Comune di Trani

Regione Puglia

OPERE DI CHIUSURA DEFINITIVA DEL I E DEL II LOTTO DI DISCARICA E IMPIANTI CONNESSI IN LOCALITÀ "PURO VECCHIO" TRANI (BAT)

PROGETTO DEFINITIVO

COMMITTENTE:

AMIU S.p.A.

Sede legale e amministrativa alla Strada Provinciale 168

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Ing. Federico Cangialosi

Ing. Gianluca Intini

Dott. geol. Vito Specchio

ALLEGATO	2. STUDI E INDAGINI 2.2 GEOLOGIA E GEOTECNICA	SCALA: ---
R.2.2.6	VERIFICA STABILITÀ GLOBALE DEL VERSANTE REPORT	DATA: GIUGNO 2022

AGGIORNAMENTO	DATA	DESCRIZIONE
1	10/2022	Riscontro al Verbale di Verifica Preventiva Intermedio del 30/09/2022

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ALLEGATI:

1. **MODELLO GEOTECNICO DELLE SEZIONI**

1 PREMESSA

La presente relazione tecnica riporta i tabulati di calcolo ottenuti a seguito delle analisi di stabilità globale considerando due sezioni delle scarpate di RSU posizionate a sud-est e sud-ovest rispetto all'ingresso della discarica, di cui si riportano le figure:

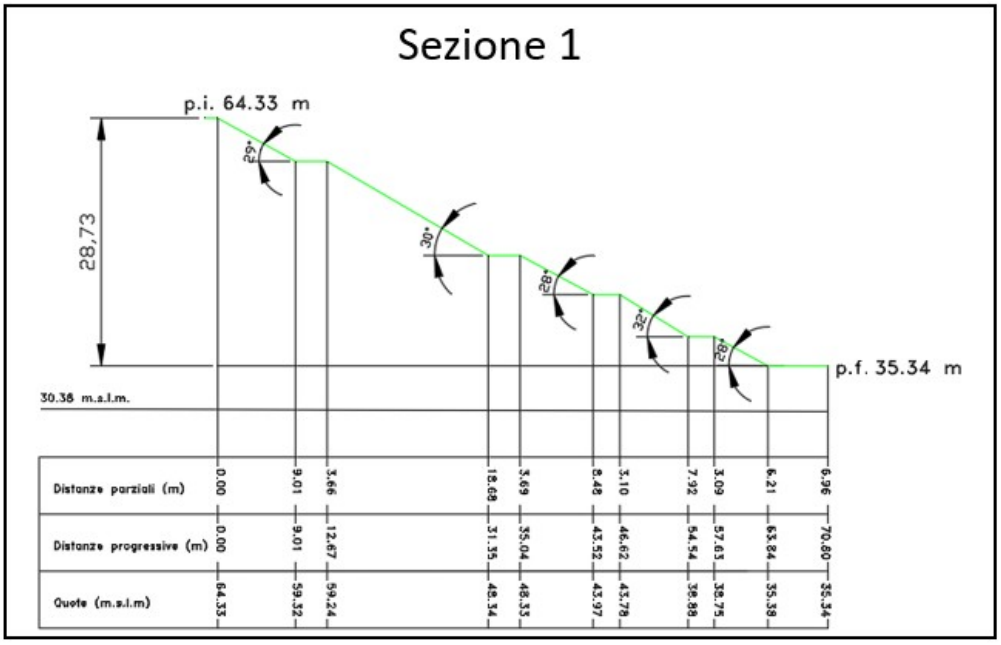

***Fig. 1**: Sezione scarpata posizionata a sud-est dell'ingresso*

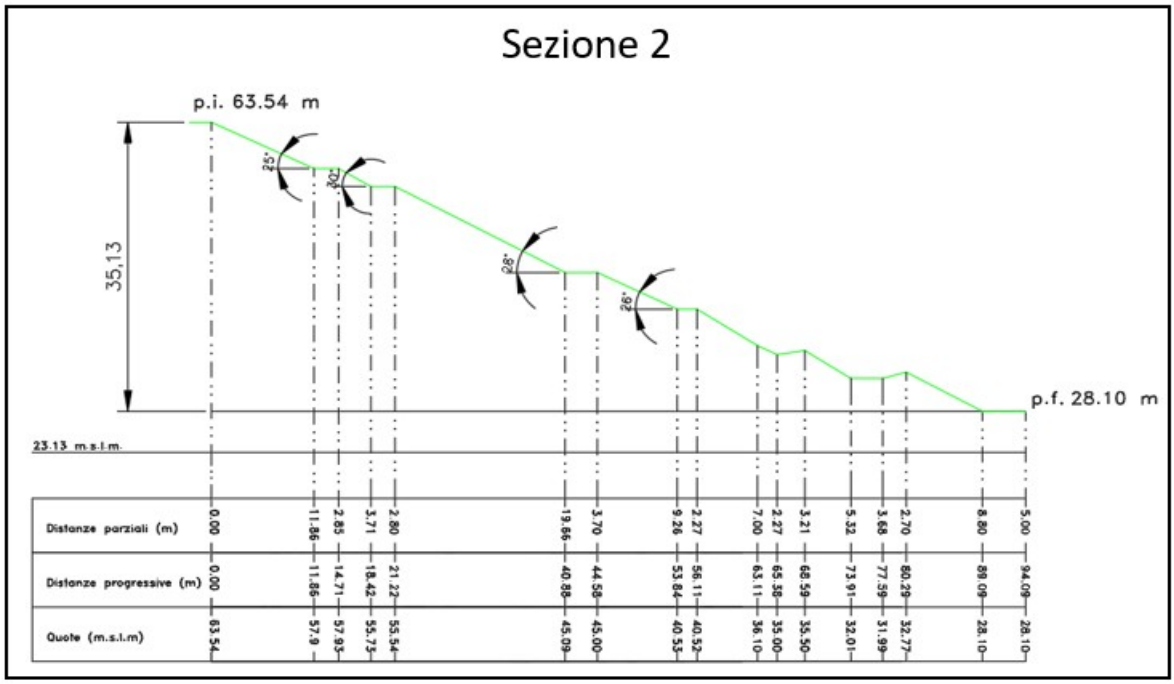

***Fig. 2**: Sezione scarpata posizionata a sud-ovest dell'ingresso*

Le analisi sono state realizzate applicando il metodo rigoroso di Morgenstern & Price (1965) e ripetute variando il verso di applicazione della componente verticale dell'azione sismica, considerando

inizialmente i coefficienti di amplificazione sismica verticali "kv" negativi e successivamente positivi.

Tutte le verifiche sono state condotte nelle condizioni ante-operam e post - operam così come meglio specificato in relazione R.2.2.4.

Per quanto concerne la scelta delle superfici indagate, in considerazione del metodo di analisi, è stato utilizzato un metodo di ricerca con "attrattore dinamico" (cfr. manuale SSAP) che consente all'utente di impostare delle zone di ricerca iniziali. Quest'ultime vengono man mano ridotte dal programma in funzione delle superfici con minor FS che via via vengono trovate.

Inoltre, come indicato precedentemente, l'utilizzo del metodo di Morgenstern & Price (1965) consente di tener in conto una diversa posizione del centro di massa di ogni striscia infinitesima in cui è suddiviso il corpo del pendio e le possibili irregolarità della superficie di scorrimento piuttosto che restringere il campo a superfici di forma esclusivamente circolare (es. metodo di Bishop, Tavenas,...,ect).

Di seguito si riportano i tabulati di calcolo ottenuti e le immagini raffiguranti la distribuzione di valori del fattore di stabilità ottenuto nello spazio.

2 NORMATIVA DI RIFERIMENTO

- **D.M. LL. PP. 11-03-88**

Norme Tecniche riguardanti le indagini sui terreni e sulle rocce, la stabilità dei pendii naturali e delle scarpate, i criteri generali e le prescrizioni per la progettazione, l'esecuzione ed il collaudo delle opere di sostegno delle terre e delle opere di fondazione. Circolare Ministeriale del 24-07-88, n. 30483/STC.

- **Legge 02-02-74 n. 64, art. 1 - D.M. 11-03-88**

Norme Tecniche riguardanti le indagini sui terreni e sulle rocce, la stabilità dei pendii naturali e delle scarpate, i criteri generali e le prescrizioni per la progettazione, l'esecuzione ed il collaudo delle opere di sostegno delle terre e delle opere di fondazione.

- **Consiglio superiore dei lavori pubblici**

Pericolosità sismica e Criteri generali per la classificazione sismica del territorio nazionale. Allegato al voto n. 36 del 27.07.2007.

- **Norma tecnica UNI EN 1997-1:2005 (EUROCODICE 7 - PROGETTAZIONE GEOTECNICA)**

Progettazione geotecnica - Parte 1: Regole generali.

- **Norme Tecniche per le Costruzioni - D.M. 17-01-18**

Sicurezza e prestazioni attese (cap.2), Azioni sulle costruzioni (cap.3), Costruzioni in calcestruzzo (par.4.1), Costruzioni in legno (par.4.4), Costruzioni in muratura (par.4.5), Progettazione geotecnica (cap.6), Progettazione per azioni sismiche (cap.7), Costruzioni esistenti (cap.8), Riferimenti tecnici (cap.12), EC3.

- **Circolare 7 21-01-19 C.S.LL.PP**

Istruzioni per l'applicazione dell'Aggiornamento delle N.T.C. di cui al decreto ministeriale 17 gennaio 2018.

- **Decreto legislativo 3 aprile 2006, n. 152**

Norme in materia ambientale

3 Tabultato verifica stabilità - sezione 1 (kv negativo)

SSAP 5.0.2 - Slope Stability Analysis Program (1991,2021)
WWW.SSAP.EU
Build No. 11893
BY
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** Gia' Ricercatore CNR-IRPI fino a Luglio 2011

Ultima Revisione struttura tabelle del report: 21 Febbraio 2021

Data: 23/4/2021

Localita' : "Puro Vecchio" - Trani (BAT)

Descrizione: Chiusura definitiva lotti I e II
Modello pendio: Modello sezione 1 assemblato.mod

---------- PARAMETRI DEL MODELLO DEL PENDIO ----------

__ PARAMETRI GEOMETRICI - Coordinate X Y (in m) __

SUP T.		SUP 2		SUP 3		SUP 4	
X	Y	X	Y	X	Y	X	Y
0.00	35.34	-	-	-	-	-	-
5.00	35.34	-	-	-	-	-	-
11.96	35.38	-	-	-	-	-	-
18.17	38.75	-	-	-	-	-	-
21.26	38.88	-	-	-	-	-	-
29.18	43.49	-	-	-	-	-	-
32.28	43.97	-	-	-	-	-	-
40.76	48.33	-	-	-	-	-	-
44.45	48.34	-	-	-	-	-	-
63.13	59.24	-	-	-	-	-	-
66.79	59.32	-	-	-	-	-	-
75.80	64.33	-	-	-	-	-	-
80.80	64.33	-	-	-	-	-	-

ASSENZA DI FALDA

------- PARAMETRI GEOMECCANICI -------

	fi`	C`	Cu	Gamm	Gamm_sat	STR_IDX	sgci	GSI	mi	D
STRATO 1	25.00	15.00	0.00	12.20	13.00	1.967	0.00	0.00	0.00	0.00

LEGENDA: fi`_____ Angolo di attrito interno efficace(in gradi)
C` _____ Coesione efficace (in Kpa)
Cu _____ Resistenza al taglio Non drenata (in Kpa)
Gamm _____ Peso di volume terreno fuori falda (in KN/m^3)
Gamm_sat __ Peso di volume terreno immerso (in KN/m^3)
STR_IDX ___ Indice di resistenza (usato in solo in 'SNIFF SEARCH) (adimensionale)
---- SOLO Per AMMASSI ROCCIOSI FRATTURATI - Parametri Criterio di Rottura di Hoek (2002)-

sigci _____ Resistenza Compressione Uniassiale Roccia Intatta (in MPa)
GSI _____ Geological Strenght Index ammasso(adimensionale)
mi _____ Indice litologico ammasso(adimensionale)
D _____ Fattore di disturbo ammasso(adimensionale)
Fattore di riduzione NTC2018: gammaPHI=1.25 e gammaC=1.25 - DISATTIVATO (solo per ROCCE)

Uso CRITERIO DI ROTTURA Hoek et al.(2002,2006) - non-lineare - Generalizzato, secondo Lei et al.(2016)

---------- INFORMAZIONI GENERAZIONE SUPERFICI RANDOM ----------
*** PARAMETRI PER LA GENERAZIONE DELLE SUPERFICI

MOTORE DI RICERCA: RANDOM SEARCH - Siegel (1981)
FILTRAGGIO SUPERFICI : ATTIVATO
COORDINATE X1,X2,Y OSTACOLO : 0.00 0.00 0.00
LUNGHEZZA MEDIA SEGMENTI (m)*: 3.2 (+/-) 50%
INTERVALLO ASCISSE RANDOM STARTING POINT (Xmin .. Xmax): 0.01 11.96
LIVELLO MINIMO CONSIDERATO (Ymin): 9.25
INTERVALLO ASCISSE AMMESSO PER LA TERMINAZIONE (Xmin .. Xmax): 18.17 80.80
TOTALE SUPERFICI GENERATE : 10000
NOTA IMPORTANTE: La lunghezza media dei segmenti non viene cosiderata nel caso di uso del motore di ricerca NEW RANOM SEARCH

---------- INFORMAZIONI PARAMETRI DI CALCOLO ----------

METODO DI CALCOLO : MORGENSTERN - PRICE (Morgenstern & Price, 1965)
METODO DI ESPLORAZIONE CAMPO VALORI (lambda0,Fs0) ADOTTATO : B (piu' accurato)
COEFFICIENTE SISMICO UTILIZZATO Kh : 0.0620
COEFFICIENTE SISMICO UTILIZZATO Kv (assunto Negativo): -0.0310
COEFFICIENTE c=Kv/Kh UTILIZZATO : 0.5000
FORZA ORIZZONTALE ADDIZIONALE IN TESTA (kN/m): 0.00
FORZA ORIZZONTALE ADDIZIONALE ALLA BASE (kN/m): 0.00

N.B. Le forze orizzontali addizionali in testa e alla base sono poste uguali a 0 durante tutte le verifiche globali

---------- RISULTATO FINALE ELABORAZIONI ----------

DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs *

Fattore di sicurezza (FS) 1.4803 - Min. - X Y Lambda= 0.5038

X	Y
9.79	35.37
13.88	33.70
17.96	31.92
23.29	31.41
29.48	33.19
34.34	34.00
37.00	35.44
41.39	37.44
47.89	39.43
52.00	41.16
58.59	44.83
62.03	47.66
65.53	50.54
70.83	55.32
74.58	60.24
74.58	63.65

Fattore di sicurezza (FS) 1.4878 - N.2 -- X Y Lambda= 0.5126

X	Y
9.62	35.37
11.92	34.24
16.97	32.76
20.61	31.72
22.85	31.55
27.11	31.98
31.71	33.56
34.03	34.85
36.36	35.48
41.51	36.73
44.50	37.36
47.00	37.94
50.96	39.71
53.85	41.63
55.59	42.58
58.14	44.48
61.89	46.85
63.37	48.19
67.23	51.91
71.36	55.16
75.40	59.12
76.90	60.76
76.90	64.33

Fattore di sicurezza (FS) 1.4883 - N.3 -- X Y Lambda= 0.5010

X	Y
10.87	35.37
13.52	34.07
16.59	33.62
22.90	32.10
26.37	32.97
32.09	34.33
38.99	36.50
43.86	37.89
49.56	41.02
53.49	42.75
59.14	45.67
62.22	48.28
68.77	53.61
71.82	57.48
73.39	59.83
73.39	62.99

Fattore di sicurezza (FS) 1.4900 - N.4 -- X Y Lambda= 0.5091

X	Y
8.34	35.36
13.40	32.40
17.56	30.50
22.30	31.02
26.97	31.39
32.71	33.86
36.60	35.08
42.92	36.82
50.35	39.43
56.31	44.27
58.99	46.28

61.71	48.18
65.71	50.44
69.93	54.10
74.99	59.54
76.35	60.85
76.35	64.33

Fattore di sicurezza (FS) 1.4989 - N.5 -- X Y Lambda= 0.5180

7.29	35.35
13.02	33.06
19.93	31.16
24.75	31.40
30.41	32.59
37.84	35.49
42.86	37.35
48.40	40.99
53.16	43.79
59.25	47.18
65.95	50.99
70.24	54.14
73.59	56.51
77.51	61.10
77.51	64.33

Fattore di sicurezza (FS) 1.5028 - N.6 -- X Y Lambda= 0.5291

11.03	35.37
14.45	34.02
16.45	33.12
18.24	33.16
20.68	32.74
23.37	33.43
25.08	33.78
28.28	34.36
32.90	35.68
37.65	35.78
41.79	37.05
44.31	38.48
48.06	39.47
51.28	40.38
54.57	42.55
56.47	43.60
59.02	45.11
62.40	47.43
65.11	50.13
67.26	52.65
70.22	54.28
71.62	55.19
73.04	56.42
74.55	58.03
75.57	59.62
76.33	60.81
76.33	64.33

Fattore di sicurezza (FS) 1.5034 - N.7 -- X Y Lambda= 0.4951

11.32	35.38
14.35	34.57
17.82	33.17
21.11	31.95
26.49	32.48
31.16	32.64
36.75	35.38
43.85	37.40
49.22	40.17
53.25	42.70
59.99	46.48
62.65	47.61
66.49	50.50
70.49	54.36
73.84	58.82
75.80	60.87
75.80	64.33

Fattore di sicurezza (FS) 1.5050 - N.8 -- X Y Lambda= 0.5118

9.08	35.36
13.12	33.40
17.50	32.02
21.87	31.30
26.64	32.91
30.27	33.56
33.30	34.00
36.06	34.70
38.74	35.69
40.40	36.65
44.78	39.11
46.56	39.42
50.99	40.97
53.88	42.75
57.75	45.49
60.01	47.06
63.84	50.04
66.43	52.75
68.71	55.10
71.50	56.52
75.06	59.09
76.91	60.76
76.91	64.33

Fattore di sicurezza (FS) 1.5060 - N.9 -- X Y Lambda= 0.5051

7.79	35.36
13.28	32.33
16.24	32.12
24.12	32.38
28.21	33.07
32.07	34.20
40.05	36.17
46.99	38.68
52.54	40.84
58.73	45.19
63.28	49.54

66.22	52.65
72.18	58.46
73.29	59.34
73.29	62.94

Fattore di sicurezza (FS) 1.5068 - N.10 -- X Y Lambda= 0.5450

11.08	35.37
13.93	34.60
20.00	33.27
25.64	33.85
31.33	35.14
36.72	35.48
42.77	38.13
46.57	40.11
51.44	42.46
57.02	43.99
60.00	45.38
63.26	47.72
66.84	50.01
70.51	53.82
72.38	55.88
74.65	58.74
76.33	60.88
76.33	64.33

---------- ANALISI DEFICIT DI RESISTENZA ----------
DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs *

Analisi Deficit in riferimento a FS(progetto) = 1.200

Sup N.	FS	FTR(kN/m)	FTA(kN/m)	Bilancio(kN/m)	ESITO
1	1.480	4195.1	2834.0	794.3	Surplus
2	1.488	4438.4	2983.2	858.6	Surplus
3	1.488	3915.5	2630.9	758.5	Surplus
4	1.490	4490.8	3014.0	874.0	Surplus
5	1.499	4343.4	2897.7	866.1	Surplus
6	1.503	4112.0	2736.2	828.5	Surplus
7	1.503	4212.8	2802.2	850.1	Surplus
8	1.505	4192.9	2785.9	849.7	Surplus
9	1.506	4128.1	2741.2	838.8	Surplus
10	1.507	4047.4	2686.1	824.0	Surplus

Esito analisi: SURPLUS di RESISTENZA!

Valore minimo di SURPLUS di RESISTENZA (kN/m): 758.5

Note: FTR --> Forza totale Resistente lungo la superficie di scivolamento

FTA --> Forza totale Agente lungo la superficie di scivolamento

IMPORTANTE! : Il Deficit o il Surplus di resistenza viene espresso in kN per metro di LARGHEZZA rispetto al fronte della scarpata

TABELLA PARAMETRI CONCI DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	alpha (°)	W (kN/m)	ru (-)	U (kPa)	phi' (°)	(c',Cu) (kPa)
9.790	0.535	-22.13	0.70	0.00	0.00	25.00	15.00
10.325	0.535	-22.13	2.09	0.00	0.00	25.00	15.00
10.860	0.535	-22.13	3.49	0.00	0.00	25.00	15.00
11.395	0.535	-22.13	4.88	0.00	0.00	25.00	15.00
11.930	0.030	-22.13	0.31	0.00	0.00	25.00	15.00
11.960	0.535	-22.13	7.26	0.00	0.00	25.00	15.00
12.495	0.535	-22.13	10.47	0.00	0.00	25.00	15.00
13.030	0.535	-22.13	13.69	0.00	0.00	25.00	15.00
13.565	0.320	-22.13	9.71	0.00	0.00	25.00	15.00
13.884	0.535	-23.63	18.87	0.00	0.00	25.00	15.00
14.419	0.535	-23.63	22.18	0.00	0.00	25.00	15.00
14.954	0.535	-23.63	25.50	0.00	0.00	25.00	15.00
15.489	0.535	-23.63	28.82	0.00	0.00	25.00	15.00
16.024	0.535	-23.63	32.13	0.00	0.00	25.00	15.00
16.559	0.535	-23.63	35.45	0.00	0.00	25.00	15.00
17.094	0.535	-23.63	38.77	0.00	0.00	25.00	15.00
17.629	0.328	-23.63	25.42	0.00	0.00	25.00	15.00
17.957	0.213	-5.48	17.07	0.00	0.00	25.00	15.00
18.170	0.535	-5.48	43.55	0.00	0.00	25.00	15.00
18.705	0.535	-5.48	44.02	0.00	0.00	25.00	15.00
19.240	0.535	-5.48	44.48	0.00	0.00	25.00	15.00
19.775	0.535	-5.48	44.95	0.00	0.00	25.00	15.00
20.310	0.535	-5.48	45.42	0.00	0.00	25.00	15.00
20.845	0.415	-5.48	35.58	0.00	0.00	25.00	15.00
21.260	0.535	-5.48	47.16	0.00	0.00	25.00	15.00
21.795	0.535	-5.48	49.46	0.00	0.00	25.00	15.00
22.330	0.535	-5.48	51.75	0.00	0.00	25.00	15.00
22.865	0.424	-5.48	42.70	0.00	0.00	25.00	15.00
23.289	0.535	16.04	55.21	0.00	0.00	25.00	15.00
23.824	0.535	16.04	56.21	0.00	0.00	25.00	15.00
24.359	0.535	16.04	57.21	0.00	0.00	25.00	15.00
24.894	0.535	16.04	58.20	0.00	0.00	25.00	15.00
25.429	0.535	16.04	59.20	0.00	0.00	25.00	15.00
25.964	0.535	16.04	60.20	0.00	0.00	25.00	15.00
26.499	0.535	16.04	61.19	0.00	0.00	25.00	15.00
27.034	0.535	16.04	62.19	0.00	0.00	25.00	15.00
27.569	0.535	16.04	63.19	0.00	0.00	25.00	15.00
28.104	0.535	16.04	64.18	0.00	0.00	25.00	15.00
28.639	0.535	16.04	65.18	0.00	0.00	25.00	15.00
29.174	0.006	16.04	0.77	0.00	0.00	25.00	15.00
29.180	0.295	16.04	36.17	0.00	0.00	25.00	15.00
29.475	0.535	9.51	65.42	0.00	0.00	25.00	15.00
30.010	0.535	9.51	65.38	0.00	0.00	25.00	15.00
30.545	0.535	9.51	65.33	0.00	0.00	25.00	15.00
31.080	0.535	9.51	65.29	0.00	0.00	25.00	15.00
31.615	0.535	9.51	65.25	0.00	0.00	25.00	15.00
32.150	0.130	9.51	15.87	0.00	0.00	25.00	15.00
32.280	0.535	9.51	65.80	0.00	0.00	25.00	15.00
32.815	0.535	9.51	66.97	0.00	0.00	25.00	15.00
33.350	0.535	9.51	68.15	0.00	0.00	25.00	15.00
33.885	0.460	9.51	59.51	0.00	0.00	25.00	15.00
34.345	0.535	28.41	69.70	0.00	0.00	25.00	15.00
34.880	0.535	28.41	69.61	0.00	0.00	25.00	15.00

35.414	0.535	28.41	69.51	0.00	0.00	25.00	15.00
35.949	0.535	28.41	69.42	0.00	0.00	25.00	15.00
36.484	0.519	28.41	67.29	0.00	0.00	25.00	15.00
37.004	0.535	24.50	69.39	0.00	0.00	25.00	15.00
37.539	0.535	24.50	69.59	0.00	0.00	25.00	15.00
38.073	0.535	24.50	69.78	0.00	0.00	25.00	15.00
38.608	0.535	24.50	69.98	0.00	0.00	25.00	15.00
39.143	0.535	24.50	70.18	0.00	0.00	25.00	15.00
39.678	0.535	24.50	70.38	0.00	0.00	25.00	15.00
40.213	0.535	24.50	70.57	0.00	0.00	25.00	15.00
40.748	0.012	24.50	1.56	0.00	0.00	25.00	15.00
40.760	0.535	24.50	69.91	0.00	0.00	25.00	15.00
41.295	0.098	24.50	12.70	0.00	0.00	25.00	15.00
41.393	0.535	17.05	68.35	0.00	0.00	25.00	15.00
41.928	0.535	17.05	67.32	0.00	0.00	25.00	15.00
42.463	0.535	17.05	66.29	0.00	0.00	25.00	15.00
42.998	0.535	17.05	65.26	0.00	0.00	25.00	15.00
43.533	0.535	17.05	64.23	0.00	0.00	25.00	15.00
44.068	0.382	17.05	45.22	0.00	0.00	25.00	15.00
44.450	0.535	17.05	63.45	0.00	0.00	25.00	15.00
44.985	0.535	17.05	64.39	0.00	0.00	25.00	15.00
45.520	0.535	17.05	65.33	0.00	0.00	25.00	15.00
46.055	0.535	17.05	66.26	0.00	0.00	25.00	15.00
46.590	0.535	17.05	67.20	0.00	0.00	25.00	15.00
47.125	0.535	17.05	68.14	0.00	0.00	25.00	15.00
47.660	0.227	17.05	29.16	0.00	0.00	25.00	15.00
47.886	0.535	22.72	69.28	0.00	0.00	25.00	15.00
48.421	0.535	22.72	69.84	0.00	0.00	25.00	15.00
48.956	0.535	22.72	70.40	0.00	0.00	25.00	15.00
49.491	0.535	22.72	70.95	0.00	0.00	25.00	15.00
50.026	0.535	22.72	71.51	0.00	0.00	25.00	15.00
50.561	0.535	22.72	72.07	0.00	0.00	25.00	15.00
51.096	0.535	22.72	72.63	0.00	0.00	25.00	15.00
51.631	0.366	22.72	50.02	0.00	0.00	25.00	15.00
51.997	0.535	29.14	73.33	0.00	0.00	25.00	15.00
52.532	0.535	29.14	73.42	0.00	0.00	25.00	15.00
53.067	0.535	29.14	73.51	0.00	0.00	25.00	15.00
53.602	0.535	29.14	73.59	0.00	0.00	25.00	15.00
54.137	0.535	29.14	73.68	0.00	0.00	25.00	15.00
54.672	0.535	29.14	73.77	0.00	0.00	25.00	15.00
55.207	0.535	29.14	73.86	0.00	0.00	25.00	15.00
55.742	0.535	29.14	73.94	0.00	0.00	25.00	15.00
56.277	0.535	29.14	74.03	0.00	0.00	25.00	15.00
56.812	0.535	29.14	74.12	0.00	0.00	25.00	15.00
57.347	0.535	29.14	74.21	0.00	0.00	25.00	15.00
57.881	0.535	29.14	74.29	0.00	0.00	25.00	15.00
58.416	0.172	29.14	23.90	0.00	0.00	25.00	15.00
58.588	0.535	39.43	73.96	0.00	0.00	25.00	15.00
59.123	0.535	39.43	73.15	0.00	0.00	25.00	15.00
59.658	0.535	39.43	72.35	0.00	0.00	25.00	15.00
60.193	0.535	39.43	71.54	0.00	0.00	25.00	15.00
60.728	0.535	39.43	70.73	0.00	0.00	25.00	15.00
61.263	0.535	39.43	69.92	0.00	0.00	25.00	15.00
61.798	0.229	39.43	29.67	0.00	0.00	25.00	15.00
62.027	0.535	39.48	68.77	0.00	0.00	25.00	15.00
62.562	0.535	39.48	67.95	0.00	0.00	25.00	15.00
63.097	0.033	39.48	4.19	0.00	0.00	25.00	15.00

63.130	0.535	39.48	66.14	0.00	0.00	25.00	15.00
63.665	0.535	39.48	63.43	0.00	0.00	25.00	15.00
64.200	0.535	39.48	60.72	0.00	0.00	25.00	15.00
64.735	0.535	39.48	58.00	0.00	0.00	25.00	15.00
65.270	0.260	39.48	27.22	0.00	0.00	25.00	15.00
65.530	0.535	42.01	53.84	0.00	0.00	25.00	15.00
66.065	0.535	42.01	50.87	0.00	0.00	25.00	15.00
66.600	0.190	42.01	17.37	0.00	0.00	25.00	15.00
66.790	0.535	42.01	47.74	0.00	0.00	25.00	15.00
67.325	0.535	42.01	46.58	0.00	0.00	25.00	15.00
67.860	0.535	42.01	45.41	0.00	0.00	25.00	15.00
68.395	0.535	42.01	44.25	0.00	0.00	25.00	15.00
68.930	0.535	42.01	43.08	0.00	0.00	25.00	15.00
69.465	0.535	42.01	41.92	0.00	0.00	25.00	15.00
70.000	0.535	42.01	40.75	0.00	0.00	25.00	15.00
70.535	0.299	42.01	22.28	0.00	0.00	25.00	15.00
70.834	0.535	52.70	38.23	0.00	0.00	25.00	15.00
71.369	0.535	52.70	35.67	0.00	0.00	25.00	15.00
71.904	0.535	52.70	33.11	0.00	0.00	25.00	15.00
72.439	0.535	52.70	30.55	0.00	0.00	25.00	15.00
72.974	0.535	52.70	27.99	0.00	0.00	25.00	15.00
73.509	0.535	52.70	25.43	0.00	0.00	25.00	15.00
74.043	0.535	52.70	22.87	0.00	0.00	25.00	15.00

LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio
dx(m) : Larghezza concio
alpha(°) : Angolo pendenza base concio
W(kN/m) : Forza peso concio
ru(-) : Coefficiente locale pressione interstiziale
U(kPa) : Pressione totale dei pori base concio
phi'(°) : Angolo di attrito efficace base concio
c'/Cu (kPa) : Coesione efficace o Resistenza al taglio in condizioni non drenate

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TABELLA DIAGRAMMA DELLE FORZE DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	ht (m)	yt (m)	yt' (--)	E(x) (kN/m)	T(x) (kN/m)	E' (kN)	rho(x) (--)	FS_qFEM (--)	FS_srmFEM (--)
9.790	0.000	35.368	-0.302	0.0000000000E+000	0.0000000000E+000	5.8932540455E-001	0.049	7.798	5.296
10.325	0.055	35.205	-0.302	8.7848696727E-001	2.5149654724E-003	2.6950789440E+000	0.049	7.798	5.296
10.860	0.112	35.044	-0.320	2.8834351399E+000	4.6498925371E-002	6.0307919686E+000	0.049	4.847	3.298
11.395	0.148	34.863	-0.264	7.3307645609E+000	2.8175181092E-001	8.4385049201E+000	0.049	5.141	3.030
11.930	0.264	34.762	-0.189	1.1911698178E+001	9.1654256329E-001	9.7664908536E+000	0.072	6.324	2.995
11.960	0.271	34.757	-0.145	1.2205321248E+001	9.7618957273E-001	1.0023046273E+001	0.076	6.418	2.993
12.495	0.412	34.680	-0.136	1.9382296261E+001	2.4996533566E+000	1.8221136400E+001	0.123	8.576	2.942
13.030	0.561	34.612	-0.121	3.1699913457E+001	5.2836255884E+000	2.8549476269E+001			

0.180 11.118 2.861
13.565 0.718 34.551 -0.111 4.9927065007E+001 9.6904515106E+000 3.8191731177E+001
0.241 12.872 2.763
13.884 0.814 34.517 -0.119 6.2917819640E+001 1.2921855612E+001 4.3399973976E+001
0.273 13.364 2.704
14.419 0.980 34.449 -0.119 8.8595082742E+001 1.9319074839E+001 5.2247935163E+001
0.318 12.534 2.604
14.954 1.154 34.389 -0.106 1.1881730732E+002 2.7062873361E+001 5.9870030781E+001
0.358 10.519 2.509
15.489 1.335 34.336 -0.094 1.5264936618E+002 3.6037133487E+001 6.5825692437E+001
0.393 8.426 2.417
16.024 1.522 34.289 -0.077 1.8924348727E+002 4.6111666310E+001 6.7618049257E+001
0.425 6.692 2.326
16.559 1.721 34.254 -0.061 2.2499316886E+002 5.6396581977E+001 6.7120947416E+001
0.451 5.371 2.241
17.094 1.926 34.224 -0.051 2.6105544618E+002 6.7211066191E+001 6.7492799907E+001
0.474 4.388 2.161
17.629 2.135 34.199 -0.041 2.9720296864E+002 7.8636404747E+001 6.4603609054E+001
0.496 3.632 2.082
17.957 2.268 34.189 -0.029 3.1780256124E+002 8.5515253534E+001 5.9246707254E+001
0.509 3.260 2.037
18.170 2.283 34.184 -0.018 3.2992699245E+002 8.9788654563E+001 5.7161949205E+001
0.518 3.072 2.010
18.705 2.326 34.175 -0.009 3.6078701792E+002 1.0119997474E+002 5.7073949547E+001
0.551 2.702 1.940
19.240 2.376 34.174 0.006 3.9098977952E+002 1.1303131073E+002 5.6515476195E+001
0.582 2.429 1.876
19.775 2.435 34.181 0.025 4.2125230053E+002 1.2547904021E+002 5.5732810187E+001
0.614 2.226 1.815
20.310 2.506 34.201 0.051 4.5061769643E+002 1.3815367508E+002 5.3881420351E+001
0.645 2.075 1.762
20.845 2.592 34.236 0.081 4.7889943594E+002 1.5099743023E+002 5.2087685390E+001
0.674 1.964 1.715
21.260 2.674 34.278 0.123 5.0027855218E+002 1.6119418442E+002 5.0457701585E+001
0.697 1.898 1.684
21.795 2.800 34.352 0.160 5.2656512788E+002 1.7432245219E+002 4.5938195073E+001
0.717 1.836 1.650
22.330 2.947 34.449 0.201 5.4942731876E+002 1.8647463865E+002 3.9617801100E+001
0.734 1.796 1.625
22.865 3.117 34.567 0.241 5.6895177489E+002 1.9770476666E+002 3.4191613409E+001
0.749 1.763 1.606
23.289 3.270 34.679 0.289 5.8268852137E+002 2.0639120832E+002 2.9822046766E+001
0.761 1.738 1.594
23.824 3.281 34.844 0.328 5.9692972836E+002 2.1674333533E+002 2.4197864131E+001
0.782 1.705 1.581
24.359 3.314 35.031 0.367 6.0857754845E+002 2.2658388751E+002 1.9674365394E+001
0.802 1.671 1.570
24.894 3.366 35.236 0.406 6.1797911419E+002 2.3586611208E+002 1.5585235266E+001
0.821 1.635 1.559
25.429 3.441 35.465 0.452 6.2525201920E+002 2.4463367386E+002 1.2357858877E+001
0.841 1.598 1.549
25.964 3.542 35.720 0.468 6.3120065065E+002 2.5319937324E+002 9.9729366936E+000
0.860 1.560 1.537
26.499 3.635 35.966 0.449 6.3592195381E+002 2.6080934455E+002 8.2505870967E+000
0.876 1.524 1.526
27.034 3.715 36.200 0.416 6.4002786249E+002 2.6759149245E+002 7.5206947239E+000
0.891 1.493 1.515

27.569	3.772	36.412	0.377	6.4396826188E+002	2.7346371628E+002	7.6249356036E+000	0.902	1.467	1.504
28.104	3.811	36.604	0.349	6.4818569672E+002	2.7875382615E+002	8.8240533439E+000	0.910	1.445	1.495
28.639	3.838	36.785	0.318	6.5340901891E+002	2.8395804845E+002	1.0112005363E+001	0.918	1.426	1.486
29.174	3.843	36.944	0.296	6.5900441937E+002	2.8871638183E+002	1.0558083590E+001	0.923	1.411	1.477
29.180	3.843	36.945	0.268	6.5907092438E+002	2.8876822594E+002	1.0588087115E+001	0.923	1.411	1.477
29.475	3.837	37.024	0.253	6.6259420007E+002	2.9134693825E+002	1.2430714289E+001	0.929	1.403	1.473
30.010	3.879	37.156	0.242	6.6972019524E+002	2.9594320508E+002	1.4308712056E+001	0.937	1.392	1.466
30.545	3.916	37.283	0.236	6.7790293276E+002	3.0069068753E+002	1.5892602911E+001	0.945	1.384	1.460
31.080	3.952	37.408	0.236	6.8672351524E+002	3.0548336438E+002	1.6664801143E+001	0.952	1.380	1.454
31.615	3.989	37.535	0.245	6.9573241910E+002	3.1026274746E+002	1.6584890707E+001	0.958	1.379	1.448
32.150	4.035	37.670	0.253	7.0446750628E+002	3.1493390790E+002	1.5189450819E+001	0.965	1.382	1.444
32.280	4.046	37.704	0.288	7.0640886065E+002	3.1598680331E+002	1.4867108400E+001	0.966	1.383	1.443
32.815	4.115	37.862	0.316	7.1426296357E+002	3.2043561252E+002	1.3410935119E+001	0.967	1.391	1.439
33.350	4.205	38.042	0.343	7.2075707174E+002	3.2451078329E+002	9.2646965080E+000	0.968	1.402	1.435
33.885	4.302	38.228	0.366	7.2417515984E+002	3.2739108612E+002	4.1594983088E+000	0.968	1.415	1.433
34.345	4.403	38.406	0.409	7.2520632298E+002	3.2925510112E+002	1.1519972554E-001	0.968	1.427	1.431
34.880	4.343	38.635	0.449	7.2394375414E+002	3.3067065970E+002	-4.4606720470E+000	0.974	1.437	1.430
35.414	4.304	38.886	0.486	7.2043389932E+002	3.3122550788E+002	-8.3045788715E+000	0.979	1.443	1.428
35.949	4.283	39.155	0.507	7.1505877710E+002	3.3091530612E+002	-1.1403917473E+001	0.983	1.443	1.428
36.484	4.267	39.428	0.519	7.0823297420E+002	3.2971012428E+002	-1.4054428415E+001	0.986	1.439	1.427
37.004	4.260	39.702	0.544	7.0028386751E+002	3.2757503150E+002	-1.6128727186E+001	0.988	1.429	1.428
37.539	4.316	40.002	0.556	6.9120510331E+002	3.2458341296E+002	-1.6998166882E+001	0.986	1.419	1.429
38.073	4.368	40.298	0.526	6.8209771685E+002	3.2116367518E+002	-1.6040995694E+001	0.984	1.408	1.431
38.608	4.391	40.564	0.475	6.7404301951E+002	3.1773147748E+002	-1.4044574639E+001	0.980	1.399	1.433
39.143	4.388	40.806	0.427	6.6707158186E+002	3.1437103441E+002	-1.2051867115E+001	0.975	1.393	1.436
39.678	4.360	41.021	0.379	6.6114886025E+002	3.1115735667E+002	-1.0115402967E+001	0.970	1.388	1.439
40.213	4.307	41.212	0.335	6.5624922416E+002	3.0814414092E+002	-8.2316025748E+000	0.964	1.386	1.441
40.748	4.231	41.380	0.314	6.5234195974E+002	3.0530651220E+002	-6.0980652006E+000	0.958	1.384	1.443
40.760	4.229	41.383	0.266	6.5227018814E+002	3.0524840995E+002	-6.0531942067E+000			

0.958 1.384 1.444
41.295 4.128 41.526 0.263 6.4947315365E+002 3.0266722548E+002 -4.2953720329E+000
0.960 1.382 1.446
41.393 4.107 41.550 0.239 6.4906703404E+002 3.0221903867E+002 -3.9242317181E+000
0.960 1.381 1.446
41.928 4.070 41.677 0.236 6.4754692113E+002 2.9987419099E+002 -2.1029925317E+000
0.959 1.378 1.448
42.463 4.031 41.802 0.236 6.4681706560E+002 2.9774533505E+002 -6.9506125411E-001
0.958 1.376 1.449
42.998 3.995 41.930 0.245 6.4680328278E+002 2.9592405765E+002 5.6454198764E-001
0.957 1.374 1.451
43.533 3.966 42.065 0.273 6.4742106282E+002 2.9450399943E+002 1.7287652326E+000
0.957 1.372 1.452
44.068 3.958 42.221 0.306 6.4865286957E+002 2.9363146849E+002 2.6922378003E+000
0.958 1.370 1.453
44.450 3.965 42.345 0.343 6.4978706638E+002 2.9336839281E+002 3.0944933918E+000
0.960 1.370 1.454
44.985 3.992 42.536 0.365 6.5153551916E+002 2.9359988078E+002 3.1136285694E+000
0.954 1.369 1.454
45.520 4.027 42.735 0.377 6.5311830313E+002 2.9450779779E+002 2.4982033454E+000
0.951 1.369 1.455
46.055 4.067 42.939 0.392 6.5420831928E+002 2.9591036659E+002 1.5743993149E+000
0.950 1.368 1.454
46.590 4.118 43.154 0.412 6.5480273554E+002 2.9757928960E+002 5.4415164605E-001
0.950 1.367 1.453
47.125 4.179 43.380 0.429 6.5479050110E+002 2.9935732380E+002 -6.8969471243E-001
0.951 1.365 1.451
47.660 4.248 43.613 0.441 6.5406483880E+002 3.0108311464E+002 -2.3441460759E+000
0.953 1.361 1.447
47.886 4.281 43.715 0.472 6.5343841118E+002 3.0174652483E+002 -3.1950886525E+000
0.954 1.359 1.445
48.421 4.314 43.972 0.480 6.5118357790E+002 3.0313490255E+002 -5.0745129937E+000
0.957 1.354 1.439
48.956 4.347 44.228 0.486 6.4800924588E+002 3.0408480513E+002 -6.7915417963E+000
0.961 1.346 1.432
49.491 4.386 44.492 0.498 6.4391738249E+002 3.0454999371E+002 -8.5244044208E+000
0.963 1.338 1.424
50.026 4.432 44.762 0.511 6.3888907991E+002 3.0445293643E+002 -1.0291104044E+001
0.965 1.328 1.415
50.561 4.485 45.038 0.523 6.3290704415E+002 3.0374081582E+002 -1.2088388457E+001
0.966 1.318 1.405
51.096 4.544 45.322 0.536 6.2595584687E+002 3.0238039472E+002 -1.3912442761E+001
0.966 1.307 1.394
51.631 4.610 45.612 0.520 6.1802227559E+002 3.0035420526E+002 -1.5615844447E+001
0.964 1.295 1.383
51.997 4.636 45.791 0.532 6.1210941435E+002 2.9855664617E+002 -1.6634733942E+001
0.962 1.287 1.375
52.532 4.638 46.091 0.551 6.0283426086E+002 2.9541534672E+002 -1.8185121788E+001
0.961 1.276 1.364
53.067 4.629 46.381 0.548 5.9265335378E+002 2.9164121290E+002 -1.9758863937E+001
0.958 1.265 1.353
53.602 4.627 46.677 0.559 5.8169447098E+002 2.8726677952E+002 -2.1094234671E+001
0.954 1.254 1.342
54.137 4.630 46.979 0.576 5.7008486552E+002 2.8232682855E+002 -2.2478065889E+001
0.949 1.244 1.330
54.672 4.647 47.293 0.594 5.5764543701E+002 2.7667339854E+002 -2.4154111679E+001
0.942 1.234 1.317

