ALLEGATO 6
VERIFICHE DI STABILITÀ INTERFERENZA 14
SEZIONE A-A' - RELAZIONI DI CALCOLO

VERIFICA DI STABILITÀ PRE-OPERAM IN ASSENZA DI FALDA ACQUIFERA

Analisi di stabilità dei pendii con BISHOP

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Numero di strati	2.0
Numero dei conci	50.0
Coefficiente di sicurezza [R2]	1.1

Superficie di forma circolare

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Maglia dei Centri

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Ascissa vertice sinistro inferiore xi	43.87 m
Ordinata vertice sinistro inferiore yi	268.82 m
Ascissa vertice destro superiore xs	126.84 m
Ordinata vertice destro superiore ys	332.33 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

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Coefficienti sismici [N.T.C.] 2018

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Dati generali

Descrizione:	
Latitudine:	41.87
Longitudine:	14.87
Tipo di costruzione:	2 - Opere ordinarie
Classe d'uso:	Classe IV
Vita nominale:	50.0 [anni]
Vita di riferimento:	100.0 [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.	60.0	0.68	2.46	0.32
S.L.D.	101.0	0.86	2.52	0.33
S.L.V.	949.0	2.13	2.51	0.36
S.L.C.	1950.0	2.77	2.47	0.37

Coefficienti sismici orizzontali e verticali

Opera: Stabilità dei pendii

S.L. Stato limite	amax [m/s²]	beta [-]	kh [-]	kv [sec]
S.L.O.	0.816	0.2	0.0166	0.0083
S.L.D.	1.032	0.2	0.021	0.0105
S.L.V.	2.5175	0.28	0.0719	0.0359
S.L.C.	3.1049	0.28	0.0887	0.0443

Coefficiente azione sismica orizzontale	0.0719
Coefficiente azione sismica verticale	0.0359

Vertici profilo

N	X m	y m
1	0.0	133.5
2	4.79	133.0
3	15.03	133.0
4	18.76	133.5
5	21.21	134.0
6	23.43	134.5
7	25.64	135.0
8	27.99	135.5
9	30.4	136.0
10	33.04	136.5
11	35.9	137.0
12	38.73	137.5
13	42.09	138.0
14	45.58	138.5
15	49.06	139.0
16	52.42	139.5
17	55.83	140.0
18	59.16	140.5
19	62.51	141.0
20	65.75	141.5
21	69.02	142.0
22	72.29	142.5
23	75.46	143.0
24	78.49	143.5
25	81.36	144.0
26	84.23	144.5
27	87.13	145.0
28	90.06	145.5
29	93.03	146.0
30	96.05	146.5
31	99.15	147.0
32	102.39	147.5
33	105.63	148.0
34	108.76	148.5
35	111.81	149.0
36	114.79	149.5
37	117.7	150.0
38	120.53	150.5
39	123.31	151.0
40	125.92	151.5
41	128.42	152.0
42	130.86	152.5
43	133.19	153.0
44	135.62	153.5
45	138.19	154.0
46	141.0	154.5
47	144.56	155.0
48	150.36	155.5
49	168.32	155.5
50	177.09	155.0

Vertici strato 1

N	X m	y m
1	0.0	128.5
2	5.84	127.79
3	10.32	128.02
4	16.38	128.69
5	23.61	130.01
6	33.08	131.97
7	42.54	134.29
8	53.87	135.46
9	59.14	135.46
10	63.6	135.87
11	68.47	136.68
12	75.36	138.3
13	81.52	139.98
14	87.08	141.12
15	91.17	141.62
16	94.15	141.79
17	97.87	142.11
18	102.28	142.27
19	107.81	142.56
20	112.68	142.76
21	118.36	143.78
22	122.41	144.79
23	125.86	146.01
24	130.04	148.22
25	135.94	150.54
26	143.08	152.33
27	148.72	152.63
28	155.15	152.45
29	161.87	152.03
30	169.14	151.59
31	177.09	151.0

Stratigrafia

c: coesione; Fi: Angolo di attrito; G: Peso Specifico; Gs: Peso Specifico Saturo

Strato	c (kg/cm²)	Fi (°)	G (Kg/m³)	Gs (Kg/m³)	Litologia
1	0.04	17.8	1835	1947	
2	0.39	22.5	2090	2110	

Risultati analisi pendio [A2+M2+R2]

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Fs minimo individuato	1.25
Ascissa centro superficie	85.35 m
Ordinata centro superficie	287.87 m
Raggio superficie	146.23 m

