



# COMUNE DI SANTA MARIA A MONTE

## Spazio insieme zerocentoventi San Sebastiano

### PROGETTO DEFINITIVO/ESECUTIVO

(redatto ai sensi del D.Lgs. 50/2016 e s.m.i.)

Strutturale

RESPONSABILE UNICO DEL PROCEDIMENTO:

Ing. Maurizio Iannotta

PROGETTAZIONE ARCHITETTONICA:

COLUCCI&PARTNERS Architettura  
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PROGETTAZIONE IMPIANTI:

STUDIO MPS

Progettazione impianti TERMOMECCANICI:

P.I. Luca POLLARI

Progettazione impianti ELETTRICI E SPECIALI:

P.I. Yuri DEMI

CODICE FILE

ES\_18\_06\_DE\_L1\_S\_D06

CONTENUTO FILE:

- Verifica Fronte Scavo

DATA :

OTTOBRE 2020

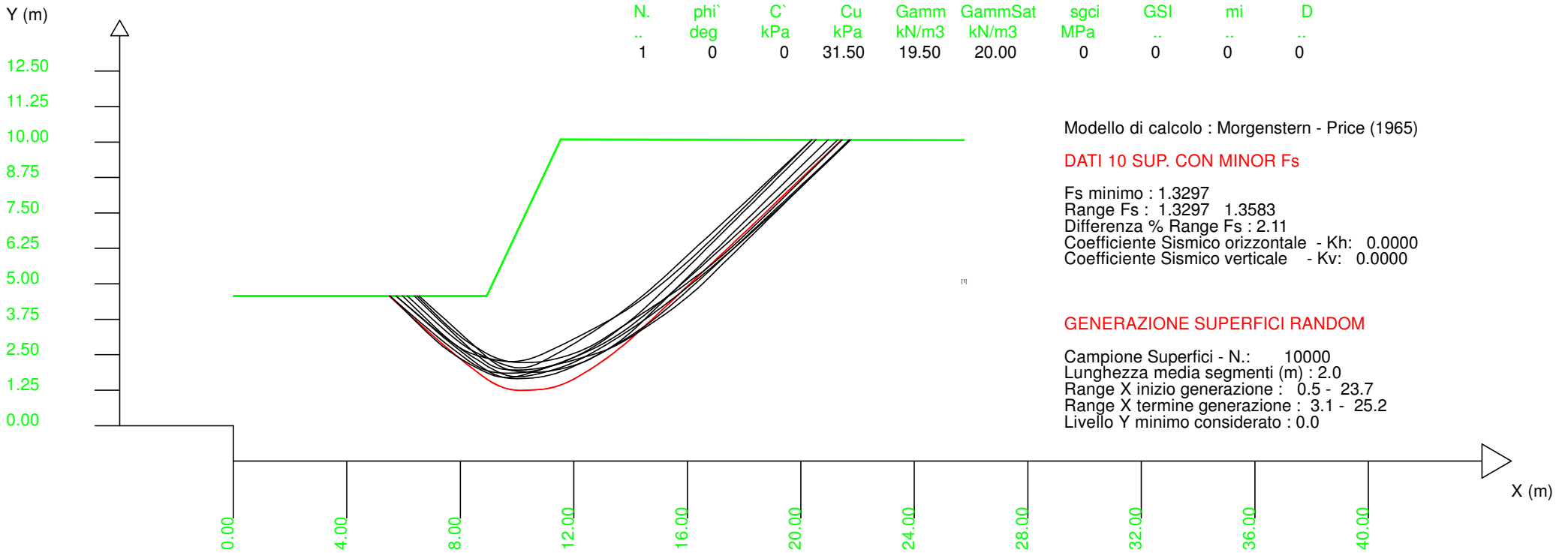
**VERIFICA DI STABILITA'**  
**FRONTE DI SCAVO**

SSAP 5.0 (2020) - Slope Stability Analysis Program  
 Software by Dr.Geol. L.Borselli - www.lorenzo-borselli.eu  
 SSAP/DXF generator rel. 2.0 (2020)

Data : 6/11/2020  
 Localita' : San Sebastiano-S. Maria a Monte  
 Descrizione : Verifica stabilita' fronte di scavo in condizioni statiche non drenate  
 [n] = N. strato o lente

# Parametri Geotecnici degli strati # -----

N.	phi` deg	C` kPa	Cu kPa	Gamm kN/m3	GammSat kN/m3	sgci MPa	GSI ..	mi ..	D ..
1	0	0	31.50	19.50	20.00	0	0	0	0



Modello di calcolo : Morgenstern - Price (1965)

**DATI 10 SUP. CON MINOR Fs**

Fs minimo : 1.3297  
 Range Fs : 1.3297 - 1.3583  
 Differenza % Range Fs : 2.11  
 Coefficiente Sismico orizzontale - Kh: 0.0000  
 Coefficiente Sismico verticale - Kv: 0.0000