55.207 4.669 47.614 0.584 5.4424264871E+002 2.7018742984E+002 -2.5229116380E+001 0.933 1.223 1.304
55.742 4.674 47.917 0.568 5.3065308457E+002 2.6334242652E+002 -2.5093661157E+001 0.922 1.213 1.291
56.277 4.680 48.221 0.568 5.1739521831E+002 2.5637540390E+002 -2.4963998467E+001 0.911 1.203 1.279
56.812 4.685 48.525 0.568 5.0394437885E+002 2.4908909759E+002 -2.5468848622E+001 0.898 1.193 1.267
57.347 4.691 48.829 0.568 4.9014637900E+002 2.4146035680E+002 -2.6249663843E+001 0.884 1.183 1.256
57.881 4.696 49.133 0.568 4.7586015397E+002 2.3346826912E+002 -2.8390104315E+001 0.868 1.172 1.246
58.416 4.702 49.437 0.568 4.5977212054E+002 2.2443670092E+002 -3.0463407450E+001 0.850 1.161 1.237
58.588 4.704 49.534 0.688 4.5451225815E+002 2.2150204996E+002 -3.1088295537E+001 0.844 1.157 1.234
59.123 4.653 49.923 0.727 4.3705001546E+002 2.1184495339E+002 -3.5283923298E+001 0.829 1.146 1.227
59.658 4.602 50.312 0.727 4.1676237904E+002 2.0059377524E+002 -3.8052531690E+001 0.809 1.138 1.221
60.193 4.550 50.701 0.700 3.9633803287E+002 1.8923713503E+002 -3.8115099639E+001 0.788 1.131 1.218
60.728 4.470 51.061 0.660 3.7598345570E+002 1.7787811985E+002 -3.7795240542E+001 0.765 1.128 1.216
61.263 4.377 51.407 0.648 3.5590132324E+002 1.6661915888E+002 -3.8017594276E+001 0.741 1.128 1.218
61.798 4.284 51.754 0.635 3.3530885227E+002 1.5498497354E+002 -3.6882457177E+001 0.714 1.132 1.223
62.027 4.233 51.892 0.604 3.2702522533E+002 1.5028996298E+002 -3.6356354343E+001 0.703 1.135 1.226
62.562 4.116 52.215 0.578 3.0737198210E+002 1.3909131503E+002 -3.5507472622E+001 0.674 1.145 1.236
63.097 3.971 52.511 0.553 2.8903617328E+002 1.2852120525E+002 -3.4344619430E+001 0.645 1.161 1.251
63.130 3.962 52.529 0.518 2.8789540237E+002 1.2786282992E+002 -3.4251256799E+001 0.643 1.162 1.252
63.665 3.798 52.805 0.512 2.7041399753E+002 1.1774412919E+002 -3.2325898455E+001 0.623 1.181 1.271
64.200 3.629 53.077 0.508 2.5331028131E+002 1.0783811922E+002 -3.1588950833E+001 0.602 1.205 1.294
64.735 3.460 53.349 0.512 2.3661732858E+002 9.8195521145E+001 -3.0809407546E+001 0.579 1.231 1.320
65.270 3.295 53.624 0.512 2.2034763710E+002 8.8855919589E+001 -2.9242277864E+001 0.555 1.261 1.350
65.530 3.213 53.756 0.536 2.1288985000E+002 8.4610686122E+001 -2.9009841821E+001 0.543 1.275 1.364
66.065 3.026 54.051 0.551 1.9700022727E+002 7.5648543986E+001 -2.8552455117E+001 0.518 1.308 1.396
66.600 2.839 54.346 0.557 1.8234189422E+002 6.7506485844E+001 -2.6669069995E+001 0.494 1.340 1.428
66.790 2.777 54.455 0.617 1.7731813208E+002 6.4750799441E+001 -2.6626641316E+001 0.486 1.351 1.438
67.325 2.633 54.793 0.637 1.6274632131E+002 5.6857025130E+001 -2.6125737890E+001 0.448 1.381 1.466
67.860 2.495 55.137 0.663 1.4936649421E+002 4.9820208494E+001 -2.4980742514E+001 0.413 1.405 1.489
68.395 2.379 55.503 0.706 1.3601970131E+002 4.3014667827E+001 -2.4992779583E+001

0.375 1.425 1.507
68.930 2.286 55.892 0.751 1.2262699589E+002 3.6431539286E+001 -2.5131213899E+001
0.335 1.442 1.522
69.465 2.218 56.306 0.774 1.0913209365E+002 3.0091597568E+001 -2.4428658375E+001
0.294 1.454 1.533
70.000 2.151 56.720 0.794 9.6491044609E+001 2.4551032708E+001 -2.3575409740E+001
0.254 1.462 1.538
70.535 2.104 57.155 0.795 8.3909023645E+001 1.9449259724E+001 -2.2860170122E+001
0.214 1.468 1.542
70.834 2.062 57.383 0.766 7.7180312588E+001 1.6615537403E+001 -2.2313910647E+001
0.190 1.468 1.541
71.369 1.772 57.794 0.803 6.5413018979E+001 1.2076168779E+001 -2.2350216432E+001
0.151 1.465 1.538
71.904 1.517 58.241 0.904 5.3268063343E+001 8.0285169889E+000 -2.3654237473E+001
0.112 1.460 1.536
72.439 1.334 58.761 1.034 4.0105612052E+001 4.4186061922E+000 -2.4713329468E+001
0.069 1.460 1.542
72.974 1.218 59.347 1.074 2.6827545610E+001 1.5537039562E+000 -2.2252981399E+001
0.049 1.476 1.561
73.509 1.079 59.910 1.076 1.6297393493E+001 3.3932240479E-001 -1.8457967509E+001
0.049 1.505 1.591
74.043 0.965 60.499 1.076 7.0795704188E+000 6.0490314620E-002 -1.5232790028E+001
0.049 1.598 1.683

LEGENDA SIMBOLI
X(m) : Ascissa sinistra concio
ht(m) : Altezza linea di thrust da nodo sinistro base concio
yt(m) : coordinata Y linea di trust
yt'(-) : gradiente pendenza locale linea di trust
E(x)(kN/m) : Forza Normale interconcio
T(x)(kN/m) : Forza Tangenziale interconcio
E' (kN) : derivata Forza normale interconcio
Rho(x) (-) : fattore mobilizzazione resistenza al taglio verticale interconcio ZhU et al.(2003)
FS_qFEM(x)(-) : fattore di sicurezza locale stimato (locale in X) by qFEM
FS_srmFEM(x)(-) : fattore di sicurezza locale stimato (locale in X) by SRM Procedure
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TABELLA SFORZI DI TAGLIO DISTRIBUITI LUNGO SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	dl (m)	alpha (°)	TauStress (kPa)	TauF (kN/m)	TauStrength (kPa)	TauS (kN/m)
9.790	0.535	0.577	-22.125	-0.386	-0.223	15.539	8.973
10.325	0.535	0.577	-22.125	-1.157	-0.668	16.680	9.632
10.860	0.535	0.577	-22.125	-1.928	-1.113	18.077	10.439
11.395	0.535	0.577	-22.125	-2.699	-1.558	19.832	11.452
11.930	0.030	0.032	-22.125	-3.106	-0.100	21.140	0.681
11.960	0.535	0.577	-22.125	-4.015	-2.318	23.181	13.386
12.495	0.535	0.577	-22.125	-5.790	-3.343	27.803	16.056
13.030	0.535	0.577	-22.125	-7.565	-4.368	33.047	19.084
13.565	0.320	0.345	-22.125	-8.983	-3.099	36.732	12.671
13.884	0.535	0.584	-23.634	-11.119	-6.492	40.361	23.567
14.419	0.535	0.584	-23.634	-13.073	-7.634	45.206	26.397
14.954	0.535	0.584	-23.634	-15.027	-8.775	49.849	29.108
15.489	0.535	0.584	-23.634	-16.981	-9.916	54.265	31.686

16.024	0.535	0.584	-23.634	-18.936	-11.057	57.124	33.356
16.559	0.535	0.584	-23.634	-20.890	-12.198	60.542	35.352
17.094	0.535	0.584	-23.634	-22.844	-13.339	64.102	37.431
17.629	0.328	0.358	-23.634	-24.420	-8.746	65.745	23.546
17.957	0.213	0.214	-5.482	-2.698	-0.577	64.365	13.765
18.170	0.535	0.537	-5.482	-2.740	-1.472	65.700	35.307
18.705	0.535	0.537	-5.482	-2.769	-1.488	66.579	35.780
19.240	0.535	0.537	-5.482	-2.799	-1.504	67.679	36.371
19.775	0.535	0.537	-5.482	-2.828	-1.520	68.341	36.726
20.310	0.535	0.537	-5.482	-2.857	-1.536	68.937	37.047
20.845	0.415	0.417	-5.482	-2.883	-1.203	69.626	29.047
21.260	0.535	0.537	-5.482	-2.967	-1.594	70.772	38.033
21.795	0.535	0.537	-5.482	-3.111	-1.672	71.665	38.513
22.330	0.535	0.537	-5.482	-3.256	-1.750	72.619	39.026
22.865	0.424	0.426	-5.482	-3.385	-1.443	74.087	31.593
23.289	0.535	0.557	16.040	33.320	18.547	59.390	33.057
23.824	0.535	0.557	16.040	33.922	18.881	60.142	33.476
24.359	0.535	0.557	16.040	34.523	19.216	60.891	33.893
24.894	0.535	0.557	16.040	35.124	19.551	61.643	34.311
25.429	0.535	0.557	16.040	35.726	19.885	62.416	34.742
25.964	0.535	0.557	16.040	36.327	20.220	63.137	35.143
26.499	0.535	0.557	16.040	36.928	20.555	63.867	35.549
27.034	0.535	0.557	16.040	37.530	20.890	64.591	35.953
27.569	0.535	0.557	16.040	38.131	21.224	65.339	36.368
28.104	0.535	0.557	16.040	38.733	21.559	66.120	36.804
28.639	0.535	0.557	16.040	39.334	21.894	66.877	37.225
29.174	0.006	0.007	16.040	39.638	0.260	67.251	0.441
29.180	0.295	0.307	16.040	39.567	12.149	67.177	20.626
29.475	0.535	0.542	9.512	27.308	14.812	71.717	38.899
30.010	0.535	0.542	9.512	27.290	14.802	71.741	38.912
30.545	0.535	0.542	9.512	27.272	14.792	71.722	38.902
31.080	0.535	0.542	9.512	27.254	14.782	71.681	38.880
31.615	0.535	0.542	9.512	27.236	14.773	71.602	38.837
32.150	0.130	0.132	9.512	27.225	3.594	71.443	9.431
32.280	0.535	0.542	9.512	27.467	14.898	71.979	39.041
32.815	0.535	0.542	9.512	27.956	15.164	72.814	39.495
33.350	0.535	0.542	9.512	28.446	15.429	73.324	39.771
33.885	0.460	0.466	9.512	28.901	13.473	73.956	34.477
34.345	0.535	0.608	28.414	60.776	36.965	59.736	36.332
34.880	0.535	0.608	28.414	60.697	36.917	60.093	36.550
35.414	0.535	0.608	28.414	60.617	36.869	60.452	36.768
35.949	0.535	0.608	28.414	60.538	36.820	60.826	36.996
36.484	0.519	0.590	28.414	60.460	35.689	61.249	36.155
37.004	0.535	0.588	24.504	55.611	32.693	64.631	37.996
37.539	0.535	0.588	24.504	55.769	32.786	64.907	38.159
38.073	0.535	0.588	24.504	55.928	32.879	65.050	38.242
38.608	0.535	0.588	24.504	56.086	32.972	65.165	38.310
39.143	0.535	0.588	24.504	56.244	33.065	65.256	38.364
39.678	0.535	0.588	24.504	56.402	33.158	65.330	38.407
40.213	0.535	0.588	24.504	56.560	33.251	65.412	38.455
40.748	0.012	0.013	24.504	56.641	0.736	65.415	0.850
40.760	0.535	0.588	24.504	56.029	32.939	64.864	38.133
41.295	0.098	0.108	24.504	55.301	5.986	64.180	6.947
41.393	0.535	0.560	17.046	43.048	24.086	68.373	38.256
41.928	0.535	0.560	17.046	42.401	23.724	67.574	37.809
42.463	0.535	0.560	17.046	41.753	23.362	66.777	37.363
42.998	0.535	0.560	17.046	41.105	22.999	65.982	36.918

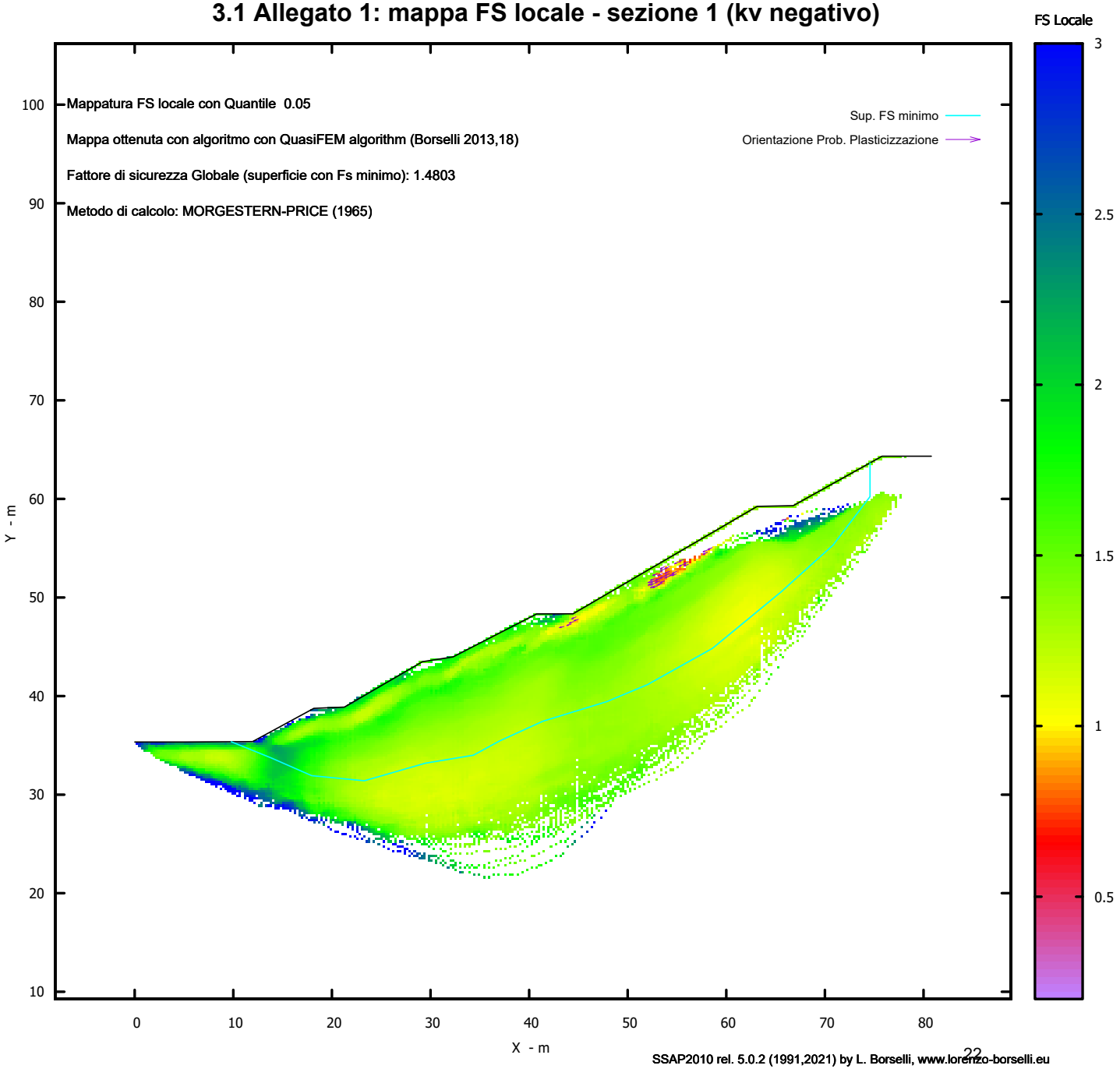
43.533	0.535	0.560	17.046	40.458	22.637	65.190	36.475
44.068	0.382	0.399	17.046	39.903	15.937	64.512	25.765
44.450	0.535	0.560	17.046	39.967	22.362	64.604	36.147
44.985	0.535	0.560	17.046	40.557	22.693	65.350	36.565
45.520	0.535	0.560	17.046	41.147	23.023	66.093	36.981
46.055	0.535	0.560	17.046	41.737	23.353	66.831	37.393
46.590	0.535	0.560	17.046	42.327	23.683	67.565	37.804
47.125	0.535	0.560	17.046	42.917	24.013	68.296	38.214
47.660	0.227	0.237	17.046	43.337	10.278	68.814	16.320
47.886	0.535	0.580	22.721	52.974	30.722	64.710	37.529
48.421	0.535	0.580	22.721	53.400	30.969	65.220	37.824
48.956	0.535	0.580	22.721	53.826	31.216	65.741	38.127
49.491	0.535	0.580	22.721	54.252	31.464	66.281	38.440
50.026	0.535	0.580	22.721	54.678	31.711	66.834	38.761
50.561	0.535	0.580	22.721	55.105	31.958	67.396	39.086
51.096	0.535	0.580	22.721	55.531	32.205	67.961	39.414
51.631	0.366	0.397	22.721	55.890	22.180	68.447	27.163
51.997	0.535	0.612	29.145	64.792	39.685	63.684	39.006
52.532	0.535	0.612	29.145	64.870	39.732	64.064	39.239
53.067	0.535	0.612	29.145	64.947	39.779	64.428	39.462
53.602	0.535	0.612	29.145	65.024	39.827	64.774	39.674
54.137	0.535	0.612	29.145	65.102	39.874	65.196	39.932
54.672	0.535	0.612	29.145	65.179	39.922	65.679	40.228
55.207	0.535	0.612	29.145	65.257	39.969	65.919	40.375
55.742	0.535	0.612	29.145	65.334	40.016	66.037	40.447
56.277	0.535	0.612	29.145	65.411	40.064	66.257	40.582
56.812	0.535	0.612	29.145	65.489	40.111	66.489	40.724
57.347	0.535	0.612	29.145	65.566	40.159	66.731	40.872
57.881	0.535	0.612	29.145	65.644	40.206	67.320	41.233
58.416	0.172	0.197	29.145	65.695	12.934	67.407	13.271
58.588	0.535	0.693	39.435	72.944	50.523	59.588	41.272
59.123	0.535	0.693	39.435	72.147	49.971	60.525	41.921
59.658	0.535	0.693	39.435	71.350	49.419	60.214	41.706
60.193	0.535	0.693	39.435	70.553	48.867	59.818	41.431
60.728	0.535	0.693	39.435	69.756	48.314	59.335	41.097
61.263	0.535	0.693	39.435	68.959	47.762	59.250	41.038
61.798	0.229	0.296	39.435	68.390	20.266	58.412	17.310
62.027	0.535	0.693	39.475	67.830	47.008	58.284	40.392
62.562	0.535	0.693	39.475	67.029	46.453	57.357	39.749
63.097	0.033	0.043	39.475	66.604	2.866	57.173	2.460
63.130	0.535	0.693	39.475	65.241	45.213	56.085	38.868
63.665	0.535	0.693	39.475	62.566	43.359	54.570	37.818
64.200	0.535	0.693	39.475	59.890	41.505	53.012	36.738
64.735	0.535	0.693	39.475	57.215	39.651	51.421	35.636
65.270	0.260	0.337	39.475	55.227	18.609	49.917	16.820
65.530	0.535	0.720	42.006	53.496	38.512	47.488	34.187
66.065	0.535	0.720	42.006	50.542	36.386	45.404	32.686
66.600	0.190	0.256	42.006	48.540	12.427	44.136	11.299
66.790	0.535	0.720	42.006	47.436	34.149	43.761	31.503
67.325	0.535	0.720	42.006	46.278	33.316	42.464	30.570
67.860	0.535	0.720	42.006	45.120	32.482	41.727	30.040
68.395	0.535	0.720	42.006	43.962	31.648	40.999	29.515
68.930	0.535	0.720	42.006	42.804	30.815	40.251	28.977
69.465	0.535	0.720	42.006	41.646	29.981	39.006	28.081
70.000	0.535	0.720	42.006	40.488	29.147	38.084	27.417
70.535	0.299	0.403	42.006	39.585	15.937	37.640	15.154
70.834	0.535	0.883	52.704	36.080	31.853	30.844	27.230

71.369	0.535	0.883	52.704	33.664	29.720	29.592	26.125
71.904	0.535	0.883	52.704	31.248	27.587	28.396	25.069
72.439	0.535	0.883	52.704	28.832	25.454	26.888	23.738
72.974	0.535	0.883	52.704	26.416	23.321	24.461	21.596
73.509	0.535	0.883	52.704	24.000	21.188	22.760	20.094
74.043	0.535	0.883	52.704	21.584	19.055	21.786	19.234

LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio
dx(m) : Larghezza concio
dl(m) : lunghezza base concio
alpha(°) : Angolo pendenza base concio
TauStress(kPa) : Sforzo di taglio su base concio
TauF (kN/m) : Forza di taglio su base concio
TauStrength(kPa) : Resistenza al taglio su base concio
TauS (kN/m) : Forza resistente al taglio su base concio

3.1 Allegato 1: mappa FS locale - sezione 1 (kv negativo)



SSAP2010 rel. 5.0.2 (1991,2021) by L. Borselli, www.lorenzo-borselli.eu

https://WWW.SSAP.EU

4 Tabultato verifica stabilità - sezione 1 (kv positivo)

SSAP 5.0.2 - Slope Stability Analysis Program (1991,2021)
WWW.SSAP.EU
Build No. 11893
BY
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** Gia' Ricercatore CNR-IRPI fino a Luglio 2011

Ultima Revisione struttura tabelle del report: 21 Febbraio 2021

Data: 23/4/2021

Localita' : "Puro Vecchio" - Trani (BAT)

Descrizione: Chiusura definitiva lotti I e II
Modello pendio: Modello sezione 1 assemblato.mod

---------- PARAMETRI DEL MODELLO DEL PENDIO ----------

__ PARAMETRI GEOMETRICI - Coordinate X Y (in m) __

SUP T.		SUP 2		SUP 3		SUP 4	
X	Y	X	Y	X	Y	X	Y
0.00	35.34	-	-	-	-	-	-
5.00	35.34	-	-	-	-	-	-
11.96	35.38	-	-	-	-	-	-
18.17	38.75	-	-	-	-	-	-
21.26	38.88	-	-	-	-	-	-
29.18	43.49	-	-	-	-	-	-
32.28	43.97	-	-	-	-	-	-
40.76	48.33	-	-	-	-	-	-
44.45	48.34	-	-	-	-	-	-
63.13	59.24	-	-	-	-	-	-
66.79	59.32	-	-	-	-	-	-
75.80	64.33	-	-	-	-	-	-
80.80	64.33	-	-	-	-	-	-

ASSENZA DI FALDA

------- PARAMETRI GEOMECCANICI -------

	fi`	C`	Cu	Gamm	Gamm_sat	STR_IDX	sgci	GSI	mi	D
STRATO 1	25.00	15.00	0.00	12.20	13.00	1.967	0.00	0.00	0.00	0.00

LEGENDA: fi`_____ Angolo di attrito interno efficace(in gradi)
C` _____ Coesione efficace (in Kpa)
Cu _____ Resistenza al taglio Non drenata (in Kpa)
Gamm _____ Peso di volume terreno fuori falda (in KN/m^3)
Gamm_sat __ Peso di volume terreno immerso (in KN/m^3)
STR_IDX ___ Indice di resistenza (usato in solo in 'SNIFF SEARCH) (adimensionale)

---- SOLO Per AMMASSI ROCCIOSI FRATTURATI - Parametri Criterio di Rottura di Hoek (2002)-
sigci _____ Resistenza Compressione Uniassiale Roccia Intatta (in MPa)
GSI _____ Geological Strenght Index ammasso(adimensionale)
mi _____ Indice litologico ammasso(adimensionale)
D _____ Fattore di disturbo ammasso(adimensionale)
Fattore di riduzione NTC2018: gammaPHI=1.25 e gammaC=1.25 - DISATTIVATO (solo per ROCCE)

Uso CRITERIO DI ROTTURA Hoek et al.(2002,2006) - non-lineare - Generalizzato, secondo Lei et al.(2016)

---------- INFORMAZIONI GENERAZIONE SUPERFICI RANDOM ----------
*** PARAMETRI PER LA GENERAZIONE DELLE SUPERFICI

MOTORE DI RICERCA: RANDOM SEARCH - Siegel (1981)
FILTRAGGIO SUPERFICI : ATTIVATO
COORDINATE X1,X2,Y OSTACOLO : 0.00 0.00 0.00
LUNGHEZZA MEDIA SEGMENTI (m)*: 3.2 (+/-) 50%
INTERVALLO ASCISSE RANDOM STARTING POINT (Xmin .. Xmax): 0.01 11.96
LIVELLO MINIMO CONSIDERATO (Ymin): 9.25
INTERVALLO ASCISSE AMMESSO PER LA TERMINAZIONE (Xmin .. Xmax): 18.17 80.80
TOTALE SUPERFICI GENERATE : 10000
NOTA IMPORTANTE: La lunghezza media dei segmenti non viene cosiderata nel caso di uso del motore di ricerca NEW RANOM SEARCH

---------- INFORMAZIONI PARAMETRI DI CALCOLO ----------

METODO DI CALCOLO : MORGENSTERN - PRICE (Morgenstern & Price, 1965)
METODO DI ESPLORAZIONE CAMPO VALORI (lambda0,Fs0) ADOTTATO : B (piu' accurato)
COEFFICIENTE SISMICO UTILIZZATO Kh : 0.0620
COEFFICIENTE SISMICO UTILIZZATO Kv (assunto Positivo): 0.0310
COEFFICIENTE c=Kv/Kh UTILIZZATO : 0.5000
FORZA ORIZZONTALE ADDIZIONALE IN TESTA (kN/m): 0.00
FORZA ORIZZONTALE ADDIZIONALE ALLA BASE (kN/m): 0.00

N.B. Le forze orizzontali addizionali in testa e alla base sono poste uguali a 0 durante tutte le verifiche globali

---------- RISULTATO FINALE ELABORAZIONI ----------

DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs *

Fattore di sicurezza (FS) 1.4468 - Min. - X Y Lambda= 0.5376

9.38	35.37
13.93	33.09
21.25	33.46
27.46	34.49
32.12	35.23
38.95	37.23
44.82	39.83
49.83	41.57
54.15	43.51
61.66	47.29
66.77	50.23
72.72	56.42
75.38	60.23
75.80	60.81
75.80	64.33

Fattore di sicurezza (FS) 1.4551 - N.2 -- X Y Lambda= 0.5180

X	Y
10.53	35.37
16.99	32.77
21.59	32.59
25.27	33.50
29.45	34.18
35.04	35.84
41.58	38.29
47.57	41.13
50.95	42.79
57.11	46.07
62.56	50.13
65.70	53.09
70.77	56.77
75.66	60.75
75.66	64.25

Fattore di sicurezza (FS) 1.4606 - N.3 -- X Y Lambda= 0.5537

X	Y
10.70	35.37
15.23	32.88
20.54	32.68
26.69	32.63
31.84	34.83
35.44	35.59
39.35	36.61
45.09	38.43
50.43	40.01
57.51	42.68
61.61	46.31
66.15	49.74
71.03	54.18
73.02	56.65
75.67	60.76
75.67	64.26

Fattore di sicurezza (FS) 1.4621 - N.4 -- X Y Lambda= 0.5117

X	Y
9.17	35.36
11.53	34.44
14.42	33.48
19.62	33.60
25.12	32.76
27.15	33.48
29.76	34.12
32.88	34.94
36.07	35.32
39.75	36.80
44.61	38.94
50.06	41.60
52.55	42.83
56.12	44.86
58.12	45.83
61.71	47.94
65.70	50.73
67.98	52.53
70.41	54.87

73.40	58.94
74.48	60.05
74.48	63.60

Fattore di sicurezza (FS) 1.4640 - N.5 -- X Y Lambda= 0.5170

11.44	35.38
16.04	32.64
20.11	30.10
23.66	30.43
27.03	30.74
33.36	32.78
36.39	34.15
42.29	36.82
45.43	38.33
48.76	39.97
54.08	40.92
60.66	45.10
63.13	46.78
68.37	50.32
70.73	52.92
75.28	59.24
76.88	60.95
76.88	64.33

Fattore di sicurezza (FS) 1.4709 - N.6 -- X Y Lambda= 0.5891

11.40	35.38
13.83	34.14
15.99	33.21
19.54	33.23
23.39	33.55
28.36	34.15
32.45	36.20
37.43	38.13
42.74	39.60
44.62	39.91
49.43	41.31
51.95	41.52
55.17	42.64
57.41	43.41
60.31	45.02
65.00	47.72
67.98	50.18
70.64	52.77
72.17	54.21
73.66	56.41
76.99	60.06
77.53	60.89
77.53	64.33

Fattore di sicurezza (FS) 1.4715 - N.7 -- X Y Lambda= 0.5458

9.55	35.37
16.17	32.34
22.88	32.75
30.43	34.15

36.95	35.22
39.78	35.62
44.28	37.59
49.06	40.55
52.11	42.35
56.71	45.13
59.55	47.16
63.61	49.98
66.11	51.78
70.76	55.96
73.04	58.27
74.66	60.39
74.66	63.70

Fattore di sicurezza (FS) 1.4730 - N.8 -- X Y Lambda= 0.5320

11.19	35.38
17.70	32.46
22.67	32.60
25.25	33.03
31.62	34.25
35.12	35.21
41.21	37.82
46.88	40.55
49.06	42.12
54.00	44.98
56.49	46.11
59.11	48.16
62.89	51.34
67.32	54.71
70.17	56.84
74.56	59.98
75.10	60.52
75.10	63.94

Fattore di sicurezza (FS) 1.4736 - N.9 -- X Y Lambda= 0.5018

11.00	35.37
14.36	34.60
17.07	33.60
21.47	33.71
27.21	33.14
30.04	33.09
36.90	33.38
42.81	35.42
49.15	37.70
54.82	40.40
58.35	42.67
61.61	45.03
66.43	48.38
71.21	52.50
74.01	56.14
77.65	60.25
78.19	61.07
78.19	64.33

Fattore di sicurezza (FS) 1.4773 - N.10 -- X Y Lambda= 0.5349

X	Y
8.56	35.36
11.22	35.01
15.49	34.74
19.12	34.06
21.61	33.62
25.96	33.00
29.33	34.17
32.03	34.72
35.88	36.25
37.77	36.79
40.58	37.64
43.35	38.15
47.12	39.57
50.82	40.80
52.74	41.33
56.61	43.35
58.45	44.54
60.72	46.69
62.83	48.39
64.50	49.47
66.63	51.31
69.55	53.82
72.03	55.94
73.65	57.41
76.22	59.73
77.33	60.83
77.33	64.33

---------- ANALISI DEFICIT DI RESISTENZA ----------
DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs *

Analisi Deficit in riferimento a FS(progetto) = 1.200

Sup N.	FS	FTR(kN/m)	FTA(kN/m)	Bilancio(kN/m)	ESITO
1	1.447	4076.8	2817.8	695.5	Surplus
2	1.455	3828.8	2631.4	671.2	Surplus
3	1.461	4480.9	3067.8	799.5	Surplus
4	1.462	4076.1	2787.9	730.6	Surplus
5	1.464	4977.4	3399.9	897.5	Surplus
6	1.471	4299.8	2923.3	791.8	Surplus
7	1.471	4196.3	2851.7	774.2	Surplus
8	1.473	3811.7	2587.7	706.5	Surplus
9	1.474	5052.3	3428.6	938.0	Surplus
10	1.477	4297.8	2909.3	806.6	Surplus

Esito analisi: SURPLUS di RESISTENZA!

Valore minimo di SURPLUS di RESISTENZA (kN/m): 671.2

Note: FTR --> Forza totale Resistente lungo la superficie di scivolamento

FTA --> Forza totale Agente lungo la superficie di scivolamento

IMPORTANTE! : Il Deficit o il Surplus di resistenza viene espresso in kN per metro di LARGHEZZA rispetto al fronte della scarpata

TABELLA PARAMETRI CONCI DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	alpha (°)	W (kN/m)	ru (-)	U (kPa)	phi' (°)	(c',Cu) (kPa)
9.382	0.542	-26.58	0.93	0.00	0.00	25.00	15.00
9.924	0.542	-26.58	2.80	0.00	0.00	25.00	15.00
10.465	0.542	-26.58	4.67	0.00	0.00	25.00	15.00
11.007	0.542	-26.58	6.53	0.00	0.00	25.00	15.00
11.548	0.412	-26.58	6.21	0.00	0.00	25.00	15.00
11.960	0.542	-26.58	10.81	0.00	0.00	25.00	15.00
12.502	0.542	-26.58	14.66	0.00	0.00	25.00	15.00
13.043	0.542	-26.58	18.51	0.00	0.00	25.00	15.00
13.585	0.344	-26.58	13.74	0.00	0.00	25.00	15.00
13.929	0.542	2.91	23.78	0.00	0.00	25.00	15.00
14.470	0.542	2.91	25.60	0.00	0.00	25.00	15.00
15.012	0.542	2.91	27.41	0.00	0.00	25.00	15.00
15.553	0.542	2.91	29.23	0.00	0.00	25.00	15.00
16.095	0.542	2.91	31.04	0.00	0.00	25.00	15.00
16.637	0.542	2.91	32.86	0.00	0.00	25.00	15.00
17.178	0.542	2.91	34.67	0.00	0.00	25.00	15.00
17.720	0.450	2.91	30.19	0.00	0.00	25.00	15.00
18.170	0.542	2.91	37.07	0.00	0.00	25.00	15.00
18.712	0.542	2.91	37.04	0.00	0.00	25.00	15.00
19.253	0.542	2.91	37.01	0.00	0.00	25.00	15.00
19.795	0.542	2.91	36.97	0.00	0.00	25.00	15.00
20.337	0.542	2.91	36.94	0.00	0.00	25.00	15.00
20.878	0.367	2.91	25.00	0.00	0.00	25.00	15.00
21.245	0.015	9.39	1.02	0.00	0.00	25.00	15.00
21.260	0.542	9.39	37.66	0.00	0.00	25.00	15.00
21.802	0.542	9.39	39.20	0.00	0.00	25.00	15.00
22.343	0.542	9.39	40.74	0.00	0.00	25.00	15.00
22.885	0.542	9.39	42.27	0.00	0.00	25.00	15.00
23.427	0.542	9.39	43.81	0.00	0.00	25.00	15.00
23.968	0.542	9.39	45.35	0.00	0.00	25.00	15.00
24.510	0.542	9.39	46.89	0.00	0.00	25.00	15.00
25.051	0.542	9.39	48.42	0.00	0.00	25.00	15.00
25.593	0.542	9.39	49.96	0.00	0.00	25.00	15.00
26.135	0.542	9.39	51.50	0.00	0.00	25.00	15.00
26.676	0.542	9.39	53.04	0.00	0.00	25.00	15.00
27.218	0.244	9.39	24.35	0.00	0.00	25.00	15.00
27.462	0.542	9.05	55.28	0.00	0.00	25.00	15.00
28.003	0.542	9.05	56.84	0.00	0.00	25.00	15.00
28.545	0.542	9.05	58.40	0.00	0.00	25.00	15.00
29.086	0.094	9.05	10.24	0.00	0.00	25.00	15.00
29.180	0.542	9.05	59.44	0.00	0.00	25.00	15.00
29.722	0.542	9.05	59.42	0.00	0.00	25.00	15.00
30.263	0.542	9.05	59.41	0.00	0.00	25.00	15.00
30.805	0.542	9.05	59.39	0.00	0.00	25.00	15.00
31.347	0.542	9.05	59.37	0.00	0.00	25.00	15.00
31.888	0.229	9.05	25.13	0.00	0.00	25.00	15.00
32.118	0.162	16.33	17.78	0.00	0.00	25.00	15.00
32.280	0.542	16.33	59.61	0.00	0.00	25.00	15.00
32.822	0.542	16.33	60.43	0.00	0.00	25.00	15.00
33.363	0.542	16.33	61.25	0.00	0.00	25.00	15.00

33.905	0.542	16.33	62.06	0.00	0.00	25.00	15.00
34.447	0.542	16.33	62.88	0.00	0.00	25.00	15.00
34.988	0.542	16.33	63.69	0.00	0.00	25.00	15.00
35.530	0.542	16.33	64.51	0.00	0.00	25.00	15.00
36.071	0.542	16.33	65.33	0.00	0.00	25.00	15.00
36.613	0.542	16.33	66.14	0.00	0.00	25.00	15.00
37.155	0.542	16.33	66.96	0.00	0.00	25.00	15.00
37.696	0.542	16.33	67.78	0.00	0.00	25.00	15.00
38.238	0.542	16.33	68.59	0.00	0.00	25.00	15.00
38.780	0.167	16.33	21.37	0.00	0.00	25.00	15.00
38.947	0.542	23.83	69.39	0.00	0.00	25.00	15.00
39.489	0.542	23.83	69.65	0.00	0.00	25.00	15.00
40.030	0.542	23.83	69.92	0.00	0.00	25.00	15.00
40.572	0.188	23.83	24.34	0.00	0.00	25.00	15.00
40.760	0.542	23.83	69.34	0.00	0.00	25.00	15.00
41.302	0.542	23.83	67.72	0.00	0.00	25.00	15.00
41.843	0.542	23.83	66.10	0.00	0.00	25.00	15.00
42.385	0.542	23.83	64.48	0.00	0.00	25.00	15.00
42.927	0.542	23.83	62.86	0.00	0.00	25.00	15.00
43.468	0.542	23.83	61.24	0.00	0.00	25.00	15.00
44.010	0.440	23.83	48.58	0.00	0.00	25.00	15.00
44.450	0.369	23.83	40.40	0.00	0.00	25.00	15.00
44.819	0.542	19.13	59.91	0.00	0.00	25.00	15.00
45.361	0.542	19.13	60.78	0.00	0.00	25.00	15.00
45.902	0.542	19.13	61.65	0.00	0.00	25.00	15.00
46.444	0.542	19.13	62.53	0.00	0.00	25.00	15.00
46.986	0.542	19.13	63.40	0.00	0.00	25.00	15.00
47.527	0.542	19.13	64.27	0.00	0.00	25.00	15.00
48.069	0.542	19.13	65.15	0.00	0.00	25.00	15.00
48.611	0.542	19.13	66.02	0.00	0.00	25.00	15.00
49.152	0.542	19.13	66.89	0.00	0.00	25.00	15.00
49.694	0.141	19.13	17.54	0.00	0.00	25.00	15.00
49.835	0.542	24.21	67.80	0.00	0.00	25.00	15.00
50.376	0.542	24.21	68.30	0.00	0.00	25.00	15.00
50.918	0.542	24.21	68.79	0.00	0.00	25.00	15.00
51.460	0.542	24.21	69.29	0.00	0.00	25.00	15.00
52.001	0.542	24.21	69.78	0.00	0.00	25.00	15.00
52.543	0.542	24.21	70.28	0.00	0.00	25.00	15.00
53.084	0.542	24.21	70.77	0.00	0.00	25.00	15.00
53.626	0.523	24.21	68.86	0.00	0.00	25.00	15.00
54.149	0.542	26.75	71.64	0.00	0.00	25.00	15.00
54.691	0.542	26.75	71.94	0.00	0.00	25.00	15.00
55.233	0.542	26.75	72.23	0.00	0.00	25.00	15.00
55.774	0.542	26.75	72.52	0.00	0.00	25.00	15.00
56.316	0.542	26.75	72.81	0.00	0.00	25.00	15.00
56.858	0.542	26.75	73.11	0.00	0.00	25.00	15.00
57.399	0.542	26.75	73.40	0.00	0.00	25.00	15.00
57.941	0.542	26.75	73.69	0.00	0.00	25.00	15.00
58.483	0.542	26.75	73.99	0.00	0.00	25.00	15.00
59.024	0.542	26.75	74.28	0.00	0.00	25.00	15.00
59.566	0.542	26.75	74.57	0.00	0.00	25.00	15.00
60.107	0.542	26.75	74.87	0.00	0.00	25.00	15.00
60.649	0.542	26.75	75.16	0.00	0.00	25.00	15.00
61.191	0.470	26.75	65.41	0.00	0.00	25.00	15.00
61.660	0.542	29.89	75.58	0.00	0.00	25.00	15.00
62.202	0.542	29.89	75.61	0.00	0.00	25.00	15.00
62.744	0.386	29.89	53.95	0.00	0.00	25.00	15.00

63.130	0.542	29.89	74.63	0.00	0.00	25.00	15.00
63.672	0.542	29.89	72.59	0.00	0.00	25.00	15.00
64.213	0.542	29.89	70.55	0.00	0.00	25.00	15.00
64.755	0.542	29.89	68.51	0.00	0.00	25.00	15.00
65.297	0.542	29.89	66.47	0.00	0.00	25.00	15.00
65.838	0.542	29.89	64.42	0.00	0.00	25.00	15.00
66.380	0.387	29.89	44.75	0.00	0.00	25.00	15.00
66.766	0.024	46.13	2.68	0.00	0.00	25.00	15.00
66.790	0.542	46.13	60.89	0.00	0.00	25.00	15.00
67.332	0.542	46.13	59.10	0.00	0.00	25.00	15.00
67.873	0.542	46.13	57.32	0.00	0.00	25.00	15.00
68.415	0.542	46.13	55.53	0.00	0.00	25.00	15.00
68.957	0.542	46.13	53.74	0.00	0.00	25.00	15.00
69.498	0.542	46.13	51.96	0.00	0.00	25.00	15.00
70.040	0.542	46.13	50.17	0.00	0.00	25.00	15.00
70.581	0.542	46.13	48.38	0.00	0.00	25.00	15.00
71.123	0.542	46.13	46.60	0.00	0.00	25.00	15.00
71.665	0.542	46.13	44.81	0.00	0.00	25.00	15.00
72.206	0.510	46.13	40.56	0.00	0.00	25.00	15.00
72.716	0.542	55.05	40.62	0.00	0.00	25.00	15.00
73.258	0.542	55.05	37.39	0.00	0.00	25.00	15.00
73.800	0.542	55.05	34.16	0.00	0.00	25.00	15.00
74.341	0.542	55.05	30.93	0.00	0.00	25.00	15.00
74.883	0.500	55.05	25.69	0.00	0.00	25.00	15.00
75.383	0.417	54.36	19.36	0.00	0.00	25.00	15.00

LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio
dx(m) : Larghezza concio
alpha(°) : Angolo pendenza base concio
W(kN/m) : Forza peso concio
ru(-) : Coefficiente locale pressione interstiziale
U(kPa) : Pressione totale dei pori base concio
phi'(°) : Angolo di attrito efficace base concio
c'/Cu (kPa) : Coesione efficace o Resistenza al taglio in condizioni non drenate

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TABELLA DIAGRAMMA DELLE FORZE DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	ht (m)	yt (m)	yt' (--)	E(x) (kN/m)	T(x) (kN/m)	E' (kN)	rho(x) (--)	FS_qFEM (--)	FS_srmFEM (--)
9.382	0.000	35.365	-0.372	0.0000000000E+000	0.0000000000E+000	2.2039502809E+000	0.048	2.118	1.876
9.924	0.069	35.163	-0.372	3.1559069732E+000	9.7456719632E-003	9.4492981094E+000	0.048	2.118	1.876
10.465	0.139	34.962	-0.382	1.0236152117E+001	1.7108230889E-001	2.0382578321E+001	0.048	1.385	1.283
11.007	0.197	34.750	-0.343	2.5235766220E+001	1.1248232983E+000	2.9842278905E+001	0.068	1.350	1.194
11.548	0.309	34.590	-0.280	4.2563432182E+001	3.0177938912E+000	3.7557095488E+001	0.120	1.503	1.238
11.960	0.407	34.483	-0.208	5.9760412186E+001	5.3458982673E+000	4.1200242404E+001	0.163	1.699	1.307
12.502	0.587	34.392	-0.118	8.1658326819E+001	8.9381960763E+000	3.8658059035E+001			

0.196 1.965 1.402
13.043 0.821 34.355 -0.034 1.0163757261E+002 1.3079195822E+001 3.5168963841E+001
0.226 2.193 1.490
13.585 1.092 34.355 -0.006 1.1975585105E+002 1.7525906557E+001 3.3575429416E+001
0.251 2.361 1.564
13.929 1.259 34.350 0.017 1.3131927283E+002 2.0314136294E+001 3.3306172400E+001
0.263 2.461 1.604
14.470 1.252 34.370 0.064 1.4906181366E+002 2.5130627796E+001 3.2215465828E+001
0.294 2.590 1.670
15.012 1.273 34.419 0.111 1.6621735784E+002 3.0361940016E+001 3.1123441404E+001
0.323 2.668 1.730
15.553 1.317 34.490 0.145 1.8277694011E+002 3.5912539910E+001 3.0064026754E+001
0.352 2.678 1.776
16.095 1.376 34.577 0.168 1.9878485095E+002 4.1672593339E+001 2.8546088473E+001
0.379 2.622 1.801
16.637 1.443 34.672 0.180 2.1370009446E+002 4.7382060474E+001 2.7502346960E+001
0.403 2.518 1.804
17.178 1.515 34.771 0.187 2.2857735023E+002 5.3233039371E+001 2.8703549976E+001
0.426 2.395 1.793
17.720 1.591 34.874 0.179 2.4479382231E+002 5.9584733837E+001 2.8743487900E+001
0.448 2.281 1.767
18.170 1.642 34.949 0.156 2.5728246875E+002 6.4401500962E+001 2.7278779896E+001
0.462 2.205 1.742
18.712 1.695 35.029 0.142 2.7175082063E+002 6.9864087364E+001 2.6135352821E+001
0.485 2.135 1.711
19.253 1.741 35.102 0.134 2.8559414270E+002 7.5028637484E+001 2.4918336571E+001
0.506 2.083 1.682
19.795 1.785 35.174 0.134 2.9874413598E+002 7.9952687689E+001 2.3591613395E+001
0.524 2.045 1.656
20.337 1.832 35.248 0.141 3.1115025709E+002 8.4715123124E+001 2.2184751687E+001
0.541 2.019 1.636
20.878 1.883 35.327 0.154 3.2277623766E+002 8.9404492955E+001 2.0940497898E+001
0.558 2.004 1.621
21.245 1.925 35.388 0.166 3.3032862990E+002 9.2671434490E+001 2.0391428433E+001
0.570 2.000 1.614
21.260 1.925 35.390 0.196 3.3063322145E+002 9.2806655315E+001 2.0358146242E+001
0.570 2.000 1.614
21.802 1.942 35.497 0.213 3.4116169783E+002 9.7846628057E+001 1.9401698297E+001
0.581 1.983 1.609
22.343 1.977 35.622 0.247 3.5165052165E+002 1.0339387816E+002 1.9360844004E+001
0.594 1.961 1.609
22.885 2.031 35.765 0.284 3.6213474176E+002 1.0950743611E+002 1.9777305650E+001
0.609 1.932 1.614
23.427 2.106 35.930 0.326 3.7307470647E+002 1.1647488822E+002 2.0834413897E+001
0.627 1.897 1.622
23.968 2.205 36.118 0.359 3.8470406146E+002 1.2444034566E+002 2.1698573975E+001
0.649 1.856 1.632
24.510 2.316 36.318 0.379 3.9658014586E+002 1.3298338315E+002 2.2238319478E+001
0.672 1.811 1.644
25.051 2.437 36.529 0.394 4.0879419158E+002 1.4205863768E+002 2.2925015476E+001
0.695 1.765 1.654
25.593 2.564 36.745 0.379 4.2141415395E+002 1.5160617563E+002 2.2293466244E+001
0.720 1.720 1.661
26.135 2.669 36.940 0.348 4.3294406060E+002 1.6035169806E+002 2.0959338768E+001
0.740 1.684 1.664
26.676 2.762 37.123 0.327 4.4411880115E+002 1.6871281983E+002 2.0314664457E+001
0.758 1.653 1.664