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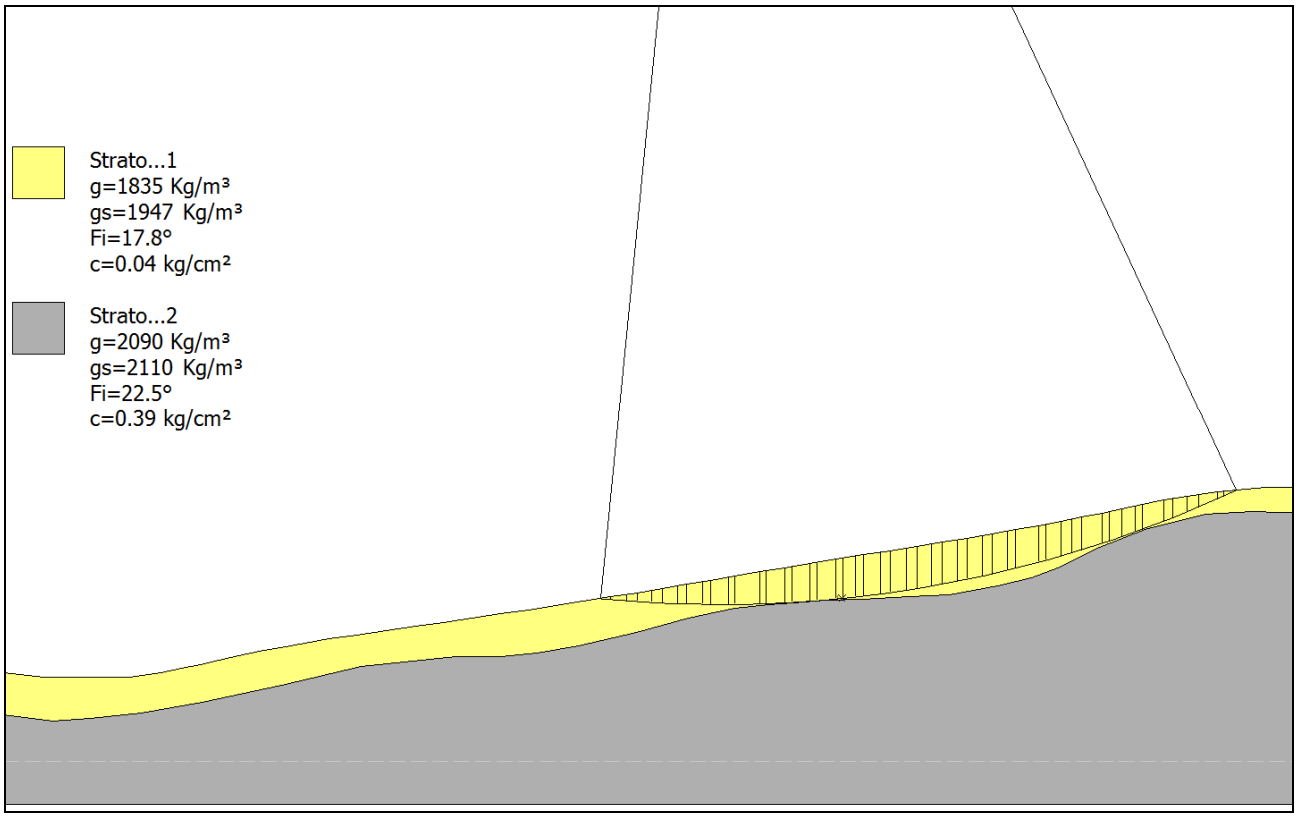
B: Larghezza del concio; Alfa: Angolo di inclinazione della base del concio; Li: Lunghezza della base del concio; Wi: Peso del concio ; Ui: Forze derivanti dalle pressioni neutre; Ni: forze agenti normalmente alla direzione di scivolamento; Ti: forze agenti parallelamente alla superficie di scivolamento; Fi: Angolo di attrito; c: coesione.

Analisi dei conci. Superficie...xc = 85.354 yc = 287.869 Rc = 146.235 Fs=1.2506

Nr.	B m	Alfa (°)	Li m	Wi (Kg)	Kh•Wi (Kg)	Kv•Wi (Kg)	c (kg/cm²)	Fi (°)	Ui (Kg)	N'i (Kg)	Ti (Kg)
1	1.14	-5.3	1.14	295.39	21.24	10.6	0.03	14.4	0.0	330.4	360.4
2	1.89	-4.8	1.9	1773.52	127.52	63.67	0.03	14.4	0.0	1851.6	865.6
3	1.28	-4.1	1.28	2077.24	149.35	74.57	0.03	14.4	0.0	2138.1	767.4
4	1.75	-3.5	1.75	3949.88	284.0	141.8	0.03	14.4	0.0	4036.3	1277.2
5	1.28	-2.9	1.28	3684.75	264.93	132.28	0.03	14.4	0.0	3746.0	1097.7
6	1.75	-2.3	1.75	6072.87	436.64	218.02	0.03	14.4	0.0	6148.1	1710.0
7	1.12	-1.8	1.12	4527.42	325.52	162.53	0.03	14.4	0.0	4567.8	1225.7
8	1.9	-1.2	1.91	8737.74	628.24	313.68	0.03	14.4	0.0	8787.3	2292.2
9	0.97	-0.6	0.97	4909.32	352.98	176.24	0.03	14.4	0.0	4923.4	1258.1
10	2.06	0.0	2.06	11521.65	828.41	413.63	0.03	14.4	0.0	11523.5	2894.6
11	0.84	0.5	0.84	5046.5	362.84	181.17	0.03	14.4	0.0	5035.1	1248.2
12	2.93	1.3	2.93	19244.62	1383.69	690.88	0.03	14.4	0.0	19145.5	4681.9
13	0.78	2.0	0.78	5468.73	393.2	196.33	0.03	14.4	0.0	5426.3	1313.0
14	2.19	2.6	2.2	16236.85	1167.43	582.9	0.03	14.4	0.0	16079.3	3864.3
15	0.83	3.2	0.84	6443.38	463.28	231.32	0.03	14.4	0.0	6368.9	1521.8
16	2.19	3.8	2.19	17523.87	1259.97	629.11	0.03	14.4	0.0	17291.2	4111.7
17	0.84	4.4	0.84	6970.81	501.2	250.25	0.03	14.4	0.0	6867.0	1626.5
18	2.26	5.0	2.27	19196.07	1380.2	689.14	0.03	14.4	0.0	18880.9	4457.6
19	0.77	5.6	0.77	6696.17	481.45	240.39	0.03	14.4	0.0	6577.0	1548.9
20	1.51	6.0	1.52	13325.19	958.08	478.37	0.03	14.4	0.0	13075.0	3074.9
21	0.96	6.5	0.96	8503.35	611.39	305.27	0.03	14.4	0.0	8335.3	1957.9
22	2.07	7.1	2.09	18655.47	1341.33	669.73	0.03	14.4	0.0	18265.8	4285.9
23	1.17	7.7	1.18	10585.22	761.08	380.01	0.03	14.4	0.0	10352.6	2427.5
24	1.86	8.3	1.88	16968.55	1220.04	609.17	0.03	14.4	0.0	16580.2	3886.5
25	1.27	9.0	1.28	11593.54	833.58	416.21	0.03	14.4	0.0	11318.5	2653.2
26	1.76	9.6	1.78	16075.77	1155.85	577.12	0.03	14.4	0.0	15682.8	3677.5
27	1.29	10.2	1.31	11753.01	845.04	421.93	0.03	14.4	0.0	11458.3	2688.7
28	1.74	10.8	1.77	15739.27	1131.65	565.04	0.03	14.4	0.0	15336.3	3602.4
29	1.24	11.4	1.27	11154.52	802.01	400.45	0.03	14.4	0.0	10864.0	2555.4
30	1.79	12.0	1.83	15860.44	1140.37	569.39	0.03	14.4	0.0	15441.6	3638.5
31	1.12	12.6	1.15	9842.19	707.65	353.33	0.03	14.4	0.0	9579.6	2262.0
32	1.9	13.2	1.96	16396.99	1178.94	588.65	0.03	14.4	0.0	15956.0	3777.4
33	0.93	13.7	0.95	7818.25	562.13	280.68	0.03	14.4	0.0	7607.0	1806.1
34	2.78	14.5	2.87	22801.33	1639.42	818.57	0.03	14.4	0.0	22183.1	5290.6
35	0.84	15.2	0.87	6635.24	477.07	238.21	0.03	14.4	0.0	6455.3	1547.7
36	1.77	15.7	1.84	13694.59	984.64	491.64	0.03	14.4	0.0	13324.1	3207.8
37	1.26	16.4	1.31	9371.64	673.82	336.44	0.03	14.4	0.0	9119.1	2207.6
38	1.24	16.9	1.3	9012.65	648.01	323.55	0.03	14.4	0.0	8770.8	2134.1
39	2.44	17.6	2.56	16781.66	1206.6	602.46	0.03	14.4	0.0	16334.4	4009.8
40	0.86	18.3	0.9	5595.43	402.31	200.88	0.03	14.4	0.0	5447.1	1349.9
41	1.47	18.8	1.56	9225.15	663.29	331.18	0.03	14.4	0.0	8981.5	2242.5
42	1.56	19.4	1.65	9159.64	658.58	328.83	0.03	14.4	0.0	8917.7	2253.6
43	0.87	19.9	0.93	4849.85	348.7	174.11	0.03	14.4	0.0	4720.9	1207.5
44	2.57	20.6	2.75	12862.04	924.78	461.75	0.03	14.4	0.0	12511.7	3272.3
45	1.1	21.4	1.18	4776.76	343.45	171.49	0.03	14.4	0.0	4638.9	1254.6
46	1.71	22.0	1.85	6472.12	465.35	232.35	0.03	14.4	0.0	6269.4	1760.0
47	1.32	22.6	1.43	4067.77	292.47	146.03	0.03	14.4	0.0	3919.5	1170.0
48	2.24	23.4	2.44	4845.77	348.41	173.96	0.03	14.4	0.0	4600.5	1570.3
49	0.78	24.1	0.86	1012.6	72.81	36.35	0.03	14.4	0.0	925.9	410.1
50	1.51	24.5	1.66	786.57	56.55	28.24	0.03	14.4	0.0	612.7	551.8