**GENERAZIONE SUPERFICI RANDOM**

Campione Superfici - N.: 10000  
 Lunghezza media segmenti (m) : 2.0  
 Range X inizio generazione : 0.5 - 23.7  
 Range X termine generazione : 3.1 - 25.2  
 Livello Y minimo considerato : 0.0

# Report elaborazioni #

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SSAP 5.0 - Slope Stability Analysis Program (1991,2020)

WWW.SSAP.EU

Build No. 11716

BY

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\*\* Gia' Ricercatore CNR-IRPI fino a Luglio 2011  
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Ultima Revisione struttura tabelle del report: 12 settembre 2020  
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File report: D:\ssp2010prove\lavori\smontemuro\frontescavostatico.txt

Data: 6/11/2020

Localita' : San Sebastiano-S. Maria a Monte

Descrizione: Verifica stabilit  fronte di scavo in condizioni statiche non drenate

Modello pendio: modcantierestatica.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	4.57	-	-	-	-	-	-
8.93	4.57	-	-	-	-	-	-
11.54	10.09	-	-	-	-	-	-
25.76	10.07	-	-	-	-	-	-

## ASSENZA DI FALDA ##

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

STRATO	1	fi`	C`	Cu	Gamm	Gamm_sat	STR_IDX	sgci	GSI	mi	D
		0.00	0.00	31.50	19.50	20.00	1.573	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

METODO DI RICERCA: CONVEX RANDOM - Chen (1992)  
FILTRAGGIO SUPERFICI : ATTIVATO  
COORDINATE X1,X2,Y OSTACOLO : 0.00 0.00 0.00  
LUNGHEZZA MEDIA SEGMENTI (m): 2.0 (+/-) 50%  
INTERVALLO ASCISSE RANDOM STARTING POINT (Xmin .. Xmax): 0.52 23.70  
LIVELLO MINIMO CONSIDERATO (Ymin): 0.00  
INTERVALLO ASCISSE AMMESSO PER LA TERMINAZIONE (Xmin .. Xmax): 3.09 25.24

\*\*\* TOTALE SUPERFICI GENERATE : 10000

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

METODO DI CALCOLO : MORGENSTERN - PRICE (Morgenstern & Price, 1965)  
METODO DI ESPLORAZIONE CAMPO VALORI (lambda0,Fs0) ADOTTATO : A (rapido)  
COEFFICIENTE SISMICO UTILIZZATO Kh : 0.0000  
COEFFICIENTE SISMICO UTILIZZATO Kv (assunto Positivo): 0.0000  
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 le tutte le verifiche globali.  
I valori >0 impostati dall'utente sono utilizzati solo in caso di verifica singola

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

\* DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs \*

Fattore di sicurezza (FS)	1.3297	- Min. -	X	Y	Lambda=	0.0313
			5.50	4.57		
			6.35	3.79		
			6.79	3.39		
			7.09	3.12		
			7.37	2.88		
			7.61	2.67		
			7.86	2.47		
			8.12	2.26		
			8.40	2.04		
			8.71	1.80		
			8.96	1.63		
			9.18	1.49		
			9.37	1.40		
			9.60	1.32		
			9.78	1.27		
			10.01	1.25		
			10.27	1.25		
			10.63	1.26		
			10.90	1.29		
			11.14	1.32		

11.35	1.37
11.59	1.45
11.79	1.54
12.02	1.65
12.27	1.80
12.58	1.99
12.85	2.16
13.10	2.34
13.34	2.51
13.58	2.70
13.82	2.90
14.06	3.10
14.30	3.32
14.57	3.57
14.82	3.81
15.08	4.05
15.33	4.29
15.58	4.52
15.83	4.75
16.08	4.99
16.33	5.22
16.57	5.45
16.82	5.68
17.07	5.92
17.32	6.15
17.57	6.39
17.82	6.62
18.07	6.86
18.32	7.10
18.57	7.33
18.81	7.57
19.06	7.81
19.31	8.05
19.56	8.28
19.84	8.55
20.15	8.85
20.59	9.27
21.43	10.08

Fattore di sicurezza (FS)	1.3308	- N.2 --	X	Y	Lambda= 0.0388
			5.74	4.57	
			6.50	3.90	
			6.89	3.56	
			7.16	3.32	
			7.41	3.12	
			7.63	2.94	
			7.85	2.75	
			8.09	2.57	
			8.34	2.38	
			8.61	2.17	
			8.83	2.01	
			9.03	1.89	