27.218	2.844	37.294	0.314	4.5495035072E+002	1.7662474316E+002	2.0343030505E+001	0.773	1.626	1.660
27.462	2.879	37.370	0.295	4.5994321710E+002	1.8016584987E+002	2.0259010970E+001	0.779	1.615	1.657
28.003	2.949	37.526	0.293	4.7062806310E+002	1.8753933679E+002	2.1020304446E+001	0.791	1.592	1.649
28.545	3.025	37.688	0.284	4.8271390667E+002	1.9536466491E+002	2.1762893623E+001	0.803	1.571	1.636
29.086	3.085	37.834	0.269	4.9420317810E+002	2.0253380709E+002	2.0909887332E+001	0.812	1.553	1.621
29.180	3.094	37.858	0.246	4.9615392933E+002	2.0373264552E+002	2.0777230553E+001	0.814	1.550	1.619
29.722	3.140	37.991	0.241	5.0715523917E+002	2.1029717294E+002	2.0013863239E+001	0.828	1.534	1.604
30.263	3.182	38.119	0.237	5.1783437016E+002	2.1655279421E+002	1.9293668187E+001	0.842	1.520	1.588
30.805	3.224	38.247	0.239	5.2805551347E+002	2.2251183849E+002	1.8324001579E+001	0.854	1.506	1.573
31.347	3.269	38.378	0.239	5.3768423260E+002	2.2820135494E+002	1.6453909511E+001	0.866	1.494	1.558
31.888	3.310	38.506	0.243	5.4587955910E+002	2.3323444804E+002	1.4636555105E+001	0.876	1.484	1.545
32.118	3.333	38.565	0.256	5.4918834718E+002	2.3539476221E+002	1.3141386034E+001	0.881	1.480	1.539
32.280	3.326	38.606	0.277	5.5117553760E+002	2.3677140303E+002	1.2193517668E+001	0.884	1.478	1.536
32.822	3.322	38.761	0.303	5.5771348089E+002	2.4163781219E+002	1.1600676999E+001	0.891	1.467	1.524
33.363	3.338	38.935	0.329	5.6374221642E+002	2.4665653543E+002	1.0015912876E+001	0.899	1.456	1.513
33.905	3.362	39.117	0.353	5.6856343044E+002	2.5138036302E+002	8.5335818218E+000	0.907	1.445	1.504
34.447	3.402	39.317	0.391	5.7298639949E+002	2.5623911233E+002	8.0181317807E+000	0.916	1.434	1.496
34.988	3.468	39.541	0.433	5.7724924135E+002	2.6137038928E+002	7.7519567354E+000	0.926	1.422	1.488
35.530	3.554	39.786	0.460	5.8138387065E+002	2.6667088807E+002	7.3343675685E+000	0.936	1.411	1.481
36.071	3.649	40.039	0.449	5.8519435021E+002	2.7182676608E+002	6.2900921046E+000	0.946	1.402	1.474
36.613	3.723	40.272	0.433	5.8819774601E+002	2.7607308581E+002	4.8452355294E+000	0.953	1.395	1.469
37.155	3.800	40.508	0.427	5.9044305412E+002	2.7959108584E+002	3.4818498404E+000	0.959	1.391	1.465
37.696	3.868	40.735	0.408	5.9196953353E+002	2.8231866028E+002	2.0818522475E+000	0.963	1.390	1.462
38.238	3.925	40.950	0.388	5.9269826461E+002	2.8417762077E+002	5.4733185671E-001	0.964	1.392	1.460
38.780	3.971	41.155	0.377	5.9256244234E+002	2.8511730977E+002	-1.4131272993E+000	0.963	1.396	1.458
38.947	3.985	41.218	0.364	5.9226565689E+002	2.8516965856E+002	-2.0491162603E+000	0.963	1.397	1.458
39.489	3.941	41.413	0.355	5.9067106961E+002	2.8477627624E+002	-3.6975337136E+000	0.962	1.404	1.457
40.030	3.891	41.603	0.345	5.8826022526E+002	2.8348244051E+002	-5.1365164686E+000	0.958	1.413	1.457
40.572	3.836	41.787	0.340	5.8510682946E+002	2.8126537410E+002	-6.4637120584E+000			

0.953 1.423 1.457
40.760 3.817 41.851 0.329 5.8384961116E+002 2.8027598276E+002 -6.8645311180E+000
0.950 1.427 1.457
41.302 3.754 42.027 0.322 5.7985372935E+002 2.7683979707E+002 -7.6696346557E+000
0.951 1.439 1.457
41.843 3.688 42.200 0.320 5.7554131714E+002 2.7285194622E+002 -8.0657040269E+000
0.950 1.450 1.457
42.385 3.622 42.373 0.324 5.7111638480E+002 2.6853781325E+002 -8.0860875630E+000
0.947 1.459 1.458
42.927 3.560 42.550 0.317 5.6678189169E+002 2.6414974051E+002 -7.3264045377E+000
0.945 1.467 1.458
43.468 3.487 42.717 0.314 5.6317990206E+002 2.6028408387E+002 -6.2103195713E+000
0.943 1.470 1.459
44.010 3.421 42.890 0.327 5.6005443161E+002 2.5691445024E+002 -5.2646740346E+000
0.943 1.471 1.460
44.450 3.374 43.038 0.351 5.5791792186E+002 2.5468489517E+002 -4.4756044823E+000
0.944 1.468 1.462
44.819 3.348 43.175 0.368 5.5638314136E+002 2.5320317526E+002 -3.5367743962E+000
0.938 1.463 1.463
45.361 3.358 43.373 0.389 5.5496183630E+002 2.5208461203E+002 -2.1915632660E+000
0.931 1.455 1.466
45.902 3.394 43.596 0.431 5.5400908408E+002 2.5183509019E+002 -1.4323230723E+000
0.927 1.446 1.469
46.444 3.449 43.839 0.455 5.5341024203E+002 2.5237630827E+002 -9.4906238723E-001
0.925 1.437 1.473
46.986 3.512 44.089 0.467 5.5298099216E+002 2.5348760540E+002 -8.0446162812E-001
0.925 1.428 1.475
47.527 3.579 44.345 0.475 5.5253879195E+002 2.5498952361E+002 -9.8913515275E-001
0.926 1.420 1.477
48.069 3.650 44.604 0.479 5.5190949058E+002 2.5669635349E+002 -1.4856477813E+000
0.929 1.412 1.477
48.611 3.722 44.863 0.466 5.5092943255E+002 2.5841771399E+002 -2.2583817362E+000
0.932 1.405 1.476
49.152 3.780 45.109 0.451 5.4946305078E+002 2.5991646829E+002 -3.2666791407E+000
0.934 1.399 1.473
49.694 3.835 45.352 0.449 5.4739073325E+002 2.6113244775E+002 -4.5480145506E+000
0.936 1.392 1.469
49.835 3.849 45.415 0.459 5.4672372746E+002 2.6138507764E+002 -4.9731180943E+000
0.937 1.390 1.467
50.376 3.856 45.665 0.470 5.4353569925E+002 2.6210438239E+002 -6.5984343041E+000
0.940 1.381 1.461
50.918 3.872 45.924 0.487 5.3957583389E+002 2.6242902899E+002 -8.0010017052E+000
0.943 1.371 1.452
51.460 3.897 46.193 0.504 5.3486844486E+002 2.6232240717E+002 -9.3580578372E+000
0.945 1.360 1.442
52.001 3.931 46.470 0.521 5.2943851973E+002 2.6176621408E+002 -1.0668384669E+001
0.947 1.347 1.430
52.543 3.974 46.757 0.538 5.2331169143E+002 2.6075721793E+002 -1.1930753588E+001
0.947 1.334 1.417
53.084 4.027 47.053 0.555 5.1651427845E+002 2.5930360776E+002 -1.3143790407E+001
0.947 1.320 1.403
53.626 4.089 47.359 0.560 5.0907340236E+002 2.5741983337E+002 -1.4011292365E+001
0.946 1.306 1.388
54.149 4.144 47.649 0.545 5.0160167041E+002 2.5525517870E+002 -1.4388813892E+001
0.944 1.292 1.372
54.691 4.161 47.939 0.537 4.9374470890E+002 2.5272655841E+002 -1.4851415433E+001
0.942 1.280 1.356

55.233	4.179	48.231	0.540	4.8551356040E+002	2.4989408228E+002	-1.5494649495E+001	0.939	1.268	1.340
55.774	4.199	48.524	0.543	4.7695980198E+002	2.4678616651E+002	-1.6042654050E+001	0.935	1.257	1.324
56.316	4.221	48.819	0.545	4.6813501594E+002	2.4342765749E+002	-1.6495321043E+001	0.931	1.247	1.307
56.858	4.244	49.115	0.547	4.5909089643E+002	2.3983784863E+002	-1.6852241124E+001	0.926	1.237	1.290
57.399	4.268	49.411	0.552	4.4987946917E+002	2.3602766871E+002	-1.7235546945E+001	0.920	1.229	1.273
57.941	4.296	49.712	0.554	4.4042012551E+002	2.3193091487E+002	-1.7484228349E+001	0.914	1.222	1.256
58.483	4.321	50.011	0.551	4.3093930885E+002	2.2763900056E+002	-1.7629482576E+001	0.906	1.215	1.240
59.024	4.347	50.310	0.549	4.2132261548E+002	2.2308072908E+002	-1.8099124007E+001	0.897	1.208	1.226
59.566	4.370	50.606	0.541	4.1133304981E+002	2.1810553423E+002	-1.8515337857E+001	0.887	1.202	1.212
60.107	4.387	50.896	0.536	4.0126548398E+002	2.1284366774E+002	-1.8690626300E+001	0.876	1.196	1.200
60.649	4.404	51.186	0.535	3.9108603339E+002	2.0724654551E+002	-1.8918998138E+001	0.863	1.191	1.190
61.191	4.420	51.475	0.515	3.8077107893E+002	2.0127323953E+002	-1.9265540993E+001	0.848	1.187	1.183
61.660	4.415	51.707	0.481	3.7163286860E+002	1.9571997576E+002	-1.9598399155E+001	0.834	1.184	1.180
62.202	4.358	51.961	0.465	3.6092970411E+002	1.8891272756E+002	-2.0301002117E+001	0.817	1.183	1.178
62.744	4.296	52.210	0.463	3.4964137850E+002	1.8126202828E+002	-2.1996232181E+001	0.796	1.186	1.180
63.130	4.254	52.391	0.447	3.4082471936E+002	1.7491360235E+002	-2.2657185733E+001	0.778	1.189	1.184
63.672	4.177	52.625	0.421	3.2867651813E+002	1.6591971466E+002	-2.2408790712E+001	0.761	1.195	1.193
64.213	4.088	52.847	0.406	3.1654992267E+002	1.5682745535E+002	-2.2465706747E+001	0.743	1.203	1.205
64.755	3.994	53.065	0.403	3.0434006594E+002	1.4770847601E+002	-2.2709236677E+001	0.724	1.213	1.219
65.297	3.902	53.284	0.409	2.9194966152E+002	1.3862112195E+002	-2.3002150853E+001	0.704	1.224	1.236
65.838	3.814	53.507	0.409	2.7942249932E+002	1.2970577957E+002	-2.3365389878E+001	0.684	1.236	1.255
66.380	3.723	53.727	0.384	2.6663860854E+002	1.2096472046E+002	-2.4168745707E+001	0.663	1.248	1.276
66.766	3.637	53.864	0.370	2.5713662622E+002	1.1477520456E+002	-2.5625660840E+001	0.648	1.256	1.291
66.790	3.628	53.879	0.630	2.5653281840E+002	1.1439291978E+002	-2.5734644352E+001	0.647	1.257	1.292
67.332	3.405	54.220	0.610	2.4203229356E+002	1.0566115088E+002	-2.7689714344E+001	0.624	1.271	1.314
67.873	3.161	54.539	0.622	2.2653734945E+002	9.6683871055E+001	-2.9533541163E+001	0.598	1.287	1.337
68.415	2.952	54.893	0.684	2.1003946019E+002	8.7313136207E+001	-3.1295722074E+001	0.569	1.303	1.361
68.957	2.776	55.281	0.743	1.9263559631E+002	7.7521972674E+001	-3.2717255246E+001	0.534	1.320	1.384
69.498	2.629	55.698	0.797	1.7459780117E+002	6.7449713502E+001	-3.3775163349E+001			

0.493 1.337 1.405
70.040 2.512 56.144 0.851 1.5604793596E+002 5.7204749743E+001 -3.4604507900E+001
0.447 1.353 1.425
70.581 2.424 56.620 0.870 1.3711173578E+002 4.6945546755E+001 -3.3612641302E+001
0.394 1.369 1.443
71.123 2.328 57.087 0.850 1.1963633105E+002 3.7755334178E+001 -3.0600989340E+001
0.341 1.382 1.457
71.665 2.218 57.541 0.823 1.0396256659E+002 2.9967941227E+001 -2.8708670189E+001
0.291 1.392 1.468
72.206 2.092 57.978 0.818 8.8537056614E+001 2.1833437300E+001 -2.7976022024E+001
0.229 1.399 1.474
72.716 1.985 58.401 0.856 7.4509871775E+001 1.5014098017E+001 -2.7332925307E+001
0.170 1.402 1.474
73.258 1.687 58.878 0.926 5.9802584743E+001 9.0213744016E+000 -2.7242620230E+001
0.115 1.404 1.473
73.800 1.438 59.404 1.031 4.4998726977E+001 4.4184152618E+000 -2.7286412936E+001
0.064 1.411 1.480
74.341 1.254 59.995 1.118 3.0244000571E+001 1.4754877054E+000 -2.5731727346E+001
0.048 1.432 1.507
74.883 1.099 60.615 1.164 1.7124288865E+001 3.2566365496E-001 -2.2466550021E+001
0.048 1.485 1.561
75.383 0.975 61.207 1.164 6.7002071686E+000 5.5073287920E-002 -1.8240298756E+001
0.048 1.567 1.644

LEGENDA SIMBOLI
X(m) : Ascissa sinistra concio
ht(m) : Altezza linea di thrust da nodo sinistro base concio
yt(m) : coordinata Y linea di trust
yt'(-) : gradiente pendenza locale linea di trust
E(x)(kN/m) : Forza Normale interconcio
T(x)(kN/m) : Forza Tangenziale interconcio
E' (kN) : derivata Forza normale interconcio
Rho(x) (-) : fattore mobilizzazione resistenza al taglio verticale interconcio ZhU et al.(2003)
FS_qFEM(x)(-) : fattore di sicurezza locale stimato (locale in X) by qFEM
FS_srmFEM(x)(-) : fattore di sicurezza locale stimato (locale in X) by SRM Procedure
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TABELLA SFORZI DI TAGLIO DISTRIBUITI LUNGO SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	dl (m)	alpha (°)	TauStress (kPa)	TauF (kN/m)	TauStrength (kPa)	TauS (kN/m)
9.382	0.542	0.606	-26.576	-0.604	-0.366	15.680	9.496
9.924	0.542	0.606	-26.576	-1.812	-1.098	17.272	10.460
10.465	0.542	0.606	-26.576	-3.021	-1.829	19.990	12.106
11.007	0.542	0.606	-26.576	-4.229	-2.561	22.966	13.909
11.548	0.412	0.460	-26.576	-5.292	-2.435	26.191	12.052
11.960	0.542	0.606	-26.576	-6.997	-4.237	28.989	17.556
12.502	0.542	0.606	-26.576	-9.487	-5.746	32.685	19.795
13.043	0.542	0.606	-26.576	-11.978	-7.254	35.955	21.775
13.585	0.344	0.384	-26.576	-14.013	-5.384	38.097	14.636
13.929	0.542	0.542	2.908	4.940	2.679	38.841	21.065
14.470	0.542	0.542	2.908	5.317	2.883	40.695	22.070
15.012	0.542	0.542	2.908	5.694	3.088	42.479	23.038
15.553	0.542	0.542	2.908	6.071	3.292	44.184	23.963

16.095	0.542	0.542	2.908	6.448	3.497	45.702	24.785
16.637	0.542	0.542	2.908	6.825	3.701	47.358	25.684
17.178	0.542	0.542	2.908	7.202	3.906	49.273	26.723
17.720	0.450	0.451	2.908	7.547	3.401	50.295	22.664
18.170	0.542	0.542	2.908	7.700	4.176	50.684	27.488
18.712	0.542	0.542	2.908	7.694	4.172	50.441	27.356
19.253	0.542	0.542	2.908	7.687	4.169	50.240	27.247
19.795	0.542	0.542	2.908	7.680	4.165	50.095	27.168
20.337	0.542	0.542	2.908	7.673	4.162	50.015	27.125
20.878	0.367	0.367	2.908	7.668	2.817	50.088	18.400
21.245	0.015	0.015	9.390	15.077	0.228	47.604	0.721
21.260	0.542	0.549	9.390	15.389	8.448	48.293	26.512
21.802	0.542	0.549	9.390	16.017	8.793	49.775	27.326
22.343	0.542	0.549	9.390	16.645	9.138	51.281	28.153
22.885	0.542	0.549	9.390	17.274	9.483	52.905	29.044
23.427	0.542	0.549	9.390	17.902	9.828	54.588	29.968
23.968	0.542	0.549	9.390	18.530	10.173	56.099	30.798
24.510	0.542	0.549	9.390	19.158	10.518	57.591	31.617
25.051	0.542	0.549	9.390	19.787	10.863	59.059	32.423
25.593	0.542	0.549	9.390	20.415	11.208	60.007	32.944
26.135	0.542	0.549	9.390	21.043	11.553	61.126	33.558
26.676	0.542	0.549	9.390	21.672	11.898	62.218	34.157
27.218	0.244	0.247	9.390	22.127	5.463	63.127	15.585
27.462	0.542	0.548	9.051	22.027	12.081	64.084	35.148
28.003	0.542	0.548	9.051	22.648	12.422	65.573	35.964
28.545	0.542	0.548	9.051	23.270	12.763	66.591	36.523
29.086	0.094	0.095	9.051	23.634	2.238	67.255	6.369
29.180	0.542	0.548	9.051	23.685	12.990	67.200	36.857
29.722	0.542	0.548	9.051	23.678	12.987	67.055	36.777
30.263	0.542	0.548	9.051	23.672	12.983	66.915	36.701
30.805	0.542	0.548	9.051	23.665	12.979	66.787	36.631
31.347	0.542	0.548	9.051	23.658	12.976	66.495	36.470
31.888	0.229	0.232	9.051	23.654	5.493	66.514	15.447
32.118	0.162	0.169	16.327	35.777	6.057	61.481	10.409
32.280	0.542	0.564	16.327	35.977	20.305	61.759	34.857
32.822	0.542	0.564	16.327	36.469	20.583	62.406	35.222
33.363	0.542	0.564	16.327	36.962	20.861	63.020	35.568
33.905	0.542	0.564	16.327	37.455	21.139	63.665	35.932
34.447	0.542	0.564	16.327	37.947	21.417	64.320	36.302
34.988	0.542	0.564	16.327	38.440	21.695	64.968	36.668
35.530	0.542	0.564	16.327	38.933	21.973	65.593	37.020
36.071	0.542	0.564	16.327	39.425	22.251	66.163	37.342
36.613	0.542	0.564	16.327	39.918	22.530	66.746	37.671
37.155	0.542	0.564	16.327	40.411	22.808	67.324	37.997
37.696	0.542	0.564	16.327	40.903	23.086	67.897	38.321
38.238	0.542	0.564	16.327	41.396	23.364	68.466	38.642
38.780	0.167	0.174	16.327	41.718	7.279	68.826	12.009
38.947	0.542	0.592	23.829	53.990	31.968	63.722	37.731
39.489	0.542	0.592	23.829	54.198	32.091	64.150	37.984
40.030	0.542	0.592	23.829	54.406	32.214	64.584	38.241
40.572	0.188	0.206	23.829	54.546	11.212	64.879	13.336
40.760	0.542	0.592	23.829	53.952	31.946	64.500	38.191
41.302	0.542	0.592	23.829	52.692	31.199	63.512	37.606
41.843	0.542	0.592	23.829	51.431	30.453	62.464	36.986
42.385	0.542	0.592	23.829	50.171	29.707	61.349	36.326
42.927	0.542	0.592	23.829	48.911	28.961	60.075	35.571
43.468	0.542	0.592	23.829	47.650	28.214	58.808	34.821

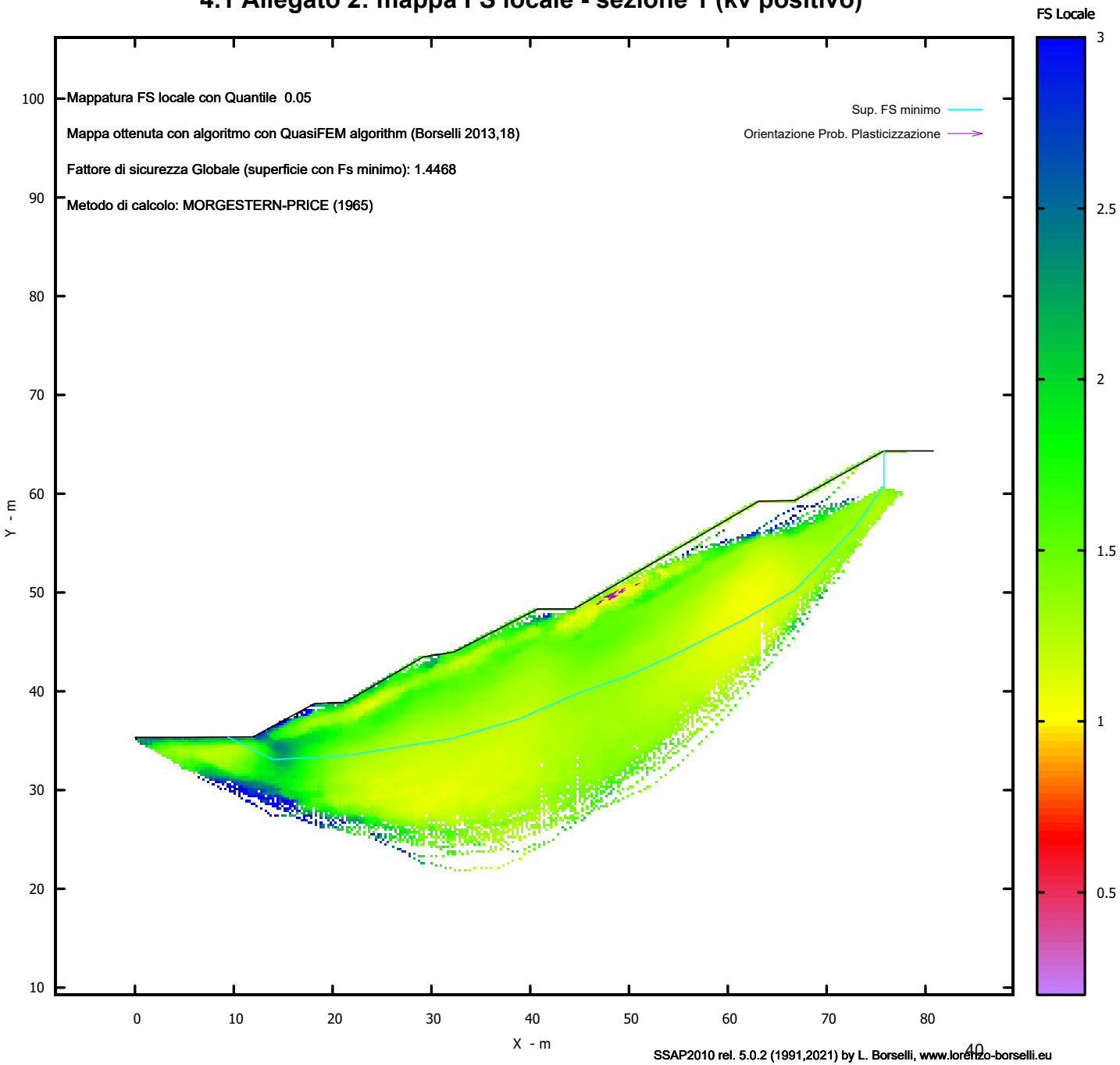
44.010	0.440	0.481	23.829	46.508	22.380	57.612	27.723
44.450	0.369	0.403	23.829	46.135	18.613	57.124	23.047
44.819	0.542	0.573	19.127	40.362	23.139	60.113	34.462
45.361	0.542	0.573	19.127	40.950	23.476	60.719	34.809
45.902	0.542	0.573	19.127	41.538	23.813	61.329	35.159
46.444	0.542	0.573	19.127	42.127	24.151	61.953	35.517
46.986	0.542	0.573	19.127	42.715	24.488	62.587	35.880
47.527	0.542	0.573	19.127	43.304	24.825	63.232	36.250
48.069	0.542	0.573	19.127	43.892	25.163	63.888	36.626
48.611	0.542	0.573	19.127	44.481	25.500	64.557	37.010
49.152	0.542	0.573	19.127	45.069	25.838	65.231	37.396
49.694	0.141	0.149	19.127	45.440	6.774	65.659	9.788
49.835	0.542	0.594	24.206	53.271	31.635	62.005	36.821
50.376	0.542	0.594	24.206	53.660	31.866	62.460	37.092
50.918	0.542	0.594	24.206	54.048	32.096	62.927	37.369
51.460	0.542	0.594	24.206	54.437	32.327	63.398	37.649
52.001	0.542	0.594	24.206	54.825	32.558	63.870	37.929
52.543	0.542	0.594	24.206	55.213	32.788	64.340	38.208
53.084	0.542	0.594	24.206	55.602	33.019	64.806	38.485
53.626	0.523	0.574	24.206	55.984	32.126	65.245	37.440
54.149	0.542	0.607	26.752	59.706	36.215	63.623	38.591
54.691	0.542	0.607	26.752	59.950	36.363	63.936	38.781
55.233	0.542	0.607	26.752	60.194	36.511	64.238	38.964
55.774	0.542	0.607	26.752	60.438	36.659	64.529	39.141
56.316	0.542	0.607	26.752	60.682	36.808	64.814	39.314
56.858	0.542	0.607	26.752	60.927	36.956	65.094	39.484
57.399	0.542	0.607	26.752	61.171	37.104	65.400	39.669
57.941	0.542	0.607	26.752	61.415	37.252	65.670	39.833
58.483	0.542	0.607	26.752	61.659	37.400	65.969	40.014
59.024	0.542	0.607	26.752	61.904	37.548	66.325	40.230
59.566	0.542	0.607	26.752	62.148	37.696	66.631	40.416
60.107	0.542	0.607	26.752	62.392	37.845	66.955	40.613
60.649	0.542	0.607	26.752	62.636	37.993	67.296	40.819
61.191	0.470	0.526	26.752	62.864	33.063	67.645	35.577
61.660	0.542	0.625	29.891	66.789	41.726	65.615	40.992
62.202	0.542	0.625	29.891	66.817	41.743	66.062	41.272
62.744	0.386	0.446	29.891	66.841	29.787	66.713	29.729
63.130	0.542	0.625	29.891	65.950	41.202	66.131	41.315
63.672	0.542	0.625	29.891	64.147	40.075	64.907	40.550
64.213	0.542	0.625	29.891	62.344	38.948	63.648	39.763
64.755	0.542	0.625	29.891	60.540	37.822	62.358	38.958
65.297	0.542	0.625	29.891	58.737	36.695	60.998	38.108
65.838	0.542	0.625	29.891	56.934	35.569	59.636	37.257
66.380	0.387	0.446	29.891	55.389	24.704	58.509	26.096
66.766	0.024	0.034	46.132	60.467	2.051	47.043	1.596
66.790	0.542	0.782	46.132	59.514	46.515	46.594	36.418
67.332	0.542	0.782	46.132	57.767	45.150	46.129	36.054
67.873	0.542	0.782	46.132	56.021	43.785	45.801	35.797
68.415	0.542	0.782	46.132	54.274	42.420	45.497	35.560
68.957	0.542	0.782	46.132	52.528	41.055	45.064	35.222
69.498	0.542	0.782	46.132	50.781	39.690	44.532	34.806
70.040	0.542	0.782	46.132	49.034	38.325	43.854	34.276
70.581	0.542	0.782	46.132	47.288	36.960	42.178	32.966
71.123	0.542	0.782	46.132	45.541	35.594	40.195	31.416
71.665	0.542	0.782	46.132	43.795	34.229	39.824	31.126
72.206	0.510	0.736	46.132	42.099	30.985	38.330	28.211
72.716	0.542	0.945	55.049	36.738	34.735	31.281	29.576

73.258	0.542	0.945	55.049	33.819	31.975	29.100	27.513
73.800	0.542	0.945	55.049	30.899	29.214	26.656	25.202
74.341	0.542	0.945	55.049	27.980	26.454	24.082	22.769
74.883	0.500	0.873	55.049	25.173	21.973	22.451	19.597
75.383	0.417	0.716	54.360	22.965	16.435	21.785	15.590

LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio
dx(m) : Larghezza concio
dl(m) : lunghezza base concio
alpha(°) : Angolo pendenza base concio
TauStress(kPa) : Sforzo di taglio su base concio
TauF (kN/m) : Forza di taglio su base concio
TauStrength(kPa) : Resistenza al taglio su base concio
TauS (kN/m) : Forza resistente al taglio su base concio

4.1 Allegato 2: mappa FS locale - sezione 1 (kv positivo)



SSAP2010 rel. 5.0.2 (1991,2021) by L. Borselli, www.lorenzo-borselli.eu

https://WWW.SSAP.EU

5 Tabultato verifica stabilità - sezione 2 (kv negativo)

SSAP 5.0.2 - Slope Stability Analysis Program (1991,2021)
WWW.SSAP.EU
Build No. 11893
BY
Dr. Geol. LORENZO BORSELLI *,**
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** Gia' Ricercatore CNR-IRPI fino a Luglio 2011

Ultima Revisione struttura tabelle del report: 21 Febbraio 2021

Data: 23/4/2021

Localita' : "Puro Vecchio" - Trani (BAT)

Descrizione: Chiusura definitiva lotti I e II
Modello pendio: Modello assemblato.mod

---------- PARAMETRI DEL MODELLO DEL PENDIO ----------

__ PARAMETRI GEOMETRICI - Coordinate X Y (in m) __

SUP T.		SUP 2		SUP 3		SUP 4	
X	Y	X	Y	X	Y	X	Y
0.00	0.00	-	-	-	-	-	-
5.00	0.00	-	-	-	-	-	-
13.80	4.67	-	-	-	-	-	-
16.50	3.89	-	-	-	-	-	-
20.18	3.91	-	-	-	-	-	-
25.50	7.40	-	-	-	-	-	-
28.71	6.90	-	-	-	-	-	-
30.98	8.00	-	-	-	-	-	-
37.98	12.42	-	-	-	-	-	-
40.25	12.43	-	-	-	-	-	-
49.51	16.90	-	-	-	-	-	-
53.21	16.90	-	-	-	-	-	-
72.87	27.44	-	-	-	-	-	-
75.67	27.63	-	-	-	-	-	-
79.38	29.83	-	-	-	-	-	-
82.23	29.80	-	-	-	-	-	-
94.09	35.44	-	-	-	-	-	-
99.09	35.44	-	-	-	-	-	-

ASSENZA DI FALDA

------- PARAMETRI GEOMECCANICI -------

	fi`	C`	Cu	Gamm	Gamm_sat	STR_IDX	sgci	GSI	mi	D
STRATO 1	25.00	15.00	0.00	12.20	13.00	1.967	0.00	0.00	0.00	0.00

LEGENDA: fi`_____ Angolo di attrito interno efficace(in gradi)

C` _____ Coesione efficace (in Kpa)
Cu _____ Resistenza al taglio Non drenata (in Kpa)
Gamm _____ Peso di volume terreno fuori falda (in KN/m^3)
Gamm_sat __ Peso di volume terreno immerso (in KN/m^3)
STR_IDX ___ Indice di resistenza (usato in solo in 'SNIFF SEARCH) (adimensionale)
---- SOLO Per AMMASSI ROCCIOSI FRATTURATI - Parametri Criterio di Rottura di Hoek (2002)----
sigci _____ Resistenza Compressione Uniassiale Roccia Intatta (in MPa)
GSI _____ Geological Strenght Index ammasso(adimensionale)
mi _____ Indice litologico ammasso(adimensionale)
D _____ Fattore di disturbo ammasso(adimensionale)
Fattore di riduzione NTC2018: gammaPHI=1.25 e gammaC=1.25 - DISATTIVATO (solo per ROCCE)

Uso CRITERIO DI ROTTURA Hoek et al.(2002,2006) - non-lineare - Generalizzato, secondo Lei et al.(2016)

---------- INFORMAZIONI GENERAZIONE SUPERFICI RANDOM ----------
*** PARAMETRI PER LA GENERAZIONE DELLE SUPERFICI

MOTORE DI RICERCA: RANDOM SEARCH - Siegel (1981)
FILTRAGGIO SUPERFICI : ATTIVATO
COORDINATE X1,X2,Y OSTACOLO : 0.00 0.00 0.00
LUNGHEZZA MEDIA SEGMENTI (m)*: 4.0 (+/-) 50%
INTERVALLO ASCISSE RANDOM STARTING POINT (Xmin .. Xmax): 0.01 13.80
LIVELLO MINIMO CONSIDERATO (Ymin): 0.00
INTERVALLO ASCISSE AMMESSO PER LA TERMINAZIONE (Xmin .. Xmax): 25.50 99.09
TOTALE SUPERFICI GENERATE : 10000

NOTA IMPORTANTE: La lunghezza media dei segmenti non viene cosiderata nel casodi uso del motore di ricerca NEW RANOM SEARCH

---------- INFORMAZIONI PARAMETRI DI CALCOLO ----------
METODO DI CALCOLO : MORGENSTERN - PRICE (Morgenstern & Price, 1965)
METODO DI ESPLORAZIONE CAMPO VALORI (lambda0,Fs0) ADOTTATO : B (piu' accurato)
COEFFICIENTE SISMICO UTILIZZATO Kh : 0.0620
COEFFICIENTE SISMICO UTILIZZATO Kv (assunto Negativo): -0.0310
COEFFICIENTE c=Kv/Kh UTILIZZATO : 0.5000
FORZA ORIZZONTALE ADDIZIONALE IN TESTA (kN/m): 0.00
FORZA ORIZZONTALE ADDIZIONALE ALLA BASE (kN/m): 0.00

N.B. Le forze orizzontali addizionali in testa e alla base sono poste uguali a 0 durante tutte le verifiche globali

---------- RISULTATO FINALE ELABORAZIONI ----------

DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs *

Fattore di sicurezza (FS) 1.5021 - Min. - X Y Lambda= 0.4970

13.29	4.40
17.33	2.14
22.92	2.07
27.42	2.04
31.18	1.33
37.18	1.86
41.60	2.56
46.79	3.78
51.89	5.19
56.48	7.62
59.19	8.61
62.76	10.09

67.72	12.01
73.24	14.32
76.76	15.76
80.87	18.57
82.42	20.10
87.08	23.21
90.83	26.27
92.75	27.96
95.83	31.66
96.49	32.47
96.49	35.44

Fattore di sicurezza (FS) 1.5238 - N.2 -- X Y Lambda= 0.4870

9.90	2.60
19.26	1.20
22.94	0.87
28.47	0.82
37.21	0.51
43.61	2.31
52.42	5.49
58.57	7.68
63.67	10.30
72.69	13.72
76.72	15.29
83.24	20.39
88.52	24.81
93.05	29.36
94.75	31.93
94.75	35.44

Fattore di sicurezza (FS) 1.5259 - N.3 -- X Y Lambda= 0.4976

12.04	3.74
17.41	2.11
20.29	1.66
27.55	1.57
33.26	1.46
38.75	2.66
44.17	4.09
49.08	5.46
53.77	6.80
60.60	8.73
65.38	10.54
68.95	12.62
75.84	16.55
80.45	19.42
82.84	21.32
85.02	23.24
90.34	29.75
90.97	30.67
90.97	33.96

Fattore di sicurezza (FS) 1.5307 - N.4 -- X Y Lambda= 0.4860

11.70	3.56
16.71	2.00

22.07	0.38
26.54	0.51
33.04	0.75
40.18	2.18
48.01	3.51
55.19	6.76
59.56	8.16
64.65	10.99
71.63	13.65
74.58	15.37
79.65	19.91
85.85	24.01
90.95	29.79
91.59	30.73
91.59	34.25

Fattore di sicurezza (FS) 1.5310 - N.5 -- X Y Lambda= 0.5110

13.57	4.55
17.50	3.45
23.99	3.13
30.67	3.06
36.71	3.04
41.77	4.32
46.45	6.20
50.57	6.84
57.43	7.44
64.53	10.97
71.61	13.93
78.21	17.07
84.75	20.97
88.27	24.54
91.66	27.65
94.65	31.60
95.29	32.38
95.29	35.44

Fattore di sicurezza (FS) 1.5314 - N.6 -- X Y Lambda= 0.4695

12.26	3.85
18.95	1.88
23.40	0.75
29.99	1.01
36.83	1.28
39.97	1.83
47.28	3.28
56.24	5.52
60.44	7.58
67.37	11.19
71.86	13.44
75.35	15.69
81.69	21.08
86.60	25.47
89.73	29.82
89.73	33.36

Fattore di sicurezza (FS) 1.5354 - N.7 -- X Y Lambda= 0.4989

X	Y
12.38	3.92
19.90	0.47
29.69	1.00
37.59	2.63
45.29	3.48
49.77	3.98
57.97	6.37
62.04	7.72
68.89	11.02
72.53	13.62
79.91	17.80
86.46	24.65
91.52	30.07
92.81	31.38
92.81	34.83

Fattore di sicurezza (FS) 1.5394 - N.8 -- X Y Lambda= 0.4634

X	Y
12.43	3.94
18.66	1.45
25.94	0.70
32.51	0.12
35.23	0.80
39.45	1.01
47.06	2.65
54.08	4.35
58.73	6.64
63.50	9.32
69.56	12.76
75.68	17.26
81.54	21.18
86.87	26.71
89.34	29.94
89.34	33.18

Fattore di sicurezza (FS) 1.5445 - N.9 -- X Y Lambda= 0.4891

X	Y
13.22	4.36
16.26	2.77
18.21	1.90
19.87	1.54
23.45	0.57
25.53	0.37
26.81	0.29
29.34	0.56
32.73	1.32
36.01	1.16
38.69	1.60
41.88	2.49
44.47	3.68
47.05	4.75
50.55	6.20
51.82	6.72
54.93	7.44
58.22	8.27
60.35	8.81

62.25	9.67
63.68	10.17
65.25	10.95
67.70	12.42
70.50	14.12
71.78	14.79
74.53	17.05
76.37	18.19
78.04	19.30
80.71	21.91
82.51	23.71
83.54	24.68
86.01	26.68
87.56	28.13
88.70	29.52
88.70	32.88

Fattore di sicurezza (FS) 1.5462 - N.10 -- X Y Lambda= 0.5293

9.71	2.50
13.48	2.54
22.06	1.92
26.77	1.70
34.36	2.37
37.32	3.15
45.90	5.34
49.20	6.45
54.07	8.78
61.51	11.09
69.33	13.50
76.17	15.86
81.46	18.59
87.22	23.45
93.41	28.57
95.36	31.09
96.04	31.97
96.04	35.44

---------- ANALISI DEFICIT DI RESISTENZA ----------
DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs *

Analisi Deficit in riferimento a FS(progetto) = 1.200

Sup N.	FS	FTR(kN/m)	FTA(kN/m)	Bilancio(kN/m)	ESITO
1	1.502	5354.8	3564.9	1076.9	Surplus
2	1.524	5610.5	3682.0	1192.1	Surplus
3	1.526	4921.5	3225.2	1051.2	Surplus
4	1.531	5170.5	3377.9	1117.1	Surplus
5	1.531	4944.5	3229.5	1069.1	Surplus
6	1.531	5193.6	3391.5	1123.8	Surplus
7	1.535	5405.6	3520.7	1180.8	Surplus
8	1.539	5211.6	3385.4	1149.1	Surplus
9	1.544	4758.5	3081.0	1061.3	Surplus
10	1.546	5066.9	3276.9	1134.6	Surplus

Esito analisi: SURPLUS di RESISTENZA!

