58.7	13.2	22.9	16.67
124	59.7	12.4	22.2	16.67
125	60.6	13.2	22.9	16.67
126	61.6	12.4	23.8	16.67
127	42.6	13.9	16.2	2.20
128	43.5	14.7	17.3	2.03
129	44.5	13.9	17.1	16.67
130	45.4	14.7	17.9	2.08
131	46.4	13.9	17.1	1.83
132	47.3	14.7	17.9	2.27
133	48.3	13.9	18.8	1.70
134	49.2	14.7	19.5	1.74

135	50.2	13.9	20.4	1.56
136	51.1	14.7	21.2	1.54
137	52.1	13.9	20.4	1.59
138	53.0	14.7	21.2	1.70
139	54.0	13.9	20.4	1.79
140	54.9	14.7	21.2	1.87
141	55.9	13.9	22.1	16.67
142	56.8	14.7	24.5	16.67
143	57.8	13.9	23.7	16.67
144	58.7	14.7	24.5	16.67
145	59.7	13.9	23.7	16.67
146	60.6	14.7	24.5	16.67
147	61.6	13.9	23.7	16.67
148	42.6	15.5	17.6	2.39
149	43.5	16.3	18.7	2.18
150	44.5	15.5	18.4	16.67
151	45.4	16.3	19.4	2.10
152	46.4	15.5	18.7	1.81
153	47.3	16.3	19.4	2.04
154	48.3	15.5	20.3	1.71
155	49.2	16.3	21.1	1.72
156	50.2	15.5	22.0	1.59
157	51.1	16.3	22.7	1.56
158	52.1	15.5	22.0	1.56
159	53.0	16.3	22.7	1.61
160	54.0	15.5	22.0	1.91
161	54.9	16.3	22.7	1.86
162	55.9	15.5	22.0	2.25
163	56.8	16.3	26.0	16.67
164	57.8	15.5	25.3	16.67
165	58.7	16.3	26.0	16.67
166	59.7	15.5	25.3	16.67
167	60.6	16.3	26.0	16.67
168	61.6	15.5	25.3	16.67
169	42.6	17.0	18.9	2.62
170	43.5	17.8	20.0	2.36
171	44.5	17.0	19.8	2.02
172	45.4	17.8	20.9	2.18
173	46.4	17.0	20.2	1.83
174	47.3	17.8	21.0	1.96
175	48.3	17.0	21.9	1.73
176	49.2	17.8	22.6	1.72
177	50.2	17.0	23.5	1.62
178	51.1	17.8	24.3	1.58
179	52.1	17.0	23.5	1.56
180	53.0	17.8	24.3	1.58

181	54.0	17.0	23.5	1.78
182	54.9	17.8	24.3	2.08
183	55.9	17.0	23.5	2.05
184	56.8	17.8	27.6	16.67
185	57.8	17.0	26.8	16.67
186	58.7	17.8	27.6	16.67
187	59.7	17.0	26.8	16.67
188	60.6	17.8	27.6	16.67
189	61.6	17.0	26.8	16.67
190	42.6	18.6	20.3	2.89
191	43.5	19.4	21.4	2.58
192	44.5	18.6	21.1	2.17
193	45.4	19.4	22.2	2.03
194	46.4	18.6	21.8	1.87
195	47.3	19.4	22.5	1.94
196	48.3	18.6	23.4	1.76
197	49.2	19.4	24.2	1.74
198	50.2	18.6	25.1	1.65
199	51.1	19.4	25.9	1.62
200	52.1	18.6	25.1	1.57
201	53.0	19.4	25.8	1.57
202	54.0	18.6	25.1	1.66
203	54.9	19.4	25.8	1.90
204	55.9	18.6	25.1	1.98
205	56.8	19.4	25.8	2.36
206	57.8	18.6	28.4	16.67
207	58.7	19.4	29.2	16.67
208	59.7	18.6	28.4	16.67
209	60.6	19.4	29.2	16.67
210	61.6	18.6	28.4	16.67
211	42.6	20.2	21.6	3.25
212	44.5	20.2	22.5	2.35
213	46.4	20.2	23.3	1.91
214	48.3	20.2	25.0	1.80
215	50.2	20.2	26.6	1.69
216	52.1	20.2	26.6	1.59
217	54.0	20.2	26.6	1.61
218	55.9	20.2	26.6	1.97
219	57.8	20.2	29.9	16.67
220	59.7	20.2	29.9	16.67
221	61.6	20.2	29.9	16.67

1.17 SEZIONE B-31

1.17.1 Fine costruzione



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	5.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata
Superficie di forma circolare	

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	12.3 m
Ordinata vertice sinistro inferiore yi	18.54 m
Ascissa vertice destro superiore xs	30.08 m
Ordinata vertice destro superiore ys	32.61 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	22.96	0.11
3	28.75	3.97
4	31.25	3.97
5	38.75	8.97
6	41.25	9.07
7	51.51	9.05

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	22.96	0.0
3	28.75	0.0
4	38.75	0.0
5	51.51	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-1.7
2	22.96	-1.7
3	28.75	-1.7
4	39.25	-1.7
5	51.51	-1.7

Vertici strato 3

N	X (m)	y (m)
1	0.0	-4.5
2	22.96	-4.5
3	28.75	-4.5
4	38.75	-4.5
5	51.51	-4.5

Vertici strato 4

N	X (m)	y (m)
1	0.0	-11.2
2	22.96	-11.2
3	28.75	-11.2
4	38.75	-11.2
5	51.51	-11.2

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	2000	2100.00	rilevato	
2	0.92		20	1850		4-C-3	
3	0.05		31.3	1900		4-G-1	
4	0.05		35.2	1900		4-G-3	
5	0.05		40.7	2000		4-G-5	

Risultati analisi pendio [A2+M2+R2]

Fs minimo individuato	1.22
Ascissa centro superficie	20.3 m
Ordinata centro superficie	30.5 m
Raggio superficie	29.59 m

xc = 20.30 yc = 30.50 Rc = 29.589 Fs=1.225
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.8	9.22	0.81	328.72
2	0.8	10.8	0.82	958.93
3	0.8	12.38	0.82	1552.36
4	0.8	13.98	0.83	2108.4
5	0.9	15.68	0.93	2974.09
6	0.71	17.3	0.74	2425.5
7	0.8	18.84	0.85	2361.1
8	0.8	20.49	0.86	1901.8

9	0.8	22.15	0.87	1624.85
10	0.8	23.84	0.88	1936.43
11	0.8	25.55	0.89	2202.46
12	0.8	27.28	0.9	2421.05
13	0.8	29.04	0.92	2589.96
14	0.8	30.84	0.93	2706.74
15	0.8	32.66	0.95	2768.43
16	0.8	34.53	0.97	2771.72
17	0.8	36.43	1.0	2712.64
18	0.47	37.98	0.6	1550.02
19	1.13	39.99	1.47	2629.56
20	0.8	42.47	1.09	573.58

Sforzi sui conci

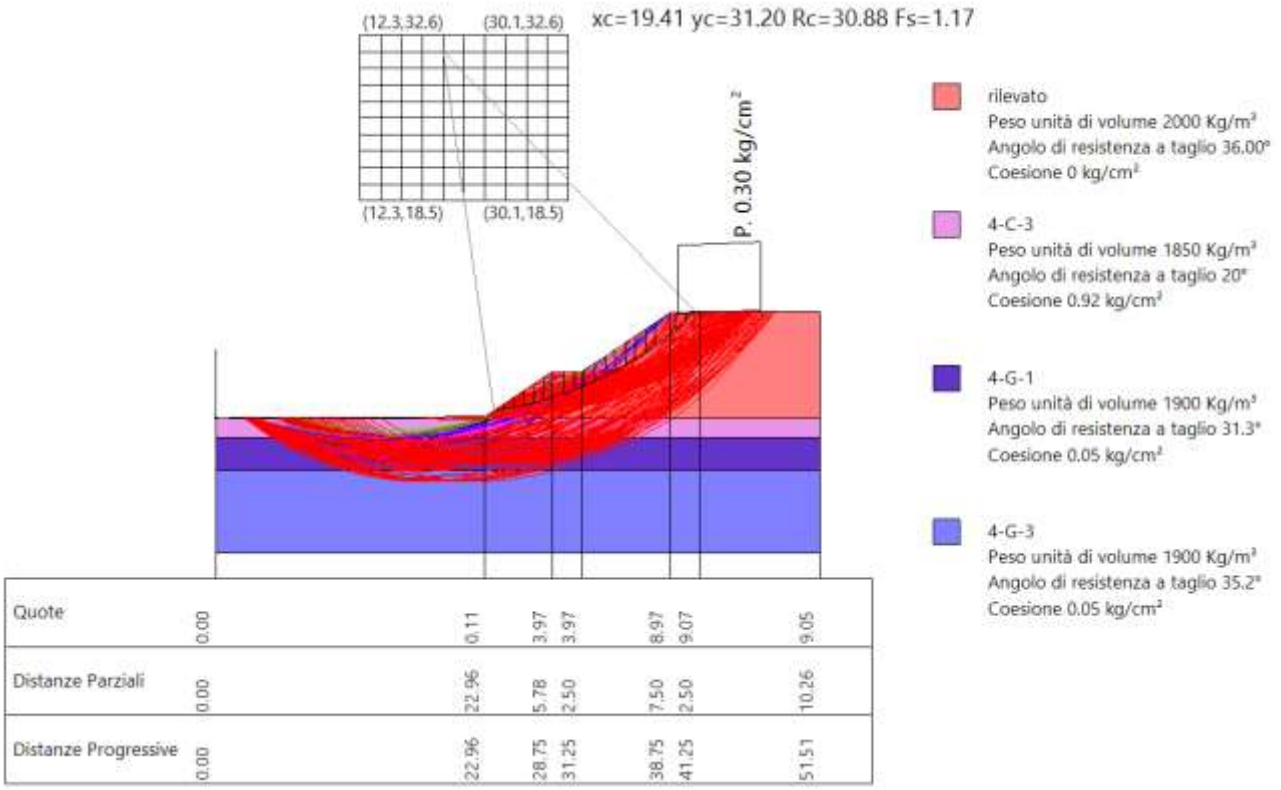
Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**53.38**	**110.74**	**0.0**	**0.0**	**289.52**	**137.38**	**0.0**
2	**190.92**	**396.05**	**53.38**	**110.74**	**860.3**	**408.22**	**0.0**
3	**385.33**	**799.35**	**190.92**	**396.05**	**1412.84**	**670.4**	**0.0**
4	**612.46**	**1270.52**	**385.33**	**799.35**	**1939.38**	**920.25**	**0.0**
5	**879.62**	**1824.73**	**612.46**	**1270.52**	**2755.97**	**1307.73**	**0.0**
6	**1057.91**	**2194.59**	**879.62**	**1824.73**	**2255.53**	**1070.27**	**0.0**
7	**1196.22**	**2481.51**	**1057.91**	**2194.59**	**2196.38**	**1042.2**	**0.0**
8	**1278.2**	**2651.56**	**1196.22**	**2481.51**	**1764.26**	**837.16**	**0.0**
9	**1323.68**	**2745.91**	**1278.2**	**2651.56**	**1498.37**	**710.99**	**0.0**
10	**1349.2**	**2798.86**	**1323.68**	**2745.91**	**1769.28**	**839.54**	**0.0**
11	**1346.18**	**2792.59**	**1349.2**	**2798.86**	**1987.13**	**942.91**	**0.0**
12	**1308.13**	**2713.65**	**1346.18**	**2792.59**	**2149.37**	**1019.89**	**0.0**
13	**1230.69**	**2553.0**	**1308.13**	**2713.65**	**2254.0**	**1069.54**	**0.0**
14	**1111.66**	**2306.07**	**1230.69**	**2553.0**	**2299.77**	**1091.26**	**0.0**
15	**951.12**	**1973.05**	**1111.66**	**2306.07**	**2286.09**	**1084.77**	**0.0**
16	**751.6**	**1559.15**	**951.12**	**1973.05**	**2213.33**	**1050.24**	**0.0**
17	**518.23**	**1075.04**	**751.6**	**1559.15**	**2082.71**	**988.26**	**0.0**
18	**367.49**	**762.34**	**518.23**	**1075.04**	**1148.12**	**544.79**	**0.0**
19	**74.02**	**153.55**	**367.49**	**762.34**	**1848.21**	**876.99**	**0.0**
20	**0.0**	**0.0**	**74.02**	**153.55**	**374.01**	**177.47**	**0.0**