9.20	1.81
9.40	1.74
9.57	1.69
9.77	1.67
9.99	1.66
10.30	1.67
10.55	1.68
10.77	1.71
10.96	1.74
11.18	1.79
11.37	1.85
11.58	1.92
11.80	2.01
12.06	2.12
12.30	2.23
12.52	2.34
12.74	2.44
12.96	2.56
13.17	2.67
13.39	2.80
13.62	2.93
13.86	3.08
14.09	3.23
14.30	3.37
14.51	3.52
14.73	3.68
14.94	3.85
15.16	4.02
15.38	4.21
15.61	4.41
15.84	4.62
16.07	4.82
16.29	5.01
16.51	5.21
16.73	5.41
16.95	5.62
17.17	5.82
17.39	6.03
17.62	6.24
17.84	6.45
18.06	6.66
18.29	6.86
18.51	7.07
18.73	7.28
18.95	7.48
19.17	7.69
19.40	7.90
19.62	8.11
19.84	8.31
20.06	8.52
20.31	8.75
20.59	9.01
20.98	9.38

21.73 10.08

Fattore di sicurezza (FS) 1.3314 - N.3 -- X Y Lambda= 0.0385

5.53	4.57
6.41	3.70
6.84	3.28
7.13	3.02
7.38	2.80
7.62	2.62
7.85	2.46
8.10	2.31
8.37	2.15
8.71	1.97
8.96	1.85
9.18	1.77
9.36	1.72
9.58	1.70
9.76	1.70
9.97	1.73
10.21	1.79
10.53	1.88
10.81	1.97
11.07	2.06
11.32	2.15
11.56	2.24
11.80	2.33
12.05	2.43
12.30	2.54
12.58	2.66
12.83	2.78
13.06	2.91
13.29	3.04
13.53	3.19
13.76	3.34
13.99	3.51
14.24	3.69
14.51	3.91
14.76	4.12
15.01	4.32
15.26	4.53
15.50	4.74
15.75	4.95
15.99	5.16
16.24	5.38
16.49	5.60
16.73	5.83
16.98	6.05
17.23	6.28
17.47	6.50
17.72	6.73
17.97	6.95
18.22	7.18



18.46	7.40
18.71	7.63
18.95	7.86
19.20	8.09
19.45	8.32
19.72	8.58
20.03	8.87
20.46	9.28
21.29	10.08

Fattore di sicurezza (FS)    1.3342   - N.4 --    X    Y    Lambda= 0.0497

5.73	4.57
6.60	3.83
7.04	3.46
7.35	3.22
7.61	3.01
7.86	2.82
8.11	2.65
8.37	2.47
8.65	2.29
8.98	2.08
9.23	1.94
9.45	1.84
9.63	1.78
9.85	1.73
10.03	1.72
10.25	1.74
10.50	1.78
10.85	1.85
11.13	1.93
11.39	2.00
11.62	2.08
11.86	2.17
12.09	2.28
12.33	2.39
12.58	2.53
12.86	2.69
13.12	2.84
13.38	2.99
13.62	3.14
13.87	3.31
14.11	3.47
14.35	3.64
14.61	3.82
14.87	4.01
15.12	4.20
15.37	4.39
15.62	4.58
15.87	4.77
16.12	4.97
16.36	5.17
16.61	5.38

16.87	5.60
17.12	5.81
17.37	6.02
17.62	6.24
17.87	6.46
18.12	6.67
18.37	6.90
18.62	7.12
18.87	7.35
19.13	7.59
19.38	7.82
19.63	8.05
19.87	8.28
20.15	8.54
20.47	8.84
20.90	9.26
21.75	10.08

Fattore di sicurezza (FS)    1.3365   - N.5   --    X            Y            Lambda= 0.0314

6.39	4.57
6.98	3.99
7.29	3.70
7.50	3.49
7.70	3.31
7.87	3.15
8.05	2.99
8.23	2.82
8.43	2.64
8.64	2.45
8.81	2.31
8.96	2.20
9.10	2.12
9.25	2.05
9.38	2.01
9.54	1.98
9.71	1.97
9.94	1.96
10.14	1.97
10.32	1.97
10.48	1.98
10.65	2.00
10.81	2.03
10.97	2.06
11.15	2.09
11.34	2.14
11.52	2.19
11.70	2.23
11.87	2.28
12.04	2.33
12.22	2.37
12.39	2.42
12.58	2.48

12.77	2.54
12.94	2.59
13.10	2.65
13.26	2.72
13.43	2.80
13.59	2.88
13.76	2.97
13.93	3.08
14.12	3.20
14.30	3.32
14.48	3.43
14.65	3.55
14.83	3.66
15.00	3.78
15.17	3.90
15.35	4.03
15.54	4.17
15.71	4.30
15.88	4.43
16.05	4.57
16.22	4.71
16.38	4.86
16.55	5.02
16.72	5.18
16.90	5.36
17.08	5.53
17.26	5.71
17.44	5.88
17.61	6.05
17.78	6.22
17.96	6.39
18.13	6.57
18.30	6.74
18.48	6.91
18.65	7.08
18.83	7.25
19.00	7.42
19.18	7.59
19.35	7.76
19.52	7.94
19.70	8.11
19.87	8.28
20.04	8.45
20.22	8.62
20.39	8.79
20.59	8.98
20.81	9.20
21.11	9.50
21.70	10.08