Valore minimo di SURPLUS di RESISTENZA (kN/m): 1051.2

Note: FTR --> Forza totale Resistente lungo la superficie di scivolamento

FTA --> Forza totale Agente lungo la superficie di scivolamento

IMPORTANTE! : Il Deficit o il Surplus di resistenza viene espresso in kN per metro di LARGHEZZA della scarpata

TABELLA PARAMETRI CONCI DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	alpha (°)	W (kN/m)	ru (-)	U (kPa)	phi' (°)	(c',CU) (kPa)
13.290	0.510	-29.22	1.67	0.00	0.00	25.00	15.00
13.800	0.652	-29.22	4.96	0.00	0.00	25.00	15.00
14.452	0.652	-29.22	6.32	0.00	0.00	25.00	15.00
15.104	0.652	-29.22	7.68	0.00	0.00	25.00	15.00
15.756	0.652	-29.22	9.04	0.00	0.00	25.00	15.00
16.408	0.092	-29.22	1.38	0.00	0.00	25.00	15.00
16.500	0.652	-29.22	11.33	0.00	0.00	25.00	15.00
17.152	0.181	-29.22	3.65	0.00	0.00	25.00	15.00
17.333	0.652	-0.66	13.58	0.00	0.00	25.00	15.00
17.985	0.652	-0.66	13.66	0.00	0.00	25.00	15.00
18.637	0.652	-0.66	13.75	0.00	0.00	25.00	15.00
19.289	0.652	-0.66	13.83	0.00	0.00	25.00	15.00
19.941	0.239	-0.66	5.09	0.00	0.00	25.00	15.00
20.180	0.652	-0.66	15.59	0.00	0.00	25.00	15.00
20.832	0.652	-0.66	18.94	0.00	0.00	25.00	15.00
21.484	0.652	-0.66	22.29	0.00	0.00	25.00	15.00
22.136	0.652	-0.66	25.65	0.00	0.00	25.00	15.00
22.788	0.131	-0.66	5.55	0.00	0.00	25.00	15.00
22.919	0.652	-0.49	29.67	0.00	0.00	25.00	15.00
23.571	0.652	-0.49	33.01	0.00	0.00	25.00	15.00
24.223	0.652	-0.49	36.35	0.00	0.00	25.00	15.00
24.875	0.625	-0.49	37.99	0.00	0.00	25.00	15.00
25.500	0.652	-0.49	40.85	0.00	0.00	25.00	15.00
26.152	0.652	-0.49	40.11	0.00	0.00	25.00	15.00
26.804	0.613	-0.49	37.01	0.00	0.00	25.00	15.00
27.417	0.652	-10.67	39.13	0.00	0.00	25.00	15.00
28.069	0.641	-10.67	38.65	0.00	0.00	25.00	15.00
28.710	0.652	-10.67	41.06	0.00	0.00	25.00	15.00
29.362	0.652	-10.67	44.45	0.00	0.00	25.00	15.00
30.014	0.652	-10.67	47.83	0.00	0.00	25.00	15.00
30.666	0.314	-10.67	24.23	0.00	0.00	25.00	15.00
30.980	0.199	-10.67	15.82	0.00	0.00	25.00	15.00
31.179	0.652	5.12	53.77	0.00	0.00	25.00	15.00
31.831	0.652	5.12	56.49	0.00	0.00	25.00	15.00
32.483	0.652	5.12	59.22	0.00	0.00	25.00	15.00
33.135	0.652	5.12	61.94	0.00	0.00	25.00	15.00
33.787	0.652	5.12	64.66	0.00	0.00	25.00	15.00
34.439	0.652	5.12	67.39	0.00	0.00	25.00	15.00
35.091	0.652	5.12	70.11	0.00	0.00	25.00	15.00
35.743	0.652	5.12	72.83	0.00	0.00	25.00	15.00
36.395	0.652	5.12	75.56	0.00	0.00	25.00	15.00

37.047	0.128	5.12	15.16	0.00	0.00	25.00	15.00
37.176	0.652	8.91	78.65	0.00	0.00	25.00	15.00
37.828	0.152	8.91	18.73	0.00	0.00	25.00	15.00
37.980	0.652	8.91	80.01	0.00	0.00	25.00	15.00
38.632	0.652	8.91	79.25	0.00	0.00	25.00	15.00
39.284	0.652	8.91	78.48	0.00	0.00	25.00	15.00
39.936	0.314	8.91	37.51	0.00	0.00	25.00	15.00
40.250	0.652	8.91	78.55	0.00	0.00	25.00	15.00
40.902	0.652	8.91	80.19	0.00	0.00	25.00	15.00
41.554	0.043	8.91	5.39	0.00	0.00	25.00	15.00
41.597	0.652	13.23	81.74	0.00	0.00	25.00	15.00
42.249	0.652	13.23	82.98	0.00	0.00	25.00	15.00
42.901	0.652	13.23	84.23	0.00	0.00	25.00	15.00
43.553	0.652	13.23	85.47	0.00	0.00	25.00	15.00
44.206	0.652	13.23	86.72	0.00	0.00	25.00	15.00
44.858	0.652	13.23	87.96	0.00	0.00	25.00	15.00
45.510	0.652	13.23	89.21	0.00	0.00	25.00	15.00
46.162	0.629	13.23	87.25	0.00	0.00	25.00	15.00
46.791	0.652	15.52	91.54	0.00	0.00	25.00	15.00
47.443	0.652	15.52	92.57	0.00	0.00	25.00	15.00
48.095	0.652	15.52	93.60	0.00	0.00	25.00	15.00
48.747	0.652	15.52	94.64	0.00	0.00	25.00	15.00
49.399	0.111	15.52	16.24	0.00	0.00	25.00	15.00
49.510	0.652	15.52	94.63	0.00	0.00	25.00	15.00
50.162	0.652	15.52	93.23	0.00	0.00	25.00	15.00
50.814	0.652	15.52	91.84	0.00	0.00	25.00	15.00
51.466	0.423	15.52	58.81	0.00	0.00	25.00	15.00
51.889	0.652	27.81	88.91	0.00	0.00	25.00	15.00
52.541	0.652	27.81	86.26	0.00	0.00	25.00	15.00
53.193	0.017	27.81	2.22	0.00	0.00	25.00	15.00
53.210	0.652	27.81	84.89	0.00	0.00	25.00	15.00
53.862	0.652	27.81	84.93	0.00	0.00	25.00	15.00
54.514	0.652	27.81	84.97	0.00	0.00	25.00	15.00
55.166	0.652	27.81	85.02	0.00	0.00	25.00	15.00
55.818	0.652	27.81	85.06	0.00	0.00	25.00	15.00
56.470	0.014	27.81	1.85	0.00	0.00	25.00	15.00
56.484	0.652	20.21	85.51	0.00	0.00	25.00	15.00
57.136	0.652	20.21	86.35	0.00	0.00	25.00	15.00
57.788	0.652	20.21	87.19	0.00	0.00	25.00	15.00
58.440	0.652	20.21	88.04	0.00	0.00	25.00	15.00
59.092	0.097	20.21	13.17	0.00	0.00	25.00	15.00
59.189	0.652	22.50	88.89	0.00	0.00	25.00	15.00
59.841	0.652	22.50	89.51	0.00	0.00	25.00	15.00
60.493	0.652	22.50	90.12	0.00	0.00	25.00	15.00
61.145	0.652	22.50	90.73	0.00	0.00	25.00	15.00
61.797	0.652	22.50	91.34	0.00	0.00	25.00	15.00
62.450	0.310	22.50	43.68	0.00	0.00	25.00	15.00
62.760	0.652	21.10	92.32	0.00	0.00	25.00	15.00
63.412	0.652	21.10	93.08	0.00	0.00	25.00	15.00
64.064	0.652	21.10	93.83	0.00	0.00	25.00	15.00
64.716	0.652	21.10	94.59	0.00	0.00	25.00	15.00
65.368	0.652	21.10	95.34	0.00	0.00	25.00	15.00
66.020	0.652	21.10	96.10	0.00	0.00	25.00	15.00
66.672	0.652	21.10	96.85	0.00	0.00	25.00	15.00
67.324	0.400	21.10	59.81	0.00	0.00	25.00	15.00
67.724	0.652	22.74	97.99	0.00	0.00	25.00	15.00
68.376	0.652	22.74	98.57	0.00	0.00	25.00	15.00

69.028	0.652	22.74	99.16	0.00	0.00	25.00	15.00
69.680	0.652	22.74	99.75	0.00	0.00	25.00	15.00
70.332	0.652	22.74	100.34	0.00	0.00	25.00	15.00
70.984	0.652	22.74	100.93	0.00	0.00	25.00	15.00
71.636	0.652	22.74	101.51	0.00	0.00	25.00	15.00
72.288	0.582	22.74	91.06	0.00	0.00	25.00	15.00
72.870	0.368	22.74	57.45	0.00	0.00	25.00	15.00
73.238	0.652	22.25	100.48	0.00	0.00	25.00	15.00
73.890	0.652	22.25	98.76	0.00	0.00	25.00	15.00
74.542	0.652	22.25	97.05	0.00	0.00	25.00	15.00
75.194	0.476	22.25	69.78	0.00	0.00	25.00	15.00
75.670	0.652	22.25	95.40	0.00	0.00	25.00	15.00
76.322	0.441	22.25	65.12	0.00	0.00	25.00	15.00
76.763	0.652	34.38	96.26	0.00	0.00	25.00	15.00
77.416	0.652	34.38	95.80	0.00	0.00	25.00	15.00
78.068	0.652	34.38	95.34	0.00	0.00	25.00	15.00
78.720	0.652	34.38	94.88	0.00	0.00	25.00	15.00
79.372	0.008	34.38	1.22	0.00	0.00	25.00	15.00
79.380	0.652	34.38	92.90	0.00	0.00	25.00	15.00
80.032	0.652	34.38	89.41	0.00	0.00	25.00	15.00
80.684	0.185	34.38	24.67	0.00	0.00	25.00	15.00
80.869	0.652	44.49	84.18	0.00	0.00	25.00	15.00
81.521	0.652	44.49	79.19	0.00	0.00	25.00	15.00
82.173	0.057	44.49	6.73	0.00	0.00	25.00	15.00
82.230	0.192	44.49	22.29	0.00	0.00	25.00	15.00
82.422	0.652	33.75	75.03	0.00	0.00	25.00	15.00
83.074	0.652	33.75	74.06	0.00	0.00	25.00	15.00
83.726	0.652	33.75	73.09	0.00	0.00	25.00	15.00
84.378	0.652	33.75	72.12	0.00	0.00	25.00	15.00
85.030	0.652	33.75	71.15	0.00	0.00	25.00	15.00
85.682	0.652	33.75	70.18	0.00	0.00	25.00	15.00
86.334	0.652	33.75	69.22	0.00	0.00	25.00	15.00
86.986	0.096	33.75	10.15	0.00	0.00	25.00	15.00
87.082	0.652	39.26	67.73	0.00	0.00	25.00	15.00
87.734	0.652	39.26	66.01	0.00	0.00	25.00	15.00
88.386	0.652	39.26	64.29	0.00	0.00	25.00	15.00
89.038	0.652	39.26	62.57	0.00	0.00	25.00	15.00
89.690	0.652	39.26	60.86	0.00	0.00	25.00	15.00
90.342	0.489	39.26	44.55	0.00	0.00	25.00	15.00
90.832	0.652	41.28	57.70	0.00	0.00	25.00	15.00
91.484	0.652	41.28	55.67	0.00	0.00	25.00	15.00
92.136	0.612	41.28	50.45	0.00	0.00	25.00	15.00
92.748	0.652	50.16	50.95	0.00	0.00	25.00	15.00
93.400	0.652	50.16	47.31	0.00	0.00	25.00	15.00
94.052	0.038	50.16	2.63	0.00	0.00	25.00	15.00
94.090	0.652	50.16	42.27	0.00	0.00	25.00	15.00
94.742	0.652	50.16	36.25	0.00	0.00	25.00	15.00
95.394	0.440	50.16	21.05	0.00	0.00	25.00	15.00
95.834	0.652	51.31	26.04	0.00	0.00	25.00	15.00

LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio
dx(m) : Larghezza concio
alpha(°) : Angolo pendenza base concio
W(kN/m) : Forza peso concio
ru(-) : Coefficiente locale pressione interstiziale

U(kPa) : Pressione totale dei pori base concio
phi'(°) : Angolo di attrito efficace base concio
c'/Cu (kPa) : Coesione efficace o Resistenza al taglio in condizioni non drenate

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TABELLA DIAGRAMMA DELLE FORZE DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	ht (m)	yt (m)	yt' (--)	E(x) (kN/m)	T(x) (kN/m)	E' (kN)	rho(x) (--)	FS_qFEM (--)	FS_srmFEM (--)
13.290	0.000	4.400	-0.400	0.0000000000E+000	0.0000000000E+000	2.7254123497E+000	0.050	2.901	2.760
13.800	0.139	4.254	-0.400	2.4740014037E+000	4.6604289502E-003	6.9840361636E+000	0.050	2.901	2.760
14.452	0.185	3.934	-0.527	8.8041397969E+000	1.0582260311E-001	1.6743122299E+001	0.050	1.536	1.566
15.104	0.182	3.567	-0.535	2.4307887304E+001	7.3347990382E-001	2.7153034084E+001	0.050	1.218	1.271
15.756	0.217	3.237	-0.409	4.4213081894E+001	1.6821081872E+000	2.6508696426E+001	0.069	1.231	1.188
16.408	0.378	3.034	-0.300	5.8876580214E+001	2.5499777738E+000	2.0040948606E+001	0.083	1.361	1.153
16.500	0.410	3.014	-0.185	6.0686592242E+001	2.6789619406E+000	1.9901306001E+001	0.085	1.384	1.150
17.152	0.657	2.896	-0.208	7.4613026866E+001	3.9306207847E+000	1.9785153523E+001	0.099	1.597	1.128
17.333	0.702	2.841	-0.083	7.8117212398E+001	4.3103626640E+000	1.9208419429E+001	0.103	1.667	1.123
17.985	0.696	2.827	-0.031	9.0313799533E+001	5.9114614267E+000	1.9573128013E+001	0.129	1.871	1.115
18.637	0.677	2.801	-0.039	1.0364157017E+002	7.9636300429E+000	2.0279830268E+001	0.159	2.040	1.114
19.289	0.660	2.776	-0.014	1.1675973311E+002	1.0022518292E+001	2.0071965368E+001	0.185	2.211	1.116
19.941	0.674	2.783	0.018	1.2981643730E+002	1.2360549694E+001	2.0720351770E+001	0.212	2.376	1.125
20.180	0.686	2.792	0.068	1.3482442499E+002	1.3330797645E+001	2.0886505912E+001	0.223	2.430	1.130
20.832	0.745	2.843	0.096	1.4828532155E+002	1.6201634210E+001	2.1183549237E+001	0.237	2.534	1.149
21.484	0.827	2.917	0.126	1.6244885422E+002	1.9513645292E+001	2.1317200954E+001	0.253	2.574	1.172
22.136	0.925	3.008	0.141	1.7608403944E+002	2.3052131652E+001	2.0937511277E+001	0.269	2.506	1.199
22.788	1.026	3.101	0.143	1.8975243739E+002	2.6855411497E+001	2.0808031076E+001	0.285	2.420	1.228
22.919	1.045	3.120	0.142	1.9246793643E+002	2.7630274793E+001	2.1098546489E+001	0.288	2.406	1.234
23.571	1.144	3.212	0.139	2.0727075599E+002	3.1999461677E+001	2.3965522583E+001	0.305	2.368	1.263
24.223	1.238	3.301	0.130	2.2372020087E+002	3.7003338278E+001	2.6639986197E+001	0.324	2.362	1.292
24.875	1.325	3.382	0.110	2.4201065746E+002	4.2687390047E+001	2.9053881485E+001	0.343	2.383	1.320
25.500	1.390	3.442	0.081	2.6077354155E+002	4.8618397788E+001	3.2186851410E+001	0.362	2.432	1.343

26.152 1.439 3.486 0.055 2.8323745992E+002 5.5795833874E+001 3.7537595141E+001 0.397 2.514 1.364
26.804 1.473 3.514 0.037 3.0972448121E+002 6.4289662300E+001 4.1392868005E+001 0.435 2.607 1.385
27.417 1.496 3.532 0.025 3.3552109177E+002 7.2635331468E+001 4.2672494756E+001 0.469 2.703 1.404
28.069 1.634 3.546 0.022 3.6373064214E+002 8.1895784207E+001 4.2054784059E+001 0.500 2.736 1.425
28.710 1.768 3.560 0.031 3.8994194247E+002 9.0790062266E+001 4.0546026695E+001 0.528 2.704 1.445
29.362 1.917 3.586 0.052 4.1616772378E+002 1.0011725580E+002 3.9641446846E+001 0.542 2.622 1.467
30.014 2.082 3.629 0.079 4.4163641211E+002 1.0975351285E+002 3.8098276652E+001 0.557 2.505 1.493
30.666 2.267 3.690 0.105 4.6584982074E+002 1.1964903370E+002 3.6153861892E+001 0.573 2.365 1.521
30.980 2.366 3.730 0.132 4.7705097324E+002 1.2465097441E+002 3.5288970733E+001 0.581 2.290 1.535
31.179 2.431 3.758 0.166 4.8403223835E+002 1.2786017999E+002 3.4708704522E+001 0.586 2.240 1.544
31.831 2.486 3.871 0.205 5.0595613795E+002 1.3893786056E+002 3.4422296668E+001 0.608 2.091 1.576
32.483 2.582 4.025 0.263 5.2892066981E+002 1.5185298498E+002 3.5475577014E+001 0.635 1.951 1.610
33.135 2.712 4.214 0.307 5.5221810074E+002 1.6616359109E+002 3.5575482863E+001 0.665 1.841 1.643
33.787 2.866 4.426 0.330 5.7531291492E+002 1.8125162624E+002 3.4571807446E+001 0.695 1.755 1.674
34.439 3.025 4.644 0.334 5.9730150189E+002 1.9621646778E+002 3.2967920947E+001 0.724 1.690 1.699
35.091 3.185 4.862 0.338 6.1830476623E+002 2.1086253918E+002 3.2146188975E+001 0.750 1.641 1.717
35.743 3.349 5.084 0.318 6.3922177277E+002 2.2550193536E+002 2.9972738811E+001 0.775 1.604 1.729
36.395 3.483 5.277 0.283 6.5739074718E+002 2.3803323874E+002 2.6886564229E+001 0.793 1.584 1.732
37.047 3.601 5.454 0.265 6.7428322458E+002 2.4923738255E+002 2.3454306859E+001 0.807 1.568 1.728
37.176 3.620 5.484 0.242 6.7722484497E+002 2.5115300604E+002 2.3022287858E+001 0.809 1.565 1.726
37.828 3.676 5.642 0.242 6.9240129031E+002 2.6091278515E+002 2.2933988700E+001 0.819 1.551 1.718
37.980 3.689 5.679 0.225 6.9588558511E+002 2.6312401038E+002 2.2587207448E+001 0.822 1.547 1.715
38.632 3.731 5.823 0.219 7.0986890533E+002 2.7187875396E+002 2.0936735467E+001 0.840 1.533 1.703
39.284 3.771 5.965 0.218 7.2318815658E+002 2.8014425539E+002 1.9900683665E+001 0.858 1.519 1.690
39.936 3.811 6.108 0.223 7.3582041238E+002 2.8802487388E+002 1.9028659448E+001 0.874 1.505 1.677
40.250 3.834 6.180 0.237 7.4174177973E+002 2.9178149405E+002 1.8590948735E+001 0.882 1.499 1.671
40.902 3.889 6.337 0.250 7.5349585827E+002 2.9943598324E+002 1.7717744376E+001 0.889 1.487 1.658
41.554 3.956 6.506 0.260 7.6484662256E+002 3.0721010957E+002 1.5792244054E+001 0.897 1.474 1.645
41.597 3.960 6.517 0.292 7.6552667776E+002 3.0769612826E+002 1.5751520111E+001

0.898 1.474 1.644
42.249 3.999 6.709 0.302 7.7645157641E+002 3.1588427898E+002 1.5945646690E+001
0.908 1.461 1.632
42.901 4.047 6.911 0.315 7.8632061477E+002 3.2391535503E+002 1.4238242606E+001
0.919 1.450 1.621
43.553 4.104 7.120 0.335 7.9501897136E+002 3.3166821175E+002 1.3129362715E+001
0.930 1.440 1.612
44.206 4.178 7.348 0.375 8.0344197376E+002 3.3964780779E+002 1.3033318476E+001
0.941 1.430 1.603
44.858 4.285 7.609 0.404 8.1201508376E+002 3.4814619949E+002 1.2667153209E+001
0.953 1.420 1.595
45.510 4.398 7.875 0.402 8.1996058796E+002 3.5624204994E+002 1.1574982531E+001
0.965 1.411 1.587
46.162 4.504 8.133 0.390 8.2710945167E+002 3.6353418830E+002 1.0441003522E+001
0.974 1.404 1.580
46.791 4.596 8.374 0.361 8.3336063820E+002 3.6963694634E+002 9.0970248918E+000
0.981 1.397 1.575
47.443 4.638 8.596 0.329 8.3872498953E+002 3.7422142174E+002 7.5596257886E+000
0.986 1.395 1.570
48.095 4.663 8.803 0.316 8.4321877600E+002 3.7752573446E+002 6.0107978971E+000
0.987 1.396 1.567
48.747 4.687 9.009 0.301 8.4656337673E+002 3.7924570044E+002 4.2012315868E+000
0.986 1.404 1.563
49.399 4.693 9.195 0.283 8.4869739639E+002 3.7964540727E+002 2.0026423595E+000
0.982 1.416 1.561
49.510 4.691 9.224 0.261 8.4889597480E+002 3.7954904038E+002 1.6566188188E+000
0.981 1.418 1.561
50.162 4.680 9.394 0.259 8.4948127752E+002 3.7837646862E+002 -1.5095194532E-001
0.982 1.436 1.559
50.814 4.667 9.562 0.261 8.4869912576E+002 3.7616303781E+002 -2.4218680600E+000
0.981 1.459 1.557
51.466 4.659 9.735 0.287 8.4632303798E+002 3.7303826071E+002 -5.9152704988E+000
0.980 1.488 1.556
51.889 4.677 9.870 0.323 8.4319892845E+002 3.7030828981E+002 -8.1768051248E+000
0.978 1.510 1.556
52.541 4.544 10.082 0.321 8.3707452001E+002 3.6577190643E+002 -1.0269002739E+001
0.980 1.541 1.556
53.193 4.407 10.289 0.317 8.2980762484E+002 3.6103130874E+002 -1.1408125784E+001
0.982 1.568 1.557
53.210 4.404 10.294 0.400 8.2961336775E+002 3.6091426370E+002 -1.1454096905E+001
0.982 1.568 1.557
53.862 4.322 10.557 0.423 8.2116804598E+002 3.5608748130E+002 -1.3935573726E+001
0.976 1.586 1.558
54.514 4.267 10.845 0.446 8.1144066846E+002 3.5107491209E+002 -1.4879309818E+001
0.970 1.595 1.561
55.166 4.216 11.138 0.453 8.0176466667E+002 3.4671995013E+002 -1.4669928791E+001
0.966 1.592 1.564
55.818 4.170 11.436 0.459 7.9231033269E+002 3.4285191493E+002 -1.4096743849E+001
0.963 1.580 1.568
56.470 4.126 11.736 0.461 7.8338179331E+002 3.3953210648E+002 -1.3337931328E+001
0.961 1.559 1.572
56.484 4.125 11.743 0.454 7.8319280440E+002 3.3946315350E+002 -1.3295987496E+001
0.961 1.558 1.572
57.136 4.181 12.039 0.463 7.7554937286E+002 3.3690384828E+002 -1.1378259479E+001
0.957 1.533 1.577
57.788 4.249 12.346 0.479 7.6835497339E+002 3.3480306697E+002 -1.0753097934E+001
0.954 1.509 1.581

58.440	4.325	12.663	0.464	7.6152678442E+002	3.3317154182E+002	-9.6320616911E+000	0.952	1.487	1.584
59.092	4.374	12.952	0.443	7.5579427341E+002	3.3218088042E+002	-8.6421444161E+000	0.951	1.469	1.586
59.189	4.381	12.994	0.447	7.5495837722E+002	3.3206812940E+002	-8.6379100786E+000	0.951	1.467	1.587
59.841	4.403	13.286	0.456	7.4924719076E+002	3.3140285798E+002	-8.8667863447E+000	0.952	1.451	1.587
60.493	4.435	13.589	0.473	7.4339563534E+002	3.3089905769E+002	-9.1421878899E+000	0.953	1.437	1.585
61.145	4.479	13.903	0.481	7.3732531121E+002	3.3049416001E+002	-9.3708411775E+000	0.955	1.423	1.581
61.797	4.522	14.216	0.468	7.3117558024E+002	3.3016000314E+002	-9.3031065961E+000	0.957	1.412	1.575
62.450	4.550	14.513	0.464	7.2519358546E+002	3.2987740518E+002	-9.4776828160E+000	0.959	1.402	1.567
62.760	4.570	14.662	0.486	7.2220814232E+002	3.2972782637E+002	-9.6538715132E+000	0.960	1.397	1.562
63.412	4.637	14.981	0.496	7.1586985415E+002	3.2937933196E+002	-9.8513242314E+000	0.962	1.385	1.549
64.064	4.714	15.309	0.488	7.0936151279E+002	3.2896282191E+002	-9.6704582066E+000	0.964	1.374	1.535
64.716	4.771	15.618	0.471	7.0325908315E+002	3.2847743268E+002	-9.3321387110E+000	0.965	1.363	1.519
65.368	4.825	15.923	0.469	6.9719192768E+002	3.2788230603E+002	-9.4206862114E+000	0.966	1.352	1.503
66.020	4.879	16.229	0.471	6.9097402758E+002	3.2713584747E+002	-9.7077550106E+000	0.966	1.343	1.486
66.672	4.936	16.537	0.474	6.8453251975E+002	3.2619391237E+002	-1.0106798214E+001	0.967	1.333	1.469
67.324	4.994	16.847	0.477	6.7779424695E+002	3.2500852257E+002	-1.0659895463E+001	0.966	1.324	1.452
67.724	5.031	17.039	0.478	6.7344859710E+002	3.2412675427E+002	-1.1103175798E+001	0.966	1.319	1.441
68.376	5.069	17.350	0.478	6.6595034954E+002	3.2229702343E+002	-1.1822884310E+001	0.965	1.312	1.426
69.028	5.108	17.662	0.475	6.5803095262E+002	3.2007109847E+002	-1.2322127272E+001	0.963	1.306	1.411
69.680	5.142	17.969	0.465	6.4988166676E+002	3.1745563776E+002	-1.2617931907E+001	0.960	1.302	1.398
70.332	5.168	18.268	0.456	6.4157652551E+002	3.1441364653E+002	-1.2973373736E+001	0.956	1.300	1.386
70.984	5.190	18.563	0.442	6.3296372537E+002	3.1076122021E+002	-1.3149966751E+001	0.951	1.300	1.376
71.636	5.198	18.845	0.427	6.2442829781E+002	3.0665595131E+002	-1.3149104321E+001	0.944	1.301	1.368
72.288	5.199	19.120	0.408	6.1581662232E+002	3.0187459457E+002	-1.3048974549E+001	0.934	1.302	1.362
72.870	5.184	19.348	0.380	6.0830837282E+002	2.9723910199E+002	-1.2678173348E+001	0.925	1.303	1.358
73.238	5.163	19.481	0.358	6.0369844151E+002	2.9414060275E+002	-1.2716184323E+001	0.923	1.302	1.357
73.890	5.129	19.714	0.346	5.9519563919E+002	2.8812378641E+002	-1.4000037620E+001	0.918	1.301	1.355
74.542	5.081	19.932	0.304	5.8544167802E+002	2.8097650925E+002	-1.6309295276E+001	0.911	1.298	1.356
75.194	4.992	20.110	0.273	5.7392748587E+002	2.7251444499E+002	-1.8081182090E+001			

0.900 1.294 1.359
75.670 4.927 20.240 0.394 5.6517220877E+002 2.6610541747E+002 -2.0066448141E+001
0.892 1.290 1.362
76.322 4.975 20.555 0.483 5.5059083283E+002 2.5577657384E+002 -2.3608203842E+001
0.867 1.284 1.369
76.763 5.007 20.768 0.581 5.3979650523E+002 2.4841314624E+002 -2.5919877627E+001
0.849 1.279 1.375
77.416 4.983 21.190 0.648 5.2148168283E+002 2.3666573904E+002 -3.0626527445E+001
0.827 1.276 1.387
78.068 4.959 21.613 0.576 4.9985795054E+002 2.2363147436E+002 -3.2638168205E+001
0.802 1.281 1.405
78.720 4.843 21.942 0.491 4.7891984592E+002 2.1149951759E+002 -3.1764178159E+001
0.778 1.289 1.424
79.372 4.707 22.252 0.476 4.5843584125E+002 1.9996995993E+002 -3.2607795933E+001
0.755 1.301 1.445
79.380 4.705 22.256 0.458 4.5816156196E+002 1.9981771169E+002 -3.2608835253E+001
0.754 1.302 1.445
80.032 4.558 22.555 0.455 4.3762432492E+002 1.8858496857E+002 -3.1482767326E+001
0.743 1.319 1.468
80.684 4.407 22.850 0.450 4.1710642676E+002 1.7758690489E+002 -3.0869870599E+001
0.731 1.341 1.493
80.869 4.362 22.931 0.445 4.1144211219E+002 1.7461297299E+002 -3.0704421374E+001
0.727 1.348 1.500
81.521 4.012 23.222 0.448 3.9141332719E+002 1.6424988522E+002 -3.0169433616E+001
0.722 1.374 1.526
82.173 3.665 23.515 0.454 3.7209963117E+002 1.5425558408E+002 -3.0570241346E+001
0.718 1.401 1.551
82.230 3.637 23.544 0.497 3.7034021345E+002 1.5332934025E+002 -3.0543270102E+001
0.717 1.403 1.554
82.422 3.544 23.639 0.505 3.6455978901E+002 1.5025493799E+002 -2.9957493682E+001
0.712 1.410 1.561
83.074 3.439 23.970 0.527 3.4550806954E+002 1.3998777481E+002 -2.9478849245E+001
0.687 1.433 1.586
83.726 3.360 24.326 0.570 3.2611786525E+002 1.2946510544E+002 -3.0140627921E+001
0.659 1.455 1.609
84.378 3.311 24.713 0.593 3.0620315262E+002 1.1866828739E+002 -2.9340436942E+001
0.627 1.474 1.631
85.030 3.261 25.099 0.606 2.8785643820E+002 1.0876689011E+002 -2.8158085607E+001
0.597 1.486 1.646
85.682 3.231 25.504 0.625 2.6948357204E+002 9.8956404442E+001 -2.7635772782E+001
0.565 1.493 1.657
86.334 3.204 25.914 0.633 2.5181798021E+002 8.9617957525E+001 -2.6975605707E+001
0.532 1.494 1.659
86.986 3.185 26.330 0.638 2.3430600560E+002 8.0529710520E+001 -2.6806970765E+001
0.498 1.490 1.657
87.082 3.182 26.391 0.613 2.3172315897E+002 7.9209676488E+001 -2.6626318972E+001
0.493 1.489 1.656
87.734 3.046 26.788 0.599 2.1512586478E+002 7.1112203535E+001 -2.4985444447E+001
0.464 1.482 1.647
88.386 2.897 27.172 0.599 1.9914086437E+002 6.3639984591E+001 -2.4868238575E+001
0.435 1.470 1.633
89.038 2.762 27.570 0.653 1.8269641262E+002 5.6153462436E+001 -2.6783240431E+001
0.404 1.456 1.616
89.690 2.683 28.024 0.699 1.6421415207E+002 4.8059184903E+001 -2.8234755102E+001
0.367 1.439 1.597
90.342 2.607 28.481 0.715 1.4587685111E+002 4.0287305702E+001 -2.8499815652E+001
0.327 1.422 1.578

90.832	2.566	28.840	0.737	1.3178982604E+002	3.4583638376E+001	-2.8631298317E+001	0.296	1.410	1.566
91.484	2.475	29.322	0.728	1.1325258540E+002	2.7376951836E+001	-2.8204022556E+001	0.252	1.390	1.543
92.136	2.370	29.790	0.700	9.5010341339E+001	1.9994833831E+001	-2.6726298339E+001	0.199	1.372	1.524
92.748	2.249	30.206	0.701	7.9362965401E+001	1.4052545762E+001	-2.5870805898E+001	0.151	1.353	1.510
93.400	1.938	30.676	0.706	6.2272418465E+001	8.4586757976E+000	-2.5140729972E+001	0.102	1.337	1.502
94.052	1.607	31.127	0.685	4.6578170556E+001	4.3970141651E+000	-1.9353102385E+001	0.060	1.337	1.511
94.090	1.584	31.149	0.692	4.5856749605E+001	4.2477822153E+000	-1.9248899332E+001	0.058	1.338	1.512
94.742	1.258	31.605	0.829	3.1402071889E+001	1.8417274266E+000	-2.3906579485E+001	0.050	1.388	1.563
95.394	1.101	32.229	0.837	1.4681349975E+001	3.4211227582E-001	-1.8257924939E+001	0.050	1.550	1.732
95.834	0.863	32.518	0.837	8.8429581384E+000	1.2160755829E-001	-1.3391379433E+001	0.050	1.653	1.843

LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio
ht(m) : Altezza linea di thrust da nodo sinistro base concio
yt(m) : coordinata Y linea di trust
yt'(-) : gradiente pendenza locale linea di trust
E(x)(kN/m) : Forza Normale interconcio
T(x)(kN/m) : Forza Tangenziale interconcio
E' (kN) : derivata Forza normale interconcio
Rho(x) (-) : fattore mobilizzazione resistenza al taglio verticale interconcio ZhU et al.(2003)
FS_qFEM(x)(-) : fattore di sicurezza locale stimato (locale in X) by qFEM
FS_srmFEM(x)(-) : fattore di sicurezza locale stimato (locale in X) by SRM Procedure

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TABELLA SFORZI DI TAGLIO DISTRIBUITI LUNGO SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	dl (m)	alpha (°)	TauStress (kPa)	TauF (kN/m)	TauStrength (kPa)	TauS (kN/m)
13.290	0.510	0.584	-29.218	-1.244	-0.726	16.216	9.468
13.800	0.652	0.747	-29.218	-2.882	-2.153	17.951	13.411
14.452	0.652	0.747	-29.218	-3.672	-2.743	19.520	14.583
15.104	0.652	0.747	-29.218	-4.461	-3.333	20.776	15.522
15.756	0.652	0.747	-29.218	-5.251	-3.923	21.419	16.002
16.408	0.092	0.105	-29.218	-5.701	-0.600	21.928	2.309
16.500	0.652	0.747	-29.218	-6.582	-4.917	23.296	17.404
17.152	0.181	0.208	-29.218	-7.635	-1.584	24.494	5.083
17.333	0.652	0.652	-0.659	1.052	0.686	25.904	16.891
17.985	0.652	0.652	-0.659	1.058	0.690	26.299	17.149
18.637	0.652	0.652	-0.659	1.065	0.694	26.365	17.192
19.289	0.652	0.652	-0.659	1.071	0.699	26.633	17.367
19.941	0.239	0.239	-0.659	1.076	0.257	26.906	6.424
20.180	0.652	0.652	-0.659	1.207	0.787	28.281	18.441
20.832	0.652	0.652	-0.659	1.467	0.956	31.009	20.220
21.484	0.652	0.652	-0.659	1.726	1.126	33.578	21.895

22.136	0.652	0.652	-0.659	1.986	1.295	36.175	23.589
22.788	0.131	0.131	-0.659	2.142	0.280	37.662	4.923
22.919	0.652	0.652	-0.491	2.431	1.585	39.439	25.716
23.571	0.652	0.652	-0.491	2.705	1.764	42.296	27.579
24.223	0.652	0.652	-0.491	2.978	1.942	45.185	29.463
24.875	0.625	0.625	-0.491	3.246	2.029	47.895	29.941
25.500	0.652	0.652	-0.491	3.347	2.183	49.504	32.279
26.152	0.652	0.652	-0.491	3.287	2.143	49.942	32.565
26.804	0.613	0.613	-0.491	3.228	1.977	49.716	30.452
27.417	0.652	0.663	-10.670	-7.326	-4.861	52.618	34.912
28.069	0.641	0.653	-10.670	-7.357	-4.802	52.489	34.260
28.710	0.652	0.663	-10.670	-7.688	-5.101	54.044	35.858
29.362	0.652	0.663	-10.670	-8.322	-5.521	56.750	37.654
30.014	0.652	0.663	-10.670	-8.955	-5.942	59.402	39.413
30.666	0.314	0.319	-10.670	-9.424	-3.010	61.700	19.710
30.980	0.199	0.203	-10.670	-9.694	-1.965	62.835	12.739
31.179	0.652	0.655	5.118	12.399	8.117	58.529	38.315
31.831	0.652	0.655	5.118	13.027	8.528	61.378	40.180
32.483	0.652	0.655	5.118	13.655	8.939	64.004	41.899
33.135	0.652	0.655	5.118	14.283	9.350	66.317	43.414
33.787	0.652	0.655	5.118	14.911	9.761	68.177	44.631
34.439	0.652	0.655	5.118	15.539	10.172	69.937	45.783
35.091	0.652	0.655	5.118	16.167	10.583	71.855	47.039
35.743	0.652	0.655	5.118	16.795	10.995	72.713	47.600
36.395	0.652	0.655	5.118	17.423	11.406	73.964	48.419
37.047	0.128	0.129	5.118	17.799	2.288	74.382	9.563
37.176	0.652	0.660	8.912	25.758	17.000	72.733	48.003
37.828	0.152	0.154	8.912	26.240	4.049	73.646	11.365
37.980	0.652	0.660	8.912	26.206	17.296	73.331	48.398
38.632	0.652	0.660	8.912	25.955	17.130	72.633	47.937
39.284	0.652	0.660	8.912	25.705	16.965	71.970	47.500
39.936	0.314	0.318	8.912	25.519	8.109	71.551	22.736
40.250	0.652	0.660	8.912	25.727	16.979	71.939	47.479
40.902	0.652	0.660	8.912	26.263	17.333	73.112	48.254
41.554	0.043	0.044	8.912	26.549	1.165	73.555	3.228
41.597	0.652	0.670	13.228	35.289	23.637	70.935	47.512
42.249	0.652	0.670	13.228	35.827	23.997	71.741	48.052
42.901	0.652	0.670	13.228	36.364	24.357	72.526	48.578
43.553	0.652	0.670	13.228	36.901	24.716	73.395	49.160
44.206	0.652	0.670	13.228	37.439	25.076	74.311	49.774
44.858	0.652	0.670	13.228	37.976	25.436	75.077	50.286
45.510	0.652	0.670	13.228	38.514	25.796	75.776	50.754
46.162	0.629	0.646	13.228	39.042	25.232	76.433	49.397
46.791	0.652	0.677	15.520	44.280	29.964	75.056	50.791
47.443	0.652	0.677	15.520	44.779	30.302	75.639	51.185
48.095	0.652	0.677	15.520	45.277	30.639	76.200	51.565
48.747	0.652	0.677	15.520	45.775	30.976	76.780	51.957
49.399	0.111	0.115	15.520	46.067	5.316	77.106	8.897
49.510	0.652	0.677	15.520	45.772	30.974	76.666	51.880
50.162	0.652	0.677	15.520	45.097	30.517	75.682	51.214
50.814	0.652	0.677	15.520	44.422	30.060	74.707	50.555
51.466	0.423	0.439	15.520	43.865	19.251	73.881	32.423
51.889	0.652	0.737	27.808	62.880	46.352	64.894	47.837
52.541	0.652	0.737	27.808	61.005	44.970	63.539	46.838
53.193	0.017	0.019	27.808	60.043	1.155	62.703	1.206
53.210	0.652	0.737	27.808	60.034	44.254	62.830	46.315
53.862	0.652	0.737	27.808	60.065	44.277	62.926	46.386

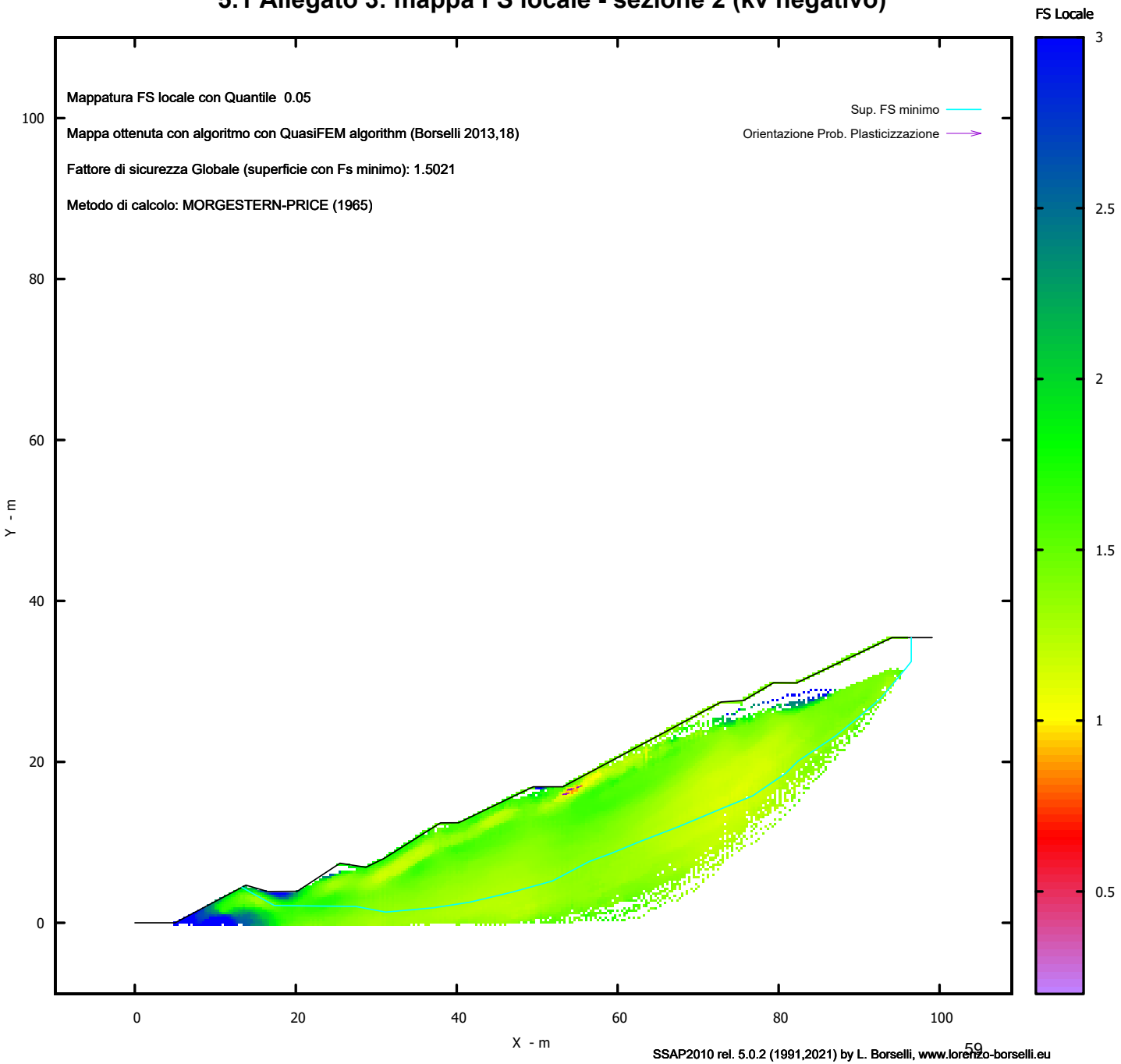
54.514	0.652	0.737	27.808	60.096	44.300	62.693	46.214
55.166	0.652	0.737	27.808	60.127	44.323	62.526	46.091
55.818	0.652	0.737	27.808	60.158	44.346	62.336	45.951
56.470	0.014	0.016	27.808	60.174	0.964	62.290	0.998
56.484	0.652	0.695	20.210	49.674	34.514	67.923	47.193
57.136	0.652	0.695	20.210	50.165	34.855	68.389	47.517
57.788	0.652	0.695	20.210	50.655	35.195	68.853	47.840
58.440	0.652	0.695	20.210	51.146	35.536	69.298	48.148
59.092	0.097	0.103	20.210	51.427	5.314	69.569	7.189
59.189	0.652	0.706	22.495	55.408	39.103	68.009	47.995
59.841	0.652	0.706	22.495	55.790	39.373	68.340	48.229
60.493	0.652	0.706	22.495	56.173	39.642	68.685	48.473
61.145	0.652	0.706	22.495	56.555	39.912	69.035	48.720
61.797	0.652	0.706	22.495	56.937	40.182	69.389	48.970
62.450	0.310	0.336	22.495	57.219	19.216	69.665	23.395
62.760	0.652	0.699	21.099	55.194	38.574	71.147	49.723
63.412	0.652	0.699	21.099	55.645	38.889	71.616	50.051
64.064	0.652	0.699	21.099	56.097	39.205	72.085	50.379
64.716	0.652	0.699	21.099	56.548	39.520	72.561	50.711
65.368	0.652	0.699	21.099	57.000	39.836	73.042	51.048
66.020	0.652	0.699	21.099	57.451	40.152	73.531	51.389
66.672	0.652	0.699	21.099	57.903	40.467	74.026	51.736
67.324	0.400	0.429	21.099	58.267	24.992	74.435	31.926
67.724	0.652	0.707	22.741	61.503	43.482	73.446	51.925
68.376	0.652	0.707	22.741	61.872	43.742	73.879	52.231
69.028	0.652	0.707	22.741	62.241	44.003	74.310	52.536
69.680	0.652	0.707	22.741	62.610	44.264	74.749	52.846
70.332	0.652	0.707	22.741	62.979	44.525	75.227	53.185
70.984	0.652	0.707	22.741	63.348	44.786	75.672	53.499
71.636	0.652	0.707	22.741	63.717	45.047	76.164	53.847
72.288	0.582	0.631	22.741	64.066	40.408	76.582	48.303
72.870	0.368	0.399	22.741	63.918	25.492	76.506	30.512
73.238	0.652	0.704	22.254	62.197	43.818	76.164	53.657
73.890	0.652	0.704	22.254	61.135	43.070	75.360	53.091
74.542	0.652	0.704	22.254	60.073	42.321	74.592	52.550
75.194	0.476	0.514	22.254	59.154	30.430	73.767	37.947
75.670	0.652	0.704	22.254	59.053	41.603	73.971	52.113
76.322	0.441	0.477	22.254	59.532	28.396	74.540	35.555
76.763	0.652	0.790	34.377	75.032	59.276	66.793	52.767
77.416	0.652	0.790	34.377	74.675	58.994	67.334	53.194
78.068	0.652	0.790	34.377	74.318	58.712	66.591	52.607
78.720	0.652	0.790	34.377	73.961	58.430	66.024	52.160
79.372	0.008	0.010	34.377	73.780	0.752	66.078	0.673
79.380	0.652	0.790	34.377	72.417	57.210	64.926	51.292
80.032	0.652	0.790	34.377	69.696	55.061	63.159	49.897
80.684	0.185	0.224	34.377	67.950	15.190	61.828	13.822
80.869	0.652	0.914	44.491	68.618	62.719	51.934	47.469
81.521	0.652	0.914	44.491	64.550	59.001	49.938	45.645
82.173	0.057	0.080	44.491	62.337	5.016	49.426	3.977
82.230	0.192	0.269	44.491	61.853	16.610	49.178	13.206
82.422	0.652	0.784	33.751	58.086	45.550	56.407	44.234
83.074	0.652	0.784	33.751	57.336	44.962	56.094	43.988
83.726	0.652	0.784	33.751	56.586	44.374	55.791	43.751
84.378	0.652	0.784	33.751	55.837	43.787	54.822	42.991
85.030	0.652	0.784	33.751	55.087	43.199	54.311	42.590
85.682	0.652	0.784	33.751	54.337	42.611	53.584	42.020
86.334	0.652	0.784	33.751	53.588	42.023	52.982	41.548

86.986	0.096	0.116	33.751	53.158	6.162	52.629	6.100
87.082	0.652	0.842	39.263	54.761	46.116	48.234	40.620
87.734	0.652	0.842	39.263	53.371	44.946	47.097	39.663
88.386	0.652	0.842	39.263	51.982	43.776	46.408	39.082
89.038	0.652	0.842	39.263	50.593	42.607	46.134	38.852
89.690	0.652	0.842	39.263	49.204	41.437	45.209	38.073
90.342	0.489	0.632	39.263	47.988	30.335	44.475	28.115
90.832	0.652	0.868	41.283	46.970	40.755	42.353	36.749
91.484	0.652	0.868	41.283	45.323	39.326	41.710	36.191
92.136	0.612	0.815	41.283	43.727	35.635	40.182	32.746
92.748	0.652	1.018	50.161	40.423	41.142	33.539	34.136
93.400	0.652	1.018	50.161	37.540	38.208	31.265	31.821
94.052	0.038	0.059	50.161	36.015	2.126	29.493	1.741
94.090	0.652	1.018	50.161	33.541	34.138	28.506	29.013
94.742	0.652	1.018	50.161	28.761	29.273	26.108	26.572
95.394	0.440	0.686	50.161	24.760	16.996	23.753	16.305
95.834	0.652	1.043	51.310	20.450	21.331	21.815	22.755

LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio
dx(m) : Larghezza concio
dl(m) : lunghezza base concio
alpha(°) : Angolo pendenza base concio
TauStress(kPa) : Sforzo di taglio su base concio
TauF (kN/m) : Forza di taglio su base concio
TauStrength(kPa) : Resistenza al taglio su base concio
TauS (kN/m) : Forza resistente al taglio su base concio

5.1 Allegato 3: mappa FS locale - sezione 2 (kv negativo)



SSAP2010 rel. 5.0.2 (1991,2021) by L. Borselli, www.lorenzo-borselli.eu

https://WWW.SSAP.EU

6 Tabultato verifica stabilità - sezione 2 (kv positivo)

SSAP 5.0.2 - Slope Stability Analysis Program (1991,2021)
WWW.SSAP.EU
Build No. 11893
BY
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** Gia' Ricercatore CNR-IRPI fino a Luglio 2011

Ultima Revisione struttura tabelle del report: 21 Febbraio 2021

Data: 23/4/2021

Localita' : "Puro Vecchio" - Trani (BAT)

Descrizione: Chiusura definitiva lotti I e II
Modello pendio: Modello assemblato.mod