Numero di superfici esaminate....(87)

N°	Xo	Yo	Ro	Fs
1	25.6	19.2	18.3	1.35
2	26.5	18.5	17.6	1.40
3	27.4	19.2	18.3	1.48
4	28.3	18.5	16.7	1.45
5	29.2	19.2	17.4	1.56
6	30.1	18.5	16.7	1.64
7	24.7	19.9	19.0	1.31
8	25.6	20.6	19.7	1.37
9	27.4	20.6	18.8	1.42
10	28.3	19.9	18.1	1.49
11	29.2	20.6	18.8	1.60
12	30.1	19.9	17.2	1.54
13	23.9	22.1	21.1	1.28
14	25.6	22.1	21.1	1.40
15	26.5	21.4	19.5	1.36
16	27.4	22.1	20.2	1.46
17	28.3	21.4	19.5	1.52
18	29.2	22.1	19.3	1.51
19	30.1	21.4	18.6	1.59
20	23.9	23.5	22.6	1.30
21	25.6	23.5	21.6	1.34
22	26.5	22.8	20.9	1.40
23	27.4	23.5	21.6	1.50
24	28.3	22.8	20.9	1.57
25	29.2	23.5	20.7	1.56
26	30.1	22.8	20.0	1.64
27	23.9	24.9	24.0	1.33
28	25.6	24.9	23.1	1.38
29	26.5	24.2	22.3	1.43
30	27.4	24.9	22.1	1.42
31	28.3	24.2	21.4	1.49
32	29.2	24.9	22.1	1.61
33	30.1	24.2	21.4	1.69
34	22.1	26.3	25.4	1.25
35	23.9	26.3	25.4	1.36
36	24.7	25.6	23.8	1.32
37	25.6	26.3	24.5	1.41
38	26.5	25.6	23.8	1.47
39	27.4	26.3	23.5	1.47
40	28.3	25.6	22.8	1.54
41	29.2	26.3	23.5	1.66
42	30.1	25.6	21.9	1.58

43	22.1	27.7	26.8	1.27
44	23.9	27.7	25.9	1.31
45	24.7	27.0	25.2	1.36
46	25.6	27.7	25.9	1.45
47	26.5	27.0	25.2	1.52
48	27.4	27.7	25.0	1.51
49	28.3	27.0	24.3	1.59
50	29.2	27.7	24.0	1.56
51	30.1	27.0	23.3	1.64
52	23.0	28.4	27.5	1.34
53	23.9	29.1	27.3	1.34
54	24.7	28.4	26.6	1.40
55	25.6	29.1	27.3	1.49
56	26.5	28.4	25.7	1.45
57	27.4	29.1	26.4	1.56
58	28.3	28.4	25.7	1.64
59	29.2	29.1	25.5	1.61
60	30.1	28.4	24.8	1.70
61	20.3	30.5	29.6	1.22
62	21.2	29.8	28.9	1.26
63	23.0	29.8	28.0	1.29
64	23.9	30.5	28.7	1.38
65	24.7	29.8	28.0	1.43
66	25.6	30.5	27.8	1.42
67	26.5	29.8	27.1	1.49
68	27.4	30.5	27.8	1.61
69	28.3	29.8	27.1	1.68
70	29.2	30.5	26.9	1.67
71	30.1	29.8	26.2	1.76
72	21.2	31.2	30.3	1.29
73	23.0	31.2	29.4	1.33
74	23.9	31.9	30.1	1.42
75	24.7	31.2	29.4	1.47
76	25.6	31.9	29.2	1.47
77	26.5	31.2	28.5	1.54
78	27.4	31.9	29.2	1.66
79	28.3	31.2	27.6	1.58
80	29.2	31.9	28.3	1.73
81	30.1	31.2	27.3	1.76
82	21.2	32.6	31.7	1.32
83	23.0	32.6	30.8	1.36
84	24.7	32.6	29.9	1.40
85	26.5	32.6	29.9	1.58
86	28.3	32.6	29.0	1.64
87	30.1	32.6	29.2	1.92

1.17.2 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata
Superficie di forma circolare	

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	12.3 m
Ordinata vertice sinistro inferiore yi	18.54 m
Ascissa vertice destro superiore xs	30.08 m
Ordinata vertice destro superiore ys	32.61 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	22.96	0.11
3	28.75	3.97
4	31.25	3.97
5	38.75	8.97
6	41.25	9.07
7	51.51	9.05

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	22.96	0.0
3	28.75	0.0
4	38.75	0.0
5	51.51	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-1.7
2	22.96	-1.7
3	28.75	-1.7
4	39.25	-1.7
5	51.51	-1.7

Vertici strato 3

N	X (m)	y (m)
1	0.0	-4.5
2	22.96	-4.5
3	28.75	-4.5
4	38.75	-4.5
5	51.51	-4.5

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	2000	2100.00	rilevato	
2	0.92		20	1850		4-C-3	
3	0.05		31.3	1900		4-G-1	
4	0.05		35.2	1900		4-G-3	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	0	0	0	0	0
2	39.46	8.91	46.46	9.190001	0.3

Risultati analisi pendio [A2+M2+R2]

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Fs minimo individuato 1.17
Ascissa centro superficie 19.41 m
Ordinata centro superficie 31.2 m
Raggio superficie 30.88 m

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xc = 19.411 yc = 31.204 Rc = 30.884 Fs=1.172
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.86	8.84	0.87	383.7
2	0.86	10.46	0.87	1118.95
3	0.86	12.09	0.88	1810.82
4	0.86	13.73	0.89	2458.56
5	0.86	15.38	0.89	3061.29
6	0.72	16.9	0.75	2973.12
7	1.0	18.58	1.06	4099.66
8	0.86	20.41	0.92	2942.25
9	0.86	22.12	0.93	2366.09
10	0.86	23.86	0.94	2490.34
11	0.86	25.62	0.95	2795.34
12	0.86	27.4	0.97	3044.06
13	0.86	29.21	0.99	3233.83
14	0.86	31.06	1.0	3361.51
15	0.86	32.94	1.03	3423.55
16	0.86	34.87	1.05	3415.78
17	1.25	37.3	1.57	4806.12
18	0.47	39.32	0.61	1563.63
19	0.86	40.94	1.14	3795.16
20	0.86	43.09	1.18	2957.2

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	72.99	144.28	0.0	0.0	329.19	163.23	0.0
2	261.6	517.08	72.99	144.28	982.56	487.22	0.0
3	529.37	1046.35	261.6	517.08	1619.67	803.13	0.0
4	844.25	1668.72	529.37	1046.35	2230.14	1105.84	0.0
5	1178.09	2328.58	844.25	1668.72	2804.79	1390.79	0.0
6	1452.34	2870.66	1178.09	2328.58	2739.9	1358.61	0.0
7	1757.6	3474.03	1452.34	2870.66	3788.93	1878.79	0.0
8	1921.81	3798.6	1757.6	3474.03	2716.83	1347.17	0.0
9	2014.27	3981.36	1921.81	3798.6	2175.06	1078.53	0.0
10	2070.92	4093.34	2014.27	3981.36	2271.03	1126.12	0.0
11	2089.8	4130.66	2070.92	4093.34	2519.71	1249.43	0.0
12	2062.51	4076.71	2089.8	4130.66	2701.98	1339.81	0.0
13	1983.39	3920.33	2062.51	4076.71	2815.26	1395.98	0.0
14	1849.6	3655.87	1983.39	3920.33	2857.77	1417.06	0.0
15	1661.19	3283.46	1849.6	3655.87	2828.74	1402.66	0.0
16	1421.33	2809.36	1661.19	3283.46	2728.42	1352.92	0.0
17	993.81	1964.34	1421.33	2809.36	3651.28	1810.53	0.0
18	830.91	1642.36	993.81	1964.34	1131.65	561.14	0.0
19	390.0	770.87	830.91	1642.36	2628.91	1303.58	0.0

Numero di superfici esaminate....(205)

N°	Xo	Yo	Ro	Fs
1	14.1	18.5	21.9	10.68
2	15.0	19.2	23.0	6.97
3	15.9	18.5	22.9	5.12
4	16.7	19.2	22.4	5.06
5	17.6	18.5	23.9	3.57
6	18.5	19.2	24.6	3.12
7	19.4	18.5	22.3	3.14
8	20.3	19.2	24.6	2.68
9	21.2	18.5	22.3	2.60
10	22.1	19.2	23.0	2.41
11	23.0	18.5	22.3	2.36
12	23.9	19.2	23.0	2.23
13	24.7	18.5	22.3	2.19
14	25.6	19.2	23.0	2.16
15	26.5	18.5	22.3	2.14
16	27.4	19.2	18.2	1.35
17	28.3	18.5	17.3	1.38
18	29.2	19.2	17.3	1.39
19	30.1	18.5	17.8	1.59
20	13.2	20.6	23.2	20.85
21	14.1	19.9	23.1	10.31