Strato...1
g=1835 Kg/m³
gs=1947 Kg/m³
Fi=17.8°
c=0.04 kg/cm²
Strato...2
g=2090 Kg/m³
gs=2110 Kg/m³
Fi=22.5°
c=0.39 kg/cm²

VERIFICA DI STABILITÀ PRE-OPERAM IN PRESENZA DI FALDA ACQUIFERA

Analisi di stabilità dei pendii con BISHOP

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Numero di strati	2.0
Numero dei conci	50.0
Coefficiente di sicurezza [R2]	1.1

Superficie di forma circolare

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Maglia dei Centri

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Ascissa vertice sinistro inferiore xi	43.87 m
Ordinata vertice sinistro inferiore yi	268.82 m
Ascissa vertice destro superiore xs	126.84 m
Ordinata vertice destro superiore ys	332.33 m
Passo di ricerca	10.0
Numero di celle lungo x	10.0
Numero di celle lungo y	10.0

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Coefficienti sismici [N.T.C.] 2018

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Dati generali

Descrizione:	
Latitudine:	41.87
Longitudine:	14.87
Tipo di costruzione:	2 - Opere ordinarie
Classe d'uso:	Classe IV
Vita nominale:	50.0 [anni]
Vita di riferimento:	100.0 [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.	60.0	0.68	2.46	0.32
S.L.D.	101.0	0.86	2.52	0.33
S.L.V.	949.0	2.13	2.51	0.36
S.L.C.	1950.0	2.77	2.47	0.37

Coefficienti sismici orizzontali e verticali

Opera: Stabilità dei pendii

S.L. Stato limite	amax [m/s²]	beta [-]	kh [-]	kv [sec]
S.L.O.	0.816	0.2	0.0166	0.0083
S.L.D.	1.032	0.2	0.021	0.0105
S.L.V.	2.5175	0.28	0.0719	0.0359
S.L.C.	3.1049	0.28	0.0887	0.0443

Coefficiente azione sismica orizzontale	0.0719
Coefficiente azione sismica verticale	0.0359

Vertici profilo

N	X m	y m
1	0.0	133.5
2	4.79	133.0
3	15.03	133.0
4	18.76	133.5
5	21.21	134.0
6	23.43	134.5
7	25.64	135.0
8	27.99	135.5
9	30.4	136.0
10	33.04	136.5
11	35.9	137.0
12	38.73	137.5
13	42.09	138.0
14	45.58	138.5
15	49.06	139.0
16	52.42	139.5
17	55.83	140.0
18	59.16	140.5
19	62.51	141.0
20	65.75	141.5
21	69.02	142.0
22	72.29	142.5
23	75.46	143.0
24	78.49	143.5
25	81.36	144.0
26	84.23	144.5
27	87.13	145.0
28	90.06	145.5
29	93.03	146.0
30	96.05	146.5
31	99.15	147.0
32	102.39	147.5
33	105.63	148.0
34	108.76	148.5
35	111.81	149.0
36	114.79	149.5
37	117.7	150.0
38	120.53	150.5
39	123.31	151.0
40	125.92	151.5
41	128.42	152.0
42	130.86	152.5
43	133.19	153.0
44	135.62	153.5
45	138.19	154.0
46	141.0	154.5
47	144.56	155.0
48	150.36	155.5
49	168.32	155.5
50	177.09	155.0

Falda

Nr.	X m	y m
1	0.0	133.5
2	4.79	133.0

3	15.03	133.0
4	18.76	133.5
5	21.21	134.0
6	23.43	134.5
7	25.64	135.0
8	27.99	135.5
9	30.4	136.0
10	33.04	136.5
11	35.9	137.0
12	38.73	137.5
13	42.09	138.0
14	45.58	138.5
15	49.06	139.0
16	52.42	139.5
17	55.83	140.0
18	59.16	140.5
19	62.51	141.0
20	65.75	141.5
21	69.02	142.0
22	72.29	142.5
23	75.46	143.0
24	78.49	143.5
25	81.36	144.0
26	84.23	144.5
27	87.13	145.0
28	90.06	145.5
29	93.03	146.0
30	96.05	146.5
31	99.15	147.0
32	102.39	147.5
33	105.63	148.0
34	108.76	148.5
35	111.81	149.0
36	114.79	149.5
37	117.7	150.0
38	120.53	150.5
39	123.31	151.0
40	125.92	151.5
41	128.42	152.0
42	130.86	152.5
43	133.19	153.0
44	135.62	153.5
45	138.19	154.0
46	141.0	154.5
47	144.56	155.0
48	150.36	155.5
49	168.32	155.5
50	177.09	155.0