---------- PARAMETRI DEL MODELLO DEL PENDIO ----------

__ PARAMETRI GEOMETRICI - Coordinate X Y (in m) __

SUP T.		SUP 2		SUP 3		SUP 4	
X	Y	X	Y	X	Y	X	Y
0.00	0.00	-	-	-	-	-	-
5.00	0.00	-	-	-	-	-	-
13.80	4.67	-	-	-	-	-	-
16.50	3.89	-	-	-	-	-	-
20.18	3.91	-	-	-	-	-	-
25.50	7.40	-	-	-	-	-	-
28.71	6.90	-	-	-	-	-	-
30.98	8.00	-	-	-	-	-	-
37.98	12.42	-	-	-	-	-	-
40.25	12.43	-	-	-	-	-	-
49.51	16.90	-	-	-	-	-	-
53.21	16.90	-	-	-	-	-	-
72.87	27.44	-	-	-	-	-	-
75.67	27.63	-	-	-	-	-	-
79.38	29.83	-	-	-	-	-	-
82.23	29.80	-	-	-	-	-	-
94.09	35.44	-	-	-	-	-	-
99.09	35.44	-	-	-	-	-	-

ASSENZA DI FALDA

------- PARAMETRI GEOMECCANICI -------

	fi`	C`	Cu	Gamm	Gamm_sat	STR_IDX	sgci	GSI	mi	D
STRATO 1	25.00	15.00	0.00	12.20	13.00	1.967	0.00	0.00	0.00	0.00

LEGENDA: fi`_____ Angolo di attrito interno efficace(in gradi)
C` _____ Coesione efficace (in Kpa)

Cu _____ Resistenza al taglio Non drenata (in Kpa)
Gamm _____ Peso di volume terreno fuori falda (in KN/m^3)
Gamm_sat __ Peso di volume terreno immerso (in KN/m^3)
STR_IDX ___ Indice di resistenza (usato in solo in 'SNIFF SEARCH) (adimensionale)
---- SOLO Per AMMASSI ROCCIOSI FRATTURATI - Parametri Criterio di Rottura di Hoek (2002)----
sigci _____ Resistenza Compressione Uniassiale Roccia Intatta (in MPa)
GSI _____ Geological Strenght Index ammasso(adimensionale)
mi _____ Indice litologico ammasso(adimensionale)
D _____ Fattore di disturbo ammasso(adimensionale)
Fattore di riduzione NTC2018: gammaPHI=1.25 e gammaC=1.25 - DISATTIVATO (solo per ROCCE)

Uso CRITERIO DI ROTTURA Hoek et al.(2002,2006) - non-lineare - Generalizzato, secondo Lei et al.(2016)

---------- INFORMAZIONI GENERAZIONE SUPERFICI RANDOM ----------
*** PARAMETRI PER LA GENERAZIONE DELLE SUPERFICI
MOTORE DI RICERCA: RANDOM SEARCH - Siegel (1981)
FILTRAGGIO SUPERFICI : ATTIVATO
COORDINATE X1,X2,Y OSTACOLO : 0.00 0.00 0.00
LUNGHEZZA MEDIA SEGMENTI (m)*: 4.0 (+/-) 50%
INTERVALLO ASCISSE RANDOM STARTING POINT (Xmin .. Xmax): 0.01 13.80
LIVELLO MINIMO CONSIDERATO (Ymin): 0.00
INTERVALLO ASCISSE AMMESSO PER LA TERMINAZIONE (Xmin .. Xmax): 25.50 99.09
TOTALE SUPERFICI GENERATE : 10000
NOTA IMPORTANTE: La lunghezza media dei segmenti non viene cosiderata nel casodi uso del motore di ricerca NEW RANOM SEARCH

---------- INFORMAZIONI PARAMETRI DI CALCOLO ----------

METODO DI CALCOLO : MORGENSTERN - PRICE (Morgenstern & Price, 1965)
METODO DI ESPLORAZIONE CAMPO VALORI (lambda0,Fs0) ADOTTATO : B (piu' accurato)
COEFFICIENTE SISMICO UTILIZZATO Kh : 0.0620
COEFFICIENTE SISMICO UTILIZZATO Kv (assunto Positivo): 0.0310
COEFFICIENTE c=Kv/Kh UTILIZZATO : 0.5000
FORZA ORIZZONTALE ADDIZIONALE IN TESTA (kN/m): 0.00
FORZA ORIZZONTALE ADDIZIONALE ALLA BASE (kN/m): 0.00

N.B. Le forze orizzontali addizionali in testa e alla base sono poste uguali a 0 durante tutte le veriche globali

---------- RISULTATO FINALE ELABORAZIONI ----------

DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs *

Fattore di sicurezza (FS) 1.4874 - Min. - X Y Lambda= 0.4756

X	Y
11.93	3.68
18.57	2.67
26.52	1.64
34.85	1.11
40.30	1.65
48.69	4.02
52.86	6.05
57.11	7.43
61.48	8.93
69.84	13.26
75.97	16.98
79.23	18.44
82.14	19.89

86.96	22.49
90.33	25.31
95.40	32.00
95.40	35.44

Fattore di sicurezza (FS) 1.4876 - N.2 -- X Y Lambda= 0.4759

12.76	4.12
17.80	2.45
24.39	1.18
30.15	0.09
37.37	0.78
39.76	1.88
42.87	3.27
49.79	5.31
56.49	7.08
59.88	8.62
65.37	11.26
69.69	13.89
74.97	16.52
78.45	18.14
82.88	21.15
85.20	22.73
89.67	27.42
92.88	31.29
92.88	34.87

Fattore di sicurezza (FS) 1.4949 - N.3 -- X Y Lambda= 0.5004

13.70	4.62
18.60	3.20
21.88	2.75
27.64	1.79
30.40	2.05
33.43	1.80
38.85	2.60
46.09	3.38
51.29	5.28
57.31	7.42
63.65	9.78
70.22	12.84
73.44	15.38
79.20	19.77
82.51	22.33
88.63	27.06
92.42	31.09
92.42	34.65

Fattore di sicurezza (FS) 1.5053 - N.4 -- X Y Lambda= 0.5000

11.30	3.34
16.55	2.17
22.42	1.45
28.02	0.52
32.90	0.75
37.86	2.16
42.76	1.87

49.48	4.12
55.12	5.97
58.53	7.02
64.25	9.34
68.84	11.31
74.96	15.40
79.06	19.15
82.55	21.99
85.64	24.66
88.84	27.03
90.93	28.53
93.53	31.80
93.53	35.17

Fattore di sicurezza (FS) 1.5062 - N.5 -- X Y Lambda= 0.4970

12.49	3.97
18.92	2.67
24.91	1.82
31.32	0.76
35.42	0.39
40.62	2.24
45.32	3.66
50.22	5.48
56.70	7.52
60.54	7.75
62.78	8.98
68.16	11.83
70.20	12.96
73.54	14.82
75.71	15.93
78.29	17.82
81.58	20.91
84.17	23.29
87.16	25.28
90.24	28.46
92.50	30.48
94.74	32.12
94.74	35.44

Fattore di sicurezza (FS) 1.5063 - N.6 -- X Y Lambda= 0.5237

13.23	4.37
19.79	0.68
29.28	1.74
35.64	3.12
40.20	4.22
46.70	5.31
53.58	7.33
57.13	7.99
65.59	11.40
68.92	12.71
77.53	18.45
84.49	23.61
88.11	28.10
89.34	29.73
89.34	33.18

Fattore di sicurezza (FS) 1.5066 - N.7 -- X Y Lambda= 0.5240

X	Y
12.99	4.24
18.22	1.23
26.63	1.81
34.28	2.81
40.93	3.46
49.58	5.32
56.30	6.84
61.70	7.87
69.15	11.37
74.22	14.77
77.74	17.10
83.02	21.61
87.21	24.48
93.77	31.48
94.09	31.93
94.09	35.44

Fattore di sicurezza (FS) 1.5073 - N.8 -- X Y Lambda= 0.5091

X	Y
11.02	3.19
17.45	2.31
21.05	1.85
27.67	0.62
31.30	0.85
38.32	3.27
45.55	4.07
51.88	6.82
59.27	9.84
67.30	12.45
74.99	17.51
81.73	21.91
85.11	23.72
89.86	27.34
92.34	29.81
94.09	31.84
94.09	35.44

Fattore di sicurezza (FS) 1.5180 - N.9 -- X Y Lambda= 0.5090

X	Y
13.70	4.62
22.92	0.45
27.06	0.05
36.45	1.71
43.56	5.20
50.39	7.66
60.44	9.55
63.79	11.34
67.55	13.52
72.88	16.55
81.04	22.39
87.92	28.68
88.53	29.44
88.53	32.79

Fattore di sicurezza (FS) 1.5183 - N.10 -- X Y Lambda= 0.4745

X	Y
11.02	3.20
18.23	1.15
27.57	0.05
36.86	0.88
42.97	0.40
50.62	3.64
58.02	6.65
62.78	8.16
71.63	12.52
75.64	14.19
83.99	19.65
90.33	26.58
94.08	32.32
94.08	35.44

---------- ANALISI DEFICIT DI RESISTENZA ----------
DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs *

Analisi Deficit in riferimento a FS(progetto) = 1.200

Sup N.	FS	FTR(kN/m)	FTA(kN/m)	Bilancio(kN/m)	ESITO
1	1.487	5619.7	3778.2	1085.9	Surplus
2	1.488	5358.6	3602.1	1036.1	Surplus
3	1.495	5141.7	3439.4	1014.4	Surplus
4	1.505	5617.2	3731.7	1139.2	Surplus
5	1.506	5481.6	3639.4	1114.3	Surplus
6	1.506	4814.3	3196.1	978.9	Surplus
7	1.507	5448.4	3616.3	1108.9	Surplus
8	1.507	5105.2	3387.0	1040.9	Surplus
9	1.518	4632.3	3051.5	970.5	Surplus
10	1.518	6213.4	4092.4	1302.5	Surplus

Esito analisi: SURPLUS di RESISTENZA!

Valore minimo di SURPLUS di RESISTENZA (kN/m): 970.5

Note: FTR --> Forza totale Resistente lungo la superficiedi scivolamento

FTA --> Forza totale Agente lungo la superficie di scivolamento

IMPORTANTE! : Il Deficit o il Surplus di resistenza viene espresso in kN per metro di LARGHEZZA rispetto al fronte di scarpata

TABELLA PARAMETRI CONCI DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	alpha (°)	W (kN/m)	ru (-)	U (kPa)	phi' (°)	(c',Cu) (kPa)
11.932	0.657	-8.63	1.85	0.00	0.00	25.00	15.00
12.588	0.657	-8.63	5.55	0.00	0.00	25.00	15.00
13.245	0.555	-8.63	7.58	0.00	0.00	25.00	15.00
13.800	0.657	-8.63	10.16	0.00	0.00	25.00	15.00
14.457	0.657	-8.63	9.41	0.00	0.00	25.00	15.00
15.113	0.657	-8.63	8.67	0.00	0.00	25.00	15.00

15.770	0.657	-8.63	7.93	0.00	0.00	25.00	15.00
16.426	0.074	-8.63	0.85	0.00	0.00	25.00	15.00
16.500	0.657	-8.63	7.90	0.00	0.00	25.00	15.00
17.157	0.657	-8.63	8.75	0.00	0.00	25.00	15.00
17.813	0.657	-8.63	9.60	0.00	0.00	25.00	15.00
18.470	0.099	-8.63	1.52	0.00	0.00	25.00	15.00
18.569	0.657	-7.40	10.52	0.00	0.00	25.00	15.00
19.225	0.657	-7.40	11.26	0.00	0.00	25.00	15.00
19.882	0.298	-7.40	5.36	0.00	0.00	25.00	15.00
20.180	0.657	-7.40	14.09	0.00	0.00	25.00	15.00
20.837	0.657	-7.40	18.35	0.00	0.00	25.00	15.00
21.493	0.657	-7.40	22.61	0.00	0.00	25.00	15.00
22.150	0.657	-7.40	26.87	0.00	0.00	25.00	15.00
22.806	0.657	-7.40	31.13	0.00	0.00	25.00	15.00
23.463	0.657	-7.40	35.39	0.00	0.00	25.00	15.00
24.119	0.657	-7.40	39.65	0.00	0.00	25.00	15.00
24.776	0.657	-7.40	43.91	0.00	0.00	25.00	15.00
25.432	0.068	-7.40	4.77	0.00	0.00	25.00	15.00
25.500	0.657	-7.40	46.41	0.00	0.00	25.00	15.00
26.157	0.367	-7.40	25.88	0.00	0.00	25.00	15.00
26.524	0.657	-3.60	46.01	0.00	0.00	25.00	15.00
27.180	0.657	-3.60	45.51	0.00	0.00	25.00	15.00
27.837	0.657	-3.60	45.00	0.00	0.00	25.00	15.00
28.493	0.217	-3.60	14.76	0.00	0.00	25.00	15.00
28.710	0.657	-3.60	46.07	0.00	0.00	25.00	15.00
29.367	0.657	-3.60	49.04	0.00	0.00	25.00	15.00
30.023	0.657	-3.60	52.01	0.00	0.00	25.00	15.00
30.680	0.300	-3.60	24.79	0.00	0.00	25.00	15.00
30.980	0.657	-3.60	56.73	0.00	0.00	25.00	15.00
31.637	0.657	-3.60	60.50	0.00	0.00	25.00	15.00
32.293	0.657	-3.60	64.26	0.00	0.00	25.00	15.00
32.950	0.657	-3.60	68.03	0.00	0.00	25.00	15.00
33.606	0.657	-3.60	71.79	0.00	0.00	25.00	15.00
34.263	0.583	-3.60	66.94	0.00	0.00	25.00	15.00
34.846	0.657	5.60	78.46	0.00	0.00	25.00	15.00
35.502	0.657	5.60	81.36	0.00	0.00	25.00	15.00
36.159	0.657	5.60	84.25	0.00	0.00	25.00	15.00
36.816	0.657	5.60	87.14	0.00	0.00	25.00	15.00
37.472	0.508	5.60	69.40	0.00	0.00	25.00	15.00
37.980	0.657	5.60	90.57	0.00	0.00	25.00	15.00
38.637	0.657	5.60	90.06	0.00	0.00	25.00	15.00
39.293	0.657	5.60	89.55	0.00	0.00	25.00	15.00
39.950	0.300	5.60	40.81	0.00	0.00	25.00	15.00
40.250	0.048	5.60	6.57	0.00	0.00	25.00	15.00
40.298	0.657	15.81	89.76	0.00	0.00	25.00	15.00
40.955	0.657	15.81	90.84	0.00	0.00	25.00	15.00
41.611	0.657	15.81	91.92	0.00	0.00	25.00	15.00
42.268	0.657	15.81	93.01	0.00	0.00	25.00	15.00
42.925	0.657	15.81	94.09	0.00	0.00	25.00	15.00
43.581	0.657	15.81	95.17	0.00	0.00	25.00	15.00
44.238	0.657	15.81	96.25	0.00	0.00	25.00	15.00
44.894	0.657	15.81	97.33	0.00	0.00	25.00	15.00
45.551	0.657	15.81	98.42	0.00	0.00	25.00	15.00
46.207	0.657	15.81	99.50	0.00	0.00	25.00	15.00
46.864	0.657	15.81	100.58	0.00	0.00	25.00	15.00
47.520	0.657	15.81	101.66	0.00	0.00	25.00	15.00
48.177	0.509	15.81	79.63	0.00	0.00	25.00	15.00

48.686	0.657	25.90	103.04	0.00	0.00	25.00	15.00
49.343	0.167	25.90	26.25	0.00	0.00	25.00	15.00
49.510	0.657	25.90	101.71	0.00	0.00	25.00	15.00
50.167	0.657	25.90	99.07	0.00	0.00	25.00	15.00
50.823	0.657	25.90	96.44	0.00	0.00	25.00	15.00
51.480	0.657	25.90	93.81	0.00	0.00	25.00	15.00
52.136	0.657	25.90	91.18	0.00	0.00	25.00	15.00
52.793	0.070	25.90	9.52	0.00	0.00	25.00	15.00
52.862	0.348	17.91	47.19	0.00	0.00	25.00	15.00
53.210	0.657	17.91	89.23	0.00	0.00	25.00	15.00
53.867	0.657	17.91	90.38	0.00	0.00	25.00	15.00
54.523	0.657	17.91	91.54	0.00	0.00	25.00	15.00
55.180	0.657	17.91	92.69	0.00	0.00	25.00	15.00
55.836	0.657	17.91	93.85	0.00	0.00	25.00	15.00
56.493	0.621	17.91	89.78	0.00	0.00	25.00	15.00
57.113	0.657	19.02	96.03	0.00	0.00	25.00	15.00
57.770	0.657	19.02	97.07	0.00	0.00	25.00	15.00
58.426	0.657	19.02	98.11	0.00	0.00	25.00	15.00
59.083	0.657	19.02	99.15	0.00	0.00	25.00	15.00
59.739	0.657	19.02	100.18	0.00	0.00	25.00	15.00
60.396	0.657	19.02	101.22	0.00	0.00	25.00	15.00
61.053	0.427	19.02	66.34	0.00	0.00	25.00	15.00
61.479	0.657	27.38	102.46	0.00	0.00	25.00	15.00
62.136	0.657	27.38	102.56	0.00	0.00	25.00	15.00
62.792	0.657	27.38	102.66	0.00	0.00	25.00	15.00
63.449	0.657	27.38	102.76	0.00	0.00	25.00	15.00
64.105	0.657	27.38	102.86	0.00	0.00	25.00	15.00
64.762	0.657	27.38	102.96	0.00	0.00	25.00	15.00
65.418	0.657	27.38	103.06	0.00	0.00	25.00	15.00
66.075	0.657	27.38	103.16	0.00	0.00	25.00	15.00
66.731	0.657	27.38	103.26	0.00	0.00	25.00	15.00
67.388	0.657	27.38	103.36	0.00	0.00	25.00	15.00
68.045	0.657	27.38	103.46	0.00	0.00	25.00	15.00
68.701	0.657	27.38	103.55	0.00	0.00	25.00	15.00
69.358	0.480	27.38	75.83	0.00	0.00	25.00	15.00
69.838	0.657	31.24	103.48	0.00	0.00	25.00	15.00
70.494	0.657	31.24	103.10	0.00	0.00	25.00	15.00
71.151	0.657	31.24	102.72	0.00	0.00	25.00	15.00
71.808	0.657	31.24	102.34	0.00	0.00	25.00	15.00
72.464	0.406	31.24	63.08	0.00	0.00	25.00	15.00
72.870	0.657	31.24	100.45	0.00	0.00	25.00	15.00
73.527	0.657	31.24	97.53	0.00	0.00	25.00	15.00
74.183	0.657	31.24	94.61	0.00	0.00	25.00	15.00
74.840	0.657	31.24	91.69	0.00	0.00	25.00	15.00
75.496	0.174	31.24	23.79	0.00	0.00	25.00	15.00
75.670	0.303	31.24	41.33	0.00	0.00	25.00	15.00
75.973	0.657	24.11	89.81	0.00	0.00	25.00	15.00
76.630	0.657	24.11	90.60	0.00	0.00	25.00	15.00
77.286	0.657	24.11	91.39	0.00	0.00	25.00	15.00
77.943	0.657	24.11	92.18	0.00	0.00	25.00	15.00
78.600	0.629	24.11	89.04	0.00	0.00	25.00	15.00
79.228	0.152	26.47	21.55	0.00	0.00	25.00	15.00
79.380	0.657	26.47	92.07	0.00	0.00	25.00	15.00
80.037	0.657	26.47	89.31	0.00	0.00	25.00	15.00
80.693	0.657	26.47	86.55	0.00	0.00	25.00	15.00
81.350	0.657	26.47	83.80	0.00	0.00	25.00	15.00
82.006	0.130	26.47	16.31	0.00	0.00	25.00	15.00

82.136	0.094	28.37	11.64	0.00	0.00	25.00	15.00
82.230	0.657	28.37	81.27	0.00	0.00	25.00	15.00
82.887	0.657	28.37	80.92	0.00	0.00	25.00	15.00
83.543	0.657	28.37	80.57	0.00	0.00	25.00	15.00
84.200	0.657	28.37	80.22	0.00	0.00	25.00	15.00
84.856	0.657	28.37	79.87	0.00	0.00	25.00	15.00
85.513	0.657	28.37	79.52	0.00	0.00	25.00	15.00
86.169	0.657	28.37	79.17	0.00	0.00	25.00	15.00
86.826	0.135	28.37	16.24	0.00	0.00	25.00	15.00
86.961	0.657	39.93	77.95	0.00	0.00	25.00	15.00
87.617	0.657	39.93	75.99	0.00	0.00	25.00	15.00
88.274	0.657	39.93	74.03	0.00	0.00	25.00	15.00
88.930	0.657	39.93	72.07	0.00	0.00	25.00	15.00
89.587	0.657	39.93	70.11	0.00	0.00	25.00	15.00
90.243	0.084	39.93	8.81	0.00	0.00	25.00	15.00
90.327	0.657	52.80	66.60	0.00	0.00	25.00	15.00
90.984	0.657	52.80	62.03	0.00	0.00	25.00	15.00
91.640	0.657	52.80	57.47	0.00	0.00	25.00	15.00
92.297	0.657	52.80	52.90	0.00	0.00	25.00	15.00
92.953	0.657	52.80	48.34	0.00	0.00	25.00	15.00
93.610	0.480	52.80	32.46	0.00	0.00	25.00	15.00
94.090	0.657	52.80	39.14	0.00	0.00	25.00	15.00
94.747	0.657	52.80	32.00	0.00	0.00	25.00	15.00

LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio
dx(m) : Larghezza concio
alpha(°) : Angolo pendenza base concio
W(kN/m) : Forza peso concio
ru(-) : Coefficiente locale pressione interstiziale
U(kPa) : Pressione totale dei pori base concio
phi'(°) : Angolo di attrito efficace base concio
c'/Cu (kPa) : Coesione efficace o Resistenza al taglio in condizioni non drenate

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TABELLA DIAGRAMMA DELLE FORZE DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	ht (m)	yt (m)	yt' (--)	E(x) (kN/m)	T(x) (kN/m)	E' (kN)	rho(x) (--)	FS_qFEM (--)	FS_srmFEM (--)
11.932	0.000	3.678	0.017	0.0000000000E+000	0.0000000000E+000	3.1523512894E+000	0.050	21.403	6.649
12.588	0.112	3.691	0.017	3.3215765882E+000	4.9586086501E-003	6.9661951029E+000	0.050	21.403	6.649
13.245	0.221	3.701	-0.025	9.1470650687E+000	5.4449054330E-002	1.0797157742E+001	0.050	7.578	2.523
13.800	0.266	3.661	-0.123	1.6048104347E+001	1.7935421512E-001	1.5373019265E+001	0.050	5.215	1.814
14.457	0.256	3.551	-0.166	2.8428893734E+001	5.6032556899E-001	1.8511060128E+001	0.050	4.200	1.457
15.113	0.246	3.442	-0.160	4.0354324454E+001	1.0598769032E+000	1.8293841298E+001	0.050	3.867	1.296
15.770	0.244	3.340	-0.142	5.2449891458E+001	1.7560342412E+000	1.7835263087E+001	0.066	3.892	1.199
16.426	0.259	3.256	-0.127	6.3773179304E+001	2.6036060552E+000	1.7774306959E+001			

0.089 4.190 1.142
16.500 0.262 3.247 -0.097 6.5090558919E+001 2.7224765938E+000 1.7687963889E+001
0.092 4.246 1.137
17.157 0.299 3.185 -0.092 7.5853347814E+001 3.7996865166E+000 1.6399417895E+001
0.112 4.737 1.106
17.813 0.341 3.127 -0.081 8.6624056095E+001 4.9307913849E+000 1.6720058779E+001
0.129 5.165 1.079
18.470 0.392 3.078 -0.071 9.7807867225E+001 6.3517452685E+000 1.7503721614E+001
0.148 5.764 1.065
18.569 0.401 3.073 -0.048 9.9549510240E+001 6.6094589972E+000 1.7638921209E+001
0.152 5.872 1.065
19.225 0.456 3.042 -0.036 1.1141013132E+002 8.5123495422E+000 1.8922287774E+001
0.177 6.639 1.065
19.882 0.525 3.026 -0.019 1.2439569886E+002 1.0937178101E+001 2.0909881584E+001
0.206 7.382 1.075
20.180 0.562 3.024 0.015 1.3078502150E+002 1.2240029683E+001 2.2815084253E+001
0.220 7.652 1.082
20.837 0.663 3.040 0.038 1.4777495289E+002 1.6120795402E+001 2.8007184785E+001
0.244 7.784 1.109
21.493 0.782 3.074 0.062 1.6756026793E+002 2.0981986543E+001 3.1077703852E+001
0.271 7.350 1.145
22.150 0.915 3.121 0.076 1.8858198960E+002 2.6499821952E+001 3.2964559670E+001
0.297 6.441 1.188
22.806 1.053 3.174 0.082 2.1084486846E+002 3.2546251898E+001 3.4879762967E+001
0.321 5.528 1.236
23.463 1.193 3.229 0.078 2.3438137603E+002 3.9083660928E+001 3.6780793234E+001
0.343 4.733 1.285
24.119 1.327 3.277 0.068 2.5914043068E+002 4.6115618560E+001 3.7358509897E+001
0.363 4.034 1.331
24.776 1.452 3.318 0.053 2.8343551761E+002 5.3097232697E+001 3.6396315671E+001
0.380 3.510 1.372
25.432 1.567 3.347 0.044 3.0693114896E+002 5.9926961468E+001 3.2132726628E+001
0.393 3.113 1.404
25.500 1.578 3.349 0.022 3.0908231005E+002 6.0554576160E+001 3.2182749480E+001
0.394 3.079 1.406
26.157 1.677 3.363 0.019 3.3292907708E+002 6.7703016796E+001 3.6103352290E+001
0.421 2.752 1.428
26.524 1.730 3.368 0.013 3.4613356816E+002 7.1738019302E+001 3.6316614005E+001
0.435 2.594 1.437
27.180 1.780 3.377 0.015 3.7037083028E+002 7.9432857100E+001 3.7180407208E+001
0.462 2.368 1.450
27.837 1.832 3.388 0.023 3.9495384938E+002 8.7623636487E+001 3.7765979403E+001
0.489 2.192 1.459
28.493 1.892 3.407 0.033 4.1996000570E+002 9.6451558759E+001 3.9477781938E+001
0.518 2.054 1.467
28.710 1.916 3.417 0.058 4.2862170594E+002 9.9700208657E+001 4.0006879674E+001
0.528 2.016 1.469
29.367 1.998 3.458 0.076 4.5502675438E+002 1.0996020531E+002 4.1876611051E+001
0.548 1.914 1.479
30.023 2.099 3.517 0.105 4.8360840678E+002 1.2182508455E+002 4.4728567490E+001
0.571 1.830 1.493
30.680 2.218 3.595 0.125 5.1375825863E+002 1.3514087289E+002 4.3342757163E+001
0.597 1.763 1.510
30.980 2.278 3.636 0.159 5.2642390615E+002 1.4109541617E+002 4.3392823769E+001
0.608 1.742 1.519
31.637 2.431 3.747 0.184 5.5667846669E+002 1.5602985702E+002 4.6235863158E+001
0.634 1.701 1.541

32.293	2.603	3.878	0.217	5.8713458717E+002	1.7210608161E+002	4.7665377198E+001	0.661	1.666	1.566
32.950	2.798	4.032	0.250	6.1926619217E+002	1.9001463380E+002	4.9809886627E+001	0.691	1.634	1.591
33.606	3.013	4.206	0.266	6.5253819234E+002	2.0941998002E+002	4.8929956834E+001	0.722	1.603	1.615
34.263	3.230	4.382	0.271	6.8351439257E+002	2.2837674865E+002	4.6435258477E+001	0.751	1.574	1.633
34.846	3.428	4.542	0.293	7.1021224461E+002	2.4528522667E+002	4.7253096415E+001	0.774	1.548	1.645
35.502	3.567	4.745	0.309	7.4232975559E+002	2.6617588100E+002	4.7847726688E+001	0.806	1.519	1.651
36.159	3.704	4.947	0.292	7.7303940677E+002	2.8641677637E+002	4.3337447311E+001	0.834	1.492	1.650
36.816	3.822	5.129	0.268	7.9923462900E+002	3.0386758774E+002	3.7718856831E+001	0.855	1.470	1.643
37.472	3.927	5.299	0.251	8.2256670721E+002	3.1938717323E+002	3.3335485784E+001	0.873	1.451	1.633
37.980	4.000	5.422	0.234	8.3863324245E+002	3.3000711986E+002	3.0240774605E+001	0.883	1.438	1.623
38.637	4.085	5.572	0.225	8.5730735311E+002	3.4228293923E+002	2.6588471694E+001	0.903	1.423	1.610
39.293	4.166	5.717	0.220	8.7354562677E+002	3.5298437193E+002	2.2929645483E+001	0.920	1.411	1.597
39.950	4.246	5.861	0.218	8.8741546179E+002	3.6227520863E+002	1.8380846253E+001	0.935	1.402	1.584
40.250	4.281	5.925	0.215	8.9255980786E+002	3.6582329412E+002	1.6245301204E+001	0.941	1.398	1.579
40.298	4.287	5.936	0.248	8.9333878433E+002	3.6637895720E+002	1.6018740787E+001	0.942	1.397	1.578
40.955	4.265	6.100	0.264	9.0309877267E+002	3.7390228643E+002	1.3838570998E+001	0.950	1.389	1.568
41.611	4.262	6.283	0.294	9.1150972378E+002	3.8109551178E+002	1.1914244171E+001	0.959	1.380	1.558
42.268	4.279	6.487	0.327	9.1874294643E+002	3.8808049777E+002	1.0263603408E+001	0.968	1.372	1.550
42.925	4.319	6.712	0.356	9.2498649938E+002	3.9493382475E+002	8.6380357533E+000	0.977	1.363	1.543
43.581	4.376	6.955	0.389	9.3008524649E+002	4.0141526843E+002	7.3565449757E+000	0.986	1.355	1.537
44.238	4.458	7.222	0.437	9.3464611910E+002	4.0773779947E+002	6.4599564777E+000	0.995	1.349	1.532
44.894	4.578	7.528	0.459	9.3856758748E+002	4.1373702660E+002	5.2216098648E+000	1.003	1.346	1.528
45.551	4.688	7.825	0.423	9.4150243083E+002	4.1857472543E+002	3.4348454254E+000	1.009	1.347	1.526
46.207	4.761	8.084	0.386	9.4307776185E+002	4.2154445706E+002	1.5490410941E+000	1.012	1.351	1.524
46.864	4.824	8.332	0.369	9.4353642205E+002	4.2322438821E+002	-2.8644539030E-001	1.013	1.359	1.523
47.520	4.874	8.569	0.364	9.4270164051E+002	4.2355561845E+002	-2.9311175608E+000	1.011	1.370	1.522
48.177	4.930	8.810	0.366	9.3968767497E+002	4.2209256688E+002	-6.1231429690E+000	1.006	1.385	1.521
48.686	4.971	8.996	0.349	9.3596268068E+002	4.1989908940E+002	-8.0965959334E+000	1.002	1.397	1.520
49.343	4.873	9.217	0.330	9.2998329431E+002	4.1618338317E+002	-9.8689489417E+000			

0.997 1.410 1.518
49.510 4.843 9.268 0.309 9.2829992465E+002 4.1509233143E+002 -1.0253905980E+001
0.996 1.413 1.518
50.167 4.728 9.471 0.305 9.2107589505E+002 4.1035373003E+002 -1.1317406415E+001
0.998 1.422 1.515
50.823 4.606 9.668 0.297 9.1343943749E+002 4.0519450778E+002 -1.1630446001E+001
0.999 1.427 1.513
51.480 4.480 9.861 0.294 9.0580436665E+002 3.9995511749E+002 -1.1345832508E+001
1.000 1.428 1.511
52.136 4.355 10.054 0.296 8.9854162503E+002 3.9495416675E+002 -1.0487111085E+001
1.001 1.424 1.509
52.793 4.230 10.249 0.297 8.9203411100E+002 3.9050345867E+002 -8.7075282761E+000
1.003 1.415 1.509
52.862 4.218 10.270 0.306 8.9143647787E+002 3.9009717118E+002 -8.4942043248E+000
1.003 1.413 1.509
53.210 4.212 10.377 0.322 8.8863164164E+002 3.8814152763E+002 -7.6139946976E+000
1.003 1.407 1.509
53.867 4.216 10.593 0.344 8.8419472431E+002 3.8514175280E+002 -6.0464585911E+000
0.996 1.395 1.510
54.523 4.240 10.829 0.363 8.8069225015E+002 3.8302817596E+002 -4.3014521434E+000
0.989 1.383 1.512
55.180 4.268 11.070 0.381 8.7854663923E+002 3.8226002098E+002 -2.8605468510E+000
0.985 1.373 1.515
55.836 4.316 11.330 0.416 8.7693616698E+002 3.8237429772E+002 -2.2368801625E+000
0.983 1.364 1.519
56.493 4.390 11.615 0.450 8.7560947079E+002 3.8326955134E+002 -1.9735531421E+000
0.983 1.357 1.523
57.113 4.478 11.904 0.479 8.7441227430E+002 3.8464308136E+002 -2.2047555403E+000
0.984 1.352 1.527
57.770 4.575 12.228 0.482 8.7277322005E+002 3.8637464927E+002 -3.0219517616E+000
0.987 1.348 1.530
58.426 4.658 12.537 0.459 8.7044425604E+002 3.8803213971E+002 -4.2281557953E+000
0.990 1.345 1.531
59.083 4.726 12.831 0.450 8.6722137782E+002 3.8932231645E+002 -5.7451098595E+000
0.992 1.343 1.531
59.739 4.795 13.127 0.453 8.6290055493E+002 3.9005369968E+002 -7.5430358353E+000
0.994 1.339 1.529
60.396 4.868 13.426 0.446 8.5731688353E+002 3.9005710732E+002 -9.5877393533E+000
0.996 1.335 1.525
61.053 4.928 13.712 0.430 8.5031123258E+002 3.8922058458E+002 -1.1992188754E+001
0.996 1.331 1.520
61.479 4.961 13.892 0.484 8.4482763844E+002 3.8815981493E+002 -1.3808209259E+001
0.995 1.327 1.517
62.136 4.966 14.237 0.513 8.3479525522E+002 3.8572984016E+002 -1.6490894049E+001
0.997 1.321 1.510
62.792 4.954 14.565 0.503 8.2317402715E+002 3.8234902440E+002 -1.8762786568E+001
0.997 1.313 1.503
63.449 4.946 14.897 0.511 8.1015850201E+002 3.7806518260E+002 -2.0720131998E+001
0.996 1.305 1.496
64.105 4.946 15.237 0.524 7.9596715270E+002 3.7294049571E+002 -2.2426760126E+001
0.994 1.297 1.488
64.762 4.954 15.586 0.541 7.8071071435E+002 3.6699451837E+002 -2.4039077255E+001
0.991 1.288 1.479
65.418 4.976 15.947 0.548 7.6440228829E+002 3.6020457339E+002 -2.5207562423E+001
0.986 1.280 1.470
66.075 4.994 16.306 0.535 7.4761155329E+002 3.5285486103E+002 -2.5491785805E+001
0.979 1.271 1.462

66.731	4.999	16.650	0.525	7.3092992353E+002	3.4515054417E+002	-2.5271927586E+001	0.972	1.263	1.453
67.388	5.004	16.995	0.525	7.1442787660E+002	3.3712098987E+002	-2.5909348346E+001	0.963	1.257	1.445
68.045	5.009	17.340	0.525	6.9690927213E+002	3.2822003798E+002	-2.6719033082E+001	0.952	1.251	1.438
68.701	5.014	17.685	0.525	6.7934405673E+002	3.1904253642E+002	-2.6852971306E+001	0.940	1.246	1.432
69.358	5.018	18.029	0.525	6.6164958270E+002	3.0960463734E+002	-2.7125785002E+001	0.927	1.242	1.427
69.838	5.022	18.282	0.550	6.4855825005E+002	3.0253886248E+002	-2.7574610938E+001	0.917	1.240	1.425
70.494	4.997	18.655	0.560	6.3016636563E+002	2.9253363146E+002	-3.0192119435E+001	0.904	1.239	1.423
71.151	4.960	19.017	0.537	6.0891404299E+002	2.8088356071E+002	-3.2058181156E+001	0.887	1.241	1.424
71.808	4.906	19.360	0.507	5.8807189875E+002	2.6941494035E+002	-3.1080377822E+001	0.870	1.246	1.427
72.464	4.829	19.682	0.474	5.6810349518E+002	2.5839355156E+002	-2.9063154926E+001	0.853	1.254	1.431
72.870	4.765	19.864	0.447	5.5664568108E+002	2.5206204023E+002	-2.8203356132E+001	0.843	1.260	1.434
73.527	4.660	20.157	0.440	5.3815477831E+002	2.4179760341E+002	-2.7433076990E+001	0.835	1.272	1.441
74.183	4.545	20.441	0.443	5.2062427534E+002	2.3199958263E+002	-2.6439246208E+001	0.827	1.286	1.448
74.840	4.445	20.739	0.435	5.0343833672E+002	2.2225547666E+002	-2.4396961450E+001	0.818	1.303	1.455
75.496	4.320	21.012	0.415	4.8858948582E+002	2.1374215543E+002	-2.1439785918E+001	0.812	1.321	1.463
75.670	4.285	21.083	0.405	4.8491594912E+002	2.1161307288E+002	-2.0563180293E+001	0.810	1.325	1.464
75.973	4.224	21.205	0.408	4.7897629847E+002	2.0812524116E+002	-1.9352148600E+001	0.802	1.334	1.468
76.630	4.199	21.475	0.425	4.6659131795E+002	2.0070792300E+002	-1.8954535078E+001	0.783	1.352	1.475
77.286	4.194	21.764	0.454	4.5408776705E+002	1.9309211418E+002	-1.9277377518E+001	0.762	1.369	1.483
77.943	4.207	22.071	0.449	4.4127887351E+002	1.8523126258E+002	-1.8401832930E+001	0.740	1.386	1.491
78.600	4.197	22.354	0.421	4.2992496933E+002	1.7824713097E+002	-1.6811132237E+001	0.719	1.399	1.500
79.228	4.173	22.612	0.408	4.1964252211E+002	1.7198112750E+002	-1.6324381080E+001	0.700	1.409	1.508
79.380	4.158	22.673	0.394	4.1716963870E+002	1.7049650491E+002	-1.6313057995E+001	0.696	1.411	1.510
80.037	4.089	22.930	0.392	4.0647506059E+002	1.6415345571E+002	-1.6417218302E+001	0.689	1.421	1.519
80.693	4.020	23.188	0.366	3.9561276844E+002	1.5780843449E+002	-1.5720578005E+001	0.682	1.429	1.528
81.350	3.916	23.411	0.342	3.8583292413E+002	1.5227034673E+002	-1.4967402223E+001	0.677	1.435	1.535
82.006	3.814	23.636	0.348	3.7595960053E+002	1.4676749674E+002	-1.5914857673E+001	0.672	1.439	1.542
82.136	3.798	23.685	0.376	3.7386291745E+002	1.4560017758E+002	-1.6079095681E+001	0.670	1.440	1.543
82.230	3.783	23.720	0.392	3.7235935207E+002	1.4476497378E+002	-1.6132830486E+001			

0.670 1.440 1.543
82.887 3.687 23.979 0.411 3.6148797024E+002 1.3877582986E+002 -1.7209822871E+001
0.653 1.443 1.547
83.543 3.614 24.260 0.447 3.4976174071E+002 1.3235672676E+002 -1.8636430444E+001
0.636 1.443 1.548
84.200 3.565 24.566 0.473 3.3701713079E+002 1.2541251228E+002 -1.9682325322E+001
0.615 1.442 1.548
84.856 3.526 24.882 0.506 3.2391757359E+002 1.1829646170E+002 -2.1218160180E+001
0.594 1.438 1.545
85.513 3.520 25.231 0.556 3.0915631310E+002 1.1033045446E+002 -2.3858431696E+001
0.568 1.430 1.540
86.169 3.546 25.611 0.591 2.9258990850E+002 1.0149366751E+002 -2.6131121487E+001
0.538 1.419 1.534
86.826 3.587 26.007 0.606 2.7484445920E+002 9.2225879392E+001 -2.8347273293E+001
0.505 1.405 1.528
86.961 3.599 26.091 0.599 2.7098010234E+002 9.0250719227E+001 -2.8578509436E+001
0.498 1.401 1.526
87.617 3.439 26.481 0.588 2.5234470364E+002 8.1041748055E+001 -2.8540515890E+001
0.468 1.387 1.521
88.274 3.272 26.863 0.596 2.3350455764E+002 7.2070576653E+001 -2.9469509564E+001
0.437 1.376 1.518
88.930 3.123 27.264 0.637 2.1364933012E+002 6.2951516255E+001 -3.1317131985E+001
0.403 1.366 1.517
89.587 3.009 27.699 0.679 1.9238313629E+002 5.3683478860E+001 -3.2740051547E+001
0.365 1.359 1.518
90.243 2.915 28.155 0.691 1.7065952328E+002 4.4766229596E+001 -3.2341066094E+001
0.325 1.350 1.518
90.327 2.901 28.210 0.728 1.6795706688E+002 4.3648513456E+001 -3.2728084481E+001
0.319 1.349 1.519
90.984 2.519 28.694 0.751 1.4398888972E+002 3.3704130564E+001 -3.6550524247E+001
0.273 1.348 1.524
91.640 2.157 29.197 0.811 1.1996386275E+002 2.4386519465E+001 -3.7355414869E+001
0.221 1.355 1.534
92.297 1.854 29.758 0.970 9.4938812106E+001 1.5632902164E+001 -4.1350233337E+001
0.161 1.364 1.551
92.953 1.701 30.471 1.008 6.5668329914E+001 6.7415418527E+000 -3.8496476512E+001
0.082 1.372 1.567
93.610 1.447 31.082 0.916 4.4390446697E+001 2.0867285938E+000 -2.9421370634E+001
0.050 1.364 1.564
94.090 1.245 31.512 1.002 3.1314046782E+001 7.3446686859E-001 -2.8264474849E+001
0.050 1.360 1.560
94.747 1.088 32.220 1.002 1.1834342795E+001 9.6933032772E-002 -2.3848060302E+001
0.050 1.505 1.713

LEGENDA SIMBOLI
X(m) : Ascissa sinistra concio
ht(m) : Altezza linea di thrust da nodo sinistro base concio
yt(m) : coordinata Y linea di trust
yt'(-) : gradiente pendenza locale linea di trust
E(x)(kN/m) : Forza Normale interconcio
T(x)(kN/m) : Forza Tangenziale interconcio
E' (kN) : derivata Forza normale interconcio
Rho(x) (-) : fattore mobilizzazione resistenza al taglio verticale interconcio ZhU et al.(2003)
FS_qFEM(x)(-) : fattore di sicurezza locale stimato (locale in X) by qFEM
FS_srmFEM(x)(-) : fattore di sicurezza locale stimato (locale in X) by SRM Procedure

TABELLA SFORZI DI TAGLIO DISTRIBUITI LUNGO SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	dl (m)	alpha (°)	TauStress (kPa)	TauF (kN/m)	TauStrength (kPa)	TauS (kN/m)
11.932	0.657	0.664	-8.627	-0.247	-0.164	16.302	10.825
12.588	0.657	0.664	-8.627	-0.741	-0.492	18.940	12.577
13.245	0.555	0.562	-8.627	-1.197	-0.673	21.434	12.041
13.800	0.657	0.664	-8.627	-1.357	-0.901	22.511	14.948
14.457	0.657	0.664	-8.627	-1.258	-0.835	22.112	14.683
15.113	0.657	0.664	-8.627	-1.158	-0.769	21.793	14.472
15.770	0.657	0.664	-8.627	-1.059	-0.703	21.428	14.229
16.426	0.074	0.075	-8.627	-1.004	-0.075	21.354	1.595
16.500	0.657	0.664	-8.627	-1.055	-0.700	21.644	14.373
17.157	0.657	0.664	-8.627	-1.169	-0.776	22.297	14.806
17.813	0.657	0.664	-8.627	-1.283	-0.852	23.192	15.401
18.470	0.099	0.100	-8.627	-1.348	-0.135	23.831	2.389
18.569	0.657	0.662	-7.399	-1.070	-0.708	24.289	16.080
19.225	0.657	0.662	-7.399	-1.144	-0.758	25.321	16.763
19.882	0.298	0.301	-7.399	-1.198	-0.360	26.134	7.860
20.180	0.657	0.662	-7.399	-1.432	-0.948	28.752	19.035
20.837	0.657	0.662	-7.399	-1.865	-1.235	32.720	21.662
21.493	0.657	0.662	-7.399	-2.298	-1.522	36.369	24.078
22.150	0.657	0.662	-7.399	-2.731	-1.808	39.891	26.410
22.806	0.657	0.662	-7.399	-3.164	-2.095	43.376	28.717
23.463	0.657	0.662	-7.399	-3.598	-2.382	46.865	31.027
24.119	0.657	0.662	-7.399	-4.031	-2.669	49.815	32.980
24.776	0.657	0.662	-7.399	-4.464	-2.955	52.665	34.867
25.432	0.068	0.068	-7.399	-4.703	-0.321	53.582	3.660
25.500	0.657	0.662	-7.399	-4.718	-3.124	54.740	36.240
26.157	0.367	0.370	-7.399	-4.707	-1.742	54.732	20.255
26.524	0.657	0.658	-3.602	-0.067	-0.044	54.215	35.664
27.180	0.657	0.658	-3.602	-0.066	-0.043	54.279	35.706
27.837	0.657	0.658	-3.602	-0.065	-0.043	54.463	35.827
28.493	0.217	0.217	-3.602	-0.065	-0.014	55.080	11.970
28.710	0.657	0.658	-3.602	-0.067	-0.044	56.437	37.126
29.367	0.657	0.658	-3.602	-0.071	-0.047	59.908	39.410
30.023	0.657	0.658	-3.602	-0.075	-0.050	63.249	41.607
30.680	0.300	0.301	-3.602	-0.079	-0.024	64.529	19.423
30.980	0.657	0.658	-3.602	-0.082	-0.054	67.980	44.719
31.637	0.657	0.658	-3.602	-0.088	-0.058	71.624	47.116
32.293	0.657	0.658	-3.602	-0.093	-0.061	75.854	49.899
32.950	0.657	0.658	-3.602	-0.099	-0.065	79.799	52.495
33.606	0.657	0.658	-3.602	-0.104	-0.068	82.092	54.003
34.263	0.583	0.584	-3.602	-0.109	-0.064	84.681	49.490
34.846	0.657	0.660	5.604	18.954	12.504	79.960	52.748
35.502	0.657	0.660	5.604	19.653	12.965	81.667	53.875
36.159	0.657	0.660	5.604	20.351	13.425	82.341	54.319
36.816	0.657	0.660	5.604	21.050	13.886	83.429	55.037
37.472	0.508	0.510	5.604	21.669	11.059	84.355	43.053
37.980	0.657	0.660	5.604	21.878	14.433	84.258	55.584
38.637	0.657	0.660	5.604	21.755	14.352	83.142	54.848
39.293	0.657	0.660	5.604	21.632	14.271	82.105	54.164
39.950	0.300	0.302	5.604	21.543	6.503	81.104	24.481
40.250	0.048	0.049	5.604	21.533	1.047	80.973	3.936