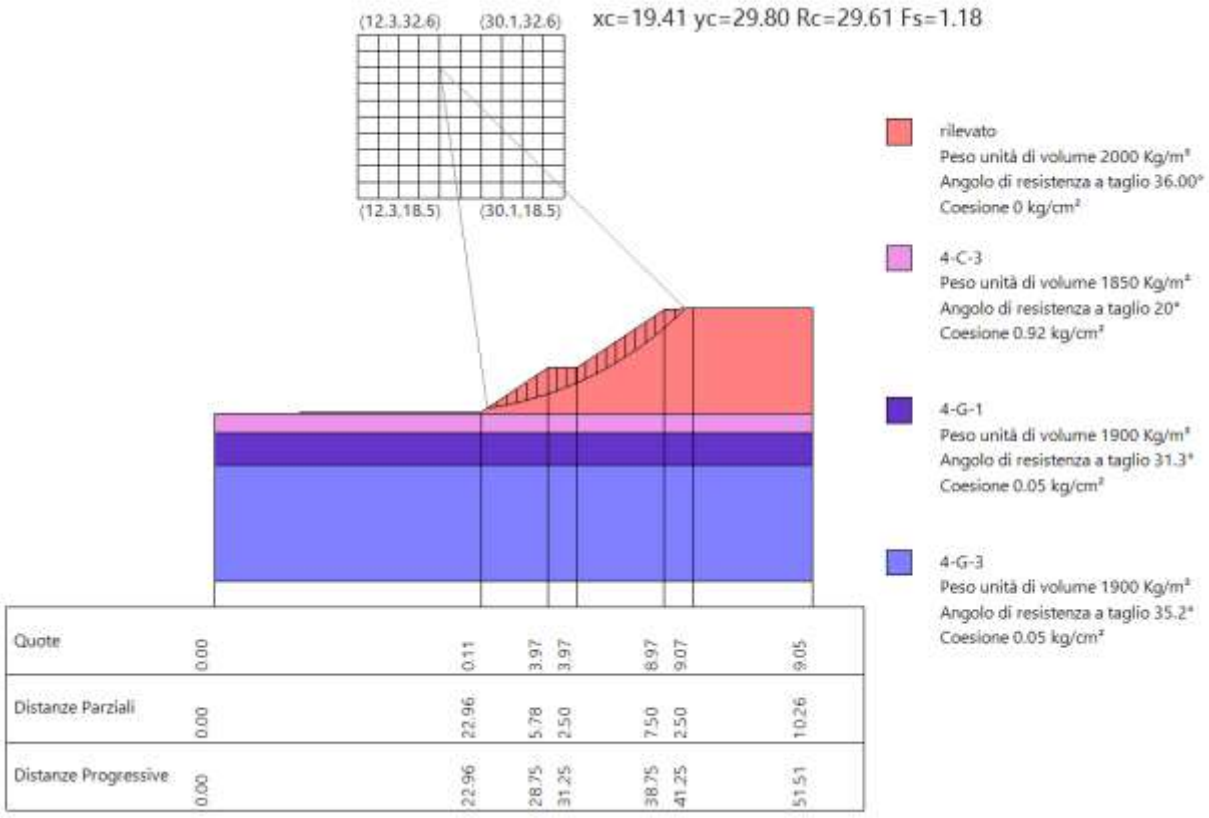
22	15.0	20.6	24.1	6.67
23	15.9	19.9	24.0	5.03
24	16.7	20.6	25.1	4.01
25	17.6	19.9	25.0	3.30
26	18.5	20.6	26.0	2.96
27	19.4	19.9	23.7	2.97
28	20.3	20.6	24.4	2.66
29	21.2	19.9	23.7	2.53
30	22.1	20.6	26.0	2.43
31	23.0	19.9	23.7	2.29
32	23.9	20.6	24.4	2.23
33	24.7	19.9	23.7	2.18
34	25.6	20.6	19.6	1.27
35	26.5	19.9	18.9	1.31
36	27.4	20.6	19.1	1.33
37	28.3	19.9	18.2	1.36
38	29.2	20.6	19.7	1.52
39	30.1	19.9	18.8	1.57
40	13.2	22.1	24.4	22.61
41	14.1	21.4	24.2	10.57
42	15.0	22.1	23.9	15.87
43	15.9	21.4	23.7	8.40
44	16.7	22.1	26.2	3.61
45	17.6	21.4	24.6	3.96
46	18.5	22.1	25.6	3.05
47	19.4	21.4	26.7	2.73
48	20.3	22.1	25.8	2.59
49	21.2	21.4	25.1	2.48
50	22.1	22.1	25.8	2.35
51	23.0	21.4	25.1	2.28
52	23.9	22.1	25.8	2.22
53	24.7	21.4	25.1	2.19
54	25.6	22.1	21.0	1.28
55	26.5	21.4	20.1	1.31
56	27.4	22.1	20.2	1.32
57	28.3	21.4	19.3	1.35
58	29.2	22.1	20.7	1.51
59	30.1	21.4	19.7	1.55
60	13.2	23.5	25.7	21.06
61	15.0	23.5	25.1	20.47
62	15.9	22.8	26.3	4.53
63	16.7	23.5	27.4	3.60
64	17.6	22.8	27.3	3.33
65	18.5	23.5	28.3	2.82
66	19.4	22.8	28.1	2.68
67	20.3	23.5	28.9	2.54

68	21.2	22.8	26.5	2.49
69	22.1	23.5	27.2	2.34
70	23.0	22.8	26.5	2.27
71	23.9	23.5	27.2	2.24
72	24.7	22.8	21.7	1.25
73	25.6	23.5	22.0	1.27
74	26.5	22.8	21.1	1.29
75	27.4	23.5	22.6	1.44
76	28.3	22.8	21.6	1.48
77	29.2	23.5	21.7	1.51
78	30.1	22.8	20.7	1.54
79	14.1	24.2	26.7	10.25
80	15.0	24.9	26.4	18.99
81	15.9	24.2	27.5	4.41
82	16.7	24.9	28.6	3.42
83	17.6	24.2	28.4	2.94
84	18.5	24.9	28.0	2.81
85	19.4	24.2	29.4	2.60
86	20.3	24.9	28.6	2.50
87	21.2	24.2	27.9	2.41
88	22.1	24.9	28.6	2.33
89	23.0	24.2	27.9	2.27
90	23.9	24.9	23.8	1.23
91	24.7	24.2	22.9	1.25
92	25.6	24.9	24.5	1.38
93	26.5	24.2	23.6	1.41
94	27.4	24.9	23.6	1.44
95	28.3	24.2	22.6	1.47
96	29.2	24.9	22.7	1.51
97	30.1	24.2	21.8	1.54
98	14.1	25.6	27.9	10.80
99	15.0	26.3	28.9	6.26
100	15.9	25.6	28.7	4.13
101	16.7	26.3	28.4	5.27
102	17.6	25.6	28.1	3.46
103	18.5	26.3	30.7	2.68
104	19.4	25.6	30.5	2.65
105	20.3	26.3	30.0	2.47
106	21.2	25.6	29.4	2.41
107	22.1	26.3	30.1	2.33
108	23.0	25.6	29.4	2.31
109	23.9	26.3	26.4	1.94
110	24.7	25.6	25.5	1.36
111	25.6	26.3	25.5	1.38
112	26.5	25.6	24.6	1.41
113	27.4	26.3	24.6	1.44

114	28.3	25.6	23.7	1.47
115	29.2	26.3	23.8	1.51
116	30.1	25.6	22.8	1.54
117	13.2	27.7	29.5	23.58
118	14.1	27.0	29.2	10.98
119	15.0	27.7	30.2	5.75
120	15.9	27.0	28.6	9.89
121	16.7	27.7	29.6	5.01
122	17.6	27.0	30.8	2.91
123	18.5	27.7	30.4	3.02
124	19.4	27.0	30.2	2.57
125	20.3	27.7	31.2	2.44
126	21.2	27.0	30.8	2.40
127	22.1	27.7	31.5	2.36
128	23.0	27.0	30.5	2.24
129	23.9	27.7	27.4	1.33
130	24.7	27.0	26.5	1.36
131	25.6	27.7	26.6	1.39
132	26.5	27.0	25.6	1.41
133	27.4	27.7	25.7	1.45
134	28.3	27.0	24.8	1.48
135	29.2	27.7	24.9	1.51
136	30.1	27.0	23.9	1.55
137	13.2	29.1	30.7	26.39
138	14.1	28.4	30.4	10.45
139	15.0	29.1	30.2	17.59
140	15.9	28.4	29.9	9.46
141	16.7	29.1	32.2	3.05
142	17.6	28.4	30.6	3.50
143	18.5	29.1	33.0	2.68
144	19.4	28.4	31.4	2.51
145	20.3	29.1	32.4	2.43
146	21.2	28.4	32.2	2.41
147	22.1	29.1	32.5	2.35
148	23.0	28.4	28.4	1.66
149	23.9	29.1	28.5	1.33
150	24.7	28.4	27.5	1.36
151	25.6	29.1	27.6	1.39
152	26.5	28.4	26.7	1.42
153	27.4	29.1	26.8	1.45
154	28.3	28.4	25.8	1.48
155	29.2	29.1	26.0	1.52
156	30.1	28.4	25.0	1.55
157	13.2	30.5	32.0	25.61
158	15.0	30.5	32.7	5.12
159	15.9	29.8	32.4	4.02

160	16.7	30.5	33.5	2.96
161	17.6	29.8	33.2	2.68
162	18.5	30.5	34.3	2.65
163	19.4	29.8	29.6	1.17
164	20.3	30.5	30.5	1.74
165	21.2	29.8	33.4	2.40
166	22.1	30.5	30.4	1.29
167	23.0	29.8	29.4	1.31
168	23.9	30.5	29.6	1.34
169	24.7	29.8	28.6	1.36
170	25.6	30.5	28.7	1.40
171	26.5	29.8	27.8	1.42
172	27.4	30.5	27.9	1.46
173	28.3	29.8	27.0	1.49
174	29.2	30.5	27.1	1.53
175	30.1	29.8	26.2	1.56
176	13.2	31.9	33.4	24.60
177	14.1	31.2	33.0	9.50
178	15.0	31.9	34.0	5.50
179	15.9	31.2	33.7	3.90
180	16.7	31.9	34.7	3.28
181	17.6	31.2	33.1	3.72
182	18.5	31.9	34.1	2.92
183	19.4	31.2	30.9	1.17
184	20.3	31.9	34.8	2.49
185	21.2	31.2	31.4	2.13
186	22.1	31.9	31.5	1.30
187	23.0	31.2	30.5	1.32
188	23.9	31.9	30.6	1.35
189	24.7	31.2	29.7	1.37
190	25.6	31.9	29.8	1.41
191	26.5	31.2	28.9	1.43
192	27.4	31.9	29.1	1.47
193	28.3	31.2	28.1	1.50
194	29.2	31.9	28.3	1.54
195	30.1	31.2	27.3	1.56
196	14.1	32.6	34.3	10.54
197	15.9	32.6	35.0	3.70
198	17.6	32.6	34.4	4.06
199	19.4	32.6	32.2	1.18
200	21.2	32.6	32.4	1.28
201	23.0	32.6	31.6	1.33
202	24.7	32.6	30.8	1.38
203	26.5	32.6	30.0	1.44
204	28.3	32.6	29.3	1.51
205	30.1	32.6	29.2	1.73

1.17.3 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.2
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	12.3 m
Ordinata vertice sinistro inferiore yi	18.54 m
Ascissa vertice destro superiore xs	30.08 m
Ordinata vertice destro superiore ys	32.61 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

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Coefficiente azione sismica orizzontale 0.032
Coefficiente azione sismica verticale 0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	0.0
2	22.96	0.11
3	28.75	3.97
4	31.25	3.97
5	38.75	8.97
6	41.25	9.07
7	51.51	9.05

Vertici strato 1

N	X (m)	y (m)
1	0.0	0.0
2	22.96	0.0
3	28.75	0.0
4	38.75	0.0
5	51.51	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	-1.7
2	22.96	-1.7
3	28.75	-1.7
4	39.25	-1.7
5	51.51	-1.7

Vertici strato 3

N	X (m)	y (m)
1	0.0	-4.5
2	22.96	-4.5
3	28.75	-4.5
4	38.75	-4.5
5	51.51	-4.5

Coefficienti parziali azioni

==========

Sfavorevoli: Permanenti, variabili 1.0 1.0
Favorevoli: Permanenti, variabili 1.0 1.0

==========

Coefficienti parziali per i parametri geotecnici del terreno

==========

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	No

==========

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0		36.00	2000	2100.00	rilevato	
2	0.92		20	1850		4-C-3	
3	0.05		31.3	1900		4-G-1	
4	0.05		35.2	1900		4-G-3	

Risultati analisi pendio

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Fs minimo individuato	1.18
Ascissa centro superficie	19.41 m
Ordinata centro superficie	29.8 m
Raggio superficie	29.61 m