Fattore di sicurezza (FS)	1.3539	- N.6 --	X	Y	Lambda=	0.0596
			6.48	4.57		

7.14	3.92
7.47	3.61
7.69	3.40
7.88	3.24
8.07	3.10
8.24	2.97
8.43	2.84
8.63	2.72
8.86	2.58
9.06	2.48
9.23	2.40
9.39	2.34
9.56	2.29
9.71	2.26
9.89	2.24
10.08	2.23
10.32	2.23
10.52	2.23
10.71	2.24
10.88	2.26
11.06	2.29
11.23	2.32
11.41	2.37
11.60	2.42
11.83	2.49
12.02	2.56
12.20	2.63
12.37	2.70
12.56	2.79
12.73	2.88
12.90	2.98
13.09	3.09
13.29	3.22
13.49	3.35
13.68	3.48
13.87	3.60
14.06	3.72
14.24	3.84
14.43	3.97
14.62	4.09
14.81	4.21
15.00	4.34
15.18	4.46
15.37	4.59
15.55	4.71
15.74	4.84
15.93	4.98
16.12	5.12
16.31	5.26
16.50	5.40
16.68	5.55
16.86	5.69
17.05	5.85

17.23	6.00
17.41	6.16
17.60	6.33
17.80	6.51
17.99	6.69
18.17	6.87
18.36	7.04
18.55	7.22
18.73	7.40
18.92	7.58
19.11	7.76
19.29	7.95
19.48	8.13
19.67	8.32
19.86	8.50
20.05	8.69
20.26	8.89
20.49	9.13
20.82	9.45
21.45	10.08

Fattore di sicurezza (FS)    1.3549   - N.7 --    X    Y    Lambda=   0.0899

6.14	4.57
7.07	3.71
7.51	3.32
7.81	3.07
8.06	2.88
8.30	2.72
8.53	2.59
8.79	2.46
9.08	2.33
9.45	2.19
9.71	2.10
9.93	2.05
10.10	2.03
10.32	2.05
10.50	2.09
10.71	2.17
10.96	2.30
11.30	2.48
11.60	2.65
11.87	2.81
12.12	2.96
12.38	3.12
12.62	3.28
12.88	3.44
13.14	3.62
13.41	3.81
13.67	3.99
13.92	4.18
14.16	4.37
14.41	4.57

14.65	4.77
14.90	4.99
15.15	5.22
15.42	5.46
15.68	5.70
15.94	5.94
16.19	6.18
16.45	6.41
16.70	6.65
16.96	6.88
17.21	7.12
17.47	7.35
17.72	7.59
17.97	7.82
18.23	8.06
18.48	8.30
18.77	8.56
19.09	8.86
19.53	9.28
20.39	10.08

Fattore di sicurezza (FS)    1.3554   - N.8   --    X            Y            Lambda=   0.0396

5.52	4.57
6.24	3.95
6.60	3.64
6.86	3.42
7.09	3.23
7.30	3.06
7.51	2.89
7.73	2.72
7.96	2.54
8.21	2.34
8.42	2.20
8.60	2.09
8.77	2.00
8.96	1.93
9.12	1.89
9.30	1.87
9.51	1.85
9.80	1.86
10.03	1.86
10.24	1.88
10.43	1.90
10.63	1.94
10.82	1.98
11.02	2.04
11.23	2.10
11.48	2.19
11.70	2.27
11.90	2.36
12.09	2.45
12.30	2.55

12.49	2.66
12.69	2.78
12.90	2.91
13.14	3.07
13.35	3.22
13.56	3.37
13.76	3.52
13.97	3.69
14.16	3.85
14.37	4.03
14.57	4.22
14.79	4.42
15.01	4.62
15.22	4.82
15.43	5.02
15.64	5.22
15.84	5.42
16.05	5.62
16.26	5.83
16.47	6.03
16.68	6.24
16.89	6.45
17.10	6.66
17.30	6.86
17.51	7.07
17.72	7.28
17.93	7.49
18.14	7.69
18.35	7.90
18.55	8.11
18.76	8.32
18.97	8.52
19.21	8.76
19.47	9.02
19.83	9.38
20.54	10.08