Vertici strato 1

N	X m	y m
1	0.0	128.5
2	5.84	127.79
3	10.32	128.02
4	16.38	128.69
5	23.61	130.01
6	33.08	131.97
7	42.54	134.29

8	53.87	135.46
9	59.14	135.46
10	63.6	135.87
11	68.47	136.68
12	75.36	138.3
13	81.52	139.98
14	87.08	141.12
15	91.17	141.62
16	94.15	141.79
17	97.87	142.11
18	102.28	142.27
19	107.81	142.56
20	112.68	142.76
21	118.36	143.78
22	122.41	144.79
23	125.86	146.01
24	130.04	148.22
25	135.94	150.54
26	143.08	152.33
27	148.72	152.63
28	155.15	152.45
29	161.87	152.03
30	169.14	151.59
31	177.09	151.0

Stratigrafia

c: coesione; Fi: Angolo di attrito; G: Peso Specifico; Gs: Peso Specifico Saturo

Strato	c (kg/cm²)	Fi (°)	G (Kg/m³)	Gs (Kg/m³)	Litologia
1	0.04	17.8	1835	1947	
2	0.39	22.5	2090	2110	

Risultati analisi pendio [A2+M2+R2]

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Fs minimo individuato	0.7
Ascissa centro superficie	85.35 m
Ordinata centro superficie	287.87 m
Raggio superficie	146.23 m

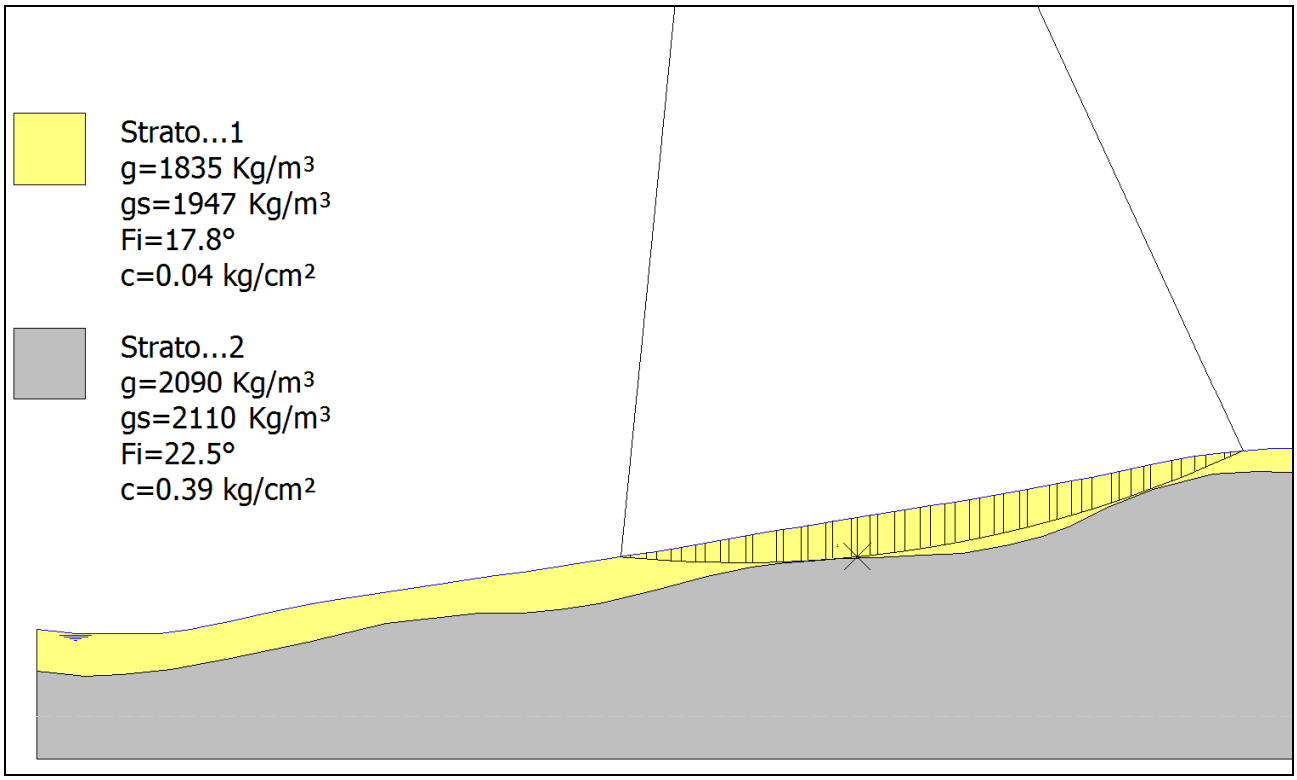
==========

B: Larghezza del concio; Alfa: Angolo di inclinazione della base del concio; Li: Lunghezza della base del concio; Wi: Peso del concio ; Ui: Forze derivanti dalle pressioni neutre; Ni: forze agenti normalmente alla direzione di scivolamento; Ti: forze agenti parallelamente alla superficie di scivolamento; Fi: Angolo di attrito; c: coesione.