==========

xc = 19.411 yc = 29.797 Rc = 29.609 Fs=1.176
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.85	8.77	0.86	376.67
2	0.85	10.44	0.87	1097.57
3	0.85	12.12	0.87	1774.64
4	0.85	13.81	0.88	2407.12
5	0.85	15.52	0.88	2994.09
6	0.99	17.37	1.04	4153.46
7	0.71	19.11	0.76	3068.63
8	0.85	20.72	0.91	3177.0
9	0.85	22.49	0.92	2603.12
10	0.85	24.29	0.93	2364.52
11	0.85	26.11	0.95	2648.95
12	0.85	27.96	0.96	2875.81
13	0.85	29.84	0.98	3042.17
14	0.85	31.76	1.0	3144.66
15	0.85	33.72	1.02	3179.33
16	0.85	35.72	1.05	3141.55
17	0.85	37.78	1.08	3025.81
18	0.77	39.79	1.01	2577.96
19	0.93	41.98	1.25	2240.29
20	0.85	44.34	1.19	693.32

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**75.02**	**140.83**	**0.0**	**0.0**	**323.72**	**166.67**	**0.0**
2	**266.43**	**500.14**	**75.02**	**140.83**	**967.18**	**497.97**	**0.0**
3	**534.22**	**1002.84**	**266.43**	**500.14**	**1594.65**	**821.03**	**0.0**
4	**843.59**	**1583.59**	**534.22**	**1002.84**	**2194.75**	**1130.0**	**0.0**
5	**1164.35**	**2185.73**	**843.59**	**1583.59**	**2757.5**	**1419.74**	**0.0**
6	**1517.31**	**2848.31**	**1164.35**	**2185.73**	**3848.69**	**1981.55**	**0.0**
7	**1717.67**	**3224.43**	**1517.31**	**2848.31**	**2847.62**	**1466.14**	**0.0**
8	**1869.38**	**3509.23**	**1717.67**	**3224.43**	**2941.97**	**1514.71**	**0.0**
9	**1945.48**	**3652.08**	**1869.38**	**3509.23**	**2396.08**	**1233.66**	**0.0**
10	**1972.0**	**3701.86**	**1945.48**	**3652.08**	**2154.94**	**1109.5**	**0.0**
11	**1955.08**	**3670.1**	**1972.0**	**3701.86**	**2380.66**	**1225.72**	**0.0**
12	**1887.12**	**3542.51**	**1955.08**	**3670.1**	**2537.95**	**1306.7**	**0.0**
13	**1763.58**	**3310.61**	**1887.12**	**3542.51**	**2624.43**	**1351.22**	**0.0**
14	**1583.18**	**2971.96**	**1763.58**	**3310.61**	**2638.85**	**1358.65**	**0.0**
15	**1347.96**	**2530.4**	**1583.18**	**2971.96**	**2580.98**	**1328.85**	**0.0**
16	**1063.54**	**1996.49**	**1347.96**	**2530.4**	**2451.86**	**1262.38**	**0.0**
17	**739.5**	**1388.2**	**1063.54**	**1996.49**	**2254.04**	**1160.52**	**0.0**
18	**422.51**	**793.14**	**739.5**	**1388.2**	**1822.41**	**938.29**	**0.0**
19	**109.32**	**205.21**	**422.51**	**793.14**	**1483.79**	**763.95**	**0.0**
20	**0.0**	**0.0**	**109.32**	**205.21**	**423.08**	**217.83**	**0.0**

Numero di superfici esaminate....(205)

N°	Xo	Yo	Ro	Fs
1	14.1	18.5	21.9	8.54
2	15.0	19.2	23.0	5.91
3	15.9	18.5	22.9	4.50
4	16.7	19.2	22.4	4.52
5	17.6	18.5	22.4	3.77
6	18.5	19.2	25.0	3.07
7	19.4	18.5	23.4	2.76
8	20.3	19.2	24.4	2.62
9	21.2	18.5	22.5	2.48
10	22.1	19.2	23.5	2.51
11	23.0	18.5	22.8	2.48
12	23.9	19.2	23.5	2.28
13	24.7	18.5	22.7	2.31
14	25.6	19.2	19.0	1.36
15	26.5	18.5	18.1	1.39
16	27.4	19.2	18.2	1.42
17	28.3	18.5	17.3	1.46
18	29.2	19.2	17.3	1.49
19	30.1	18.5	16.4	1.54
20	13.2	20.6	23.2	14.85
21	14.1	19.9	23.1	8.34
22	15.0	20.6	24.1	5.72
23	15.9	19.9	24.0	4.46
24	16.7	20.6	25.1	3.65
25	17.6	19.9	25.0	3.10
26	18.5	20.6	26.1	2.90
27	19.4	19.9	24.4	2.95
28	20.3	20.6	25.5	2.64
29	21.2	19.9	20.0	2.13
30	22.1	20.6	24.6	2.39
31	23.0	19.9	24.2	2.41
32	23.9	20.6	20.8	2.03
33	24.7	19.9	19.9	1.32
34	25.6	20.6	20.0	1.34
35	26.5	19.9	19.1	1.38
36	27.4	20.6	19.1	1.41
37	28.3	19.9	18.2	1.45
38	29.2	20.6	18.4	1.48
39	30.1	19.9	17.4	1.52
40	13.2	22.1	24.4	16.63
41	14.1	21.4	24.2	8.67
42	15.0	22.1	23.9	13.33

43	15.9	21.4	23.7	7.34
44	16.7	22.1	26.2	3.30
45	17.6	21.4	24.6	3.65
46	18.5	22.1	25.6	2.95
47	19.4	21.4	25.5	2.66
48	20.3	22.1	26.6	2.71
49	21.2	21.4	24.7	2.48
50	22.1	22.1	22.1	1.82
51	23.0	21.4	25.4	2.30
52	23.9	22.1	21.8	1.28
53	24.7	21.4	20.9	1.31
54	25.6	22.1	21.0	1.33
55	26.5	21.4	20.1	1.37
56	27.4	22.1	20.2	1.40
57	28.3	21.4	19.3	1.44
58	29.2	22.1	19.4	1.47
59	30.1	21.4	18.5	1.51
60	13.2	23.5	25.7	15.88
61	15.0	23.5	25.1	17.42
62	15.9	22.8	26.3	4.08
63	16.7	23.5	27.4	3.37
64	17.6	22.8	27.3	3.22
65	18.5	23.5	28.3	2.81
66	19.4	22.8	26.7	2.60
67	20.3	23.5	27.7	2.54
68	21.2	22.8	25.9	2.48
69	22.1	23.5	23.3	1.22
70	23.0	22.8	22.7	1.25
71	23.9	23.5	22.8	1.27
72	24.7	22.8	21.9	1.30
73	25.6	23.5	22.0	1.33
74	26.5	22.8	21.1	1.36
75	27.4	23.5	21.2	1.39
76	28.3	22.8	20.3	1.43
77	29.2	23.5	20.5	1.46
78	30.1	22.8	19.6	1.50
79	14.1	24.2	26.7	8.54
80	15.0	24.9	26.4	16.31
81	15.9	24.2	27.5	4.00
82	16.7	24.9	28.6	3.26
83	17.6	24.2	28.4	2.88
84	18.5	24.9	28.0	2.79
85	19.4	24.2	29.4	2.63
86	20.3	24.9	28.8	2.57
87	21.2	24.2	28.7	2.57
88	22.1	24.9	24.5	1.22

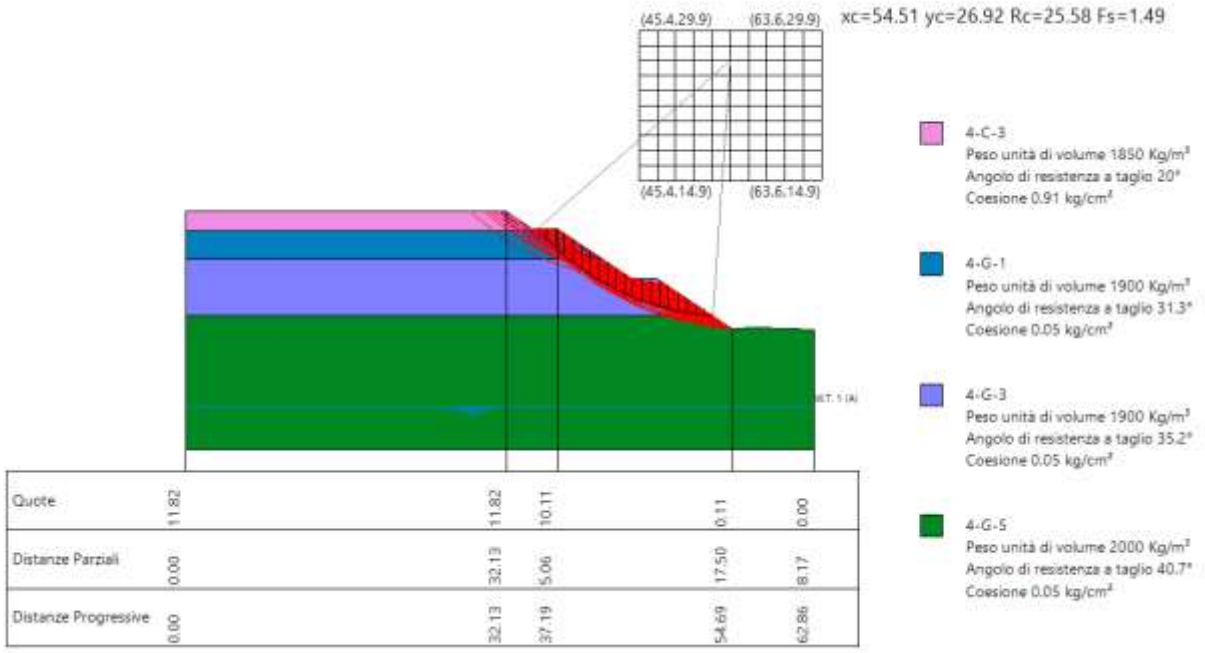
89	23.0	24.2	23.7	1.25
90	23.9	24.9	23.8	1.27
91	24.7	24.2	22.9	1.30
92	25.6	24.9	23.0	1.33
93	26.5	24.2	22.1	1.36
94	27.4	24.9	22.3	1.39
95	28.3	24.2	21.4	1.42
96	29.2	24.9	21.6	1.45
97	30.1	24.2	21.8	1.66
98	14.1	25.6	27.9	9.11
99	15.0	26.3	28.9	5.59
100	15.9	25.6	28.7	3.78
101	16.7	26.3	28.4	4.90
102	17.6	25.6	28.1	3.35
103	18.5	26.3	30.7	2.70
104	19.4	25.6	30.5	2.69
105	20.3	26.3	30.0	2.54
106	21.2	25.6	29.9	2.44
107	22.1	26.3	25.6	1.22
108	23.0	25.6	24.7	1.25
109	23.9	26.3	24.9	1.27
110	24.7	25.6	24.0	1.30
111	25.6	26.3	24.1	1.33
112	26.5	25.6	23.2	1.36
113	27.4	26.3	23.4	1.39
114	28.3	25.6	22.5	1.42
115	29.2	26.3	23.8	1.62
116	30.1	25.6	22.8	1.66
117	13.2	27.7	29.5	18.83
118	14.1	27.0	29.2	9.40
119	15.0	27.7	30.2	5.19
120	15.9	27.0	28.6	9.01
121	16.7	27.7	29.6	4.72
122	17.6	27.0	30.8	2.91
123	18.5	27.7	30.4	3.07
124	19.4	27.0	30.2	2.63
125	20.3	27.7	31.2	2.52
126	21.2	27.0	31.0	2.50
127	22.1	27.7	26.7	1.22
128	23.0	27.0	25.8	1.25
129	23.9	27.7	26.0	1.27
130	24.7	27.0	25.0	1.30
131	25.6	27.7	25.2	1.33
132	26.5	27.0	24.3	1.36
133	27.4	27.7	25.7	1.54
134	28.3	27.0	24.8	1.58