Fattore di sicurezza (FS)	1.3575	- N.9 --	X	Y	Lambda= 0.0349
			6.55	4.57	
			7.16	4.02	
			7.47	3.74	
			7.70	3.53	
			7.90	3.35	
			8.08	3.19	
			8.27	3.02	
			8.46	2.85	
			8.66	2.66	
			8.88	2.47	
			9.05	2.32	
			9.21	2.21	
			9.35	2.12	
			9.52	2.04	

9.66	1.99
9.82	1.95
10.00	1.92
10.24	1.90
10.44	1.89
10.62	1.88
10.79	1.89
10.96	1.90
11.12	1.92
11.30	1.95
11.48	1.99
11.70	2.04
11.89	2.09
12.06	2.14
12.23	2.20
12.40	2.27
12.56	2.35
12.74	2.43
12.92	2.54
13.14	2.66
13.32	2.78
13.50	2.89
13.67	3.02
13.84	3.15
14.01	3.29
14.18	3.44
14.36	3.61
14.55	3.80
14.74	3.98
14.92	4.16
15.10	4.34
15.28	4.52
15.47	4.70
15.65	4.87
15.83	5.05
16.00	5.22
16.18	5.40
16.36	5.58
16.55	5.75
16.72	5.93
16.91	6.11
17.09	6.28
17.27	6.46
17.44	6.63
17.62	6.81
17.80	6.99
17.99	7.17
18.17	7.34
18.35	7.52
18.53	7.69
18.71	7.87
18.89	8.05
19.07	8.22



19.25	8.40
19.43	8.58
19.61	8.75
19.81	8.95
20.03	9.17
20.35	9.48
20.96	10.08

Fattore di sicurezza (FS)    1.3583    - N.10    --    X    Y    Lambda=    0.0732

5.97	4.57
6.94	3.63
7.39	3.21
7.68	2.96
7.92	2.79
8.16	2.65
8.36	2.55
8.61	2.47
8.88	2.39
9.25	2.32
9.53	2.28
9.77	2.26
9.97	2.27
10.21	2.30
10.41	2.34
10.64	2.42
10.89	2.52
11.21	2.67
11.50	2.81
11.77	2.94
12.02	3.07
12.28	3.20
12.53	3.33
12.79	3.47
13.06	3.61
13.34	3.77
13.59	3.92
13.84	4.07
14.09	4.23
14.34	4.41
14.58	4.59
14.83	4.78
15.09	4.99
15.37	5.22
15.63	5.45
15.89	5.67
16.14	5.90
16.40	6.13
16.65	6.37
16.90	6.61
17.16	6.86
17.42	7.12
17.68	7.38

17.94	7.64
18.20	7.90
18.46	8.16
18.75	8.44
19.07	8.77
19.52	9.21
20.39	10.08

----- ANALISI DEFICIT DI RESISTENZA -----

# DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs \*

# Analisi Deficit in riferimento a FS(progetto) = 1.100

Sup N.	FS	FTR(kN/m)	FTA(kN/m)	Bilancio(kN/m)	ESITO
1	1.330	653.9	491.8	113.0	Surplus
2	1.331	637.9	479.4	110.6	Surplus
3	1.331	627.8	471.5	109.1	Surplus
4	1.334	635.3	476.2	111.5	Surplus
5	1.336	610.3	456.6	108.0	Surplus
6	1.354	593.3	438.2	111.3	Surplus
7	1.355	583.8	430.9	109.8	Surplus
8	1.355	607.2	447.9	114.4	Surplus
9	1.358	591.5	435.7	112.2	Surplus
10	1.358	576.6	424.5	109.7	Surplus

Esito analisi: SURPLUS di RESISTENZA!

Valore minimo di SURPLUS di RESISTENZA (kN/m): 108.0

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

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TABELLA PARAMETRI CONCI DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	alpha (°)	W (kN/m)	ru (-)	U (kPa)	phi' (°)	(c', Cu) (kPa)
5.497	0.205	-42.55	0.38	0.00	0.00	0.00	31.50
5.702	0.205	-42.55	1.13	0.00	0.00	0.00	31.50
5.907	0.205	-42.55	1.89	0.00	0.00	0.00	31.50
6.113	0.205	-42.55	2.64	0.00	0.00	0.00	31.50
6.318	0.033	-42.55	0.49	0.00	0.00	0.00	31.50
6.351	0.205	-42.23	3.51	0.00	0.00	0.00	31.50
6.556	0.205	-42.23	4.26	0.00	0.00	0.00	31.50
6.761	0.024	-42.23	0.56	0.00	0.00	0.00	31.50
6.786	0.205	-41.63	5.08	0.00	0.00	0.00	31.50
6.991	0.101	-41.63	2.78	0.00	0.00	0.00	31.50