Analisi dei conci. Superficie...xc = 85.354 yc = 287.869 Rc = 146.235 Fs=0.7016

Nr.	B m	Alfa (°)	Li m	Wi (Kg)	Kh•Wi (Kg)	Kv•Wi (Kg)	c (kg/cm²)	Fi (°)	Ui (Kg)	N'i (Kg)	Ti (Kg)
1	1.14	-5.3	1.14	313.42	22.53	11.25	0.03	14.4	141.4	209.1	597.9
2	1.89	-4.8	1.9	1881.76	135.3	67.56	0.03	14.4	511.3	1021.5	1239.0
3	1.28	-4.1	1.28	2204.03	158.47	79.12	0.03	14.4	884.5	1147.4	1005.3
4	1.75	-3.5	1.75	4190.97	301.33	150.46	0.03	14.4	1231.1	2140.1	1582.4
5	1.28	-2.9	1.28	3909.65	281.1	140.36	0.03	14.4	1566.8	1971.3	1306.9
6	1.75	-2.3	1.75	3134.07	225.34	112.51	0.03	14.4	1894.7	3217.7	1975.3
7	1.12	-1.8	1.12	4803.76	345.39	172.45	0.03	14.4	2196.5	2380.8	1384.1
8	1.9	-1.2	1.91	9271.05	666.59	332.83	0.03	14.4	2499.6	4563.1	2539.6
9	0.97	-0.6	0.97	5208.96	374.52	187.0	0.03	14.4	2772.4	2548.8	1373.2

10	2.06	0.0	2.06	12224.88	878.97	438.87	0.03	14.4	3043.1	5948.0	3118.5
11	0.84	0.5	0.84	5354.51	384.99	192.23	0.03	14.4	3286.9	2592.1	1330.6
12	2.93	1.3	2.93	20419.22	1468.14	733.05	0.03	14.4	3579.4	9824.7	4933.4
13	0.78	2.0	0.78	5802.52	417.2	208.31	0.03	14.4	3841.8	2776.2	1370.4
14	2.19	2.6	2.2	17227.87	1238.68	618.48	0.03	14.4	4032.5	8207.5	4006.5
15	0.83	3.2	0.84	3325.28	239.09	119.38	0.03	14.4	4210.2	3243.5	1568.4
16	2.19	3.8	2.19	18593.45	1336.87	667.5	0.03	14.4	4368.7	8785.8	4215.5
17	0.84	4.4	0.84	7396.27	531.79	265.53	0.03	14.4	4510.0	3481.3	1659.8
18	2.26	5.0	2.27	20367.71	1464.44	731.2	0.03	14.4	4633.5	9550.2	4529.8
19	0.77	5.6	0.77	7104.88	510.84	255.07	0.03	14.4	4735.5	3319.3	1568.3
20	1.51	6.0	1.52	14138.5	1016.56	507.57	0.03	14.4	4795.9	6587.6	3106.0
21	0.96	6.5	0.96	9022.35	648.71	323.9	0.03	14.4	4851.0	4191.9	1973.1
22	2.07	7.1	2.09	19794.11	1423.2	710.61	0.03	14.4	4904.1	9165.5	4308.2
23	1.17	7.7	1.18	11231.3	807.53	403.2	0.03	14.4	4943.2	5182.2	2434.3
24	1.86	8.3	1.88	18004.24	1294.51	646.35	0.03	14.4	4968.0	8280.5	3889.4
25	1.27	9.0	1.28	12301.16	884.45	441.61	0.03	14.4	4980.0	5639.3	2650.2
26	1.76	9.6	1.78	17056.96	1226.4	612.34	0.03	14.4	4978.7	7795.5	3667.7
27	1.29	10.2	1.31	12470.36	896.62	447.69	0.03	14.4	4963.6	5682.0	2678.0
28	1.74	10.8	1.77	16699.92	1200.72	599.53	0.03	14.4	4935.4	7586.5	3584.2
29	1.24	11.4	1.27	11835.34	850.96	424.89	0.03	14.4	4894.0	5361.1	2540.5
30	1.79	12.0	1.83	16828.49	1209.97	604.14	0.03	14.4	4838.9	7600.7	3615.3
31	1.12	12.6	1.15	10442.92	750.85	374.9	0.03	14.4	4772.7	4703.4	2247.0
32	1.9	13.2	1.96	17397.79	1250.9	624.58	0.03	14.4	4691.9	7812.9	3752.3
33	0.93	13.7	0.95	8295.44	596.44	297.81	0.03	14.4	4603.6	3715.0	1794.6
34	2.78	14.5	2.87	24193.02	1739.48	868.53	0.03	14.4	4469.7	10794.5	5261.3
35	0.84	15.2	0.87	7040.23	506.19	252.74	0.03	14.4	4320.5	3129.5	1541.3
36	1.77	15.7	1.84	14530.44	1044.74	521.64	0.03	14.4	4209.1	6441.3	3198.3
37	1.26	16.4	1.31	9943.64	714.95	356.98	0.03	14.4	4068.7	4393.2	2205.0
38	1.24	16.9	1.3	9562.74	687.56	343.3	0.03	14.4	3945.7	4212.7	2135.5
39	2.44	17.6	2.56	17805.93	1280.25	639.23	0.03	14.4	3748.1	7808.0	4026.1
40	0.86	18.3	0.9	5936.95	426.87	213.14	0.03	14.4	3555.4	2591.4	1360.7
41	1.47	18.8	1.56	9788.21	703.77	351.4	0.03	14.4	3414.5	4257.3	2267.9
42	1.56	19.4	1.65	9718.7	698.77	348.9	0.03	14.4	3208.1	4204.4	2291.6
43	0.87	19.9	0.93	5145.86	369.99	184.74	0.03	14.4	3023.8	2214.7	1234.8
44	2.57	20.6	2.75	13647.08	981.23	489.93	0.03	14.4	2727.3	5818.8	3382.8
45	1.1	21.4	1.18	5068.31	364.41	181.95	0.03	14.4	2370.0	2131.0	1318.2
46	1.71	22.0	1.85	6867.14	493.75	246.53	0.03	14.4	2060.6	2841.8	1882.4
47	1.32	22.6	1.43	2099.28	150.94	75.36	0.03	14.4	1683.6	1737.8	1286.9
48	2.24	23.4	2.44	2500.79	179.81	89.78	0.03	14.4	1177.2	1935.7	1823.5
49	0.78	24.1	0.86	1074.41	77.25	38.57	0.03	14.4	703.0	341.5	517.1
50	1.51	24.5	1.66	834.58	60.01	29.96	0.03	14.4	283.1	85.3	790.4


Strato...1
g=1835 Kg/m³
gs=1947 Kg/m³
Fi=17.8°
c=0.04 kg/cm²
Strato...2
g=2090 Kg/m³
gs=2110 Kg/m³
Fi=22.5°
c=0.39 kg/cm²

VERIFICA DI STABILITÀ POST-OPERAM IN PRESENZA DI FALDA ACQUIFERA

Analisi di stabilità dei pendii con BISHOP

Numero di strati	2.0
Numero dei conci	50.0
Coefficiente di sicurezza [R2]	1.1

Superficie di forma circolare

Maglia dei Centri

Ascissa vertice sinistro inferiore xi	47.25 m
Ordinata vertice sinistro inferiore yi	243.85 m
Ascissa vertice destro superiore xs	130.23 m
Ordinata vertice destro superiore ys	307.35 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.] 2018