135	29.2	27.7	24.9	1.62
136	30.1	27.0	23.9	1.67
137	13.2	29.1	30.7	21.43
138	14.1	28.4	30.4	9.07
139	15.0	29.1	30.2	15.61
140	15.9	28.4	29.9	8.70
141	16.7	29.1	32.2	3.03
142	17.6	28.4	30.6	3.51
143	18.5	29.1	33.0	2.73
144	19.4	28.4	31.4	2.58
145	20.3	29.1	32.4	2.52
146	21.2	28.4	32.2	2.48
147	22.1	29.1	27.8	1.22
148	23.0	28.4	26.9	1.25
149	23.9	29.1	27.1	1.27
150	24.7	28.4	26.2	1.30
151	25.6	29.1	27.6	1.46
152	26.5	28.4	26.7	1.50
153	27.4	29.1	26.8	1.54
154	28.3	28.4	25.8	1.58
155	29.2	29.1	26.0	1.63
156	30.1	28.4	25.0	1.67
157	13.2	30.5	32.0	21.06
158	15.0	30.5	32.7	4.72
159	15.9	29.8	32.4	3.91
160	16.7	30.5	33.5	2.98
161	17.6	29.8	33.2	2.72
162	18.5	30.5	34.3	2.71
163	19.4	29.8	29.6	1.18
164	20.3	30.5	30.5	1.83
165	21.2	29.8	33.4	2.47
166	22.1	30.5	30.4	1.34
167	23.0	29.8	28.0	1.25
168	23.9	30.5	29.6	1.40
169	24.7	29.8	28.6	1.43
170	25.6	30.5	28.7	1.47
171	26.5	29.8	27.8	1.51
172	27.4	30.5	27.9	1.55
173	28.3	29.8	27.0	1.59
174	29.2	30.5	27.1	1.64
175	30.1	29.8	26.2	1.67
176	13.2	31.9	33.4	20.50
177	14.1	31.2	33.0	8.50
178	15.0	31.9	34.0	5.23
179	15.9	31.2	33.7	3.86
180	16.7	31.9	34.7	3.33

181	17.6	31.2	33.1	3.83
182	18.5	31.9	34.1	3.04
183	19.4	31.2	30.9	1.19
184	20.3	31.9	36.3	2.53
185	21.2	31.2	31.4	2.27
186	22.1	31.9	31.5	1.34
187	23.0	31.2	30.5	1.37
188	23.9	31.9	30.6	1.41
189	24.7	31.2	29.7	1.44
190	25.6	31.9	29.8	1.48
191	26.5	31.2	28.9	1.52
192	27.4	31.9	29.1	1.56
193	28.3	31.2	28.1	1.60
194	29.2	31.9	28.3	1.64
195	30.1	31.2	27.3	1.66
196	14.1	32.6	34.3	9.54
197	15.9	32.6	35.0	3.71
198	17.6	32.6	34.4	4.22
199	19.4	32.6	32.2	1.20
200	21.2	32.6	32.4	1.32
201	23.0	32.6	31.6	1.38
202	24.7	32.6	30.8	1.45
203	26.5	32.6	30.0	1.53
204	28.3	32.6	29.3	1.61
205	30.1	32.6	29.2	1.80

1.18 SEZIONE B-48

1.18.1 Fine costruzione



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	45.38 m
Ordinata vertice sinistro inferiore yi	14.93 m
Ascissa vertice destro superiore xs	63.63 m
Ordinata vertice destro superiore ys	29.91 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	11.82
2	32.13	11.82
3	34.69	10.11
4	37.19	10.11
5	44.69	5.11
6	47.19	5.11
7	54.69	0.11
8	57.19	0.21
9	58.69	0.16
10	62.86	0.0
11	62.86	0.0

Falda

Nr.	X (m)	y (m)
1	0.0	-7.68
2	28.67	-7.68
3	47.74	-7.68
4	57.71	-7.68
5	62.86	-7.68

Vertici strato 1

N	X (m)	y (m)
1	0.0	9.92
2	16.01	9.92
3	34.75	9.92
4	37.48	9.92
5	44.69	5.11
6	47.19	5.11
7	54.69	0.11
8	57.19	0.21
9	58.69	0.16
10	62.86	0.0
11	62.86	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	7.02
2	14.06	7.02
3	24.86	7.02
4	40.56	7.02
5	41.83	7.02
6	44.69	5.11

7	47.19	5.11
8	54.69	0.11
9	57.19	0.21
10	58.69	0.16
11	62.86	0.0
12	62.86	0.0

Vertici strato 3

N	X (m)	y (m)
1	0.0	1.42
2	23.67	1.42
3	34.51	1.42
4	47.96	1.42
5	52.73	1.42
6	54.69	0.11
7	57.19	0.21
8	58.69	0.16
9	62.86	0.0
10	62.86	0.0

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0.91		20	1850	1950	4-C-3	
2	0.05		31.3	1900	2000	4-G-1	
3	0.05		35.2	1900	2000	4-G-3	
4	0.05		40.7	2000	2100	4-G-5	

Risultati analisi pendio [A2+M2+R2]

==========

Fs minimo individuato	1.49
Ascissa centro superficie	54.51 m
Ordinata centro superficie	26.92 m
Raggio superficie	25.58 m

==========

xc = 54.506 yc = 26.918 Rc = 25.579 Fs=1.495

Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.88	47.47	1.3	808.51
2	0.88	44.64	1.23	2323.96
3	0.88	41.94	1.18	3458.23
4	0.88	39.35	1.13	3739.89
5	0.88	36.85	1.1	3911.08
6	0.88	34.43	1.06	3984.36
7	0.88	32.08	1.04	3968.2
8	0.88	29.79	1.01	3869.6
9	0.88	27.55	0.99	3694.27
10	0.88	25.36	0.97	3447.0
11	0.7	23.42	0.76	2523.55
12	1.06	21.3	1.13	4065.96
13	0.88	18.99	0.93	3969.8
14	0.88	16.92	0.92	4443.3
15	0.88	14.88	0.91	4028.91
16	0.88	12.86	0.9	3415.34
17	0.88	10.85	0.89	2747.7
18	0.88	8.85	0.89	2027.14
19	0.88	6.87	0.88	1254.63
20	0.88	4.89	0.88	430.89

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	**-28.73**	**-61.14**	**0.0**	**0.0**	**520.83**	**516.67**	**0.0**
2	**-338.21**	**-719.87**	**-28.73**	**-61.14**	**1410.88**	**788.9**	**0.0**
3	**-806.9**	**-1717.46**	**-338.21**	**-719.87**	**2254.27**	**1048.99**	**0.0**
4	**-1263.55**	**-2689.42**	**-806.9**	**-1717.46**	**2628.9**	**1158.87**	**0.0**
5	**-1614.32**	**-3436.02**	**-1263.55**	**-2689.42**	**2962.55**	**1411.68**	**0.0**
6	**-1909.69**	**-4064.7**	**-1614.32**	**-3436.02**	**3174.4**	**1482.91**	**0.0**
7	**-2139.63**	**-4554.14**	**-1909.69**	**-4064.7**	**3297.06**	**1521.66**	**0.0**
8	**-2298.76**	**-4892.84**	**-2139.63**	**-4554.14**	**3328.02**	**1526.79**	**0.0**
9	**-2385.75**	**-5077.98**	**-2298.76**	**-4892.84**	**3266.81**	**1497.96**	**0.0**
10	**-2402.97**	**-5114.64**	**-2385.75**	**-5077.98**	**3114.78**	**1435.57**	**0.0**

11	**-2348.28**	**-4998.24**	**-2402.97**	**-5114.64**	**2311.79**	**1076.53**	**0.0**
12	**-2258.45**	**-4807.04**	**-2348.28**	**-4998.24**	**3774.09**	**1727.81**	**0.0**
13	**-2091.82**	**-4452.37**	**-2258.45**	**-4807.04**	**3711.63**	**1649.37**	**0.0**
14	**-1838.76**	**-3913.74**	**-2091.82**	**-4452.37**	**4165.59**	**1817.87**	**0.0**
15	**-1524.08**	**-3243.96**	**-1838.76**	**-3913.74**	**3761.68**	**1662.9**	**0.0**
16	**-1174.12**	**-2499.07**	**-1524.08**	**-3243.96**	**3154.27**	**1431.49**	**0.0**
17	**-814.44**	**-1733.5**	**-1174.12**	**-2499.07**	**2489.42**	**1178.74**	**0.0**
18	**-474.9**	**-1010.81**	**-814.44**	**-1733.5**	**1778.73**	**909.0**	**0.0**
19	**-190.09**	**-404.61**	**-474.9**	**-1010.81**	**1035.37**	**627.24**	**0.0**
20	**-0.02**	**-0.05**	**-190.09**	**-404.61**	**274.46**	**339.15**	**0.0**

Numero di superfici esaminate....(140)

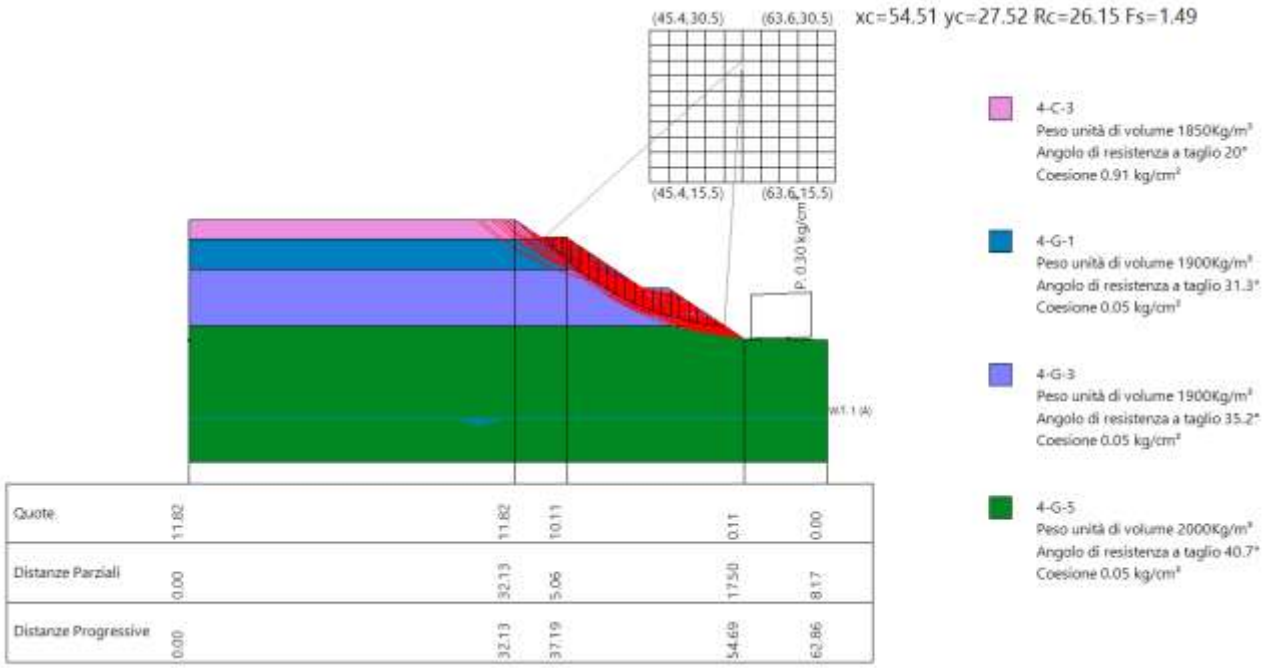
N°	Xo	Yo	Ro	Fs
1	45.4	14.9	11.1	20.00
2	46.3	15.7	11.5	20.00
3	47.2	14.9	12.4	20.00
4	48.1	15.7	12.7	20.00
5	49.0	14.9	11.7	20.00
6	49.9	15.7	13.8	20.00
7	50.9	14.9	12.8	20.00
8	51.8	15.7	14.6	20.00
9	52.7	14.9	13.6	1.81
10	53.6	15.7	15.4	20.00
11	54.5	14.9	14.3	1.77
12	55.4	15.7	16.0	20.00
13	56.3	14.9	15.0	20.00
14	45.4	16.4	12.4	20.00
15	46.3	17.2	12.8	20.00
16	47.2	16.4	11.9	20.00
17	48.1	17.2	14.0	20.00
18	49.0	16.4	13.1	20.00
19	49.9	17.2	15.1	20.00
20	50.9	16.4	14.1	20.00
21	51.8	17.2	15.9	20.00
22	52.7	16.4	14.9	1.78
23	53.6	17.2	16.7	20.00
24	54.5	16.4	15.7	1.77
25	55.4	17.2	17.4	20.00
26	56.3	16.4	16.4	1.67
27	45.4	17.9	13.7	20.00
28	46.3	18.7	14.1	20.00
29	47.2	17.9	13.2	20.00
30	48.1	18.7	15.3	20.00
31	49.0	17.9	14.4	20.00