7.092	0.205	-40.98	6.17	0.00	0.00	0.00	31.50
7.298	0.067	-40.98	2.18	0.00	0.00	0.00	31.50
7.365	0.205	-40.14	7.11	0.00	0.00	0.00	31.50
7.571	0.041	-40.14	1.51	0.00	0.00	0.00	31.50
7.612	0.205	-39.44	7.93	0.00	0.00	0.00	31.50
7.817	0.045	-39.44	1.83	0.00	0.00	0.00	31.50
7.862	0.205	-38.76	8.75	0.00	0.00	0.00	31.50
8.067	0.056	-38.76	2.50	0.00	0.00	0.00	31.50
8.123	0.205	-38.12	9.58	0.00	0.00	0.00	31.50
8.329	0.075	-38.12	3.66	0.00	0.00	0.00	31.50
8.404	0.205	-37.56	10.45	0.00	0.00	0.00	31.50
8.609	0.106	-37.56	5.64	0.00	0.00	0.00	31.50
8.715	0.205	-35.17	11.38	0.00	0.00	0.00	31.50
8.920	0.010	-35.17	0.56	0.00	0.00	0.00	31.50
8.930	0.031	-35.17	1.78	0.00	0.00	0.00	31.50
8.961	0.205	-31.40	13.17	0.00	0.00	0.00	31.50
9.166	0.014	-31.40	0.96	0.00	0.00	0.00	31.50
9.180	0.192	-25.95	14.42	0.00	0.00	0.00	31.50
9.372	0.205	-19.94	17.45	0.00	0.00	0.00	31.50
9.577	0.019	-19.94	1.68	0.00	0.00	0.00	31.50
9.595	0.189	-13.23	18.01	0.00	0.00	0.00	31.50
9.785	0.205	-6.19	21.35	0.00	0.00	0.00	31.50
9.990	0.018	-6.19	1.99	0.00	0.00	0.00	31.50
10.008	0.205	-0.79	23.30	0.00	0.00	0.00	31.50
10.214	0.056	-0.79	6.64	0.00	0.00	0.00	31.50
10.269	0.205	2.49	25.50	0.00	0.00	0.00	31.50
10.475	0.156	2.49	20.50	0.00	0.00	0.00	31.50
10.631	0.205	5.08	28.48	0.00	0.00	0.00	31.50
10.836	0.069	5.08	9.91	0.00	0.00	0.00	31.50
10.905	0.205	8.98	30.68	0.00	0.00	0.00	31.50
11.110	0.033	8.98	5.12	0.00	0.00	0.00	31.50
11.143	0.205	13.72	32.51	0.00	0.00	0.00	31.50
11.348	0.005	13.72	0.74	0.00	0.00	0.00	31.50
11.353	0.187	18.41	30.94	0.00	0.00	0.00	31.50
11.540	0.045	18.41	7.65	0.00	0.00	0.00	31.50
11.585	0.205	22.67	34.41	0.00	0.00	0.00	31.50
11.791	0.003	22.67	0.52	0.00	0.00	0.00	31.50
11.794	0.205	26.66	34.03	0.00	0.00	0.00	31.50
11.999	0.024	26.66	4.00	0.00	0.00	0.00	31.50
12.023	0.205	29.75	33.54	0.00	0.00	0.00	31.50
12.229	0.046	29.75	7.49	0.00	0.00	0.00	31.50
12.275	0.205	31.90	32.94	0.00	0.00	0.00	31.50
12.480	0.102	31.90	16.15	0.00	0.00	0.00	31.50
12.582	0.205	33.20	32.16	0.00	0.00	0.00	31.50
12.787	0.063	33.20	9.84	0.00	0.00	0.00	31.50
12.851	0.205	34.72	31.44	0.00	0.00	0.00	31.50
13.056	0.046	34.72	6.94	0.00	0.00	0.00	31.50
13.102	0.205	36.33	30.72	0.00	0.00	0.00	31.50
13.307	0.033	36.33	4.87	0.00	0.00	0.00	31.50
13.340	0.205	37.93	30.00	0.00	0.00	0.00	31.50
13.546	0.038	37.93	5.47	0.00	0.00	0.00	31.50
13.584	0.205	39.37	29.22	0.00	0.00	0.00	31.50
13.789	0.028	39.37	4.00	0.00	0.00	0.00	31.50