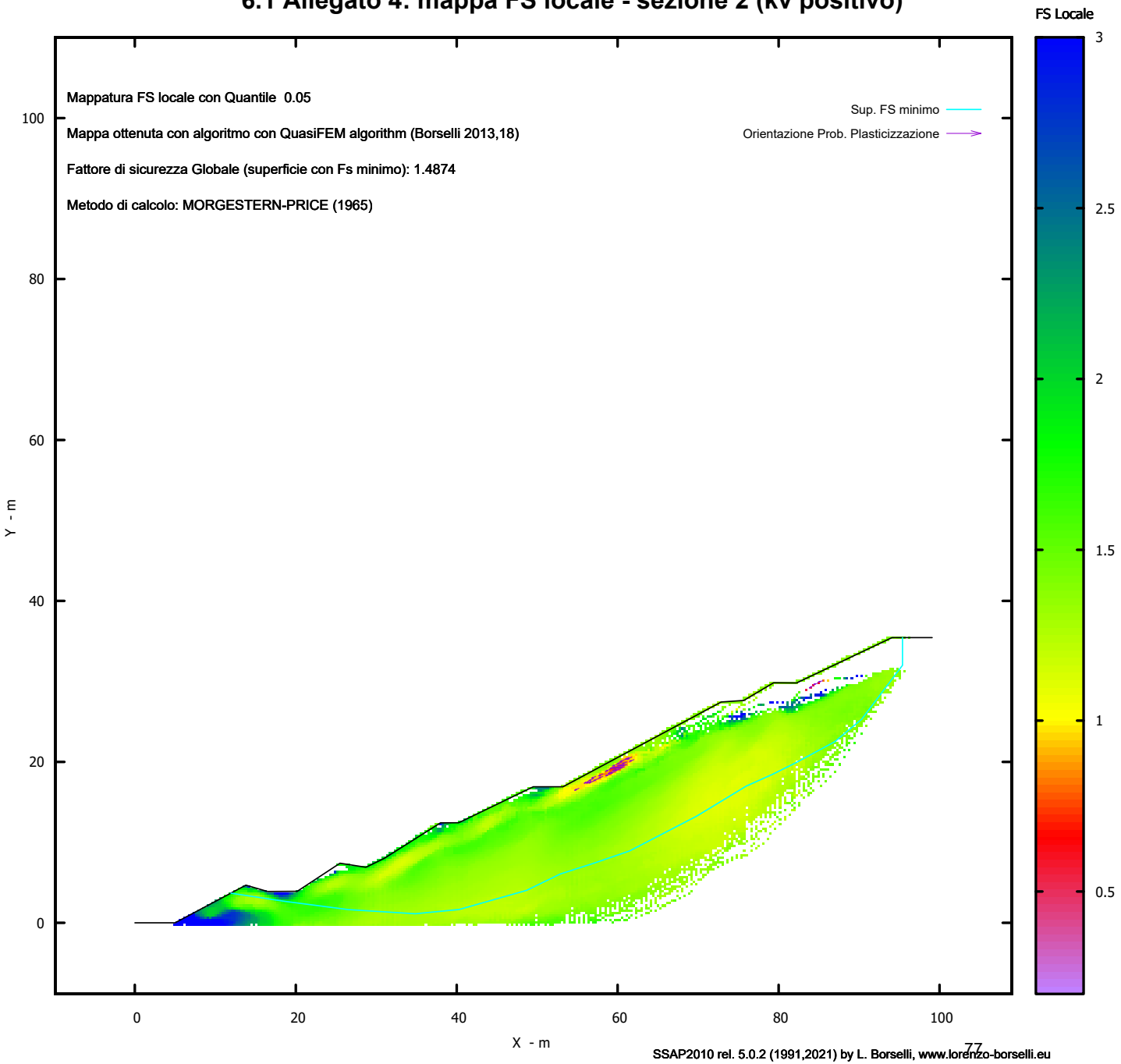
40.298	0.657	0.682	15.809	43.685	29.808	73.464	50.128
40.955	0.657	0.682	15.809	44.211	30.167	74.142	50.590
41.611	0.657	0.682	15.809	44.738	30.526	74.828	51.058
42.268	0.657	0.682	15.809	45.264	30.886	75.518	51.529
42.925	0.657	0.682	15.809	45.791	31.245	76.194	51.990
43.581	0.657	0.682	15.809	46.318	31.605	76.883	52.460
44.238	0.657	0.682	15.809	46.844	31.964	77.561	52.923
44.894	0.657	0.682	15.809	47.371	32.323	78.186	53.350
45.551	0.657	0.682	15.809	47.898	32.683	78.766	53.745
46.207	0.657	0.682	15.809	48.424	33.042	79.383	54.166
46.864	0.657	0.682	15.809	48.951	33.401	79.996	54.585
47.520	0.657	0.682	15.809	49.477	33.761	80.581	54.984
48.177	0.509	0.529	15.809	49.945	26.443	81.115	42.946
48.686	0.657	0.730	25.901	69.542	50.755	73.607	53.722
49.343	0.167	0.186	25.901	69.535	12.931	73.780	13.720
49.510	0.657	0.730	25.901	68.645	50.100	73.189	53.417
50.167	0.657	0.730	25.901	66.868	48.804	71.854	52.443
50.823	0.657	0.730	25.901	65.091	47.507	70.412	51.390
51.480	0.657	0.730	25.901	63.314	46.210	68.869	50.264
52.136	0.657	0.730	25.901	61.537	44.913	67.228	49.066
52.793	0.070	0.077	25.901	60.555	4.689	66.220	5.128
52.862	0.348	0.365	17.912	47.343	17.299	71.233	26.028
53.210	0.657	0.690	17.912	47.403	32.707	71.291	49.189
53.867	0.657	0.690	17.912	48.016	33.130	72.001	49.679
54.523	0.657	0.690	17.912	48.630	33.553	72.701	50.162
55.180	0.657	0.690	17.912	49.243	33.976	73.411	50.652
55.836	0.657	0.690	17.912	49.856	34.399	74.123	51.143
56.493	0.621	0.652	17.912	50.452	32.909	74.819	48.802
57.113	0.657	0.694	19.020	53.173	36.925	74.552	51.772
57.770	0.657	0.694	19.020	53.747	37.324	75.201	52.223
58.426	0.657	0.694	19.020	54.322	37.723	75.869	52.687
59.083	0.657	0.694	19.020	54.896	38.123	76.549	53.159
59.739	0.657	0.694	19.020	55.471	38.522	77.240	53.639
60.396	0.657	0.694	19.020	56.046	38.921	77.938	54.123
61.053	0.427	0.451	19.020	56.520	25.510	78.520	35.439
61.479	0.657	0.739	27.377	71.360	52.759	71.432	52.812
62.136	0.657	0.739	27.377	71.429	52.810	71.833	53.109
62.792	0.657	0.739	27.377	71.498	52.861	72.216	53.392
63.449	0.657	0.739	27.377	71.567	52.912	72.577	53.659
64.105	0.657	0.739	27.377	71.636	52.963	72.930	53.920
64.762	0.657	0.739	27.377	71.705	53.014	73.292	54.188
65.418	0.657	0.739	27.377	71.774	53.065	73.550	54.378
66.075	0.657	0.739	27.377	71.843	53.116	73.733	54.514
66.731	0.657	0.739	27.377	71.912	53.167	73.906	54.641
67.388	0.657	0.739	27.377	71.981	53.218	74.277	54.916
68.045	0.657	0.739	27.377	72.050	53.269	74.432	55.030
68.701	0.657	0.739	27.377	72.119	53.320	74.581	55.140
69.358	0.480	0.541	27.377	72.178	39.044	74.707	40.412
69.838	0.657	0.768	31.243	77.041	59.160	71.565	54.954
70.494	0.657	0.768	31.243	76.757	58.941	72.172	55.421
71.151	0.657	0.768	31.243	76.472	58.722	71.893	55.206
71.808	0.657	0.768	31.243	76.187	58.504	71.485	54.893
72.464	0.406	0.475	31.243	75.957	36.061	70.951	33.685
72.870	0.657	0.768	31.243	74.782	57.424	70.174	53.886
73.527	0.657	0.768	31.243	72.607	55.754	68.488	52.592
74.183	0.657	0.768	31.243	70.432	54.085	67.002	51.451
74.840	0.657	0.768	31.243	68.258	52.415	64.945	49.871

75.496	0.174	0.203	31.243	66.882	13.601	63.792	12.973
75.670	0.303	0.355	31.243	66.582	23.627	63.352	22.480
75.973	0.657	0.719	24.115	58.079	41.776	68.545	49.305
76.630	0.657	0.719	24.115	58.588	42.143	69.048	49.667
77.286	0.657	0.719	24.115	59.098	42.509	69.564	50.038
77.943	0.657	0.719	24.115	59.608	42.876	69.795	50.204
78.600	0.629	0.689	24.115	60.107	41.418	70.127	48.323
79.228	0.152	0.169	26.466	63.815	10.803	68.666	11.624
79.380	0.657	0.733	26.466	62.914	46.141	67.909	49.804
80.037	0.657	0.733	26.466	61.031	44.759	66.389	48.689
80.693	0.657	0.733	26.466	59.147	43.378	64.599	47.376
81.350	0.657	0.733	26.466	57.264	41.997	63.067	46.252
82.006	0.130	0.146	26.466	56.135	8.172	62.282	9.067
82.136	0.094	0.106	28.373	57.977	6.164	60.728	6.457
82.230	0.657	0.746	28.373	57.702	43.055	60.573	45.197
82.887	0.657	0.746	28.373	57.453	42.870	60.558	45.186
83.543	0.657	0.746	28.373	57.205	42.685	60.580	45.203
84.200	0.657	0.746	28.373	56.957	42.499	60.463	45.115
84.856	0.657	0.746	28.373	56.708	42.314	60.614	45.229
85.513	0.657	0.746	28.373	56.460	42.128	60.774	45.348
86.169	0.657	0.746	28.373	56.211	41.943	60.760	45.337
86.826	0.135	0.153	28.373	56.061	8.604	60.781	9.328
86.961	0.657	0.856	39.927	62.763	53.733	52.290	44.767
87.617	0.657	0.856	39.927	61.185	52.383	51.348	43.961
88.274	0.657	0.856	39.927	59.607	51.032	50.675	43.385
88.930	0.657	0.856	39.927	58.030	49.681	50.003	42.809
89.587	0.657	0.856	39.927	56.452	48.330	48.983	41.936
90.243	0.084	0.109	39.927	55.563	6.072	48.433	5.293
90.327	0.657	1.086	52.802	51.148	55.544	39.145	42.509
90.984	0.657	1.086	52.802	47.642	51.736	37.535	40.761
91.640	0.657	1.086	52.802	44.136	47.929	35.978	39.070
92.297	0.657	1.086	52.802	40.630	44.122	35.004	38.013
92.953	0.657	1.086	52.802	37.124	40.314	30.394	33.006
93.610	0.480	0.794	52.802	34.089	27.071	27.119	21.536
94.090	0.657	1.086	52.802	30.064	32.648	24.862	26.999
94.747	0.657	1.086	52.802	24.578	26.690	22.710	24.661

LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio
dx(m) : Larghezza concio
dl(m) : lunghezza base concio
alpha(°) : Angolo pendenza base concio
TauStress(kPa) : Sforzo di taglio su base concio
TauF (kN/m) : Forza di taglio su base concio
TauStrength(kPa) : Resistenza al taglio su base concio
TauS (kN/m) : Forza resistente al taglio su base concio

6.1 Allegato 4: mappa FS locale - sezione 2 (kv positivo)



SSAP2010 rel. 5.0.2 (1991,2021) by L. Borselli, www.lorenzo-borselli.eu

https://WWW.SSAP.EU

7 Tabulato verifia stabilità - sezione 1 (kv positivo) - POST-OPERAM

SSAP 5.0.2 - Slope Stability Analysis Program (1991,2021)
WWW.SSAP.EU
Build No. 11893
BY
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** Gia' Ricercatore CNR-IRPI fino a Luglio 2011

Ultima Revisione struttura tabelle del report: 21 Febbraio 2021

Data: 17/5/2021

Localita' : "Puro Vecchio" - Trani (BAT)

Descrizione: Chiusura definitiva lotti I e II
Modello pendio: Modello sez 1.mod

---------- PARAMETRI DEL MODELLO DEL PENDIO ----------

__ PARAMETRI GEOMETRICI - Coordinate X Y (in m) __

SUP T.		SUP 2		SUP 3		SUP 4	
X	Y	X	Y	X	Y	X	Y
0.00	35.34	-	-	-	-	-	-
5.00	35.34	-	-	-	-	-	-
11.96	35.38	-	-	-	-	-	-
18.17	38.75	-	-	-	-	-	-
21.26	38.88	-	-	-	-	-	-
29.18	43.49	-	-	-	-	-	-
32.28	43.97	-	-	-	-	-	-
40.76	48.33	-	-	-	-	-	-
44.45	48.34	-	-	-	-	-	-
63.13	59.24	-	-	-	-	-	-
66.79	59.32	-	-	-	-	-	-
75.80	64.33	-	-	-	-	-	-
80.80	64.33	-	-	-	-	-	-

ASSENZA DI FALDA

------- PARAMETRI GEOMECCANICI -------

	fi`	C`	Cu	Gamm	Gamm_sat	STR_IDX	sgci	GSI	mi	D
STRATO 1	25.00	15.00	0.00	12.20	13.00	1.967	0.00	0.00	0.00	0.00

LEGENDA: fi`_____ Angolo di attrito interno efficace(in gradi)

C` _____ Coesione efficace (in Kpa)
Cu _____ Resistenza al taglio Non drenata (in Kpa)
Gamm _____ Peso di volume terreno fuori falda (in KN/m^3)
Gamm_sat __ Peso di volume terreno immerso (in KN/m^3)
STR_IDX ___ Indice di resistenza (usato in solo in 'SNIFF SEARCH) (adimensionale)

---- SOLO Per AMMASSI ROCCIOSI FRATTURATI - Parametri Criterio di Rottura di Hoek (2002)----
sigci _____ Resistenza Compressione Uniassiale Roccia Intatta (in MPa)
GSI _____ Geological Strenght Index ammasso(adimensionale)
mi _____ Indice litologico ammasso(adimensionale)
D _____ Fattore di disturbo ammasso(adimensionale)
Fattore di riduzione NTC2018: gammaPHI=1.25 e gammaC=1.25 - DISATTIVATO (solo per ROCCE

Uso CRITERIO DI ROTTURA Hoek et al.(2002,2006) - non-lineare - Generalizzato, secondo Lei et al.(2016)

----- SOVRACCARICHI PRESENTI -----

Nota Bene:

la distribuzione del carico e delle forze unitarie puo' variare in modo lineare tra gli estremi di coordinate X1 e X2

TABELLA SOVRACCARICHI IN SUPERFICIE

N. (-)	da X1 (m)	a X2 (m)	SX1 (kPa)	SX2 (kPa)	Alpha (°)	WsH1 (kN/m)	WsH2 (kN/m)	WsV1 (kN/m)	WsV2 (kN/m)
1	0.0000	80.5000	16.00	16.00	90.00	0.00	0.00	16.00	16.00

LEGENDA SIMBOLI
N.(-) : NUMERO SOVRACCARICO
X1(m) : Posizione carico da X1
X2(m) : Posizione carico a X2
SX1(kPa) : Carico in X1 (Kpa)
SX2(kPa) : Carico in X2 (Kpa)
Alpha(°) : Inclinazione carico (gradi):
Componenti distribuzione forza unitaria applicata:
WsH1,WsH2(kN/m) : forza unitaria Orizzontale (per metro di proiezione Verticale) : da X1 a X2 (vedasi cap.2 manuale)
WsV1,WsV2(kN/m) : forza unitaria Verticale (per metro di proiezione Orizzontale) : da X1 a X2 (vedasi Cap.2 manuale

---------- INFORMAZIONI GENERAZIONE SUPERFICI RANDOM ----------
*** PARAMETRI PER LA GENERAZIONE DELLE SUPERFICI

MOTORE DI RICERCA: RANDOM SEARCH - Siegel (1981)
FILTRAGGIO SUPERFICI : ATTIVATO
COORDINATE X1,X2,Y OSTACOLO : 0.00 0.00 0.00
LUNGHEZZA MEDIA SEGMENTI (m)*: 3.2 (+/-) 50%
INTERVALLO ASCISSE RANDOM STARTING POINT (Xmin .. Xmax): 0.01 11.96
LIVELLO MINIMO CONSIDERATO (Ymin): 9.25
INTERVALLO ASCISSE AMMESSO PER LA TERMINAZIONE (Xmin .. Xmax): 18.17 80.80
TOTALE SUPERFICI GENERATE : 10000
*NOTA IMPORTANTE: La lunghezza media dei segmenti non viene cosiderata nel caso di uso del motore di recerca NEW RANDOM SEARCH

---------- INFORMAZIONI PARAMETRI DI CALCOLO ----------

METODO DI CALCOLO : MORGENSTERN - PRICE (Morgenstern & Price, 1965)
METODO DI ESPLORAZIONE CAMPO VALORI (lambda0,Fs0) ADOTTATO : B (piu' accurato)
COEFFICIENTE SISMICO UTILIZZATO Kh : 0.0620
COEFFICIENTE SISMICO UTILIZZATO Kv (assunto Positivo): 0.0310
COEFFICIENTE c=Kv/Kh UTILIZZATO : 0.5000
FORZA ORIZZONTALE ADDIZIONALE IN TESTA (kN/m): 0.00
FORZA ORIZZONTALE ADDIZIONALE ALLA BASE (kN/m): 0.00

N.B. Le forze orizzontali addizionali in testa e alla base sono poste uguali a 0 durante tutte le verifiche globali

---------- RISULTATO FINALE ELABORAZIONI ----------

DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs *

Fattore di sicurezza (FS) 1.4301 - Min. - X Y Lambda= 0.5525

X	Y
11.12	35.38
17.65	31.92
22.97	32.61
25.75	33.25
31.47	35.04
37.80	37.29
43.15	39.46
47.53	40.18
50.46	40.97
56.83	43.47
62.62	47.93
68.04	52.86
72.46	57.09
74.27	59.39
75.33	60.76
75.33	64.07

Fattore di sicurezza (FS) 1.4307 - N.2 -- X Y Lambda= 0.5445

X	Y
9.38	35.37
15.60	31.61
20.94	32.22
24.38	32.93
29.76	35.44
33.85	37.56
40.24	40.02
43.16	41.16
49.59	42.77
55.91	45.21
60.80	48.16
65.82	51.47
71.50	55.51
75.80	60.78
75.80	64.33

Fattore di sicurezza (FS) 1.4307 - N.3 -- X Y Lambda= 0.4992

X	Y
9.16	35.36
13.83	33.79
16.73	33.71
19.32	33.45
25.75	34.55
29.32	34.52
33.00	35.42
37.42	37.36
43.05	39.85
49.70	42.85
56.08	46.20

62.27	49.16
68.12	52.61
73.00	56.71
76.33	60.52
76.88	61.28
76.88	64.33

Fattore di sicurezza (FS) 1.4344 - N.4 -- X Y Lambda= 0.5260

11.29	35.38
14.66	33.55
19.86	33.77
22.22	33.76
26.15	33.80
28.65	34.64
32.60	36.42
37.33	36.82
41.92	38.21
44.13	38.49
47.66	39.68
50.97	40.74
53.40	42.46
57.64	45.10
60.10	46.03
64.14	49.49
67.12	52.60
70.16	54.58
73.30	57.30
76.87	61.27
76.87	64.33

Fattore di sicurezza (FS) 1.4352 - N.5 -- X Y Lambda= 0.4996

9.92	35.37
15.03	33.01
20.47	32.84
24.19	33.34
30.07	34.03
36.98	34.73
43.20	36.97
46.67	38.44
50.62	40.11
56.69	43.86
59.46	45.63
64.47	48.88
67.79	52.66
74.19	57.25
75.98	59.44
77.07	60.96
77.07	64.33

Fattore di sicurezza (FS) 1.4364 - N.6 -- X Y Lambda= 0.5100

11.35	35.38
15.69	33.48
18.58	33.14
23.30	32.57

28.05	34.28
31.50	35.67
37.22	36.68
41.28	38.39
46.14	40.73
49.08	42.14
54.36	44.61
57.43	46.44
61.27	48.72
64.19	51.13
65.70	52.64
68.82	55.40
70.59	56.65
73.23	59.51
73.23	62.90

Fattore di sicurezza (FS) 1.4407 - N.7 -- X Y Lambda= 0.5117

11.53	35.38
15.03	33.51
20.29	30.61
25.16	31.50
31.17	33.40
35.93	35.09
38.59	35.76
41.94	36.29
44.81	36.75
49.08	38.71
55.23	42.00
57.61	43.53
61.02	46.04
64.43	49.55
69.50	54.45
72.25	56.06
75.95	59.31
77.03	60.80
77.03	64.33

Fattore di sicurezza (FS) 1.4419 - N.8 -- X Y Lambda= 0.5075

9.47	35.37
13.86	33.50
16.77	32.13
19.04	31.96
24.15	31.36
28.80	32.80
31.38	33.32
34.29	33.89
39.75	34.69
44.43	37.43
49.60	39.74
52.62	41.22
55.56	42.80
58.74	44.84
64.11	48.03
68.31	51.71
70.35	53.89

72.73	56.36
76.68	60.31
77.23	61.10
77.23	64.33

Fattore di sicurezza (FS) 1.4435 - N.9 -- X Y Lambda= 0.5336

10.76	35.37
15.77	33.19
21.77	32.21
25.10	33.25
31.69	36.02
36.40	37.53
42.78	39.70
49.23	41.45
54.10	43.56
59.73	46.33
65.44	50.54
69.20	54.30
72.16	57.75
73.74	59.75
73.74	63.19

Fattore di sicurezza (FS) 1.4435 - N.10 -- X Y Lambda= 0.5094

11.38	35.38
15.44	33.34
22.68	33.17
28.61	34.58
31.23	36.02
37.59	38.22
44.27	40.41
47.65	42.19
53.90	45.51
57.00	47.75
60.46	50.67
63.58	52.84
70.08	56.53
73.79	59.62
73.79	63.21

---------- ANALISI DEFICIT DI RESISTENZA ----------
DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs *

Analisi Deficit in riferimento a FS(progetto) = 1.200

Sup N.	FS	FTR(kN/m)	FTA(kN/m)	Bilancio(kN/m)	ESITO
1	1.430	4641.4	3245.5	746.8	Surplus
2	1.431	4331.3	3027.4	698.4	Surplus
3	1.431	4353.8	3043.0	702.2	Surplus
4	1.434	4592.7	3201.8	750.5	Surplus
5	1.435	4999.3	3483.4	819.2	Surplus
6	1.436	4157.0	2894.0	684.2	Surplus
7	1.441	5212.9	3618.3	870.8	Surplus
8	1.442	5289.6	3668.4	887.5	Surplus
9	1.443	4337.6	3004.9	731.7	Surplus
10	1.444	3854.9	2670.4	650.4	Surplus

Esito analisi: SURPLUS di RESISTENZA!

Valore minimo di SURPLUS di RESISTENZA (kN/m): 650.4

Note: FTR --> Forza totale Resistente lungo la superficie di scivolamento

FTA --> Forza totale Agente lungo la superficie di scivolamento

IMPORTANTE! : Il Deficit o il Surplus di resistenza viene espresso in kN per metro di LARGHEZZA rispetto al fronte della scarpata

TABELLA PARAMETRI CONCI DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X	dx	alpha	W	ru	U	phi'	(c',Cu)
(m)	(m)	(°)	(kN/m)	(-)	(kPa)	(°)	(kPa)
11.123	0.529	-27.88	9.67	0.00	0.00	25.00	15.00
11.652	0.308	-27.88	6.50	0.00	0.00	25.00	15.00
11.960	0.529	-27.88	13.59	0.00	0.00	25.00	15.00
12.489	0.529	-27.88	17.36	0.00	0.00	25.00	15.00
13.018	0.529	-27.88	21.13	0.00	0.00	25.00	15.00
13.547	0.529	-27.88	24.90	0.00	0.00	25.00	15.00
14.076	0.529	-27.88	28.67	0.00	0.00	25.00	15.00
14.604	0.529	-27.88	32.44	0.00	0.00	25.00	15.00
15.133	0.529	-27.88	36.21	0.00	0.00	25.00	15.00
15.662	0.529	-27.88	39.98	0.00	0.00	25.00	15.00
16.191	0.529	-27.88	43.76	0.00	0.00	25.00	15.00
16.720	0.529	-27.88	47.53	0.00	0.00	25.00	15.00
17.249	0.397	-27.88	38.12	0.00	0.00	25.00	15.00
17.646	0.524	7.31	52.52	0.00	0.00	25.00	15.00
18.170	0.529	7.31	53.53	0.00	0.00	25.00	15.00
18.699	0.529	7.31	53.23	0.00	0.00	25.00	15.00
19.228	0.529	7.31	52.93	0.00	0.00	25.00	15.00
19.757	0.529	7.31	52.63	0.00	0.00	25.00	15.00
20.286	0.529	7.31	52.32	0.00	0.00	25.00	15.00
20.814	0.446	7.31	43.85	0.00	0.00	25.00	15.00
21.260	0.529	7.31	52.71	0.00	0.00	25.00	15.00
21.789	0.529	7.31	54.31	0.00	0.00	25.00	15.00
22.318	0.529	7.31	55.91	0.00	0.00	25.00	15.00
22.847	0.122	7.31	13.08	0.00	0.00	25.00	15.00
22.968	0.529	13.09	57.69	0.00	0.00	25.00	15.00
23.497	0.529	13.09	58.92	0.00	0.00	25.00	15.00
24.026	0.529	13.09	60.15	0.00	0.00	25.00	15.00
24.555	0.529	13.09	61.38	0.00	0.00	25.00	15.00
25.084	0.529	13.09	62.61	0.00	0.00	25.00	15.00
25.613	0.139	13.09	16.62	0.00	0.00	25.00	15.00
25.751	0.529	17.31	64.02	0.00	0.00	25.00	15.00
26.280	0.529	17.31	64.97	0.00	0.00	25.00	15.00
26.809	0.529	17.31	65.92	0.00	0.00	25.00	15.00
27.338	0.529	17.31	66.87	0.00	0.00	25.00	15.00
27.867	0.529	17.31	67.83	0.00	0.00	25.00	15.00
28.396	0.529	17.31	68.78	0.00	0.00	25.00	15.00
28.925	0.255	17.31	33.55	0.00	0.00	25.00	15.00
29.180	0.529	17.31	69.44	0.00	0.00	25.00	15.00
29.709	0.529	17.31	68.89	0.00	0.00	25.00	15.00

30.238	0.529	17.31	68.33	0.00	0.00	25.00	15.00
30.767	0.529	17.31	67.78	0.00	0.00	25.00	15.00
31.296	0.178	17.31	22.66	0.00	0.00	25.00	15.00
31.473	0.529	19.58	66.97	0.00	0.00	25.00	15.00
32.002	0.278	19.58	34.90	0.00	0.00	25.00	15.00
32.280	0.529	19.58	66.52	0.00	0.00	25.00	15.00
32.809	0.529	19.58	67.08	0.00	0.00	25.00	15.00
33.338	0.529	19.58	67.64	0.00	0.00	25.00	15.00
33.867	0.529	19.58	68.19	0.00	0.00	25.00	15.00
34.396	0.529	19.58	68.75	0.00	0.00	25.00	15.00
34.924	0.529	19.58	69.31	0.00	0.00	25.00	15.00
35.453	0.529	19.58	69.87	0.00	0.00	25.00	15.00
35.982	0.529	19.58	70.42	0.00	0.00	25.00	15.00
36.511	0.529	19.58	70.98	0.00	0.00	25.00	15.00
37.040	0.529	19.58	71.54	0.00	0.00	25.00	15.00
37.569	0.226	19.58	30.80	0.00	0.00	25.00	15.00
37.795	0.529	22.07	72.25	0.00	0.00	25.00	15.00
38.324	0.529	22.07	72.63	0.00	0.00	25.00	15.00
38.853	0.529	22.07	73.01	0.00	0.00	25.00	15.00
39.382	0.529	22.07	73.39	0.00	0.00	25.00	15.00
39.911	0.529	22.07	73.78	0.00	0.00	25.00	15.00
40.440	0.320	22.07	44.86	0.00	0.00	25.00	15.00
40.760	0.529	22.07	73.49	0.00	0.00	25.00	15.00
41.289	0.529	22.07	72.07	0.00	0.00	25.00	15.00
41.818	0.529	22.07	70.65	0.00	0.00	25.00	15.00
42.347	0.529	22.07	69.24	0.00	0.00	25.00	15.00
42.876	0.275	22.07	35.47	0.00	0.00	25.00	15.00
43.151	0.529	9.34	67.51	0.00	0.00	25.00	15.00
43.680	0.529	9.34	66.94	0.00	0.00	25.00	15.00
44.209	0.241	9.34	30.37	0.00	0.00	25.00	15.00
44.450	0.529	9.34	67.13	0.00	0.00	25.00	15.00
44.979	0.529	9.34	68.60	0.00	0.00	25.00	15.00
45.508	0.529	9.34	70.08	0.00	0.00	25.00	15.00
46.037	0.529	9.34	71.55	0.00	0.00	25.00	15.00
46.566	0.529	9.34	73.03	0.00	0.00	25.00	15.00
47.094	0.431	9.34	60.55	0.00	0.00	25.00	15.00
47.525	0.529	15.19	75.51	0.00	0.00	25.00	15.00
48.054	0.529	15.19	76.61	0.00	0.00	25.00	15.00
48.583	0.529	15.19	77.71	0.00	0.00	25.00	15.00
49.112	0.529	15.19	78.81	0.00	0.00	25.00	15.00
49.641	0.529	15.19	79.90	0.00	0.00	25.00	15.00
50.170	0.292	15.19	44.54	0.00	0.00	25.00	15.00
50.461	0.529	21.41	81.40	0.00	0.00	25.00	15.00
50.990	0.529	21.41	82.07	0.00	0.00	25.00	15.00
51.519	0.529	21.41	82.74	0.00	0.00	25.00	15.00
52.048	0.529	21.41	83.42	0.00	0.00	25.00	15.00
52.577	0.529	21.41	84.09	0.00	0.00	25.00	15.00
53.106	0.529	21.41	84.76	0.00	0.00	25.00	15.00
53.635	0.529	21.41	85.44	0.00	0.00	25.00	15.00
54.163	0.529	21.41	86.11	0.00	0.00	25.00	15.00
54.692	0.529	21.41	86.79	0.00	0.00	25.00	15.00
55.221	0.529	21.41	87.46	0.00	0.00	25.00	15.00
55.750	0.529	21.41	88.13	0.00	0.00	25.00	15.00
56.279	0.529	21.41	88.81	0.00	0.00	25.00	15.00
56.808	0.025	21.41	4.21	0.00	0.00	25.00	15.00
56.833	0.529	37.59	88.85	0.00	0.00	25.00	15.00
57.362	0.529	37.59	88.19	0.00	0.00	25.00	15.00

57.891	0.529	37.59	87.54	0.00	0.00	25.00	15.00
58.419	0.529	37.59	86.88	0.00	0.00	25.00	15.00
58.948	0.529	37.59	86.22	0.00	0.00	25.00	15.00
59.477	0.529	37.59	85.57	0.00	0.00	25.00	15.00
60.006	0.529	37.59	84.91	0.00	0.00	25.00	15.00
60.535	0.529	37.59	84.26	0.00	0.00	25.00	15.00
61.064	0.529	37.59	83.60	0.00	0.00	25.00	15.00
61.593	0.529	37.59	82.95	0.00	0.00	25.00	15.00
62.122	0.502	37.59	78.14	0.00	0.00	25.00	15.00
62.624	0.506	42.32	77.95	0.00	0.00	25.00	15.00
63.130	0.529	42.32	79.33	0.00	0.00	25.00	15.00
63.659	0.529	42.32	76.20	0.00	0.00	25.00	15.00
64.188	0.529	42.32	73.08	0.00	0.00	25.00	15.00
64.717	0.529	42.32	69.95	0.00	0.00	25.00	15.00
65.246	0.529	42.32	66.82	0.00	0.00	25.00	15.00
65.774	0.529	42.32	63.69	0.00	0.00	25.00	15.00
66.303	0.487	42.32	55.85	0.00	0.00	25.00	15.00
66.790	0.529	42.32	58.63	0.00	0.00	25.00	15.00
67.319	0.529	42.32	57.38	0.00	0.00	25.00	15.00
67.848	0.189	42.32	20.15	0.00	0.00	25.00	15.00
68.036	0.529	43.77	55.60	0.00	0.00	25.00	15.00
68.565	0.529	43.77	54.19	0.00	0.00	25.00	15.00
69.094	0.529	43.77	52.78	0.00	0.00	25.00	15.00
69.623	0.529	43.77	51.36	0.00	0.00	25.00	15.00
70.152	0.529	43.77	49.95	0.00	0.00	25.00	15.00
70.681	0.529	43.77	48.53	0.00	0.00	25.00	15.00
71.210	0.529	43.77	47.12	0.00	0.00	25.00	15.00
71.738	0.529	43.77	45.71	0.00	0.00	25.00	15.00
72.267	0.188	43.77	15.94	0.00	0.00	25.00	15.00
72.456	0.529	51.67	43.25	0.00	0.00	25.00	15.00
72.985	0.529	51.67	40.76	0.00	0.00	25.00	15.00
73.513	0.529	51.67	38.26	0.00	0.00	25.00	15.00
74.042	0.232	51.67	15.96	0.00	0.00	25.00	15.00
74.274	0.529	52.26	34.63	0.00	0.00	25.00	15.00
74.803	0.529	52.26	32.04	0.00	0.00	25.00	15.00

LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio
dx(m) : Larghezza concio
alpha(°) : Angolo pendenza base concio
W(kN/m) : Forza peso concio
ru(-) : Coefficiente locale pressione interstiziale
U(kPa) : Pressione totale dei pori base concio
phi'(°) : Angolo di attrito efficace base concio
c'/Cu (kPa) : Coesione efficace o Resistenza al taglio in condizioni non drenate

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TABELLA DIAGRAMMA DELLE FORZE DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X	ht	yt	yt'	E(x)	T(x)	E'	rho(x)	FS_qFEM	FS_srmFEM
(m)	(m)	(m)	(--)	(kN/m)	(kN/m)	(kN)	(--)	(--)	(--)
11.123	0.000	35.375	-0.378	0.0000000000E+000	0.0000000000E+000	3.8086669018E+000	0.048	8.423	7.585
11.652	0.057	35.152	-0.378	1.9792415841E+000	1.4200852656E-002	3.6759201150E+000			

0.048 7.861 7.061
11.960 0.127 35.059 -0.266 3.1004945791E+000 4.6246903483E-002 6.0938118519E+000
0.048 7.223 6.570
12.489 0.277 34.930 -0.234 8.5524697690E+000 5.2839575832E-001 1.5587693460E+001
0.048 7.857 6.340
13.018 0.439 34.811 -0.211 1.9588678110E+001 2.8861592082E+000 3.2387821502E+001
0.126 10.081 4.985
13.547 0.614 34.707 -0.187 4.2811312904E+001 8.5676266691E+000 5.5495156647E+001
0.235 12.339 3.849
14.076 0.800 34.613 -0.171 7.8289750864E+001 1.7687859366E+001 7.8404916004E+001
0.328 13.612 3.184
14.604 0.993 34.526 -0.148 1.2574562567E+002 3.0084995768E+001 9.3090874612E+001
0.399 12.351 2.765
15.133 1.204 34.457 -0.130 1.7675841973E+002 4.4183389810E+001 9.2092964897E+001
0.451 8.623 2.482
15.662 1.415 34.388 -0.111 2.2315873628E+002 5.7329747935E+001 8.7913848660E+001
0.481 6.927 2.288
16.191 1.646 34.340 -0.076 2.6975098949E+002 7.1197614486E+001 8.7727182856E+001
0.508 5.522 2.132
16.720 1.894 34.308 -0.045 3.1595385669E+002 8.5648694517E+001 8.5200038879E+001
0.531 4.404 2.000
17.249 2.158 34.292 -0.014 3.5987297460E+002 1.0017775596E+002 8.0178958344E+001
0.552 3.527 1.888
17.646 2.370 34.294 0.024 3.9082532810E+002 1.1116526844E+002 7.3451113497E+001
0.567 2.978 1.812
18.170 2.324 34.315 0.055 4.2617269729E+002 1.2488247110E+002 6.2518485587E+001
0.595 2.488 1.725
18.699 2.293 34.352 0.090 4.5663793698E+002 1.3785387142E+002 5.4126036861E+001
0.629 2.147 1.648
19.228 2.283 34.410 0.125 4.8342555717E+002 1.5033522089E+002 4.6912218563E+001
0.661 1.899 1.580
19.757 2.289 34.484 0.153 5.0626024137E+002 1.6183585948E+002 3.9525785590E+001
0.690 1.723 1.521
20.286 2.309 34.571 0.177 5.2523471955E+002 1.7210518453E+002 3.2989900351E+001
0.716 1.601 1.474
20.814 2.341 34.671 0.199 5.4115594502E+002 1.8131748623E+002 2.8131555415E+001
0.740 1.522 1.437
21.260 2.378 34.765 0.223 5.5295049968E+002 1.8848832835E+002 2.4928736686E+001
0.759 1.480 1.414
21.789 2.433 34.888 0.253 5.6516717540E+002 1.9611171462E+002 2.2867278545E+001
0.769 1.459 1.395
22.318 2.510 35.033 0.280 5.7713880480E+002 2.0372625132E+002 2.1484154843E+001
0.780 1.450 1.384
22.847 2.594 35.185 0.291 5.8789245473E+002 2.1082342567E+002 1.9093127212E+001
0.789 1.450 1.379
22.968 2.615 35.222 0.313 5.9017941093E+002 2.1242327307E+002 1.8562386011E+001
0.791 1.451 1.379
23.497 2.659 35.388 0.325 5.9943142429E+002 2.1920062592E+002 1.6695065629E+001
0.801 1.458 1.380
24.026 2.713 35.566 0.346 6.0783893874E+002 2.2588263724E+002 1.5113968685E+001
0.812 1.466 1.385
24.555 2.779 35.754 0.363 6.1541851630E+002 2.3244310024E+002 1.3559252657E+001
0.822 1.475 1.392
25.084 2.852 35.951 0.385 6.2218149987E+002 2.3882708417E+002 1.2002089517E+001
0.833 1.484 1.401
25.613 2.940 36.161 0.399 6.2811395808E+002 2.4507037032E+002 1.0584920188E+001
0.843 1.492 1.410

25.751	2.963	36.217	0.409	6.2955889560E+002	2.4666768819E+002	1.0128343366E+001	0.846	1.494	1.413
26.280	3.016	36.434	0.417	6.3432895896E+002	2.5243524987E+002	8.5177301463E+000	0.856	1.498	1.421
26.809	3.075	36.658	0.409	6.3856868901E+002	2.5792055815E+002	7.1774301453E+000	0.867	1.496	1.428
27.338	3.119	36.867	0.402	6.4192102419E+002	2.6247250485E+002	6.1007360080E+000	0.874	1.490	1.433
27.867	3.171	37.084	0.405	6.4502186024E+002	2.6658715977E+002	5.5414414749E+000	0.881	1.482	1.436
28.396	3.217	37.295	0.392	6.4778259083E+002	2.7010908516E+002	4.9295713097E+000	0.885	1.474	1.437
28.925	3.256	37.498	0.379	6.5023620941E+002	2.7303422528E+002	4.3753890348E+000	0.888	1.467	1.436
29.180	3.270	37.593	0.358	6.5132089889E+002	2.7423643034E+002	4.1284032668E+000	0.889	1.464	1.435
29.709	3.292	37.779	0.329	6.5337332416E+002	2.7630949880E+002	3.4964627343E+000	0.896	1.457	1.433
30.238	3.289	37.941	0.300	6.5501934981E+002	2.7763565462E+002	2.8842836328E+000	0.901	1.453	1.429
30.767	3.280	38.097	0.292	6.5642423082E+002	2.7862221966E+002	2.3994869526E+000	0.906	1.450	1.426
31.296	3.269	38.250	0.285	6.5755745344E+002	2.7938224517E+002	1.7668837309E+000	0.910	1.450	1.422
31.473	3.262	38.298	0.294	6.5784904633E+002	2.7958433669E+002	1.5551130172E+000	0.911	1.450	1.421
32.002	3.233	38.457	0.309	6.5853698340E+002	2.8021429068E+002	1.0371281820E+000	0.916	1.450	1.419
32.280	3.224	38.548	0.336	6.5878666490E+002	2.8056813104E+002	7.7761439031E-001	0.918	1.450	1.418
32.809	3.216	38.728	0.352	6.5907608141E+002	2.8128968366E+002	3.0871435752E-001	0.918	1.449	1.417
33.338	3.221	38.921	0.378	6.5911321346E+002	2.8213477447E+002	-1.5232512617E-001	0.918	1.446	1.418
33.867	3.240	39.128	0.415	6.5891495657E+002	2.8315427828E+002	-5.6681340848E-001	0.919	1.442	1.420
34.396	3.283	39.359	0.447	6.5851365564E+002	2.8440939913E+002	-9.3776091963E-001	0.921	1.437	1.423
34.924	3.336	39.601	0.465	6.5792302186E+002	2.8578778321E+002	-1.3103451517E+000	0.923	1.432	1.428
35.453	3.399	39.851	0.461	6.5712761278E+002	2.8723081319E+002	-1.6682732437E+000	0.926	1.427	1.433
35.982	3.448	40.088	0.437	6.5615837365E+002	2.8855717317E+002	-2.0284254723E+000	0.928	1.422	1.438
36.511	3.484	40.313	0.431	6.5498200659E+002	2.8966843981E+002	-2.6026925990E+000	0.931	1.420	1.443
37.040	3.527	40.544	0.430	6.5340532533E+002	2.9050617936E+002	-3.2498193566E+000	0.932	1.418	1.447
37.569	3.563	40.768	0.419	6.5154444746E+002	2.9101539914E+002	-3.7571475085E+000	0.933	1.419	1.451
37.795	3.575	40.861	0.411	6.5067039412E+002	2.9113767431E+002	-4.0874734650E+000	0.933	1.420	1.452
38.324	3.579	41.079	0.409	6.4822683085E+002	2.9105796502E+002	-4.9532272096E+000	0.933	1.422	1.454
38.853	3.579	41.293	0.409	6.4543102246E+002	2.9056087461E+002	-5.7355443361E+000	0.933	1.424	1.455
39.382	3.582	41.511	0.402	6.4215994816E+002	2.8956874979E+002	-6.2790076088E+000			