32	49.9	18.7	14.8	2.37
33	50.9	17.9	15.4	1.75
34	51.8	18.7	15.8	2.20
35	52.7	17.9	16.3	1.74
36	53.6	18.7	18.1	1.67
37	54.5	17.9	17.1	1.76
38	56.3	17.9	17.8	1.72
39	45.4	19.4	15.0	20.00
40	46.3	20.2	15.5	20.00
41	47.2	19.4	14.6	20.00
42	48.1	20.2	16.7	20.00
43	49.0	19.4	15.7	1.67
44	49.9	20.2	16.2	2.11
45	50.9	19.4	16.8	1.67
46	51.8	20.2	17.2	2.06
47	52.7	19.4	17.7	1.68
48	53.6	20.2	19.4	1.60
49	54.5	19.4	18.5	1.71
50	55.4	20.2	18.9	1.89
51	45.4	20.9	16.4	20.00
52	46.3	21.7	16.8	20.00
53	47.2	20.9	17.6	20.00
54	48.1	21.7	18.0	20.00
55	49.0	20.9	17.1	1.64
56	49.9	21.7	17.6	1.89
57	50.9	20.9	18.1	1.62
58	51.8	21.7	18.6	1.90
59	52.7	20.9	19.0	1.61
60	53.6	21.7	20.8	1.57
61	54.5	20.9	19.9	1.65
62	55.4	21.7	20.3	1.86
63	56.3	20.9	20.7	1.71
64	45.4	22.4	17.7	20.00
65	46.3	23.2	18.2	20.00
66	47.2	22.4	19.0	20.00
67	48.1	23.2	19.4	20.00
68	49.0	22.4	18.5	1.63
69	49.9	23.2	19.0	1.77
70	50.9	22.4	19.5	1.60
71	51.8	23.2	21.4	1.54
72	52.7	22.4	20.4	1.57
73	53.6	23.2	22.3	1.54
74	54.5	22.4	21.3	1.59
75	55.4	23.2	23.1	1.57
76	56.3	22.4	22.1	1.65
77	57.2	23.2	22.6	1.77

78	45.4	23.9	19.1	20.00
79	46.3	24.7	19.6	2.59
80	47.2	23.9	20.4	20.00
81	48.1	24.7	20.8	20.00
82	49.0	23.9	19.9	1.64
83	49.9	24.7	20.4	1.72
84	50.9	23.9	20.9	1.60
85	51.8	24.7	21.4	1.69
86	52.7	23.9	21.8	1.55
87	53.6	24.7	23.7	1.54
88	54.5	23.9	22.7	1.54
89	55.4	24.7	24.5	1.54
90	45.4	25.4	20.5	20.00
91	46.3	26.2	21.0	2.56
92	47.2	25.4	20.1	3.16
93	48.1	26.2	22.2	20.00
94	49.0	25.4	21.3	2.46
95	49.9	26.2	21.8	1.69
96	50.9	25.4	22.3	1.73
97	51.8	26.2	22.8	1.66
98	52.7	25.4	23.3	1.54
99	53.6	26.2	23.7	1.61
100	54.5	25.4	24.1	1.50
101	55.4	26.2	24.6	1.60
102	56.3	25.4	23.7	2.13
103	57.2	26.2	25.5	1.64
104	58.2	25.4	24.6	1.94
105	45.4	26.9	21.9	20.00
106	46.3	27.7	22.4	2.55
107	47.2	26.9	21.5	3.43
108	48.1	27.7	23.6	20.00
109	49.0	26.9	22.7	2.58
110	49.9	27.7	23.2	1.69
111	50.9	26.9	23.7	20.00
112	51.8	27.7	24.2	1.64
113	52.7	26.9	24.7	1.68
114	53.6	27.7	25.2	1.59
115	54.5	26.9	25.6	1.49
116	55.4	27.7	26.1	1.55
117	56.3	26.9	26.4	1.52
118	45.4	28.4	21.6	5.11
119	46.3	29.2	23.8	2.55
120	47.2	28.4	22.9	3.29
121	48.1	29.2	23.5	4.15
122	49.0	28.4	24.1	20.00
123	49.9	29.2	24.6	2.91

124	50.9	28.4	25.2	20.00
125	51.8	29.2	25.7	20.00
126	52.7	28.4	24.8	1.82
127	53.6	29.2	26.6	1.58
128	54.5	28.4	27.0	1.58
129	55.4	29.2	27.6	1.53
130	56.3	28.4	26.7	1.76
131	57.2	29.2	27.2	2.52
132	59.1	29.2	28.2	2.15
133	45.4	29.9	24.7	2.48
134	47.2	29.9	24.4	3.21
135	49.0	29.9	25.5	20.00
136	50.9	29.9	26.6	20.00
137	52.7	29.9	26.2	1.75
138	54.5	29.9	27.2	1.69
139	56.3	29.9	28.1	1.65
140	58.2	29.9	29.1	1.63

1.18.2 Esercizio



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.0
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	45.39 m
Ordinata vertice sinistro inferiore yi	15.53 m
Ascissa vertice destro superiore xs	63.64 m
Ordinata vertice destro superiore ys	30.51 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Vertici profilo

Nr	X (m)	y (m)
1	0.0	11.82
2	32.13	11.82
3	34.69	10.11
4	37.19	10.11
5	44.69	5.11
6	47.19	5.11
7	54.69	0.11
8	57.19	0.21
9	58.69	0.16
10	62.86	0.0
11	62.86	0.0

Falda

Nr.	X (m)	y (m)
1	0.0	-7.68
2	28.67	-7.68
3	47.74	-7.68
4	57.71	-7.68
5	62.86	-7.68

Vertici strato 1

N	X (m)	y (m)
1	0.0	9.92
2	16.01	9.92
3	34.75	9.92
4	37.48	9.92
5	44.69	5.11
6	47.19	5.11
7	54.69	0.11
8	57.19	0.21
9	58.69	0.16
10	62.86	0.0
11	62.86	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	7.02
2	14.06	7.02
3	24.86	7.02
4	40.56	7.02
5	41.83	7.02
6	44.69	5.11

7	47.19	5.11
8	54.69	0.11
9	57.19	0.21
10	58.69	0.16
11	62.86	0.0
12	62.86	0.0

Vertici strato 3

N	X (m)	y (m)
1	0.0	1.42
2	23.67	1.42
3	34.51	1.42
4	47.96	1.42
5	52.73	1.42
6	54.69	0.11
7	57.19	0.21
8	58.69	0.16
9	62.86	0.0
10	62.86	0.0

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	Si

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0.91		20	1850	1950	4-C-3	
2	0.05		31.3	1900	2000	4-G-1	
3	0.05		35.2	1900	2000	4-G-3	
4	0.05		40.7	2000	2100	4-G-5	

Carichi distribuiti

N°	xi (m)	yi (m)	xf (m)	yf (m)	Carico esterno (kg/cm²)
1	0	0	0	0	0
2	55.33	0.1	61.33	0.34	0.3

Risultati analisi pendio [A2+M2+R2]

==========

Fs minimo individuato	1.49
Ascissa centro superficie	54.51 m
Ordinata centro superficie	27.52 m
Raggio superficie	26.15 m

==========

xc = 54.512 yc = 27.515 Rc = 26.154 Fs=1.495

Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.89	46.87	1.3	808.73
2	0.89	44.09	1.23	2327.32
3	0.89	41.44	1.18	3692.23
4	0.89	38.9	1.14	3965.12
5	0.89	36.44	1.1	4122.25
6	0.89	34.06	1.07	4181.9
7	0.89	31.75	1.04	4152.31
8	0.89	29.49	1.02	4040.28
9	0.89	27.28	1.0	3851.33
10	0.89	25.11	0.98	3590.18
11	0.83	23.05	0.91	3075.01
12	0.94	20.95	1.01	3611.77
13	0.89	18.83	0.94	3963.83
14	0.89	16.78	0.93	4443.62
15	0.89	14.76	0.92	4127.43
16	0.89	12.76	0.91	3497.22
17	0.89	10.78	0.9	2812.34
18	0.89	8.81	0.9	2074.03
19	0.89	6.85	0.89	1283.18
20	0.89	4.89	0.89	440.55

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	-25.35	-54.63	0.0	0.0	530.39	519.65	0.0
2	-323.63	-697.51	-25.35	-54.63	1438.43	798.43	0.0
3	-814.75	-1756.01	-323.63	-697.51	2435.26	1108.95	0.0
4	-1288.56	-2777.19	-814.75	-1756.01	2813.34	1220.31	0.0
5	-1648.24	-3552.4	-1288.56	-2777.19	3144.97	1482.24	0.0
6	-1948.82	-4200.25	-1648.24	-3552.4	3350.53	1551.3	0.0
7	-2181.11	-4700.89	-1948.82	-4200.25	3465.11	1587.16	0.0
8	-2340.37	-5044.13	-2181.11	-4700.89	3486.51	1588.81	0.0
9	-2425.81	-5228.29	-2340.37	-5044.13	3414.5	1556.0	0.0
10	-2440.31	-5259.55	-2425.81	-5228.29	3250.64	1489.22	0.0
11	-2388.25	-5147.34	-2440.31	-5259.55	2825.56	1309.07	0.0
12	-2286.13	-4927.25	-2388.25	-5147.34	3356.26	1536.39	0.0
13	-2115.05	-4558.51	-2286.13	-4927.25	3708.85	1650.84	0.0
14	-1858.61	-4005.82	-2115.05	-4558.51	4168.41	1821.47	0.0
15	-1537.59	-3313.92	-1858.61	-4005.82	3857.05	1701.47	0.0
16	-1182.36	-2548.3	-1537.59	-3313.92	3233.5	1463.99	0.0
17	-818.64	-1764.4	-1182.36	-2548.3	2552.03	1204.98	0.0
18	-476.38	-1026.73	-818.64	-1764.4	1824.29	928.81	0.0
19	-190.19	-409.92	-476.38	-1026.73	1063.41	640.45	0.0
20	0.0	0.0	-190.19	-409.92	284.4	345.53	0.0