13.817	0.205	40.76	28.44	0.00	0.00	0.00	31.50
14.023	0.035	40.76	4.73	0.00	0.00	0.00	31.50
14.057	0.205	42.02	27.59	0.00	0.00	0.00	31.50
14.263	0.040	42.02	5.33	0.00	0.00	0.00	31.50
14.303	0.205	43.11	26.69	0.00	0.00	0.00	31.50
14.508	0.058	43.11	7.35	0.00	0.00	0.00	31.50
14.566	0.205	43.12	25.70	0.00	0.00	0.00	31.50
14.771	0.053	43.12	6.53	0.00	0.00	0.00	31.50
14.824	0.205	43.12	24.73	0.00	0.00	0.00	31.50
15.030	0.048	43.12	5.70	0.00	0.00	0.00	31.50
15.078	0.205	43.12	23.78	0.00	0.00	0.00	31.50
15.283	0.047	43.12	5.32	0.00	0.00	0.00	31.50
15.330	0.205	43.12	22.83	0.00	0.00	0.00	31.50
15.535	0.043	43.12	4.69	0.00	0.00	0.00	31.50
15.578	0.205	43.12	21.90	0.00	0.00	0.00	31.50
15.784	0.045	43.12	4.66	0.00	0.00	0.00	31.50
15.828	0.205	43.12	20.96	0.00	0.00	0.00	31.50
16.034	0.044	43.12	4.37	0.00	0.00	0.00	31.50
16.077	0.205	43.12	20.03	0.00	0.00	0.00	31.50
16.283	0.044	43.12	4.22	0.00	0.00	0.00	31.50
16.327	0.205	43.12	19.09	0.00	0.00	0.00	31.50
16.532	0.043	43.12	3.86	0.00	0.00	0.00	31.50
16.575	0.205	43.19	18.16	0.00	0.00	0.00	31.50
16.780	0.044	43.19	3.77	0.00	0.00	0.00	31.50
16.824	0.205	43.25	17.22	0.00	0.00	0.00	31.50
17.029	0.043	43.25	3.53	0.00	0.00	0.00	31.50
17.073	0.205	43.31	16.28	0.00	0.00	0.00	31.50
17.278	0.044	43.31	3.37	0.00	0.00	0.00	31.50
17.322	0.205	43.37	15.34	0.00	0.00	0.00	31.50
17.527	0.043	43.37	3.10	0.00	0.00	0.00	31.50
17.570	0.205	43.43	14.40	0.00	0.00	0.00	31.50
17.775	0.044	43.43	2.98	0.00	0.00	0.00	31.50
17.819	0.205	43.49	13.45	0.00	0.00	0.00	31.50
18.024	0.043	43.49	2.74	0.00	0.00	0.00	31.50
18.068	0.205	43.55	12.51	0.00	0.00	0.00	31.50
18.273	0.044	43.55	2.57	0.00	0.00	0.00	31.50
18.317	0.205	43.61	11.55	0.00	0.00	0.00	31.50
18.522	0.043	43.61	2.31	0.00	0.00	0.00	31.50
18.565	0.205	43.64	10.61	0.00	0.00	0.00	31.50
18.770	0.044	43.64	2.18	0.00	0.00	0.00	31.50
18.815	0.205	43.67	9.65	0.00	0.00	0.00	31.50
19.020	0.044	43.67	1.95	0.00	0.00	0.00	31.50
19.064	0.205	43.70	8.70	0.00	0.00	0.00	31.50
19.269	0.044	43.70	1.77	0.00	0.00	0.00	31.50
19.313	0.205	43.72	7.74	0.00	0.00	0.00	31.50
19.518	0.043	43.72	1.52	0.00	0.00	0.00	31.50
19.561	0.205	43.76	6.79	0.00	0.00	0.00	31.50
19.767	0.075	43.76	2.30	0.00	0.00	0.00	31.50
19.842	0.205	43.79	5.71	0.00	0.00	0.00	31.50
20.047	0.106	43.79	2.63	0.00	0.00	0.00	31.50
20.153	0.205	43.82	4.52	0.00	0.00	0.00	31.50
20.359	0.205	43.82	3.72	0.00	0.00	0.00	31.50
20.564	0.026	43.82	0.41	0.00	0.00	0.00	31.50

20.590	0.205	43.84	2.83	0.00	0.00	0.00	31.50
20.795	0.205	43.84	2.04	0.00	0.00	0.00	31.50
21.000	0.205	43.84	1.25	0.00	0.00	0.00	31.50
21.206	0.205	43.84	0.46	0.00	0.00	0.00	31.50
21.411	0.018	43.84	0.00	0.00	0.00	0.00	31.50