Dati generali

Descrizione:	
Latitudine:	41.87
Longitudine:	14.87
Tipo opera:	2 - Opere ordinarie
Classe d'uso:	Classe IV
Vita nominale:	50.0 [anni]
Vita di riferimento:	100.0 [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.	60.0	0.68	2.46	0.32
S.L.D.	101.0	0.86	2.52	0.33
S.L.V.	949.0	2.13	2.51	0.36
S.L.C.	1950.0	2.77	2.47	0.37

Coefficienti sismici orizzontali e verticali

Opera: Stabilità dei pendii

S.L. Stato limite	amax [m/s²]	beta [-]	kh [-]	kv [sec]
S.L.O.	0.816	0.2	0.0166	0.0083
S.L.D.	1.032	0.2	0.021	0.0105
S.L.V.	2.5175	0.28	0.0719	0.0359
S.L.C.	3.1049	0.28	0.0887	0.0443

Coefficiente azione sismica orizzontale	0.0719
Coefficiente azione sismica verticale	0.0359

Vertici profilo

N	X m	y m
1	0.0	133.5
2	4.79	133.0
3	15.03	133.0
4	18.76	133.5
5	21.21	134.0
6	23.43	134.5
7	25.64	135.0
8	27.99	135.5
9	30.4	136.0
10	33.04	136.5
11	35.9	137.0
12	38.73	137.5
13	42.09	138.0
14	45.58	138.5
15	49.06	139.0
16	52.42	139.5
17	55.83	140.0
18	59.16	140.5
19	62.51	141.0
20	65.75	141.5
21	69.02	142.0
22	72.29	142.5
23	75.46	143.0
24	78.49	143.5
25	81.36	144.0
26	84.23	144.5
27	87.13	145.0
28	90.06	145.5
29	93.03	146.0
30	96.05	146.5
31	99.15	147.0
32	102.39	147.5
33	105.63	148.0
34	108.76	148.5
35	111.81	149.0
36	114.79	149.5
37	117.7	150.0
38	120.53	150.5
39	123.31	151.0
40	125.92	151.5
41	128.42	152.0
42	130.86	152.5
43	133.19	153.0
44	135.62	153.5
45	138.19	154.0
46	141.0	154.5
47	144.56	155.0
48	150.36	155.5
49	168.32	155.5
50	177.09	155.0

Falda

Nr.	X m	y m
1	0.0	133.5
2	4.79	133.0

3	15.03	133.0
4	18.76	133.5
5	21.21	134.0
6	23.43	134.5
7	25.64	135.0
8	27.99	135.5
9	30.4	136.0
10	33.04	136.5
11	35.9	137.0
12	38.73	137.5
13	42.09	138.0
14	45.58	138.5
15	49.06	139.0
16	52.42	139.5
17	55.83	140.0
18	59.16	140.5
19	62.51	141.0
20	65.75	141.5
21	69.02	142.0
22	72.29	142.5
23	75.46	143.0
24	78.49	143.5
25	81.36	144.0
26	84.23	144.5
27	87.13	145.0
28	90.06	145.5
29	93.03	146.0
30	96.05	146.5
31	99.15	147.0
32	102.39	147.5
33	105.63	148.0
34	108.76	148.5
35	111.81	149.0
36	114.79	149.5
37	117.7	150.0
38	120.53	150.5
39	123.31	151.0
40	125.92	151.5
41	128.42	152.0
42	130.86	152.5
43	133.19	153.0
44	135.62	153.5
45	138.19	154.0
46	141.0	154.5
47	144.56	155.0
48	150.36	155.5
49	168.32	155.5
50	177.09	155.0

Vertici strato 1

N	X m	y m
1	0.0	128.5
2	5.84	127.79
3	10.32	128.02
4	16.38	128.69
5	23.61	130.01
6	33.08	131.97
7	42.54	134.29

8	53.87	135.46
9	59.14	135.46
10	63.6	135.87
11	68.47	136.68
12	75.36	138.3
13	81.52	139.98
14	87.08	141.12
15	91.17	141.62
16	94.15	141.79
17	97.87	142.11
18	102.28	142.27
19	107.81	142.56
20	112.68	142.76
21	118.36	143.78
22	122.41	144.79
23	125.86	146.01
24	130.04	148.22
25	135.94	150.54
26	143.08	152.33
27	148.72	152.63
28	155.15	152.45
29	161.87	152.03
30	169.14	151.59
31	177.09	151.0

Stratigrafia

c: coesione; Fi: Angolo di attrito; G: Peso Specifico; Gs: Peso Specifico Saturo

Strato	c (kg/cm²)	Fi (°)	G (Kg/m³)	Gs (Kg/m³)	Litologia
1	0.04	17.8	1835	1947	
2	0.39	22.5	2090	2110	

Pali...

N°	x m	y m	Diametro m	Lunghezza m	Inclinazione (°)	Interasse m
1	142.0157	154.6427	0.8	12	90	1

Risultati analisi pendio [A2+M2+R2]

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Fs minimo individuato	0.7
Ascissa centro superficie	84.59 m
Ordinata centro superficie	272.42 m
Raggio superficie	130.96 m

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Numero di superfici esaminate....(183)

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N°	Xo	Yo	Ro	Fs
1	47.3	243.8	114.3	2.18
2	51.4	247.0	115.4	2.19
3	55.6	243.8	110.8	2.26
4	59.7	247.0	112.1	2.23
5	63.8	243.8	107.7	1.99
6	68.0	247.0	109.4	1.79
7	72.1	243.8	105.2	1.83
8	76.3	247.0	107.3	1.63
9	80.4	243.8	103.3	1.59
10	84.6	247.0	105.8	1.17