Numero di superfici esaminate....(142)

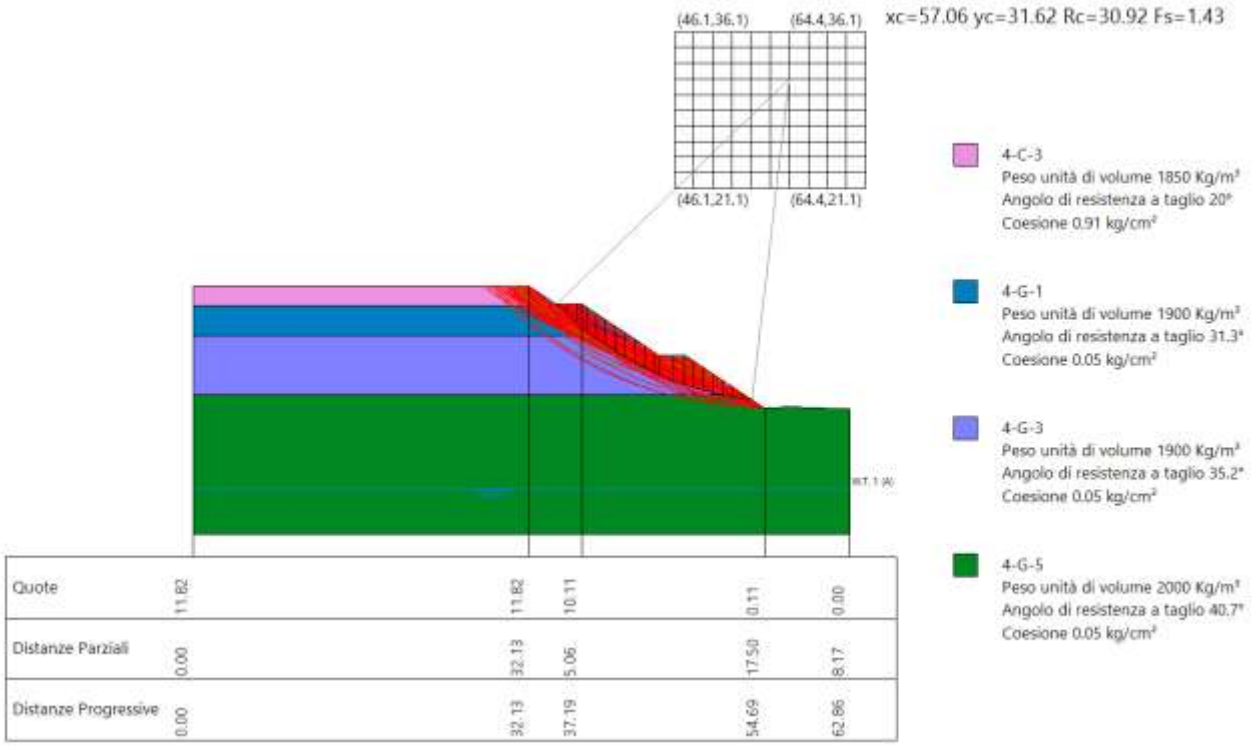
N°	Xo	Yo	Ro	Fs
1	45.4	15.5	11.6	20.00
2	46.3	16.3	12.0	20.00
3	47.2	15.5	11.1	20.00
4	48.1	16.3	13.2	20.00
5	49.0	15.5	12.3	20.00
6	49.9	16.3	14.3	20.00
7	50.9	15.5	13.3	20.00
8	51.8	16.3	15.1	20.00
9	52.7	15.5	14.1	1.79
10	53.6	16.3	15.9	20.00
11	54.5	15.5	14.9	1.77
12	55.4	16.3	16.6	20.00
13	56.3	15.5	15.5	20.00
14	45.4	17.0	12.9	20.00
15	46.3	17.8	13.3	20.00
16	47.2	17.0	12.4	20.00
17	48.1	17.8	14.5	20.00
18	49.0	17.0	13.6	20.00

19	49.9	17.8	15.6	20.00
20	50.9	17.0	14.6	20.00
21	51.8	17.8	15.0	2.26
22	52.7	17.0	15.5	1.76
23	53.6	17.8	17.2	20.00
24	54.5	17.0	16.2	1.78
25	56.3	17.0	16.9	1.70
26	45.4	18.5	14.2	20.00
27	46.3	19.3	14.7	20.00
28	47.2	18.5	13.7	20.00
29	48.1	19.3	15.9	20.00
30	49.0	18.5	14.9	20.00
31	49.9	19.3	15.3	2.27
32	50.9	18.5	15.9	1.72
33	51.8	19.3	16.3	2.15
34	52.7	18.5	16.8	1.72
35	53.6	19.3	18.6	1.65
36	54.5	18.5	17.6	1.75
37	56.3	18.5	18.4	1.73
38	45.4	20.0	15.6	20.00
39	46.3	20.8	16.0	20.00
40	47.2	20.0	16.8	20.00
41	48.1	20.8	17.2	20.00
42	49.0	20.0	16.3	1.65
43	49.9	20.8	16.7	2.01
44	50.9	20.0	17.3	1.65
45	51.8	20.8	17.7	2.00
46	52.7	20.0	18.2	1.66
47	53.6	20.8	20.0	1.59
48	54.5	20.0	19.0	1.70
49	55.4	20.8	19.5	1.89
50	57.2	20.8	20.3	1.77
51	45.4	21.5	16.9	20.00
52	46.3	22.3	17.4	20.00
53	47.2	21.5	18.2	20.00
54	48.1	22.3	18.6	20.00
55	49.0	21.5	17.7	1.63
56	49.9	22.3	18.1	1.83
57	50.9	21.5	18.7	1.61
58	51.8	22.3	19.1	1.84
59	52.7	21.5	19.6	1.59
60	53.6	22.3	21.4	1.55
61	54.5	21.5	20.4	1.64
62	55.4	22.3	20.9	1.84
63	45.4	23.0	18.3	20.00
64	46.3	23.8	18.8	20.00

65	47.2	23.0	19.5	20.00
66	48.1	23.8	20.0	20.00
67	49.0	23.0	19.0	1.64
68	49.9	23.8	19.5	1.75
69	50.9	23.0	20.1	1.60
70	51.8	23.8	20.5	1.73
71	52.7	23.0	21.0	1.56
72	53.6	23.8	22.8	1.54
73	54.5	23.0	21.8	1.56
74	55.4	23.8	22.3	1.76
75	56.3	23.0	22.7	1.64
76	57.2	23.8	23.2	1.76
77	45.4	24.5	19.7	20.00
78	46.3	25.3	21.8	20.00
79	47.2	24.5	19.3	2.42
80	48.1	25.3	21.4	20.00
81	49.0	24.5	20.4	20.00
82	49.9	25.3	20.9	1.70
83	50.9	24.5	21.5	1.59
84	51.8	25.3	21.9	1.67
85	52.7	24.5	22.4	1.55
86	53.6	25.3	24.2	1.53
87	54.5	24.5	23.3	1.51
88	55.4	25.3	23.8	1.66
89	56.3	24.5	24.1	1.57
90	57.2	25.3	24.6	1.68
91	45.4	26.0	21.1	20.00
92	46.3	26.8	21.6	2.55
93	47.2	26.0	20.7	3.06
94	48.1	26.8	22.8	20.00
95	49.0	26.0	21.8	20.00
96	49.9	26.8	22.3	1.69
97	50.9	26.0	22.9	20.00
98	51.8	26.8	23.4	1.65
99	52.7	26.0	23.8	1.55
100	53.6	26.8	24.3	1.60
101	54.5	26.0	24.7	1.50
102	55.4	26.8	26.5	1.54
103	56.3	26.0	25.6	1.53
104	57.2	26.8	26.1	1.60
105	58.2	26.0	25.2	1.92
106	45.4	27.5	22.5	20.00
107	46.3	28.3	23.0	2.55
108	47.2	27.5	22.1	3.38
109	48.1	28.3	24.2	20.00
110	49.0	27.5	23.3	20.00

111	49.9	28.3	23.8	2.05
112	50.9	27.5	24.3	2.70
113	51.8	28.3	24.8	1.64
114	52.7	27.5	23.9	1.90
115	53.6	28.3	25.8	1.58
116	54.5	27.5	26.2	1.49
117	55.4	28.3	26.7	1.54
118	56.3	27.5	27.0	1.51
119	57.2	28.3	26.3	2.79
120	45.4	29.0	23.9	2.46
121	46.3	29.8	24.4	2.55
122	47.2	29.0	23.5	3.25
123	48.1	29.8	24.1	4.77
124	49.0	29.0	24.7	2.46
125	49.9	29.8	25.2	2.99
126	50.9	29.0	25.7	20.00
127	51.8	29.8	26.2	2.49
128	52.7	29.0	25.3	1.79
129	53.6	29.8	27.2	1.58
130	54.5	29.0	26.3	1.73
131	55.4	29.8	28.1	1.53
132	56.3	29.0	28.5	1.51
133	57.2	29.8	27.8	2.35
134	58.2	29.0	28.2	1.70
135	45.4	30.5	25.3	2.49
136	47.2	30.5	24.9	3.18
137	49.0	30.5	26.1	2.74
138	50.9	30.5	27.2	20.00
139	52.7	30.5	26.8	1.74
140	54.5	30.5	27.8	1.67
141	56.3	30.5	28.7	1.62
142	58.2	30.5	29.7	1.59

1.18.3 Sismica



Analisi di stabilità dei pendii con : MORGENSTERN-PRICE (1965)

Calcolo eseguito secondo	NTC 2018
Numero di strati	4.0
Numero dei conci	20.0
Grado di sicurezza ritenuto accettabile	1.1
Coefficiente parziale resistenza	1.2
Analisi	Condizione drenata

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	46.11 m
Ordinata vertice sinistro inferiore yi	21.13 m
Ascissa vertice destro superiore xs	64.36 m
Ordinata vertice destro superiore ys	36.11 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

Coefficienti sismici [N.T.C.]