0.931 1.426 1.454
39.911 3.575 41.719 0.380 6.3878928101E+002 2.8824963465E+002 -6.1580091877E+000
0.928 1.426 1.451
40.440 3.555 41.913 0.362 6.3564619511E+002 2.8673620203E+002 -5.2997911329E+000
0.925 1.423 1.447
40.760 3.538 42.026 0.338 6.3407362518E+002 2.8576515460E+002 -4.5347074506E+000
0.922 1.418 1.444
41.289 3.498 42.200 0.315 6.3200342823E+002 2.8423860868E+002 -2.9557881586E+000
0.926 1.408 1.438
41.818 3.443 42.360 0.278 6.3094708322E+002 2.8301067509E+002 -5.8842411196E-001
0.929 1.395 1.431
42.347 3.363 42.494 0.245 6.3138101127E+002 2.8239351489E+002 2.2531259393E+000
0.934 1.380 1.424
42.876 3.272 42.618 0.227 6.3333037066E+002 2.8251404254E+002 5.2856887510E+000
0.939 1.362 1.417
43.151 3.219 42.677 0.222 6.3501435987E+002 2.8291976713E+002 7.3929276883E+000
0.942 1.353 1.414
43.680 3.252 42.797 0.229 6.4021974860E+002 2.8470816858E+002 1.1431032571E+001
0.946 1.336 1.407
44.209 3.288 42.919 0.237 6.4710575514E+002 2.8759636821E+002 1.4442504113E+001
0.951 1.321 1.402
44.450 3.308 42.979 0.253 6.5074977269E+002 2.8931064249E+002 1.5631497507E+001
0.954 1.315 1.399
44.979 3.356 43.114 0.269 6.5964204260E+002 2.9403674186E+002 1.7794332205E+001
0.954 1.305 1.395
45.508 3.418 43.264 0.297 6.6957207093E+002 2.9993029595E+002 1.9425565137E+001
0.955 1.296 1.391
46.037 3.496 43.428 0.331 6.8018980895E+002 3.0686554148E+002 2.0537016773E+001
0.960 1.289 1.388
46.566 3.594 43.614 0.369 6.9129549670E+002 3.1483525806E+002 2.0992816430E+001
0.967 1.283 1.384
47.094 3.713 43.819 0.387 7.0239536560E+002 3.2356584158E+002 1.9251985780E+001
0.976 1.278 1.379
47.525 3.808 43.985 0.400 7.1007795456E+002 3.3037603624E+002 1.7005005475E+001
0.983 1.274 1.375
48.054 3.883 44.203 0.416 7.1853000318E+002 3.3880981309E+002 1.4460023018E+001
0.995 1.268 1.369
48.583 3.961 44.425 0.417 7.2537332292E+002 3.4667168396E+002 1.1236709591E+001
1.007 1.261 1.362
49.112 4.036 44.644 0.418 7.3041584957E+002 3.5362622490E+002 8.1726698971E+000
1.017 1.253 1.354
49.641 4.116 44.867 0.426 7.3401812220E+002 3.5983399231E+002 5.4426068495E+000
1.026 1.244 1.345
50.170 4.199 45.094 0.436 7.3617287198E+002 3.6522957627E+002 2.5201387513E+000
1.034 1.234 1.336
50.461 4.251 45.225 0.450 7.3665798498E+002 3.6787705208E+002 9.0103663486E-001
1.038 1.229 1.330
50.990 4.282 45.464 0.460 7.3640382794E+002 3.7200168763E+002 -1.6027632055E+000
1.047 1.218 1.320
51.519 4.323 45.712 0.470 7.3496263127E+002 3.7542867670E+002 -3.6673625580E+000
1.055 1.209 1.309
52.048 4.365 45.961 0.478 7.3252460443E+002 3.7799121512E+002 -5.3451656494E+000
1.062 1.200 1.298
52.577 4.414 46.217 0.504 7.2930867917E+002 3.7984401858E+002 -6.9475555373E+000
1.067 1.192 1.287
53.106 4.484 46.494 0.537 7.2517569350E+002 3.8086034075E+002 -8.5841433206E+000
1.070 1.185 1.276

53.635 4.566 46.785 0.533 7.2022863593E+002 3.8098861731E+002 -1.0054992857E+001 1.072 1.179 1.264
54.163 4.633 47.058 0.493 7.1453983079E+002 3.8025346107E+002 -1.1352425293E+001 1.073 1.173 1.253
54.692 4.673 47.306 0.469 7.0822038903E+002 3.7852814209E+002 -1.2936851922E+001 1.071 1.167 1.243
55.221 4.714 47.554 0.469 7.0085562604E+002 3.7580627595E+002 -1.5165027090E+001 1.067 1.162 1.235
55.750 4.754 47.802 0.469 6.9217928901E+002 3.7202081337E+002 -1.7868415469E+001 1.062 1.157 1.228
56.279 4.795 48.050 0.469 6.8195496480E+002 3.6711884411E+002 -2.0995714879E+001 1.055 1.151 1.221
56.808 4.836 48.298 0.469 6.6997066647E+002 3.6107172550E+002 -2.4782928882E+001 1.046 1.144 1.216
56.833 4.837 48.309 0.685 6.6934872497E+002 3.6075740649E+002 -2.5055531346E+001 1.045 1.143 1.216
57.362 4.798 48.677 0.671 6.5416947962E+002 3.5306864532E+002 -3.1007152058E+001 1.041 1.135 1.212
57.891 4.733 49.019 0.628 6.3655031158E+002 3.4381957972E+002 -3.5326316670E+001 1.035 1.127 1.209
58.419 4.648 49.342 0.627 6.1680238652E+002 3.3303844751E+002 -3.9179056849E+001 1.025 1.119 1.206
58.948 4.582 49.683 0.661 5.9510790822E+002 3.2070984226E+002 -4.2572562226E+001 1.012 1.113 1.205
59.477 4.533 50.041 0.690 5.7177043737E+002 3.0695993442E+002 -4.5339392019E+001 0.996 1.107 1.204
60.006 4.497 50.413 0.712 5.4714929146E+002 2.9200051157E+002 -4.7542376517E+001 0.976 1.104 1.205
60.535 4.472 50.794 0.708 5.2148157125E+002 2.7596964839E+002 -4.7840694356E+001 0.953 1.104 1.208
61.064 4.432 51.162 0.667 4.9654487389E+002 2.5985632964E+002 -4.5534122973E+001 0.926 1.108 1.213
61.593 4.363 51.500 0.631 4.7331697407E+002 2.4433811535E+002 -4.3788840114E+001 0.899 1.116 1.221
62.122 4.286 51.829 0.616 4.5022638333E+002 2.2871803833E+002 -4.3601618546E+001 0.869 1.128 1.231
62.624 4.204 52.135 0.602 4.2836012342E+002 2.1387617386E+002 -4.3720903991E+001 0.838 1.143 1.244
63.130 4.045 52.437 0.587 4.0613984554E+002 1.9886350983E+002 -4.3672152471E+001 0.808 1.162 1.262
63.659 3.870 52.743 0.583 3.8316606783E+002 1.8342007942E+002 -4.3738964628E+001 0.785 1.187 1.284
64.188 3.699 53.054 0.595 3.5987411174E+002 1.6789725715E+002 -4.4024272137E+001 0.759 1.218 1.311
64.717 3.536 53.372 0.597 3.3659854451E+002 1.5257288742E+002 -4.2968728317E+001 0.731 1.254 1.344
65.246 3.367 53.686 0.592 3.1442311026E+002 1.3820257550E+002 -4.0860030852E+001 0.703 1.294 1.379
65.774 3.198 53.998 0.594 2.9337805846E+002 1.2484918883E+002 -3.8719464399E+001 0.676 1.336 1.418
66.303 3.032 54.314 0.599 2.7346684967E+002 1.1254068179E+002 -3.6437288836E+001 0.649 1.379 1.457
66.790 2.882 54.606 0.610 2.5627514078E+002 1.0221415182E+002 -3.4359576065E+001 0.626 1.416 1.492
67.319 2.726 54.933 0.624 2.3865693655E+002 9.1961048927E+001 -3.2471439093E+001 0.591 1.454 1.528
67.848 2.578 55.266 0.637 2.2192784953E+002 8.2550790706E+001 -3.1224592403E+001

0.557 1.486 1.560
68.036 2.530 55.389 0.674 2.1606899576E+002 7.9333849647E+001 -3.1086674368E+001
0.545 1.496 1.570
68.565 2.384 55.750 0.712 1.9961749983E+002 7.0511919996E+001 -3.1578111373E+001
0.511 1.518 1.593
69.094 2.270 56.143 0.751 1.8266663914E+002 6.1651468908E+001 -3.1746401068E+001
0.474 1.531 1.609
69.623 2.165 56.544 0.767 1.6603713153E+002 5.3168362868E+001 -3.1200835690E+001
0.434 1.534 1.616
70.152 2.068 56.954 0.808 1.4966335315E+002 4.5048784027E+001 -3.1641368848E+001
0.392 1.530 1.616
70.681 2.006 57.399 0.838 1.3256786309E+002 3.6995500726E+001 -3.1708397271E+001
0.345 1.516 1.606
71.210 1.941 57.841 0.829 1.1612318411E+002 2.9657956677E+001 -3.0914101709E+001
0.298 1.499 1.594
71.738 1.869 58.275 0.780 9.9867875507E+001 2.2201173633E+001 -2.8739476938E+001
0.241 1.475 1.573
72.267 1.753 58.665 0.738 8.5723447830E+001 1.5970467670E+001 -2.6338245327E+001
0.188 1.446 1.544
72.456 1.712 58.805 0.761 8.0789752182E+001 1.3957178187E+001 -2.6263998058E+001
0.169 1.435 1.532
72.985 1.449 59.211 0.823 6.6794855365E+001 8.9938307424E+000 -2.7736596348E+001
0.121 1.401 1.500
73.513 1.244 59.675 0.940 5.1450832202E+001 4.7810774840E+000 -3.0154278743E+001
0.073 1.361 1.465
74.042 1.106 60.206 0.941 3.4898585181E+001 1.5152761743E+000 -2.5431908454E+001
0.048 1.331 1.436
74.274 0.997 60.390 1.059 2.9605186771E+001 8.7532735754E-001 -2.5316075379E+001
0.048 1.321 1.427
74.803 0.935 61.011 1.059 1.3254156696E+001 1.3254214950E-001 -2.7988321173E+001
0.048 1.335 1.439

LEGENDA SIMBOLI
X(m) : Ascissa sinistra concio
ht(m) : Altezza linea di thrust da nodo sinistro base concio
yt(m) : coordinata Y linea di trust
yt'(-) : gradiente pendenza locale linea di trust
E(x)(kN/m) : Forza Normale interconcio
T(x)(kN/m) : Forza Tangenziale interconcio
E' (kN) : derivata Forza normale interconcio
Rho(x) (-) : fattore mobilizzazione resistenza al taglio verticale interconcio ZhU et al.(2003)
FS_qFEM(x)(-) : fattore di sicurezza locale stimato (locale in X) by qFEM
FS_srmFEM(x)(-) : fattore di sicurezza locale stimato (locale in X) by SRM Procedure
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TABELLA SFORZI DI TAGLIO DISTRIBUITI LUNGO SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	dl (m)	alpha (°)	TauStress (kPa)	TauF (kN/m)	TauStrength (kPa)	TauS (kN/m)
11.123	0.529	0.598	-27.883	-6.669	-3.991	21.902	13.105
11.652	0.308	0.349	-27.883	-7.697	-2.684	23.035	8.034
11.960	0.529	0.598	-27.883	-9.376	-5.610	25.539	15.281
12.489	0.529	0.598	-27.883	-11.978	-7.167	31.610	18.914
13.018	0.529	0.598	-27.883	-14.580	-8.724	40.298	24.112

13.547	0.529	0.598	-27.883	-17.182	-10.281	49.194	29.435
14.076	0.529	0.598	-27.883	-19.784	-11.838	57.797	34.583
14.604	0.529	0.598	-27.883	-22.386	-13.395	63.553	38.027
15.133	0.529	0.598	-27.883	-24.988	-14.952	64.516	38.603
15.662	0.529	0.598	-27.883	-27.590	-16.508	68.502	40.989
16.191	0.529	0.598	-27.883	-30.192	-18.065	72.239	43.224
16.720	0.529	0.598	-27.883	-32.794	-19.622	75.063	44.914
17.249	0.397	0.449	-27.883	-35.070	-15.738	77.629	34.837
17.646	0.524	0.529	7.307	18.741	9.910	67.855	35.881
18.170	0.529	0.533	7.307	18.943	10.101	67.894	36.202
18.699	0.529	0.533	7.307	18.836	10.044	67.375	35.926
19.228	0.529	0.533	7.307	18.729	9.986	66.598	35.511
19.757	0.529	0.533	7.307	18.621	9.929	65.690	35.027
20.286	0.529	0.533	7.307	18.514	9.872	64.873	34.591
20.814	0.446	0.449	7.307	18.415	8.273	64.263	28.869
21.260	0.529	0.533	7.307	18.653	9.946	64.373	34.325
21.789	0.529	0.533	7.307	19.218	10.247	65.743	35.055
22.318	0.529	0.533	7.307	19.783	10.548	66.844	35.642
22.847	0.122	0.123	7.307	20.130	2.468	67.617	8.289
22.968	0.529	0.543	13.093	30.481	16.551	64.181	34.850
23.497	0.529	0.543	13.093	31.131	16.904	65.172	35.388
24.026	0.529	0.543	13.093	31.781	17.257	66.157	35.923
24.555	0.529	0.543	13.093	32.431	17.610	67.128	36.450
25.084	0.529	0.543	13.093	33.080	17.963	68.108	36.983
25.613	0.139	0.142	13.093	33.490	4.768	68.711	9.783
25.751	0.529	0.554	17.306	41.219	22.834	65.661	36.374
26.280	0.529	0.554	17.306	41.831	23.173	66.401	36.784
26.809	0.529	0.554	17.306	42.444	23.512	67.118	37.181
27.338	0.529	0.554	17.306	43.057	23.852	67.852	37.588
27.867	0.529	0.554	17.306	43.670	24.191	68.581	37.992
28.396	0.529	0.554	17.306	44.282	24.531	69.310	38.395
28.925	0.255	0.267	17.306	44.737	11.965	69.851	18.681
29.180	0.529	0.554	17.306	44.707	24.766	69.800	38.666
29.709	0.529	0.554	17.306	44.352	24.569	69.339	38.411
30.238	0.529	0.554	17.306	43.997	24.373	68.892	38.163
30.767	0.529	0.554	17.306	43.642	24.176	68.449	37.918
31.296	0.178	0.186	17.306	43.405	8.080	68.153	12.688
31.473	0.529	0.561	19.583	46.954	26.358	66.211	37.168
32.002	0.278	0.295	19.583	46.576	13.735	65.795	19.403
32.280	0.529	0.561	19.583	46.641	26.182	65.863	36.972
32.809	0.529	0.561	19.583	47.031	26.401	66.281	37.207
33.338	0.529	0.561	19.583	47.422	26.621	66.695	37.439
33.867	0.529	0.561	19.583	47.813	26.840	67.104	37.669
34.396	0.529	0.561	19.583	48.204	27.059	67.522	37.904
34.924	0.529	0.561	19.583	48.595	27.279	67.944	38.141
35.453	0.529	0.561	19.583	48.985	27.498	68.379	38.385
35.982	0.529	0.561	19.583	49.376	27.717	68.821	38.633
36.511	0.529	0.561	19.583	49.767	27.937	69.267	38.883
37.040	0.529	0.561	19.583	50.158	28.156	69.717	39.136
37.569	0.226	0.240	19.583	50.437	12.124	70.038	16.836
37.795	0.529	0.571	22.074	54.846	31.302	68.342	39.004
38.324	0.529	0.571	22.074	55.136	31.467	68.701	39.209
38.853	0.529	0.571	22.074	55.426	31.633	69.074	39.422
39.382	0.529	0.571	22.074	55.716	31.798	69.417	39.617
39.911	0.529	0.571	22.074	56.006	31.964	69.735	39.799
40.440	0.320	0.346	22.074	56.239	19.435	69.978	24.183
40.760	0.529	0.571	22.074	55.789	31.840	69.526	39.680

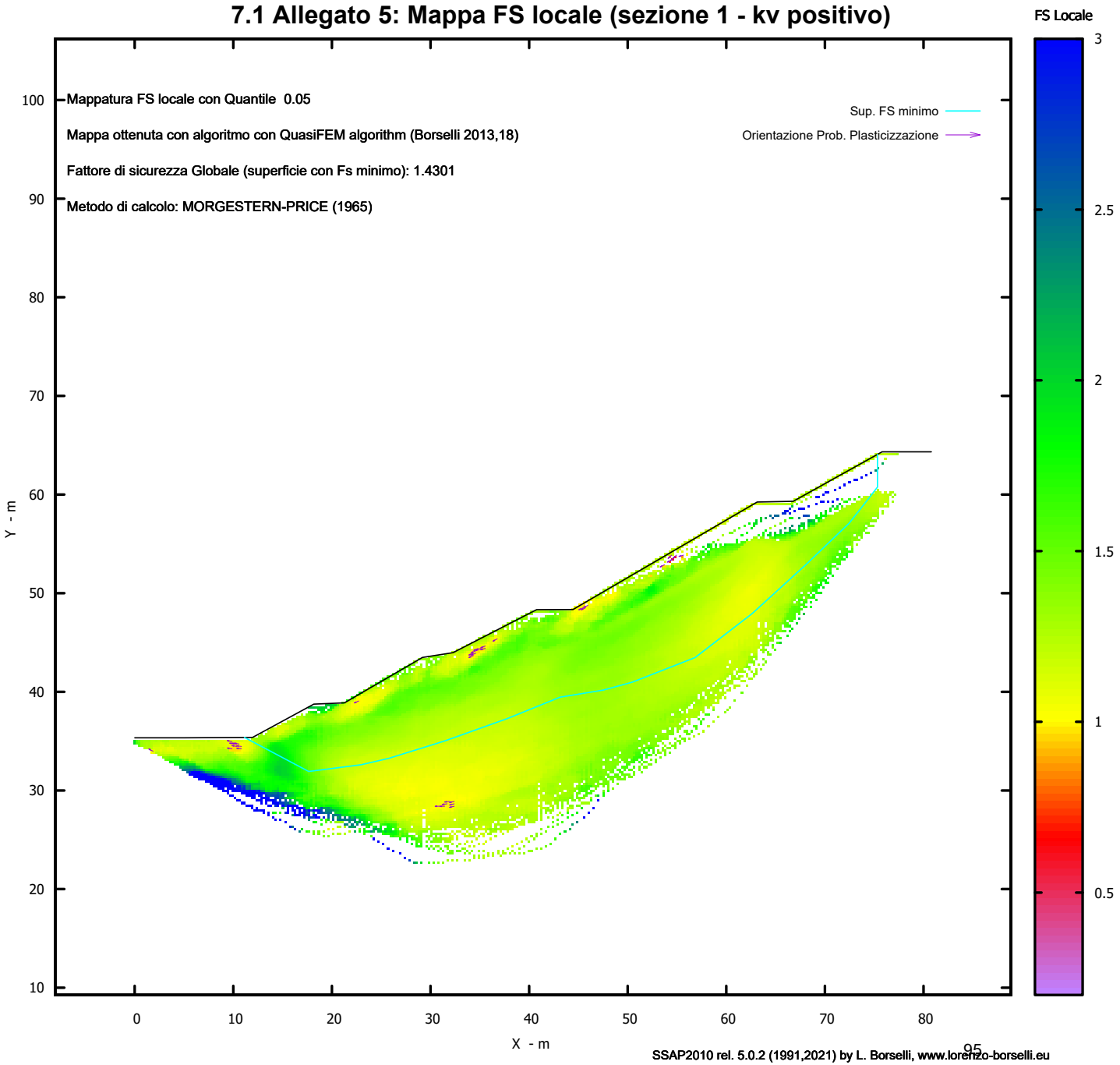
41.289	0.529	0.571	22.074	54.713	31.226	68.425	39.051
41.818	0.529	0.571	22.074	53.637	30.612	67.266	38.390
42.347	0.529	0.571	22.074	52.561	29.998	66.083	37.715
42.876	0.275	0.297	22.074	51.744	15.368	65.166	19.355
43.151	0.529	0.536	9.339	28.143	15.084	73.122	39.192
43.680	0.529	0.536	9.339	27.906	14.957	73.106	39.184
44.209	0.241	0.245	9.339	27.733	6.786	73.123	17.893
44.450	0.529	0.536	9.339	27.986	15.000	74.052	39.691
44.979	0.529	0.536	9.339	28.601	15.330	75.801	40.629
45.508	0.529	0.536	9.339	29.216	15.659	77.497	41.538
46.037	0.529	0.536	9.339	29.830	15.989	79.190	42.445
46.566	0.529	0.536	9.339	30.445	16.318	80.767	43.290
47.094	0.431	0.436	9.339	31.003	13.531	81.747	35.678
47.525	0.529	0.548	15.192	44.353	24.307	77.121	42.265
48.054	0.529	0.548	15.192	44.997	24.660	77.929	42.708
48.583	0.529	0.548	15.192	45.642	25.013	78.690	43.125
49.112	0.529	0.548	15.192	46.287	25.367	79.474	43.555
49.641	0.529	0.548	15.192	46.931	25.720	80.249	43.979
50.170	0.292	0.302	15.192	47.431	14.337	80.854	24.439
50.461	0.529	0.568	21.406	60.566	34.406	75.056	42.637
50.990	0.529	0.568	21.406	61.068	34.691	75.666	42.984
51.519	0.529	0.568	21.406	61.569	34.976	76.302	43.345
52.048	0.529	0.568	21.406	62.070	35.260	76.914	43.693
52.577	0.529	0.568	21.406	62.572	35.545	77.546	44.052
53.106	0.529	0.568	21.406	63.073	35.830	78.186	44.415
53.635	0.529	0.568	21.406	63.574	36.115	78.822	44.776
54.163	0.529	0.568	21.406	64.076	36.400	79.477	45.149
54.692	0.529	0.568	21.406	64.577	36.684	80.134	45.522
55.221	0.529	0.568	21.406	65.078	36.969	80.801	45.901
55.750	0.529	0.568	21.406	65.580	37.254	81.476	46.284
56.279	0.529	0.568	21.406	66.081	37.539	82.155	46.670
56.808	0.025	0.027	21.406	66.343	1.781	82.512	2.215
56.833	0.529	0.667	37.593	87.743	58.566	67.630	45.141
57.362	0.529	0.667	37.593	87.095	58.134	68.460	45.695
57.891	0.529	0.667	37.593	86.447	57.701	69.269	46.235
58.419	0.529	0.667	37.593	85.800	57.269	70.090	46.783
58.948	0.529	0.667	37.593	85.152	56.837	70.815	47.267
59.477	0.529	0.667	37.593	84.505	56.404	71.381	47.645
60.006	0.529	0.667	37.593	83.857	55.972	71.843	47.953
60.535	0.529	0.667	37.593	83.209	55.540	71.559	47.764
61.064	0.529	0.667	37.593	82.562	55.108	70.765	47.234
61.593	0.529	0.667	37.593	81.914	54.675	70.496	47.054
62.122	0.502	0.634	37.593	81.283	51.509	70.169	44.466
62.624	0.506	0.685	42.325	81.880	56.061	65.593	44.909
63.130	0.529	0.715	42.325	79.754	57.052	64.422	46.084
63.659	0.529	0.715	42.325	76.610	54.803	63.069	45.116
64.188	0.529	0.715	42.325	73.466	52.554	61.475	43.976
64.717	0.529	0.715	42.325	70.322	50.305	59.229	42.369
65.246	0.529	0.715	42.325	67.178	48.056	56.927	40.723
65.774	0.529	0.715	42.325	64.034	45.806	54.602	39.060
66.303	0.487	0.658	42.325	61.015	40.165	52.298	34.426
66.790	0.529	0.715	42.325	58.941	42.164	50.522	36.141
67.319	0.529	0.715	42.325	57.687	41.266	49.226	35.214
67.848	0.189	0.255	42.325	56.836	14.492	48.509	12.368
68.036	0.529	0.732	43.769	55.918	40.954	46.909	34.356
68.565	0.529	0.732	43.769	54.496	39.913	46.332	33.933
69.094	0.529	0.732	43.769	53.074	38.871	45.384	33.239

69.623	0.529	0.732	43.769	51.652	37.830	44.448	32.554
70.152	0.529	0.732	43.769	50.230	36.788	43.778	32.063
70.681	0.529	0.732	43.769	48.809	35.747	42.528	31.148
71.210	0.529	0.732	43.769	47.387	34.706	42.023	30.778
71.738	0.529	0.732	43.769	45.965	33.664	40.319	29.529
72.267	0.188	0.261	43.769	45.000	11.737	39.390	10.274
72.456	0.529	0.853	51.670	41.734	35.590	33.364	28.452
72.985	0.529	0.853	51.670	39.328	33.538	31.852	27.162
73.513	0.529	0.853	51.670	36.921	31.485	30.147	25.709
74.042	0.232	0.373	51.670	35.192	13.136	27.826	10.387
74.274	0.529	0.864	52.256	33.214	28.697	26.251	22.681
74.803	0.529	0.864	52.256	30.731	26.552	24.867	21.485

LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio
dx(m) : Larghezza concio
dl(m) : lunghezza base concio
alpha(°) : Angolo pendenza base concio
TauStress(kPa) : Sforzo di taglio su base concio
TauF (kN/m) : Forza di taglio su base concio
TauStrength(kPa) : Resistenza al taglio su base concio
TauS (kN/m) : Forza resistente al taglio su base concio

7.1 Allegato 5: Mappa FS locale (sezione 1 - kv positivo)



SSAP2010 rel. 5.0.2 (1991,2021) by L. Borselli, www.lorenzo-borselli.eu
https://WWW.SSAP.EU

8 Tabulato verifica di stabilità - Sezione 2 (kv positivo) - POST OPERAM

SSAP 5.0.2 - Slope Stability Analysis Program (1991,2021)
WWW.SSAP.EU
Build No. 11893
BY
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** Gia' Ricercatore CNR-IRPI fino a Luglio 2011

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Localita' : "Puro Vecchio" - Trani (BAT)

Descrizione: Chiusura definitiva lotti I e II
Modello pendio: Modello sez 2.mod

---------- PARAMETRI DEL MODELLO DEL PENDIO ----------

__ PARAMETRI GEOMETRICI - Coordinate X Y (in m) __

SUP T.		SUP 2		SUP 3		SUP 4	
X	Y	X	Y	X	Y	X	Y
0.00	0.00	-	-	-	-	-	-
5.00	0.00	-	-	-	-	-	-
13.80	4.67	-	-	-	-	-	-
16.50	3.89	-	-	-	-	-	-
20.18	3.91	-	-	-	-	-	-
25.50	7.40	-	-	-	-	-	-
28.71	6.90	-	-	-	-	-	-
30.98	8.00	-	-	-	-	-	-
37.98	12.42	-	-	-	-	-	-
40.25	12.43	-	-	-	-	-	-
49.51	16.90	-	-	-	-	-	-
53.21	16.90	-	-	-	-	-	-
72.87	27.44	-	-	-	-	-	-
75.67	27.63	-	-	-	-	-	-
79.38	29.83	-	-	-	-	-	-
82.23	29.80	-	-	-	-	-	-
94.09	35.44	-	-	-	-	-	-
99.09	35.44	-	-	-	-	-	-

ASSENZA DI FALDA

------- PARAMETRI GEOMECCANICI -------

	fi`	C`	Cu	Gamm	Gamm_sat	STR_IDX	sgci	GSI	mi	D
STRATO 1	25.00	15.00	0.00	12.20	13.00	1.967	0.00	0.00	0.00	0.00

LEGENDA: fi`_____ Angolo di attrito interno efficace(in gradi)

C` _____ Coesione efficace (in Kpa)
Cu _____ Resistenza al taglio Non drenata (in Kpa)
Gamm _____ Peso di volume terreno fuori falda (in KN/m^3)
Gamm_sat __ Peso di volume terreno immerso (in KN/m^3)
STR_IDX ___ Indice di resistenza (usato in solo in 'SNIFF SEARCH) (adimensionale)
---- SOLO Per AMMASSI ROCCIOSI FRATTURATI - Parametri Criterio di Rottura di Hoek (2002)----
sigci _____ Resistenza Compressione Uniassiale Roccia Intatta (in MPa)
GSI _____ Geological Strenght Index ammasso(adimensionale)
mi _____ Indice litologico ammasso(adimensionale)
D _____ Fattore di disturbo ammasso(adimensionale)
Fattore di riduzione NTC2018: gammaPHI=1.25 e gammaC=1.25 - DISATTIVATO (solo per ROCCE)

Uso CRITERIO DI ROTTURA Hoek et al.(2002,2006) - non-lineare - Generalizzato, secondo Lei et al.(2016)

----- SOVRACCARICHI PRESENTI -----
Nota Bene:

la distribuzione del carico e delle forze unitarie puo' variare in modo lineare tra gli estremi di coordinate X1 e X2

TABELLA SOVRACCARICHI IN SUPERFICIE

N. (-)	da X1 (m)	a X2 (m)	SX1 (kPa)	SX2 (kPa)	Alpha (°)	WsH1 (kN/m)	WsH2 (kN/m)	WsV1 (kN/m)	WsV2 (kN/m)
1	0.0000	99.0900	16.00	16.00	90.00	0.00	0.00	16.00	16.00

LEGENDA SIMBOLI

N.(-) : NUMERO SOVRACCARICO
X1(m) : Posizione carico da X1
X2(m) : Posizione carico a X2
SX1(kPa) : Carico in X1 (Kpa)
SX2(kPa) : Carico in X2 (Kpa)
Alpha(°) : Inclinazione carico (gradi):
Componenti distribuzione forza unitaria applicata:
WsH1,WsH2(kN/m) : forza unitaria Orizzontale (per metro di proiezione Verticale) : da X1 a X2 (vedasi cap.2 manuale)
WsV1,WsV2(kN/m) : forza unitaria Verticale (per metro di proiezione Orizzontale) : da X1 a X2 (vedasi Cap.2 manuale

---------- INFORMAZIONI GENERAZIONE SUPERFICI RANDOM ----------
*** PARAMETRI PER LA GENERAZIONE DELLE SUPERFICI

MOTORE DI RICERCA: RANDOM SEARCH - Siegel (1981)
FILTRAGGIO SUPERFICI : ATTIVATO
COORDINATE X1,X2,Y OSTACOLO : 0.00 0.00 0.00
LUNGHEZZA MEDIA SEGMENTI (m)*: 4.0 (+/-) 50%
INTERVALLO ASCISSE RANDOM STARTING POINT (Xmin .. Xmax): 0.01 13.80
LIVELLO MINIMO CONSIDERATO (Ymin): 0.00
INTERVALLO ASCISSE AMMESSO PER LA TERMINAZIONE (Xmin .. Xmax): 25.50 99.09
TOTALE SUPERFICI GENERATE : 10000
*NOTA IMPORTANTE: La lunghezza media dei segmenti non viene cosiderata nel caso di uso del motore di recerca NEW RANDOM SEARCH

---------- INFORMAZIONI PARAMETRI DI CALCOLO ----------

METODO DI CALCOLO : MORGENSTERN - PRICE (Morgenstern & Price, 1965)
METODO DI ESPLORAZIONE CAMPO VALORI (lambda0,Fs0) ADOTTATO : B (piu' accurato)
COEFFICIENTE SISMICO UTILIZZATO Kh : 0.0620
COEFFICIENTE SISMICO UTILIZZATO Kv (assunto Positivo): 0.0310

COEFFICIENTE c=Kv/Kh UTILIZZATO : 0.5000
FORZA ORIZZONTALE ADDIZIONALE IN TESTA (kN/m): 0.00
FORZA ORIZZONTALE ADDIZIONALE ALLA BASE (kN/m): 0.00

N.B. Le forze orizzontali addizionali in testa e alla base sono poste uguali a 0 durante tutte le verifiche globali

---------- RISULTATO FINALE ELABORAZIONI ----------

DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs *

Fattore di sicurezza (FS) 1.4794 - Min. - X Y Lambda= 0.4765

X	Y
13.75	4.64
21.50	2.40
28.16	2.52
33.59	2.85
39.43	3.11
44.43	3.71
51.64	5.85
56.47	8.35
63.74	11.47
68.45	13.35
74.65	16.44
78.82	18.62
84.15	21.74
89.06	26.53
92.89	30.13
94.09	31.89
94.09	35.44

Fattore di sicurezza (FS) 1.4852 - N.2 -- X Y Lambda= 0.4923

X	Y
13.75	4.64
18.32	2.54
21.11	1.09
24.98	1.75
31.48	3.07
36.03	3.40
39.19	4.03
45.22	5.69
49.72	6.12
52.74	7.30
56.69	8.84
60.42	10.01
67.88	13.43
74.89	16.81
80.27	19.96
84.50	23.34
86.60	25.29
90.01	29.39
90.62	30.32
90.62	33.79

Fattore di sicurezza (FS) 1.4946 - N.3 -- X Y Lambda= 0.4742

10.64	2.99
15.04	0.60
18.61	0.18
22.52	0.12
26.51	0.21
29.95	0.43
32.94	0.61
38.72	1.38
43.97	2.66
48.60	4.09
51.27	4.70
57.22	6.20
59.24	7.44
62.69	9.62
65.83	11.93
69.26	14.24
74.28	16.96
77.63	18.49
82.36	22.47
86.08	24.93
88.87	26.95
92.40	30.26
93.72	31.69
93.72	35.26

Fattore di sicurezza (FS) 1.4965 - N.4 -- X Y Lambda= 0.4910

12.77	4.12
18.93	0.39
27.24	0.86
30.07	1.77
35.09	3.17
40.72	5.23
45.42	6.17
48.89	7.22
51.86	8.26
55.80	9.44
59.09	10.35
64.91	13.16
68.01	14.64
74.12	17.86
81.12	22.40
84.49	23.93
87.23	26.49
89.74	29.77
89.74	33.37

Fattore di sicurezza (FS) 1.4977 - N.5 -- X Y Lambda= 0.4801

11.54	3.47
14.50	3.18
16.95	2.61
20.68	1.65
24.98	1.61
27.84	1.59
32.22	1.95
36.20	2.32

39.97	2.42
43.60	3.29
45.74	4.64
47.87	5.04
50.24	6.38
51.92	7.55
53.49	7.95
55.86	8.49
59.12	9.64
61.22	10.74
63.66	11.88
67.73	13.12
70.28	14.66
72.78	16.57
74.33	17.36
77.59	19.22
81.37	21.53
83.52	23.06
87.08	25.98
90.87	28.70
93.14	30.97
93.79	31.82
93.79	35.30

Fattore di sicurezza (FS) 1.4978 - N.6 -- X Y Lambda= 0.4903

13.27	4.39
16.36	3.30
20.27	1.84
22.77	1.38
26.74	1.63
29.87	2.22
33.93	2.85
37.17	3.16
40.07	3.82
43.63	4.08
47.54	5.73
49.86	6.81
53.95	7.84
57.30	9.91
60.63	11.53
62.75	12.63
67.09	14.47
70.66	15.36
74.73	17.32
78.00	19.82
81.60	21.83
84.53	24.72
86.03	25.66
88.32	26.89
91.26	29.41
94.09	31.83
94.09	35.44

Fattore di sicurezza (FS) 1.4982 - N.7 -- X Y Lambda= 0.4824

12.59	4.03

18.27	1.86
27.34	1.86
33.89	2.20
43.11	3.29
46.23	4.03
55.09	6.82
61.96	8.93
68.67	13.86
76.37	18.29
82.88	22.78
88.66	27.89
91.86	31.06
91.86	34.38

Fattore di sicurezza (FS) 1.5001 - N.8 -- X Y Lambda= 0.4851

12.14	3.79
15.74	2.17
21.62	1.06
26.51	1.36
34.41	1.19
39.78	3.46
45.95	5.06
53.38	6.89
59.32	8.18
63.91	11.48
71.78	14.31
77.63	16.51
83.48	20.24
86.48	23.33
92.39	29.22
94.13	31.64
94.78	32.34
94.78	35.44

Fattore di sicurezza (FS) 1.5009 - N.9 -- X Y Lambda= 0.4760

12.70	4.08
16.91	2.89
20.90	1.75
23.81	1.17
29.32	1.32
34.64	2.46
40.08	3.74
44.46	4.95
46.94	5.86
51.73	7.52
55.70	9.77
60.97	11.54
64.61	14.28
71.69	17.73
78.17	21.18
83.64	24.98
89.18	28.80
91.08	30.62
91.08	34.01

Fattore di sicurezza (FS) 1.5013 - N.10 -- X Y Lambda= 0.4817

X	Y
9.96	2.63
13.00	2.12
17.25	2.00
22.72	2.00
25.99	2.71
30.45	2.23
32.73	3.01
38.65	3.24
44.51	3.11
49.36	5.14
52.24	6.10
55.89	7.36
61.95	9.06
64.97	10.51
70.72	13.70
76.42	16.75
80.28	18.97
84.72	22.01
87.18	24.92
90.36	27.79
91.92	29.60
94.04	30.95
95.43	32.42
95.43	35.44

---------- ANALISI DEFICIT DI RESISTENZA ----------
DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs *

Analisi Deficit in riferimento a FS(progetto) = 1.200

Sup N.	FS	FTR(kN/m)	FTA(kN/m)	Bilancio(kN/m)	ESITO
1	1.479	5642.8	3814.3	1065.7	Surplus
2	1.485	5247.4	3533.0	1007.7	Surplus
3	1.495	6201.4	4149.2	1222.4	Surplus
4	1.496	5018.1	3353.3	994.2	Surplus
5	1.498	5600.7	3739.6	1113.2	Surplus
6	1.498	5300.6	3538.9	1053.8	Surplus
7	1.498	5621.8	3752.4	1118.9	Surplus
8	1.500	6034.6	4022.9	1207.1	Surplus
9	1.501	4947.8	3296.7	991.8	Surplus
10	1.501	6075.3	4046.7	1219.2	Surplus

Esito analisi: SURPLUS di RESISTENZA!

Valore minimo di SURPLUS di RESISTENZA (kN/m): 991.8

Note: FTR --> Forza totale Resistente lungo la superficie di scivolamento
FTA --> Forza totale Agente lungo la superficie di scivolamento

IMPORTANTE! : Il Deficit o il Surplus di resistenza viene espresso in kN per metro di LARGHEZZA rispetto al fronte di scarpata

TABELLA PARAMETRI CONCI DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	alpha (°)	W (kN/m)	ru (-)	U (kPa)	phi' (°)	(c',Cu) (kPa)
13.750	0.050	-16.15	0.84	0.00	0.00	25.00	15.00
13.800	0.633	-16.15	10.77	0.00	0.00	25.00	15.00
14.433	0.633	-16.15	10.77	0.00	0.00	25.00	15.00
15.066	0.633	-16.15	10.78	0.00	0.00	25.00	15.00
15.699	0.633	-16.15	10.78	0.00	0.00	25.00	15.00
16.332	0.168	-16.15	2.87	0.00	0.00	25.00	15.00
16.500	0.633	-16.15	11.53	0.00	0.00	25.00	15.00
17.133	0.633	-16.15	13.02	0.00	0.00	25.00	15.00
17.766	0.633	-16.15	14.50	0.00	0.00	25.00	15.00
18.399	0.633	-16.15	15.99	0.00	0.00	25.00	15.00
19.032	0.633	-16.15	17.48	0.00	0.00	25.00	15.00
19.665	0.515	-16.15	15.32	0.00	0.00	25.00	15.00
20.180	0.633	-16.15	21.81	0.00	0.00	25.00	15.00
20.813	0.633	-16.15	26.58	0.00	0.00	25.00	15.00
21.446	0.056	-16.15	2.59	0.00	0.00	25.00	15.00
21.502	0.633	1.06	30.99	0.00	0.00	25.00	15.00
22.135	0.633	1.06	34.20	0.00	0.00	25.00	15.00
22.768	0.633	1.06	37.42	0.00	0.00	25.00	15.00
23.401	0.633	1.06	40.63	0.00	0.00	25.00	15.00
24.034	0.633	1.06	43.84	0.00	0.00	25.00	15.00
24.667	0.633	1.06	47.06	0.00	0.00	25.00	15.00
25.300	0.200	1.06	15.55	0.00	0.00	25.00	15.00
25.500	0.633	1.06	49.24	0.00	0.00	25.00	15.00
26.133	0.633	1.06	48.36	0.00	0.00	25.00	15.00
26.766	0.633	1.06	47.48	0.00	0.00	25.00	15.00
27.399	0.633	1.06	46.61	0.00	0.00	25.00	15.00
28.032	0.129	1.06	9.41	0.00	0.00	25.00	15.00
28.161	0.549	3.49	39.48	0.00	0.00	25.00	15.00
28.710	0.633	3.49	46.11	0.00	0.00	25.00	15.00
29.343	0.633	3.49	48.24	0.00	0.00	25.00	15.00
29.976	0.633	3.49	50.38	0.00	0.00	25.00	15.00
30.609	0.371	3.49	30.53	0.00	0.00	25.00	15.00
30.980	0.633	3.49	54.13	0.00	0.00	25.00	15.00
31.613	0.633	3.49	57.01	0.00	0.00	25.00	15.00
32.246	0.633	3.49	59.88	0.00	0.00	25.00	15.00
32.879	0.633	3.49	62.76	0.00	0.00	25.00	15.00
33.512	0.075	3.49	7.64	0.00	0.00	25.00	15.00
33.587	0.633	2.56	66.01	0.00	0.00	25.00	15.00
34.220	0.633	2.56	68.97	0.00	0.00	25.00	15.00
34.853	0.633	2.56	71.93	0.00	0.00	25.00	15.00
35.486	0.633	2.56	74.88	0.00	0.00	25.00	15.00
36.119	0.633	2.56	77.84	0.00	0.00	25.00	15.00
36.752	0.633	2.56	80.80	0.00	0.00	25.00	15.00
37.385	0.595	2.56	78.68	0.00	0.00	25.00	15.00
37.980	0.633	2.56	84.96	0.00	0.00	25.00	15.00
38.613	0.633	2.56	84.75	0.00	0.00	25.00	15.00
39.246	0.187	2.56	24.99	0.00	0.00	25.00	15.00
39.433	0.633	6.81	84.30	0.00	0.00	25.00	15.00
40.066	0.184	6.81	24.43	0.00	0.00	25.00	15.00
40.250	0.633	6.81	84.76	0.00	0.00	25.00	15.00
40.883	0.633	6.81	86.59	0.00	0.00	25.00	15.00
41.516	0.633	6.81	88.42	0.00	0.00	25.00	15.00
42.149	0.633	6.81	90.25	0.00	0.00	25.00	15.00

42.782	0.633	6.81	92.08	0.00	0.00	25.00	15.00
43.415	0.633	6.81	93.91	0.00	0.00	25.00	15.00
44.048	0.381	6.81	57.34	0.00	0.00	25.00	15.00
44.428	0.633	16.55	96.40	0.00	0.00	25.00	15.00
45.061	0.633	16.55	97.33	0.00	0.00	25.00	15.00
45.694	0.633	16.55	98.27	0.00	0.00	25.00	15.00
46.327	0.633	16.55	99.20	0.00	0.00	25.00	15.00
46.960	0.633	16.55	100.14	0.00	0.00	25.00	15.00
47.593	0.633	16.55	101.07	0.00	0.00	25.00	15.00
48.226	0.633	16.55	102.01	0.00	0.00	25.00	15.00
48.859	0.633	16.55	102.94	0.00	0.00	25.00	15.00
49.492	0.018	16.55	2.95	0.00	0.00	25.00	15.00
49.510	0.633	16.55	102.69	0.00	0.00	25.00	15.00
50.143	0.633	16.55	101.19	0.00	0.00	25.00	15.00
50.776	0.633	16.55	99.70	0.00	0.00	25.00	15.00
51.409	0.234	16.55	36.49	0.00	0.00	25.00	15.00
51.643	0.633	27.37	97.09	0.00	0.00	25.00	15.00
52.276	0.633	27.37	94.48	0.00	0.00	25.00	15.00
52.909	0.301	27.37	44.04	0.00	0.00	25.00	15.00
53.210	0.633	27.37	91.98	0.00	0.00	25.00	15.00
53.843	0.633	27.37	92.07	0.00	0.00	25.00	15.00
54.476	0.633	27.37	92.17	0.00	0.00	25.00	15.00
55.109	0.633	27.37	92.26	0.00	0.00	25.00	15.00
55.742	0.633	27.37	92.35	0.00	0.00	25.00	15.00
56.375	0.091	27.37	13.25	0.00	0.00	25.00	15.00
56.466	0.633	23.23	92.68	0.00	0.00	25.00	15.00
57.099	0.633	23.23	93.22	0.00	0.00	25.00	15.00
57.731	0.633	23.23	93.76	0.00	0.00	25.00	15.00
58.364	0.633	23.23	94.30	0.00	0.00	25.00	15.00
58.997	0.633	23.23	94.83	0.00	0.00	25.00	15.00
59.630	0.633	23.23	95.37	0.00	0.00	25.00	15.00
60.263	0.633	23.23	95.91	0.00	0.00	25.00	15.00
60.896	0.633	23.23	96.45	0.00	0.00	25.00	15.00
61.529	0.633	23.23	96.99	0.00	0.00	25.00	15.00
62.162	0.633	23.23	97.53	0.00	0.00	25.00	15.00
62.795	0.633	23.23	98.06	0.00	0.00	25.00	15.00
63.428	0.316	23.23	49.13	0.00	0.00	25.00	15.00
63.744	0.633	21.70	98.95	0.00	0.00	25.00	15.00
64.377	0.633	21.70	99.65	0.00	0.00	25.00	15.00
65.010	0.633	21.70	100.34	0.00	0.00	25.00	15.00
65.643	0.633	21.70	101.04	0.00	0.00	25.00	15.00
66.276	0.633	21.70	101.73	0.00	0.00	25.00	15.00
66.909	0.633	21.70	102.43	0.00	0.00	25.00	15.00
67.542	0.633	21.70	103.13	0.00	0.00	25.00	15.00
68.175	0.274	21.70	44.87	0.00	0.00	25.00	15.00
68.449	0.633	26.54	103.87	0.00	0.00	25.00	15.00
69.082	0.633	26.54	104.05	0.00	0.00	25.00	15.00
69.715	0.633	26.54	104.24	0.00	0.00	25.00	15.00
70.348	0.633	26.54	104.42	0.00	0.00	25.00	15.00
70.981	0.633	26.54	104.61	0.00	0.00	25.00	15.00
71.613	0.633	26.54	104.79	0.00	0.00	25.00	15.00
72.246	0.624	26.54	103.42	0.00	0.00	25.00	15.00
72.870	0.633	26.54	103.98	0.00	0.00	25.00	15.00
73.503	0.633	26.54	101.81	0.00	0.00	25.00	15.00
74.136	0.517	26.54	81.53	0.00	0.00	25.00	15.00
74.653	0.633	27.62	97.80	0.00	0.00	25.00	15.00
75.286	0.384	27.62	58.24	0.00	0.00	25.00	15.00