11	88.7	243.8	102.1	0.75
12	92.9	247.0	104.9	1.62
13	97.0	243.8	101.5	2.25
14	101.2	247.0	104.7	3.65
15	105.3	243.8	101.6	3.75
16	109.5	247.0	105.1	3.43
17	113.6	243.8	102.4	3.04
18	117.8	247.0	106.2	2.56
19	121.9	243.8	103.8	2.46
20	47.3	250.2	120.0	2.17
21	51.4	253.4	121.1	2.21
22	55.6	250.2	116.6	2.33
23	59.7	253.4	118.1	2.22
24	63.8	250.2	113.7	1.90
25	68.0	253.4	115.5	1.83
26	72.1	250.2	111.4	1.70
27	76.3	253.4	113.5	1.62
28	80.4	250.2	109.6	1.48
29	84.6	253.4	112.1	1.09
30	88.7	250.2	108.4	0.74
31	92.9	253.4	111.2	1.59
32	97.0	250.2	107.9	2.53
33	101.2	253.4	111.0	3.16
34	105.3	250.2	108.0	3.53
35	109.5	253.4	111.4	3.13
36	113.6	250.2	108.7	2.83
37	117.8	253.4	112.4	2.53
38	47.3	256.5	125.7	2.20
39	51.4	259.7	127.0	2.32
40	55.6	256.5	122.5	2.24
41	59.7	259.7	124.1	2.02
42	63.8	256.5	119.7	1.90
43	68.0	259.7	121.6	1.79
44	72.1	256.5	117.5	1.73
45	76.3	259.7	119.7	1.59
46	80.4	256.5	115.8	1.39
47	84.6	259.7	118.4	1.06
48	88.7	256.5	114.7	0.72
49	92.9	259.7	117.6	2.16
50	97.0	256.5	114.2	2.58
51	101.2	259.7	117.4	3.51
52	105.3	256.5	114.3	3.66
53	109.5	259.7	117.8	3.15
54	113.6	256.5	115.0	2.83
55	117.8	259.7	118.7	2.45
56	47.3	262.9	131.5	2.14
57	51.4	266.1	132.9	2.25
58	55.6	262.9	128.4	2.25
59	59.7	266.1	130.1	1.94
60	63.8	262.9	125.8	1.89
61	68.0	266.1	127.8	1.75
62	72.1	262.9	123.7	1.63
63	76.3	266.1	125.9	1.57
64	80.4	262.9	122.1	1.49
65	84.6	266.1	124.7	0.97
66	88.7	262.9	121.1	1.76
67	92.9	266.1	123.9	2.25
68	97.0	262.9	120.6	2.88
69	101.2	266.1	123.7	3.38

70	105.3	262.9	120.7	3.91
71	109.5	266.1	124.1	3.11
72	113.6	262.9	121.3	2.77
73	117.8	266.1	125.0	2.58
74	47.3	269.2	137.4	2.21
75	51.4	272.4	138.8	2.27
76	55.6	269.2	134.4	2.24
77	59.7	272.4	136.1	1.85
78	63.8	269.2	131.9	1.77
79	68.0	272.4	133.9	1.69
80	72.1	269.2	129.9	1.59
81	76.3	272.4	132.2	1.52
82	80.4	269.2	128.4	1.34
83	84.6	272.4	131.0	0.70
84	88.7	269.2	127.4	1.91
85	92.9	272.4	130.3	2.55
86	97.0	269.2	126.9	3.21
87	101.2	272.4	130.1	3.38
88	105.3	269.2	127.0	3.65
89	109.5	272.4	130.4	2.98
90	113.6	269.2	127.6	2.69
91	117.8	272.4	131.3	2.50
92	47.3	275.6	143.3	2.21
93	51.4	278.8	144.8	2.28
94	55.6	275.6	140.4	2.30
95	59.7	278.8	142.2	1.79
96	63.8	275.6	138.0	1.76
97	68.0	278.8	140.1	1.62
98	72.1	275.6	136.1	1.52
99	76.3	278.8	138.4	1.42
100	80.4	275.6	134.7	1.26
101	84.6	278.8	137.3	1.75
102	88.7	275.6	133.7	2.11
103	92.9	278.8	136.6	2.80
104	97.0	275.6	133.3	2.80
105	101.2	278.8	136.4	3.67
106	105.3	275.6	133.4	3.51
107	109.5	278.8	136.8	2.92
108	113.6	275.6	133.9	2.70
109	47.3	282.0	149.2	2.22
110	51.4	285.1	150.8	2.31
111	55.6	282.0	146.5	1.93
112	59.7	285.1	148.3	1.74
113	63.8	282.0	144.2	1.65
114	68.0	285.1	146.3	1.65
115	72.1	282.0	142.3	1.50
116	76.3	285.1	144.7	1.37
117	80.4	282.0	140.9	1.19
118	84.6	285.1	143.6	1.72
119	88.7	282.0	140.0	2.32
120	92.9	285.1	142.9	2.57
121	97.0	282.0	139.6	3.07
122	101.2	285.1	142.8	3.81
123	105.3	282.0	139.7	3.49
124	109.5	285.1	143.1	2.96
125	113.6	282.0	140.3	2.78
126	47.3	288.3	155.1	2.22
127	51.4	291.5	156.8	2.27
128	55.6	288.3	152.5	1.81

129	59.7	291.5	154.4	1.71
130	63.8	288.3	150.3	1.71
131	68.0	291.5	152.5	1.56
132	72.1	288.3	148.6	1.47
133	76.3	291.5	151.0	1.29
134	80.4	288.3	147.2	1.08
135	84.6	291.5	149.9	1.84
136	88.7	288.3	146.4	2.35
137	92.9	291.5	149.3	2.76
138	97.0	288.3	146.0	2.80
139	101.2	291.5	149.1	3.34
140	105.3	288.3	146.0	3.14
141	109.5	291.5	149.4	2.93
142	113.6	288.3	146.6	2.68
143	47.3	294.7	161.1	2.22
144	51.4	297.8	162.9	2.22
145	55.6	294.7	158.6	1.78
146	59.7	297.8	160.6	1.76
147	63.8	294.7	156.5	1.71
148	68.0	297.8	158.7	1.48
149	72.1	294.7	154.8	1.45
150	76.3	297.8	157.2	1.21
151	80.4	294.7	153.5	2.53
152	84.6	297.8	156.2	2.02
153	88.7	294.7	152.7	2.43
154	92.9	297.8	155.6	2.67
155	97.0	294.7	152.3	2.93
156	101.2	297.8	155.5	3.47
157	105.3	294.7	152.4	3.20
158	109.5	297.8	155.8	2.93
159	113.6	294.7	152.9	2.80
160	47.3	301.0	167.2	2.20
161	51.4	304.2	168.9	2.14
162	55.6	301.0	164.7	1.72
163	59.7	304.2	166.7	1.65
164	63.8	301.0	162.7	1.59
165	68.0	304.2	164.9	1.54
166	72.1	301.0	161.1	1.50
167	76.3	304.2	163.5	3.16
168	80.4	301.0	159.8	2.36
169	84.6	304.2	162.5	2.09
170	88.7	301.0	159.0	2.27
171	92.9	304.2	162.0	2.68
172	97.0	301.0	158.7	3.03
173	101.2	304.2	161.8	3.37
174	105.3	301.0	158.7	3.15
175	109.5	304.2	162.1	2.99
176	47.3	307.4	173.2	2.28
177	55.6	307.4	170.9	1.74
178	63.8	307.4	168.9	1.61
179	72.1	307.4	167.3	1.27
180	80.4	307.4	166.1	2.02
181	88.7	307.4	165.4	2.59
182	97.0	307.4	165.0	3.03
183	105.3	307.4	165.1	3.02