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Coefficiente azione sismica orizzontale 0.032
Coefficiente azione sismica verticale 0.016

Vertici profilo

Nr	X (m)	y (m)
1	0.0	11.82
2	32.13	11.82
3	34.69	10.11
4	37.19	10.11
5	44.69	5.11
6	47.19	5.11
7	54.69	0.11
8	57.19	0.21
9	58.69	0.16
10	62.86	0.0
11	62.86	0.0

Falda

Nr.	X (m)	y (m)
1	0.0	-7.68
2	28.67	-7.68
3	47.74	-7.68
4	57.71	-7.68
5	62.86	-7.68

Vertici strato 1

N	X (m)	y (m)
1	0.0	9.92
2	16.01	9.92
3	34.75	9.92
4	37.48	9.92
5	44.69	5.11
6	47.19	5.11
7	54.69	0.11
8	57.19	0.21
9	58.69	0.16
10	62.86	0.0
11	62.86	0.0

Vertici strato 2

N	X (m)	y (m)
1	0.0	7.02
2	14.06	7.02
3	24.86	7.02
4	40.56	7.02
5	41.83	7.02
6	44.69	5.11
7	47.19	5.11
8	54.69	0.11
9	57.19	0.21
10	58.69	0.16
11	62.86	0.0
12	62.86	0.0

Vertici strato 3

N	X (m)	y (m)
1	0.0	1.42
2	23.67	1.42
3	34.51	1.42
4	47.96	1.42
5	52.73	1.42
6	54.69	0.11
7	57.19	0.21
8	58.69	0.16
9	62.86	0.0
10	62.86	0.0

Coefficienti parziali azioni

Sfavorevoli: Permanenti, variabili	1.0	1.0
Favorevoli: Permanenti, variabili	1.0	1.0

Coefficienti parziali per i parametri geotecnici del terreno

Tangente angolo di resistenza al taglio	1.25
Coesione efficace	1.25
Coesione non drenata	1.4
Riduzione parametri geotecnici terreno	No

Stratigrafia

Strato	Coesione (kg/cm²)	Coesione non drenata (kg/cm²)	Angolo resistenza al taglio (°)	Peso unità di volume (Kg/m³)	Peso unità di volume saturo (Kg/m³)	Litologia	
1	0.91		20	1850	1950	4-C-3	
2	0.05		31.3	1900	2000	4-G-1	
3	0.05		35.2	1900	2000	4-G-3	
4	0.05		40.7	2000	2100	4-G-5	

Risultati analisi pendio

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Fs minimo individuato 1.43
Ascissa centro superficie 57.06 m
Ordinata centro superficie 31.62 m
Raggio superficie 30.92 m

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xc = 57.059 yc = 31.617 Rc = 30.918 Fs=1.432
Lambda = 0.00

Nr.	B m	Alfa (°)	Li m	Wi (Kg)
1	0.93	44.71	1.31	827.09
2	0.93	42.33	1.26	2397.1
3	0.93	40.03	1.22	3843.39
4	0.93	37.81	1.18	4101.81
5	0.93	35.65	1.15	4232.85
6	0.93	33.55	1.12	4270.81
7	0.93	31.5	1.09	4222.48
8	0.93	29.49	1.07	4093.6
9	0.93	27.52	1.05	3888.99
10	0.93	25.59	1.03	3612.8
11	0.52	24.1	0.57	1856.65
12	1.35	22.23	1.46	5426.86
13	0.93	19.96	0.99	4533.2
14	0.93	18.13	0.98	4810.29
15	0.93	16.32	0.97	4220.34
16	0.93	14.52	0.96	3573.93
17	0.93	12.75	0.96	2872.45
18	0.93	10.98	0.95	2131.6
19	0.93	9.22	0.95	1339.07
20	0.93	7.47	0.94	472.86

Sforzi sui conci

Nr.	Xi (Kg)	Ei (Kg)	Xi-1 (Kg)	Ei-1 (Kg)	N'i (Kg)	Ti (Kg)	Ui (Kg)
1	-8.59	-20.11	0.0	0.0	570.5	584.01	0.0
2	-271.83	-635.96	-8.59	-20.11	1528.79	908.33	0.0
3	-724.65	-1695.4	-271.83	-635.96	2576.25	1266.36	0.0
4	-1162.6	-2720.02	-724.65	-1695.4	2930.12	1380.66	0.0
5	-1487.22	-3479.5	-1162.6	-2720.02	3236.92	1663.25	0.0
6	-1759.25	-4115.95	-1487.22	-3479.5	3415.87	1728.38	0.0
7	-1970.93	-4611.19	-1759.25	-4115.95	3509.2	1759.35	0.0
8	-2118.18	-4955.7	-1970.93	-4611.19	3514.4	1754.98	0.0
9	-2200.24	-5147.67	-2118.18	-4955.7	3430.68	1714.84	0.0
10	-2219.42	-5192.56	-2200.24	-5147.67	3258.61	1639.07	0.0
11	-2153.09	-5037.37	-2219.42	-5192.56	1700.44	863.03	0.0
12	-2107.42	-4930.5	-2153.09	-5037.37	5036.37	2492.11	0.0
13	-1971.39	-4612.26	-2107.42	-4930.5	4260.38	2038.22	0.0
14	-1764.23	-4127.59	-1971.39	-4612.26	4550.67	2154.26	0.0
15	-1505.03	-3521.17	-1764.23	-4127.59	3998.82	1924.87	0.0
16	-1212.28	-2836.25	-1505.03	-3521.17	3374.75	1666.2	0.0
17	-907.47	-2123.1	-1212.28	-2836.25	2686.25	1381.38	0.0
18	-522.06	-1221.41	-907.47	-2123.1	1906.44	1231.08	0.0
19	-206.01	-481.98	-522.06	-1221.41	1142.57	847.13	0.0
20	0.03	0.07	-206.01	-481.98	332.79	440.48	0.0

Numero di superfici esaminate....(147)

N°	Xo	Yo	Ro	Fs
1	46.1	21.1	16.4	16.67
2	47.0	21.9	18.5	16.67
3	47.9	21.1	17.6	16.67
4	48.8	21.9	18.0	1.56
5	49.8	21.1	17.1	1.75
6	50.7	21.9	19.1	1.53
7	51.6	21.1	18.1	1.77
8	52.5	21.9	20.0	1.50
9	53.4	21.1	20.4	1.51
10	54.3	21.9	20.8	1.53
11	55.2	21.1	19.8	1.74
12	46.1	22.6	17.8	16.67
13	47.0	23.4	18.2	16.67
14	47.9	22.6	19.0	16.67
15	48.8	23.4	19.4	1.64
16	49.8	22.6	18.5	1.67
17	50.7	23.4	20.5	1.52

18	51.6	22.6	19.5	1.66
19	52.5	23.4	21.4	1.48
20	53.4	22.6	21.8	1.50
21	54.3	23.4	22.2	1.48
22	55.2	22.6	21.3	1.68
23	56.1	23.4	23.1	1.54
24	57.1	22.6	22.1	1.67
25	46.1	24.1	19.1	16.67
26	47.0	24.9	19.6	2.97
27	47.9	24.1	20.4	16.67
28	48.8	24.9	20.8	16.67
29	49.8	24.1	19.9	1.63
30	50.7	24.9	21.9	16.67
31	51.6	24.1	20.9	1.60
32	52.5	24.9	22.8	1.47
33	53.4	24.1	23.2	1.48
34	54.3	24.9	23.7	1.45
35	55.2	24.1	24.0	1.50
36	56.1	24.9	23.2	1.96
37	57.1	24.1	23.6	1.63
38	58.0	24.9	24.1	1.81
39	46.1	25.6	22.2	16.67
40	47.0	26.4	21.0	2.77
41	47.9	25.6	21.7	16.67
42	48.8	26.4	22.2	16.67
43	49.8	25.6	21.3	1.62
44	50.7	26.4	23.3	16.67
45	51.6	25.6	22.3	1.57
46	52.5	26.4	22.8	1.82
47	53.4	25.6	23.3	1.54
48	54.3	26.4	25.1	1.43
49	55.2	25.6	24.2	1.53
50	56.1	26.4	26.0	1.47
51	58.0	26.4	25.6	1.75
52	46.1	27.1	21.9	2.38
53	47.0	27.9	22.5	3.05
54	47.9	27.1	23.1	16.67
55	48.8	27.9	23.6	2.35
56	49.8	27.1	22.7	1.61
57	50.7	27.9	24.7	16.67
58	51.6	27.1	23.8	1.57
59	52.5	27.9	24.3	1.72
60	53.4	27.1	24.7	1.51
61	54.3	27.9	25.2	1.68
62	55.2	27.1	25.6	1.48
63	56.1	27.9	27.4	1.45

64	57.1	27.1	26.5	1.50
65	58.0	27.9	27.1	1.65
66	46.1	28.6	23.4	2.40
67	47.0	29.4	23.9	2.98
68	47.9	28.6	23.0	4.00
69	48.8	29.4	25.1	16.67
70	49.8	28.6	24.1	2.76
71	50.7	29.4	26.1	16.67
72	51.6	28.6	26.6	2.07
73	52.5	29.4	25.7	1.66
74	53.4	28.6	26.1	1.51
75	54.3	29.4	26.7	1.61
76	55.2	28.6	27.1	1.47
77	56.1	29.4	27.6	1.57
78	57.1	28.6	28.0	1.45
79	58.9	28.6	27.7	2.02
80	46.1	30.1	24.8	2.41
81	47.0	30.9	25.3	2.94
82	47.9	30.1	24.4	3.71
83	48.8	30.9	26.5	16.67
84	49.8	30.1	25.6	2.61
85	50.7	30.9	27.5	16.67
86	51.6	30.1	26.6	2.41
87	52.5	30.9	27.2	1.64
88	53.4	30.1	27.6	16.67
89	54.3	30.9	28.1	1.58
90	55.2	30.1	28.5	1.46
91	56.1	30.9	29.1	1.52
92	57.1	30.1	28.2	1.97
93	58.9	30.1	29.2	1.84
94	46.1	31.6	26.2	2.42
95	47.0	32.4	26.8	2.91
96	47.9	31.6	25.9	3.50
97	48.8	32.4	27.9	2.52
98	49.8	31.6	27.0	2.96
99	50.7	32.4	29.0	2.15
100	51.6	31.6	28.1	2.31
101	52.5	32.4	30.0	2.10
102	53.4	31.6	29.0	2.22
103	54.3	32.4	29.6	1.57
104	55.2	31.6	28.7	1.80
105	56.1	32.4	30.6	1.50
106	57.1	31.6	30.9	1.43
107	58.0	32.4	31.5	1.46
108	58.9	31.6	30.7	1.68
109	46.1	33.1	27.6	2.45

110	47.0	33.9	28.2	2.91
111	47.9	33.1	27.3	3.37
112	48.8	33.9	29.4	2.51
113	49.8	33.1	28.5	2.84
114	50.7	33.9	30.4	2.18
115	51.6	33.1	29.5	2.26
116	52.5	33.9	30.1	3.23
117	53.4	33.1	30.5	16.67
118	54.3	33.9	33.6	1.70
119	55.2	33.1	32.7	1.69
120	56.1	33.9	32.0	1.57
121	57.1	33.1	31.2	1.62
122	58.0	33.9	33.0	1.44
123	46.1	34.6	29.1	2.49
124	47.0	35.4	29.6	2.92
125	47.9	34.6	28.8	3.29
126	48.8	35.4	30.8	2.51
127	49.8	34.6	29.9	2.48
128	50.7	35.4	30.5	3.33
129	51.6	34.6	31.0	16.67
130	52.5	35.4	31.5	2.95
131	53.4	34.6	32.0	2.11
132	54.3	35.4	35.1	1.72
133	55.2	34.6	31.7	1.65
134	56.1	35.4	33.5	2.23
135	57.1	34.6	32.6	1.57
136	58.0	35.4	34.5	1.69
137	58.9	34.6	33.6	1.50
138	59.8	35.4	34.3	1.68
139	46.1	36.1	30.5	2.52
140	47.9	36.1	30.2	3.63
141	49.8	36.1	31.4	2.77
142	51.6	36.1	31.1	4.44
143	53.4	36.1	33.4	2.09
144	55.2	36.1	33.1	1.63
145	57.1	36.1	34.1	1.55
146	58.9	36.1	35.1	1.47
147	60.7	36.1	35.0	16.67