75.670	0.633	27.62	95.43	0.00	0.00	25.00	15.00
76.303	0.633	27.62	95.78	0.00	0.00	25.00	15.00
76.936	0.633	27.62	96.13	0.00	0.00	25.00	15.00
77.569	0.633	27.62	96.48	0.00	0.00	25.00	15.00
78.202	0.613	27.62	93.80	0.00	0.00	25.00	15.00
78.815	0.565	30.29	86.60	0.00	0.00	25.00	15.00
79.380	0.633	30.29	95.54	0.00	0.00	25.00	15.00
80.013	0.633	30.29	92.54	0.00	0.00	25.00	15.00
80.646	0.633	30.29	89.55	0.00	0.00	25.00	15.00
81.279	0.633	30.29	86.55	0.00	0.00	25.00	15.00
81.912	0.318	30.29	42.37	0.00	0.00	25.00	15.00
82.230	0.633	30.29	83.27	0.00	0.00	25.00	15.00
82.863	0.633	30.29	82.73	0.00	0.00	25.00	15.00
83.496	0.633	30.29	82.18	0.00	0.00	25.00	15.00
84.129	0.023	30.29	2.95	0.00	0.00	25.00	15.00
84.152	0.633	44.29	80.63	0.00	0.00	25.00	15.00
84.785	0.633	44.29	78.11	0.00	0.00	25.00	15.00
85.418	0.633	44.29	75.59	0.00	0.00	25.00	15.00
86.051	0.633	44.29	73.07	0.00	0.00	25.00	15.00
86.684	0.633	44.29	70.55	0.00	0.00	25.00	15.00
87.316	0.633	44.29	68.03	0.00	0.00	25.00	15.00
87.949	0.633	44.29	65.51	0.00	0.00	25.00	15.00
88.582	0.482	44.29	48.16	0.00	0.00	25.00	15.00
89.064	0.633	43.26	61.16	0.00	0.00	25.00	15.00
89.697	0.633	43.26	58.81	0.00	0.00	25.00	15.00
90.330	0.633	43.26	56.47	0.00	0.00	25.00	15.00
90.963	0.633	43.26	54.12	0.00	0.00	25.00	15.00
91.596	0.633	43.26	51.78	0.00	0.00	25.00	15.00
92.229	0.633	43.26	49.43	0.00	0.00	25.00	15.00
92.862	0.029	43.26	2.22	0.00	0.00	25.00	15.00
92.891	0.633	55.72	45.65	0.00	0.00	25.00	15.00
93.524	0.566	55.72	36.60	0.00	0.00	25.00	15.00

LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio
dx(m) : Larghezza concio
alpha(°) : Angolo pendenza base concio
W(kN/m) : Forza peso concio
ru(-) : Coefficiente locale pressione interstiziale
U(kPa) : Pressione totale dei pori base concio
phi'(°) : Angolo di attrito efficace base concio
c'/Cu (kPa) : Coesione efficace o Resistenza al taglio in condizioni non drenate

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TABELLA DIAGRAMMA DELLE FORZE DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	ht (m)	yt (m)	yt' (--)	E(x) (kN/m)	T(x) (kN/m)	E' (kN)	rho(x) (--)	FS_qFEM (--)	FS_srmFEM (--)
13.750	0.000	4.643	-0.274	0.0000000000E+000	0.0000000000E+000	5.4982701824E+000	0.049	1.877	1.391
13.800	0.010	4.639	-0.274	2.8381271655E-001	4.8853114740E-005	5.8217355645E+000	0.049	1.877	1.391
14.433	0.010	4.456	-0.289	5.2609415512E+000	2.2180922256E-002	1.2267411442E+001	0.049	1.245	1.053

15.066 0.011 4.273 -0.291 1.5813342007E+001 2.4287258297E-001 2.2755651879E+001 0.049 1.257 1.034
15.699 0.009 4.087 -0.284 3.4067716644E+001 9.6074197856E-001 2.5704680672E+001 0.086 1.319 1.007
16.332 0.017 3.913 -0.279 4.8353343888E+001 1.9173479687E+000 2.3254638858E+001 0.122 1.373 0.984
16.500 0.017 3.864 -0.196 5.2294572252E+001 2.2767866818E+000 2.3937162170E+001 0.135 1.393 0.980
17.133 0.092 3.755 -0.189 6.8638251316E+001 4.0610616820E+000 2.8318046299E+001 0.169 1.487 0.968
17.766 0.145 3.625 -0.190 8.8142879088E+001 6.7016378934E+000 3.2793414542E+001 0.209 1.622 0.969
18.399 0.218 3.515 -0.155 1.1015200457E+002 1.0194854933E+001 3.2714915484E+001 0.250 1.751 0.983
19.032 0.316 3.430 -0.153 1.2955725902E+002 1.3476881470E+001 3.0638570543E+001 0.276 1.847 0.997
19.665 0.391 3.321 -0.172 1.4893790337E+002 1.6931481399E+001 3.0862212484E+001 0.298 1.938 1.013
20.180 0.452 3.233 -0.028 1.6494025693E+002 2.0088360800E+001 3.1529161493E+001 0.317 2.000 1.030
20.813 0.691 3.289 0.072 1.8526168763E+002 2.4541277761E+001 3.2228873202E+001 0.323 2.051 1.056
21.446 0.909 3.323 0.055 2.0573934749E+002 2.9465072606E+001 2.8134592189E+001 0.333 2.066 1.088
21.502 0.929 3.327 0.081 2.0729998494E+002 2.9877672029E+001 2.7846583123E+001 0.334 2.063 1.090
22.135 0.969 3.379 0.097 2.2554289025E+002 3.4881060545E+001 2.8789906177E+001 0.351 2.032 1.125
22.768 1.028 3.450 0.122 2.4374562739E+002 4.0189778183E+001 2.9208627367E+001 0.368 1.988 1.160
23.401 1.101 3.534 0.140 2.6251859913E+002 4.5902463983E+001 3.0541227586E+001 0.385 1.934 1.196
24.034 1.182 3.627 0.145 2.8240829805E+002 5.2098862794E+001 3.1091741241E+001 0.402 1.873 1.230
24.667 1.262 3.718 0.138 3.0187817459E+002 5.8242046280E+001 3.0108388153E+001 0.417 1.815 1.259
25.300 1.333 3.801 0.128 3.2052302974E+002 6.4168030134E+001 2.8820254712E+001 0.429 1.762 1.281
25.500 1.353 3.824 0.111 3.2625003171E+002 6.5987367459E+001 2.8886041312E+001 0.432 1.747 1.287
26.133 1.410 3.894 0.101 3.4506823626E+002 7.1975040491E+001 2.9406999771E+001 0.457 1.702 1.301
26.766 1.457 3.952 0.086 3.6347686367E+002 7.7863346133E+001 2.8259850462E+001 0.480 1.667 1.308
27.399 1.496 4.003 0.081 3.8084287197E+002 8.3504708832E+001 2.7155851377E+001 0.501 1.639 1.312
28.032 1.537 4.055 0.085 3.9785392776E+002 8.9239895302E+001 2.7552322344E+001 0.522 1.614 1.315
28.161 1.547 4.068 0.102 4.0143156566E+002 9.0504028990E+001 2.7530063506E+001 0.527 1.610 1.316
28.710 1.570 4.124 0.125 4.1617040289E+002 9.5895041943E+001 2.8376804272E+001 0.547 1.592 1.320
29.343 1.623 4.216 0.156 4.3524715104E+002 1.0349862351E+002 3.0380046595E+001 0.563 1.570 1.331
29.976 1.691 4.322 0.179 4.5462903173E+002 1.1172467269E+002 3.0471458698E+001 0.579 1.550 1.345
30.609 1.773 4.443 0.198 4.7382150005E+002 1.2045757602E+002 3.0158963196E+001

0.598 1.534 1.364
30.980 1.828 4.521 0.221 4.8497877221E+002 1.2587456670E+002 3.0143021841E+001
0.609 1.527 1.378
31.613 1.933 4.665 0.238 5.0414394126E+002 1.3564215835E+002 3.0936236652E+001
0.627 1.516 1.404
32.246 2.052 4.822 0.258 5.2414149171E+002 1.4636845560E+002 3.2341634514E+001
0.647 1.507 1.435
32.879 2.183 4.991 0.265 5.4508577833E+002 1.5806452268E+002 3.2777515809E+001
0.668 1.499 1.468
33.512 2.311 5.158 0.263 5.6563511848E+002 1.6998434950E+002 3.2048803929E+001
0.689 1.493 1.500
33.587 2.326 5.178 0.264 5.6804006056E+002 1.7139626833E+002 3.2166660219E+001
0.691 1.492 1.504
34.220 2.465 5.345 0.275 5.8929225924E+002 1.8407609579E+002 3.6071139597E+001
0.712 1.488 1.535
34.853 2.617 5.526 0.289 6.1370314291E+002 1.9874534592E+002 4.0363051177E+001
0.736 1.484 1.564
35.486 2.775 5.711 0.287 6.4038854703E+002 2.1480130056E+002 4.2796288401E+001
0.762 1.479 1.589
36.119 2.925 5.889 0.272 6.6787970798E+002 2.3128852434E+002 4.3085689352E+001
0.785 1.473 1.608
36.752 3.063 6.056 0.255 6.9493146980E+002 2.4742361207E+002 4.2384926967E+001
0.807 1.467 1.620
37.385 3.190 6.212 0.239 7.2153552347E+002 2.6316838576E+002 4.1527672124E+001
0.825 1.459 1.626
37.980 3.301 6.349 0.220 7.4597325361E+002 2.7751489518E+002 4.0147343314E+001
0.841 1.451 1.627
38.613 3.406 6.482 0.194 7.7077458839E+002 2.9197180480E+002 3.6505887217E+001
0.865 1.443 1.625
39.246 3.490 6.594 0.176 7.9218669053E+002 3.0437226860E+002 3.2249880356E+001
0.884 1.434 1.619
39.433 3.514 6.626 0.183 7.9812756759E+002 3.0782808114E+002 3.1952107199E+001
0.890 1.432 1.617
40.066 3.556 6.744 0.189 8.1871294304E+002 3.1992449564E+002 3.2111257067E+001
0.910 1.423 1.609
40.250 3.570 6.780 0.205 8.2460604789E+002 3.2343741250E+002 3.1743942110E+001
0.915 1.421 1.606
40.883 3.626 6.911 0.217 8.4416004927E+002 3.3528556493E+002 3.0504599346E+001
0.926 1.413 1.598
41.516 3.694 7.055 0.239 8.6322235022E+002 3.4722858483E+002 2.9587592181E+001
0.938 1.406 1.589
42.149 3.778 7.214 0.265 8.8161549630E+002 3.5925909909E+002 2.8380551332E+001
0.950 1.400 1.581
42.782 3.878 7.390 0.292 8.9914978326E+002 3.7133515383E+002 2.6725855310E+001
0.961 1.394 1.574
43.415 3.996 7.584 0.320 9.1544822090E+002 3.8326950539E+002 2.4709252780E+001
0.974 1.389 1.566
44.048 4.132 7.796 0.340 9.3042965568E+002 3.9501293075E+002 2.1842535706E+001
0.986 1.385 1.560
44.428 4.220 7.929 0.375 9.3832366854E+002 4.0167695814E+002 1.9447202328E+001
0.993 1.382 1.556
45.061 4.278 8.175 0.384 9.4926708800E+002 4.1206134082E+002 1.4792581642E+001
1.007 1.378 1.550
45.694 4.330 8.415 0.376 9.5704985467E+002 4.2049170383E+002 1.0907937973E+001
1.018 1.373 1.546
46.327 4.378 8.651 0.374 9.6307563620E+002 4.2756636293E+002 8.4463536333E+000
1.028 1.369 1.541

46.960 4.427 8.888 0.369 9.6774224049E+002 4.3319796258E+002 6.3905371785E+000
1.035 1.365 1.537
47.593 4.468 9.118 0.351 9.7116552825E+002 4.3727599504E+002 4.4397442384E+000
1.039 1.365 1.533
48.226 4.495 9.332 0.333 9.7336258986E+002 4.3979384129E+002 2.4541679705E+000
1.040 1.369 1.530
48.859 4.513 9.539 0.308 9.7427230213E+002 4.4062415164E+002 6.0493227026E-001
1.038 1.378 1.526
49.492 4.509 9.722 0.289 9.7412838413E+002 4.3999232523E+002 -7.3589717566E-001
1.034 1.392 1.524
49.510 4.508 9.727 0.258 9.7411484429E+002 4.3995430408E+002 -7.8619696163E-001
1.034 1.393 1.523
50.143 4.483 9.890 0.256 9.7282224434E+002 4.3775765969E+002 -2.9715194408E+000
1.034 1.413 1.521
50.776 4.456 10.051 0.257 9.7035314620E+002 4.3447924107E+002 -4.9879878229E+000
1.033 1.440 1.518
51.409 4.432 10.215 0.254 9.6650786389E+002 4.3028527634E+002 -8.3925633892E+000
1.031 1.474 1.516
51.643 4.419 10.272 0.292 9.6434301925E+002 4.2836142713E+002 -9.9173394030E+000
1.030 1.490 1.515
52.276 4.288 10.468 0.311 9.5692257047E+002 4.2252246989E+002 -1.2823123022E+001
1.030 1.531 1.514
52.909 4.157 10.665 0.311 9.4811000501E+002 4.1622130364E+002 -1.5053830043E+001
1.030 1.571 1.513
53.210 4.094 10.758 0.433 9.4341438377E+002 4.1307015657E+002 -1.5988511985E+001
1.030 1.589 1.513
53.843 4.077 11.069 0.463 9.3276677080E+002 4.0637779401E+002 -1.7598534878E+001
1.021 1.621 1.514
54.476 4.025 11.345 0.436 9.2113609270E+002 3.9962192366E+002 -1.8270816122E+001
1.013 1.646 1.517
55.109 3.974 11.621 0.447 9.0963742721E+002 3.9367410981E+002 -1.8289448387E+001
1.007 1.655 1.521
55.742 3.936 11.911 0.466 8.9798316221E+002 3.8810935471E+002 -1.8298615529E+001
1.002 1.653 1.526
56.375 3.909 12.211 0.471 8.8647289188E+002 3.8300695755E+002 -1.6666987875E+001
0.998 1.638 1.533
56.466 3.902 12.252 0.459 8.8497994702E+002 3.8237453830E+002 -1.6380041263E+001
0.997 1.635 1.534
57.099 3.922 12.544 0.472 8.7491795167E+002 3.7834960777E+002 -1.5802742752E+001
0.993 1.611 1.542
57.731 3.956 12.849 0.482 8.6497498040E+002 3.7468295599E+002 -1.5288514847E+001
0.990 1.586 1.551
58.364 3.989 13.153 0.490 8.5556395509E+002 3.7155987681E+002 -1.4851079367E+001
0.988 1.562 1.561
58.997 4.033 13.469 0.507 8.4617474099E+002 3.6879274093E+002 -1.4903069655E+001
0.986 1.539 1.570
59.630 4.088 13.796 0.518 8.3669790027E+002 3.6625661821E+002 -1.4888896250E+001
0.986 1.516 1.579
60.263 4.145 14.125 0.523 8.2732662853E+002 3.6394063441E+002 -1.4763380935E+001
0.986 1.495 1.587
60.896 4.206 14.457 0.521 8.1800867983E+002 3.6179054673E+002 -1.4534449605E+001
0.986 1.477 1.593
61.529 4.261 14.784 0.494 8.0892721624E+002 3.5982115916E+002 -1.3691310784E+001
0.986 1.461 1.597
62.162 4.288 15.083 0.468 8.0067661162E+002 3.5815079413E+002 -1.2841456939E+001
0.987 1.448 1.598
62.795 4.310 15.377 0.460 7.9267099278E+002 3.5657064908E+002 -1.2424651880E+001

0.987 1.436 1.597
63.428 4.327 15.665 0.464 7.8494802893E+002 3.5504284455E+002 -1.2467575166E+001
0.988 1.426 1.594
63.744 4.343 15.817 0.478 7.8096897916E+002 3.5421848485E+002 -1.2491730661E+001
0.988 1.420 1.591
64.377 4.393 16.119 0.475 7.7320008006E+002 3.5255148436E+002 -1.2247582823E+001
0.988 1.410 1.585
65.010 4.441 16.419 0.474 7.6546455126E+002 3.5078907861E+002 -1.2319178242E+001
0.987 1.400 1.577
65.643 4.489 16.719 0.474 7.5760501828E+002 3.4885885209E+002 -1.2636804032E+001
0.986 1.391 1.568
66.276 4.537 17.018 0.475 7.4946740147E+002 3.4667576303E+002 -1.3195533024E+001
0.985 1.382 1.559
66.909 4.586 17.319 0.476 7.4090056376E+002 3.4414574576E+002 -1.3991716916E+001
0.983 1.374 1.549
67.542 4.636 17.621 0.468 7.3175504392E+002 3.4117679591E+002 -1.5040037230E+001
0.980 1.365 1.539
68.175 4.674 17.911 0.457 7.2186111931E+002 3.3767378899E+002 -1.6328884213E+001
0.976 1.357 1.529
68.449 4.689 18.036 0.485 7.1730271063E+002 3.3598374268E+002 -1.6878146711E+001
0.974 1.354 1.525
69.082 4.689 18.352 0.485 7.0625827352E+002 3.3162105021E+002 -1.8262328597E+001
0.970 1.347 1.517
69.715 4.671 18.650 0.476 6.9418411155E+002 3.2650602405E+002 -1.9989411602E+001
0.966 1.341 1.510
70.348 4.659 18.954 0.488 6.8095333006E+002 3.2047453178E+002 -2.1974043354E+001
0.959 1.337 1.504
70.981 4.656 19.267 0.489 6.6636678827E+002 3.1334983030E+002 -2.3394437577E+001
0.950 1.335 1.500
71.613 4.646 19.572 0.477 6.5133790505E+002 3.0563821425E+002 -2.3959399605E+001
0.939 1.333 1.497
72.246 4.627 19.870 0.464 6.3603616802E+002 2.9745729368E+002 -2.4281967818E+001
0.927 1.334 1.495
72.870 4.601 20.156 0.446 6.2082918700E+002 2.8904562240E+002 -2.4109200517E+001
0.914 1.335 1.495
73.503 4.560 20.430 0.418 6.0574780758E+002 2.8042836896E+002 -2.3113301272E+001
0.908 1.339 1.497
74.136 4.498 20.684 0.401 5.9156965733E+002 2.7205993735E+002 -2.2433085524E+001
0.903 1.343 1.500
74.653 4.447 20.891 0.368 5.7995969965E+002 2.6512062392E+002 -2.2311162995E+001
0.897 1.347 1.503
75.286 4.331 21.107 0.341 5.6595321851E+002 2.5671337782E+002 -2.1550840119E+001
0.891 1.352 1.507
75.670 4.261 21.238 0.453 5.5780784925E+002 2.5182367365E+002 -2.1674853734E+001
0.887 1.356 1.510
76.303 4.260 21.568 0.478 5.4359355786E+002 2.4329905156E+002 -2.2741522130E+001
0.870 1.362 1.516
76.936 4.204 21.844 0.450 5.2901896125E+002 2.3456042327E+002 -2.3953729247E+001
0.851 1.369 1.523
77.569 4.167 22.138 0.467 5.1327011581E+002 2.2510306617E+002 -2.5122324512E+001
0.830 1.378 1.532
78.202 4.132 22.434 0.467 4.9721617415E+002 2.1545133620E+002 -2.5498397828E+001
0.808 1.387 1.541
78.815 4.096 22.719 0.468 4.8150106180E+002 2.0598853272E+002 -2.6178914696E+001
0.786 1.396 1.551
79.380 4.033 22.986 0.477 4.6642396934E+002 1.9688580019E+002 -2.7289712499E+001
0.765 1.407 1.562

80.013 3.968 23.291 0.471 4.4872219173E+002 1.8613239369E+002 -2.7686124214E+001 0.751 1.422 1.577
80.646 3.891 23.583 0.446 4.3137562365E+002 1.7567647623E+002 -2.6776342866E+001 0.736 1.438 1.594
81.279 3.794 23.856 0.430 4.1482555406E+002 1.6589038979E+002 -2.6080913901E+001 0.723 1.456 1.611
81.912 3.696 24.128 0.428 3.9835934159E+002 1.5642024497E+002 -2.5718726164E+001 0.709 1.475 1.630
82.230 3.645 24.263 0.446 3.9022386724E+002 1.5186692227E+002 -2.6000603019E+001 0.703 1.485 1.639
82.863 3.564 24.551 0.469 3.7322429637E+002 1.4259577307E+002 -2.7413171514E+001 0.679 1.506 1.661
83.496 3.499 24.856 0.495 3.5552105712E+002 1.3330244619E+002 -2.8547979710E+001 0.654 1.530 1.683
84.129 3.451 25.178 0.510 3.3708491283E+002 1.2399375905E+002 -3.1715837062E+001 0.629 1.555 1.707
84.152 3.451 25.191 0.572 3.3635892796E+002 1.2363807556E+002 -3.1834159093E+001 0.628 1.556 1.708
84.785 3.195 25.553 0.598 3.1577086749E+002 1.1386438360E+002 -3.3724010403E+001 0.608 1.581 1.733
85.418 2.973 25.948 0.648 2.9366711724E+002 1.0358469354E+002 -3.5908359765E+001 0.585 1.605 1.759
86.051 2.781 26.374 0.693 2.7031385096E+002 9.2811836367E+001 -3.7678790890E+001 0.557 1.628 1.783
86.684 2.616 26.826 0.723 2.4596888119E+002 8.1597492177E+001 -3.8511610731E+001 0.524 1.648 1.806
87.316 2.462 27.289 0.733 2.2156133380E+002 7.0367682026E+001 -3.8166933546E+001 0.486 1.660 1.822
87.949 2.310 27.754 0.781 1.9765269686E+002 5.9437984847E+001 -3.9178936797E+001 0.443 1.664 1.830
88.582 2.216 28.278 0.837 1.7196403697E+002 4.8011993190E+001 -4.0383340277E+001 0.391 1.655 1.823
89.064 2.155 28.687 0.765 1.5258924544E+002 3.9666312022E+001 -3.7075288527E+001 0.347 1.650 1.823
89.697 2.003 29.130 0.702 1.3174635774E+002 3.0235429214E+001 -3.2226716138E+001 0.289 1.633 1.809
90.330 1.852 29.576 0.710 1.1179288554E+002 2.1303377327E+001 -3.0875427470E+001 0.223 1.602 1.775
90.963 1.710 30.029 0.733 9.2660617648E+001 1.3417458323E+001 -3.0129927171E+001 0.155 1.559 1.719
91.596 1.589 30.504 0.727 7.3650887228E+001 6.8031782669E+000 -2.8241482353E+001 0.088 1.504 1.646
92.229 1.439 30.950 0.681 5.6909234443E+001 2.5797911108E+000 -2.4693550402E+001 0.049 1.446 1.572
92.862 1.260 31.366 0.644 4.2390892725E+001 7.5174028563E-001 -1.1831725112E+001 0.049 1.388 1.525
92.891 1.242 31.376 1.108 4.2060887039E+001 7.3721226562E-001 -1.2453673589E+001 0.049 1.385 1.524
93.524 1.038 32.100 1.108 1.8601370220E+001 1.5084120339E-001 -3.4843093146E+001 0.049 1.385 1.569

LEGENDA SIMBOLI
X(m) : Ascissa sinistra concio
ht(m) : Altezza linea di thrust da nodo sinistro base concio
yt(m) : coordinata Y linea di trust

yt'(-) : gradiente pendenza locale linea di trust
E(x)(kN/m) : Forza Normale interconcio
T(x)(kN/m) : Forza Tangenziale interconcio
E' (kN) : derivata Forza normale interconcio
Rho(x) (-) : fattore mobilizzazione resistenza al taglio verticale interconcio ZhU et al.(2003)
FS_qFEM(x)(-) : fattore di sicurezza locale stimato (locale in X) by qFEM
FS_srmFEM(x)(-) : fattore di sicurezza locale stimato (locale in X) by SRM Procedure
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TABELLA SFORZI DI TAGLIO DISTRIBUITI LUNGO SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	dl (m)	alpha (°)	TauStress (kPa)	TauF (kN/m)	TauStrength (kPa)	TauS (kN/m)
13.750	0.050	0.052	-16.154	-3.519	-0.184	22.338	1.166
13.800	0.633	0.659	-16.154	-3.574	-2.355	22.481	14.814
14.433	0.633	0.659	-16.154	-3.575	-2.356	22.743	14.987
15.066	0.633	0.659	-16.154	-3.576	-2.357	23.394	15.416
15.699	0.633	0.659	-16.154	-3.578	-2.358	23.708	15.623
16.332	0.168	0.175	-16.154	-3.579	-0.627	24.226	4.241
16.500	0.633	0.659	-16.154	-3.825	-2.521	25.304	16.675
17.133	0.633	0.659	-16.154	-4.319	-2.846	27.449	18.089
17.766	0.633	0.659	-16.154	-4.812	-3.171	29.590	19.499
18.399	0.633	0.659	-16.154	-5.306	-3.496	30.344	19.996
19.032	0.633	0.659	-16.154	-5.799	-3.822	31.598	20.822
19.665	0.515	0.536	-16.154	-6.247	-3.351	33.084	17.746
20.180	0.633	0.659	-16.154	-7.238	-4.770	35.900	23.657
20.813	0.633	0.659	-16.154	-8.819	-5.812	39.812	26.235
21.446	0.056	0.059	-16.154	-9.680	-0.567	41.244	2.414
21.502	0.633	0.633	1.055	3.936	2.492	41.267	26.125
22.135	0.633	0.633	1.055	4.344	2.750	43.843	27.755
22.768	0.633	0.633	1.055	4.752	3.008	46.486	29.429
23.401	0.633	0.633	1.055	5.160	3.267	49.185	31.138
24.034	0.633	0.633	1.055	5.568	3.525	51.512	32.611
24.667	0.633	0.633	1.055	5.976	3.783	53.725	34.012
25.300	0.200	0.200	1.055	6.245	1.250	55.162	11.040
25.500	0.633	0.633	1.055	6.254	3.959	55.374	35.055
26.133	0.633	0.633	1.055	6.142	3.888	54.659	34.603
26.766	0.633	0.633	1.055	6.031	3.818	53.843	34.086
27.399	0.633	0.633	1.055	5.919	3.747	53.262	33.718
28.032	0.129	0.129	1.055	5.852	0.756	53.191	6.873
28.161	0.549	0.550	3.492	8.814	4.847	51.960	28.577
28.710	0.633	0.634	3.492	8.929	5.662	53.215	33.746
29.343	0.633	0.634	3.492	9.342	5.924	55.144	34.969
29.976	0.633	0.634	3.492	9.755	6.186	57.005	36.149
30.609	0.371	0.372	3.492	10.083	3.749	58.542	21.767
30.980	0.633	0.634	3.492	10.482	6.647	60.364	38.279
31.613	0.633	0.634	3.492	11.039	7.000	63.033	39.971
32.246	0.633	0.634	3.492	11.596	7.353	65.709	41.668
32.879	0.633	0.634	3.492	12.152	7.706	67.943	43.085
33.512	0.075	0.075	3.492	12.464	0.938	69.101	5.203
33.587	0.633	0.634	2.556	11.100	7.033	71.404	45.241
34.220	0.633	0.634	2.556	11.597	7.348	74.828	47.410
34.853	0.633	0.634	2.556	12.094	7.663	77.871	49.338
35.486	0.633	0.634	2.556	12.592	7.978	80.311	50.884
36.119	0.633	0.634	2.556	13.089	8.293	82.257	52.117
36.752	0.633	0.634	2.556	13.586	8.608	84.179	53.335

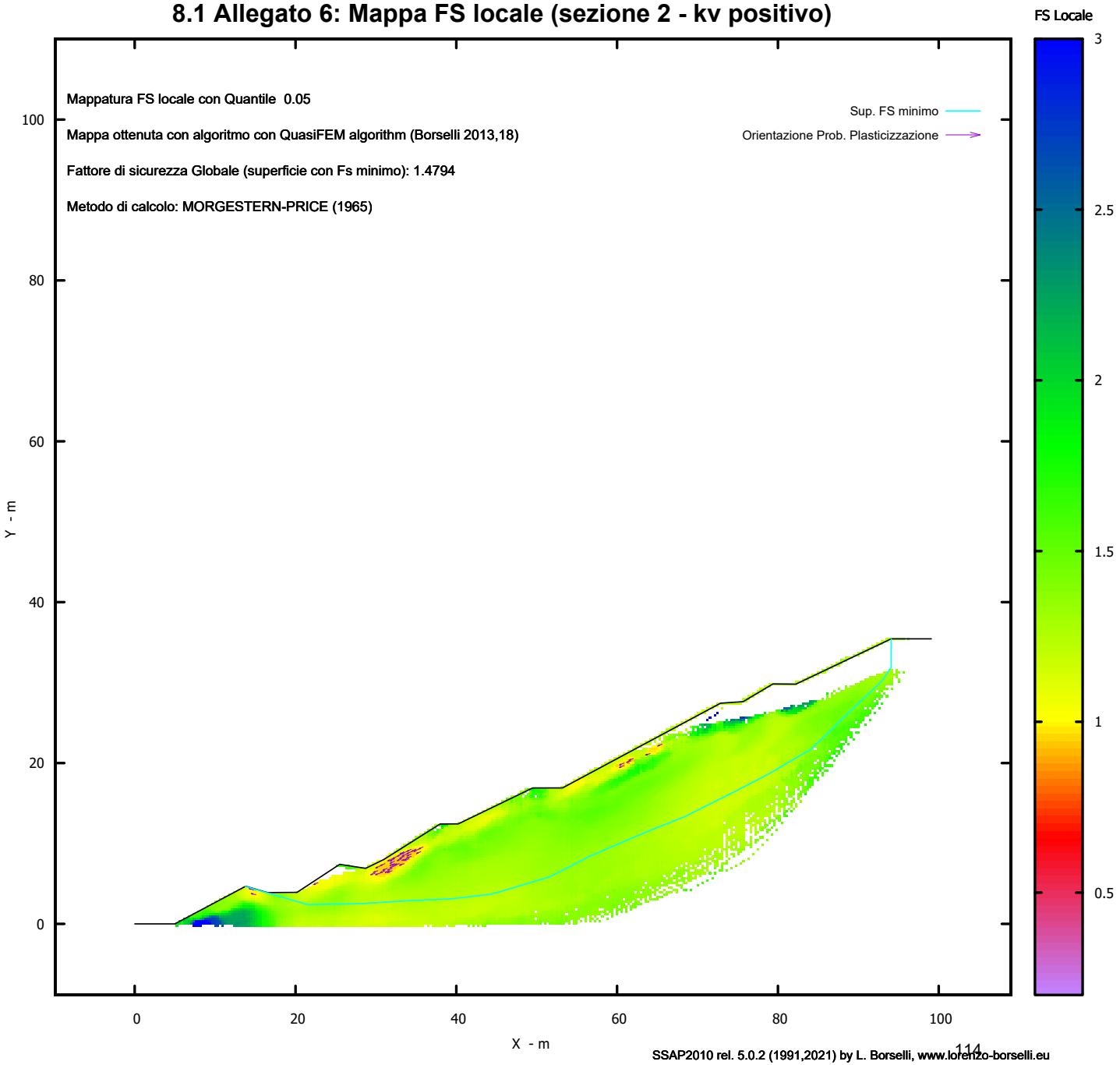
37.385	0.595	0.596	2.556	14.068	8.383	85.974	51.227
37.980	0.633	0.634	2.556	14.285	9.051	86.415	54.752
38.613	0.633	0.634	2.556	14.251	9.029	84.968	53.835
39.246	0.187	0.187	2.556	14.229	2.662	84.432	15.797
39.433	0.633	0.637	6.808	23.819	15.184	81.239	51.786
40.066	0.184	0.186	6.808	23.714	4.399	80.958	15.019
40.250	0.633	0.637	6.808	23.948	15.266	81.457	51.925
40.883	0.633	0.637	6.808	24.466	15.596	82.820	52.794
41.516	0.633	0.637	6.808	24.983	15.926	84.179	53.660
42.149	0.633	0.637	6.808	25.500	16.255	85.520	54.515
42.782	0.633	0.637	6.808	26.018	16.585	86.776	55.316
43.415	0.633	0.637	6.808	26.535	16.915	88.010	56.102
44.048	0.381	0.383	6.808	26.949	10.328	88.769	34.020
44.428	0.633	0.660	16.549	50.259	33.187	79.457	52.466
45.061	0.633	0.660	16.549	50.747	33.509	80.002	52.826
45.694	0.633	0.660	16.549	51.234	33.831	80.571	53.202
46.327	0.633	0.660	16.549	51.722	34.153	81.136	53.575
46.960	0.633	0.660	16.549	52.210	34.475	81.698	53.946
47.593	0.633	0.660	16.549	52.697	34.797	82.259	54.316
48.226	0.633	0.660	16.549	53.185	35.118	82.814	54.683
48.859	0.633	0.660	16.549	53.672	35.440	83.379	55.056
49.492	0.018	0.019	16.549	53.923	1.015	83.671	1.575
49.510	0.633	0.660	16.549	53.540	35.353	83.149	54.904
50.143	0.633	0.660	16.549	52.759	34.837	82.112	54.220
50.776	0.633	0.660	16.549	51.978	34.322	81.082	53.539
51.409	0.234	0.244	16.549	51.444	12.561	80.361	19.621
51.643	0.633	0.713	27.371	70.125	49.982	71.777	51.159
52.276	0.633	0.713	27.371	68.241	48.639	70.482	50.236
52.909	0.301	0.339	27.371	66.850	22.670	69.520	23.576
53.210	0.633	0.713	27.371	66.436	47.352	69.223	49.339
53.843	0.633	0.713	27.371	66.503	47.400	69.299	49.393
54.476	0.633	0.713	27.371	66.570	47.448	69.049	49.215
55.109	0.633	0.713	27.371	66.637	47.495	68.958	49.150
55.742	0.633	0.713	27.371	66.704	47.543	68.838	49.064
56.375	0.091	0.102	27.371	66.742	6.821	68.610	7.012
56.466	0.633	0.689	23.233	60.743	41.841	72.025	49.612
57.099	0.633	0.689	23.233	61.095	42.084	72.271	49.781
57.731	0.633	0.689	23.233	61.448	42.327	72.474	49.922
58.364	0.633	0.689	23.233	61.801	42.570	72.720	50.091
58.997	0.633	0.689	23.233	62.154	42.813	72.994	50.280
59.630	0.633	0.689	23.233	62.507	43.056	73.270	50.470
60.263	0.633	0.689	23.233	62.859	43.299	73.559	50.669
60.896	0.633	0.689	23.233	63.212	43.542	73.844	50.865
61.529	0.633	0.689	23.233	63.565	43.785	74.103	51.043
62.162	0.633	0.689	23.233	63.918	44.028	74.409	51.254
62.795	0.633	0.689	23.233	64.271	44.271	74.723	51.470
63.428	0.316	0.344	23.233	64.535	22.178	74.995	25.773
63.744	0.633	0.681	21.700	62.073	42.286	76.657	52.221
64.377	0.633	0.681	21.700	62.509	42.584	77.105	52.527
65.010	0.633	0.681	21.700	62.946	42.881	77.565	52.840
65.643	0.633	0.681	21.700	63.383	43.179	78.039	53.163
66.276	0.633	0.681	21.700	63.820	43.476	78.529	53.497
66.909	0.633	0.681	21.700	64.256	43.774	79.034	53.841
67.542	0.633	0.681	21.700	64.693	44.071	79.555	54.196
68.175	0.274	0.295	21.700	65.006	19.177	79.931	23.579
68.449	0.633	0.708	26.538	73.738	52.170	75.853	53.666
69.082	0.633	0.708	26.538	73.869	52.262	76.218	53.924

69.715	0.633	0.708	26.538	74.000	52.355	76.639	54.223
70.348	0.633	0.708	26.538	74.131	52.448	77.122	54.564
70.981	0.633	0.708	26.538	74.263	52.541	77.430	54.782
71.613	0.633	0.708	26.538	74.394	52.634	77.697	54.971
72.246	0.624	0.697	26.538	74.524	51.943	77.925	54.314
72.870	0.633	0.708	26.538	73.817	52.226	77.383	54.749
73.503	0.633	0.708	26.538	72.273	51.134	76.055	53.809
74.136	0.517	0.578	26.538	70.871	40.948	74.970	43.317
74.653	0.633	0.714	27.624	70.993	50.717	72.933	52.103
75.286	0.384	0.434	27.624	69.654	30.205	71.767	31.121
75.670	0.633	0.714	27.624	69.276	49.490	71.654	51.189
76.303	0.633	0.714	27.624	69.531	49.673	71.932	51.388
76.936	0.633	0.714	27.624	69.786	49.855	72.403	51.724
77.569	0.633	0.714	27.624	70.041	50.037	72.674	51.918
78.202	0.613	0.692	27.624	70.292	48.646	72.912	50.459
78.815	0.565	0.654	30.291	73.842	48.317	71.140	46.549
79.380	0.633	0.733	30.291	72.717	53.304	70.618	51.766
80.013	0.633	0.733	30.291	70.436	51.632	68.892	50.500
80.646	0.633	0.733	30.291	68.156	49.960	66.992	49.107
81.279	0.633	0.733	30.291	65.875	48.288	65.258	47.836
81.912	0.318	0.368	30.291	64.161	23.641	63.873	23.535
82.230	0.633	0.733	30.291	63.380	46.459	63.429	46.495
82.863	0.633	0.733	30.291	62.963	46.154	63.150	46.291
83.496	0.633	0.733	30.291	62.547	45.849	62.867	46.084
84.129	0.023	0.026	30.291	62.331	1.648	62.977	1.665
84.152	0.633	0.884	44.288	67.716	59.876	51.325	45.382
84.785	0.633	0.884	44.288	65.600	58.005	50.831	44.946
85.418	0.633	0.884	44.288	63.485	56.134	50.328	44.501
86.051	0.633	0.884	44.288	61.369	54.263	49.784	44.019
86.684	0.633	0.884	44.288	59.253	52.393	48.902	43.240
87.316	0.633	0.884	44.288	57.137	50.522	47.772	42.240
87.949	0.633	0.884	44.288	55.022	48.651	47.270	41.797
88.582	0.482	0.673	44.288	53.159	35.764	46.122	31.030
89.064	0.633	0.869	43.264	51.402	44.678	44.816	38.954
89.697	0.633	0.869	43.264	49.430	42.964	43.566	37.867
90.330	0.633	0.869	43.264	47.458	41.250	41.891	36.412
90.963	0.633	0.869	43.264	45.486	39.536	40.041	34.804
91.596	0.633	0.869	43.264	43.514	37.822	37.323	32.442
92.229	0.633	0.869	43.264	41.542	36.108	34.602	30.076
92.862	0.029	0.040	43.264	40.511	1.622	32.977	1.320
92.891	0.633	1.124	55.717	34.986	39.314	25.201	28.318
93.524	0.566	1.005	55.717	31.359	31.518	23.839	23.959

LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio
dx(m) : Larghezza concio
dl(m) : lunghezza base concio
alpha(°) : Angolo pendenza base concio
TauStress(kPa) : Sforzo di taglio su base concio
TauF (kN/m) : Forza di taglio su base concio
TauStrength(kPa) : Resistenza al taglio su base concio
TauS (kN/m) : Forza resistente al taglio su base concio

8.1 Allegato 6: Mappa FS locale (sezione 2 - kv positivo)



SSAP2010 rel. 5.0.2 (1991,2021) by L. Borselli, www.lorenzo-borselli.eu

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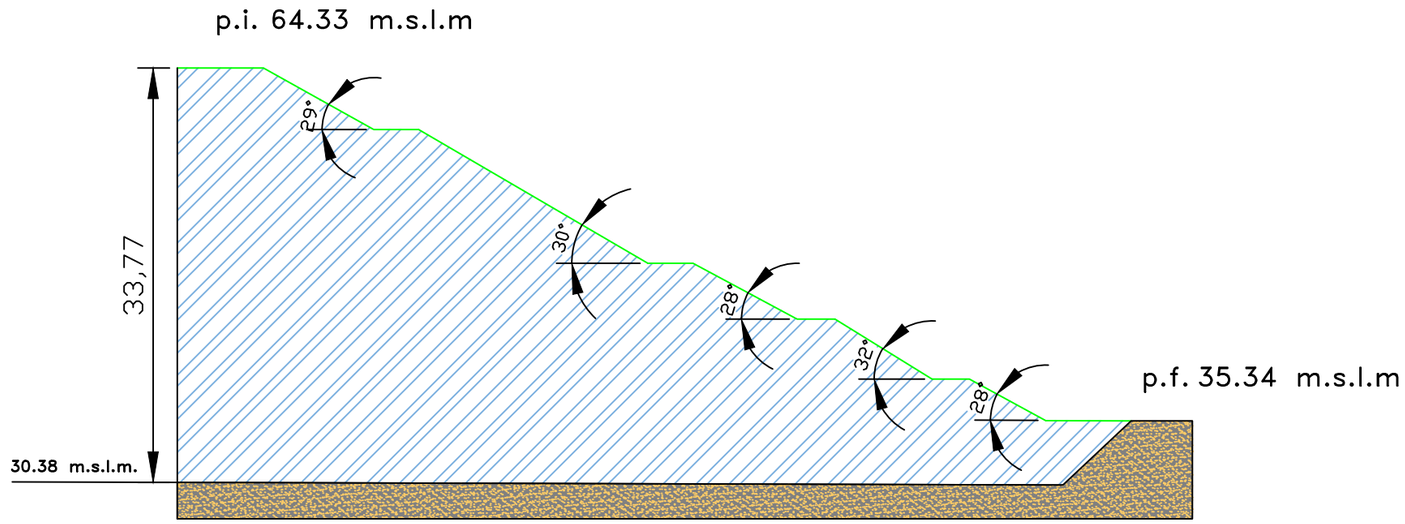
ALLEGATO 1

MODELLO GEOTECNICO DELLE SEZIONI

MODELLO GEOTECNICO - SEZIONE 1
Scala 1:500

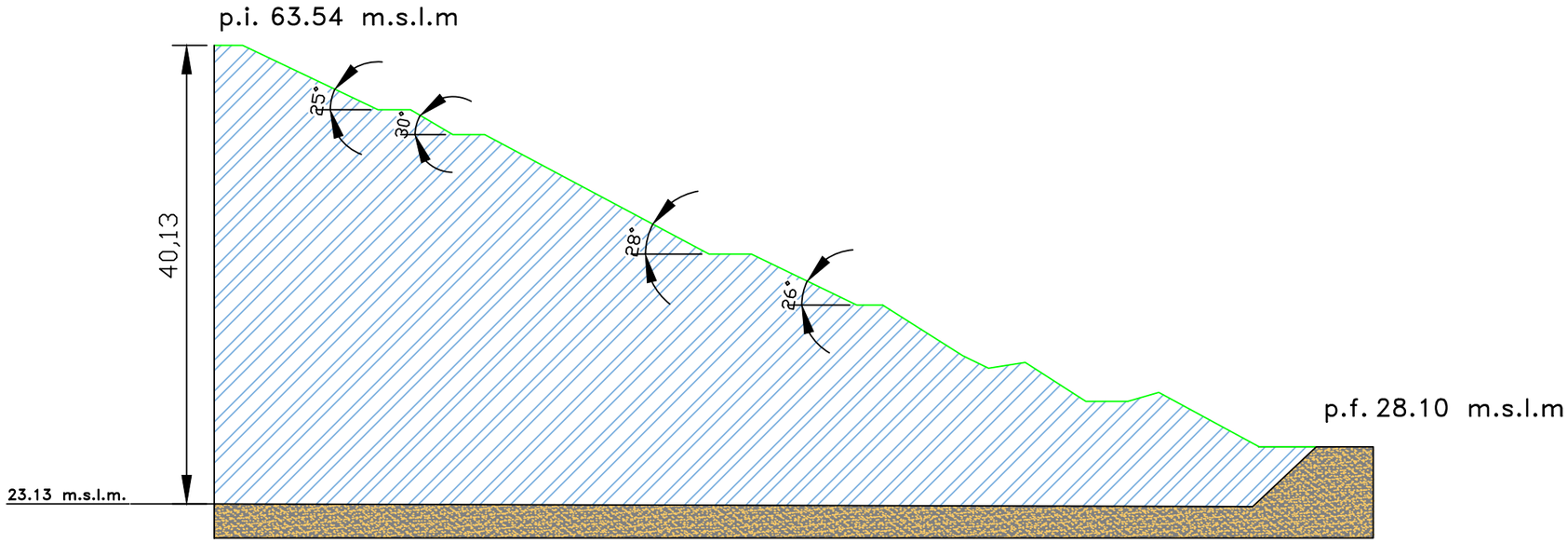
LEGENDA MATERIALI MODELLO			
MATERIALI	ANGOLO DI ATTRITO (Ø')	COESIONE EFFICACE (c' [kPa])	PESO UNITA' DI VOLUME (γ [kN/m³])
Rifiuto solido urbano (RSU)	25,00°	15,00	12,12
Tappo di argilla	---	---	---



Distanze parziali (m)	0.00	9.01	3.66	18.68	3.69	8.48	3.10	7.92	3.09	6.21	6.96
Distanze progressive (m)	0.00	9.01	12.67	31.35	35.04	43.52	46.62	54.54	57.63	63.84	70.80
Quote (m.s.l.m)	64.33	59.32	59.24	48.34	48.33	43.97	43.78	38.88	38.75	35.38	35.34

MODELLO GEOTECNICO - SEZIONE 2
Scala 1:500

LEGENDA MATERIALI MODELLO			
MATERIALI	ANGOLO DI ATTRITO (Ø')	COESIONE EFFICACE (c' [kPa])	PESO UNITA' DI VOLUME (γ [kN/m³])
Rifiuto solido urbano (RSU)	25,00°	15,00	12,12
Tappo di argilla	---	---	---



Distanze parziali (m)	0.00	11.86	2.85	3.71	2.80	19.66	3.70	9.26	2.27	7.00	2.27	3.21	5.32	3.68	2.70	8.80	5.00
Distanze progressive (m)	0.00	11.86	14.71	18.42	21.22	40.88	44.58	53.84	56.11	63.11	65.38	68.59	73.91	77.59	80.29	89.09	94.09
Quote (m.s.l.m)	63.54	57.9	57.93	55.73	55.54	45.09	45.00	40.53	40.52	36.10	35.00	35.50	32.01	31.99	32.77	28.10	28.10