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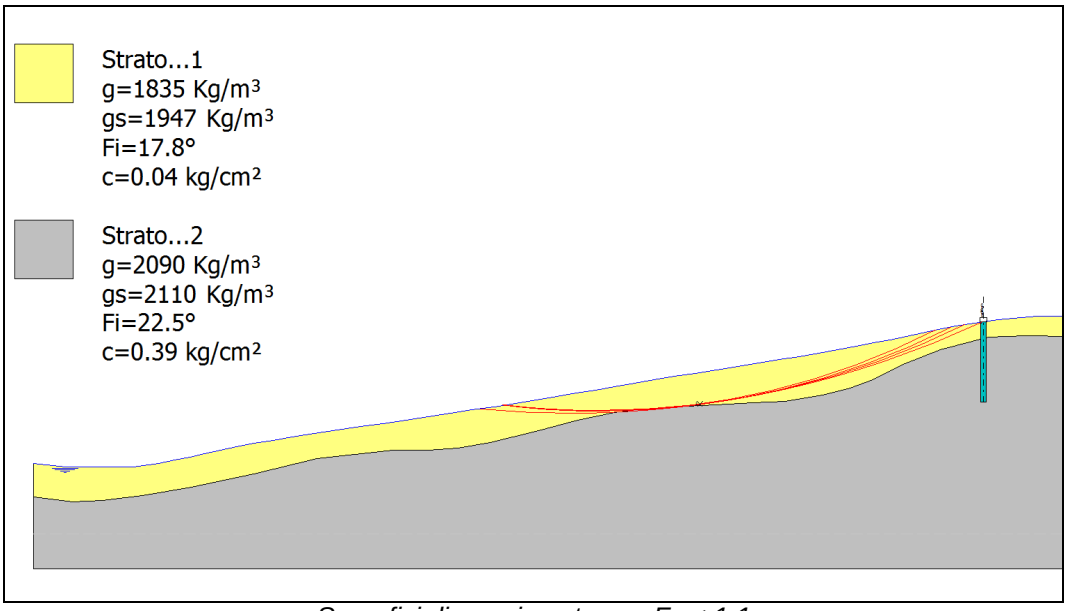
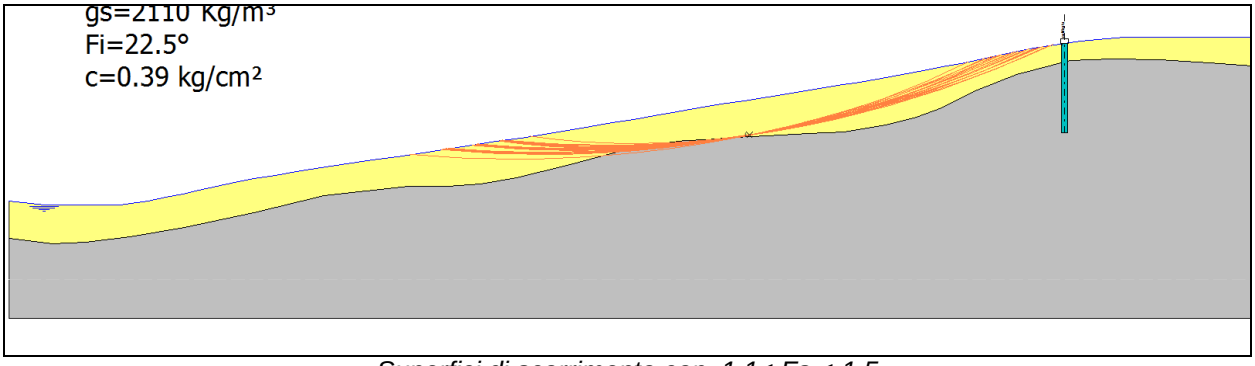
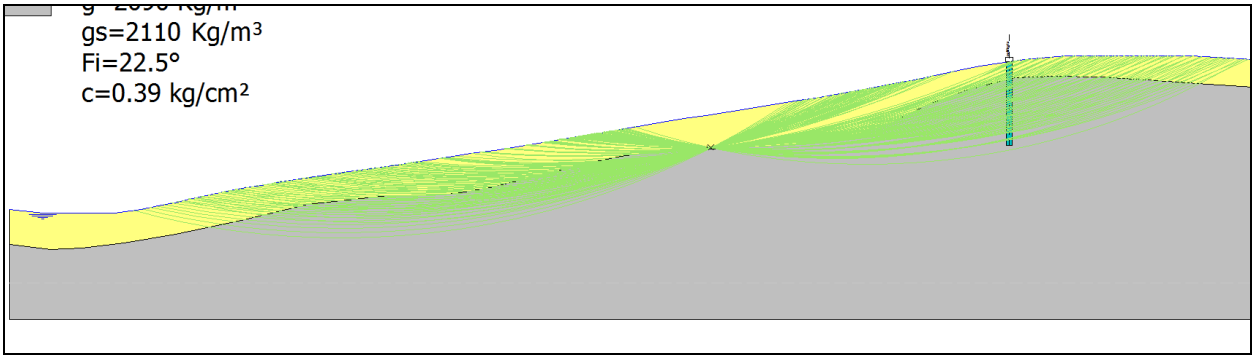


Superfici di scorrimento con Fs < 1.1



Superfici di scorrimento con 1.1< Fs < 1.5



Superfici di scorrimento con Fs > 1.5