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 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  
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X (m)	ht (m)	yt (m)	yt' (--)	E(x) (kN/m)	T(x) (kN/m)	E' (kN)	rho(x) (--)	FS_qFEM (--)	FS_srmFEM (--)
5.497	0.000	4.570	-0.686	0.0000000000E+000	0.0000000000E+000	1.0055262015E+002	0.044	4.761	5.075
5.702	0.047	4.429	-0.686	1.7161649398E+001	2.8055958594E-003	6.6624618837E+001	0.044	4.761	5.075
5.907	0.095	4.288	-0.740	2.7357512462E+001	1.6640227762E-002	5.6631942236E+001	0.044	2.454	2.615
6.113	0.120	4.125	-0.746	4.0415952275E+001	6.7626083840E-002	6.2333962222E+001	0.044	1.620	1.725
6.318	0.166	3.982	-0.687	5.2953188326E+001	1.4702276172E-001	5.9372548168E+001	0.044	1.306	1.390
6.351	0.175	3.961	-0.609	5.4875084940E+001	1.6134095169E-001	5.8886900858E+001	0.044	1.275	1.356
6.556	0.238	3.837	-0.606	6.6683054471E+001	2.5801215553E-001	5.8625133200E+001	0.044	1.131	1.201
6.761	0.299	3.712	-0.599	7.8947835226E+001	3.6589012183E-001	5.3402985990E+001	0.044	1.027	1.090
6.786	0.308	3.700	-0.597	8.0237196272E+001	3.7804228781E-001	5.3832884922E+001	0.044	1.019	1.081
6.991	0.366	3.575	-0.599	9.3330172523E+001	5.1147308388E-001	6.3683639794E+001	0.044	0.959	1.015
7.092	0.397	3.516	-0.607	9.9784704932E+001	5.8112741304E-001	6.5759147842E+001	0.044	0.939	0.992
7.298	0.449	3.389	-0.610	1.1416641696E+002	7.4786631958E-001	6.8901744451E+001	0.044	0.912	0.961
7.365	0.468	3.349	-0.559	1.1878898421E+002	8.0409008569E-001	6.8169994737E+001	0.044	0.907	0.955
7.571	0.528	3.237	-0.538	1.3256321200E+002	9.8396830282E-001	6.1693396831E+001	0.044	0.906	0.951
7.612	0.543	3.217	-0.541	1.3505553926E+002	1.0178437952E+000	6.2409788771E+001	0.044	0.908	0.952
7.817	0.598	3.103	-0.534	1.4971125014E+002	1.2290451847E+000	6.2477528681E+001	0.044	0.922	0.963
7.862	0.615	3.083	-0.540	1.5244044611E+002	1.2708073254E+000	6.3733628210E+001	0.044	0.927	0.968
8.067	0.665	2.968	-0.551	1.6852819592E+002	1.5393968093E+000	7.6267691927E+001	0.044	0.969	1.005
8.123	0.681	2.939	-0.524	1.7275909582E+002	1.6141965342E+000	7.7444210528E+001	0.044	0.983	1.018
8.329	0.734	2.831	-0.501	1.8997571283E+002	1.9434726029E+000	7.9474547714E+001	0.044	1.061	1.087
8.404	0.760	2.799	-0.396	1.9582190469E+002	2.0637871286E+000	7.7688510363E+001	0.044	1.096	1.117
8.609	0.840	2.720	-0.328	2.1166900608E+002	2.4123489928E+000	7.3807082932E+001	0.044	1.221	1.221
8.715	0.898	2.696	-0.167	2.1929625238E+002	2.6066060310E+000	7.0383530284E+001	0.044	1.311	1.293
8.920	1.014	2.668	-0.132	2.3307694864E+002	2.9864216232E+000	5.5103451107E+001	0.044	1.536	1.468
8.930	1.021	2.668	-0.010	2.3361698127E+002	3.0026408609E+000	5.4523215983E+001	0.044	1.548	1.477
8.961	1.042	2.668	0.131	2.3529300096E+002	3.0540398781E+000	5.5546558661E+001	0.044	1.587	1.505
9.166	1.199	2.699	0.156	2.4810261066E+002	3.5131356189E+000	5.2460901652E+001	0.044	1.988	1.795
9.180	1.210	2.702	0.374	2.4881415460E+002	3.5415458680E+000	5.2369755173E+001	0.044	2.019	1.816
9.372	1.377	2.776	0.460	2.6039360899E+002	4.0599055689E+000	5.7294019070E+001	0.044	2.688	2.233

9.577	1.561	2.885	0.536	2.7147980080E+002	4.6451079251E+000	5.3870133506E+001	0.044	3.918	2.841
9.595	1.579	2.896	0.695	2.7248109852E+002	4.7012644759E+000	5.3451026231E+001	0.044	4.083	2.908
9.785	1.756	3.029	0.795	2.8180703971E+002	5.3010320582E+000	4.7691494789E+001	0.044	6.297	3.551
9.990	1.959	3.210	0.872	2.9123929714E+002	6.0219335220E+000	3.2047288028E+001	0.046	10.894	3.958
10.008	1.976	3.224	0.932	2.9180246830E+002	6.0749415212E+000	3.0832393046E+001	0.046	11.162	3.934
10.214	2.172	3.418	0.942	2.9818361708E+002	6.7341196189E+000	2.4331255868E+001	0.047	12.806	3.356
10.269	2.225	3.470	1.070	2.9943970327E+002	6.8947343686E+000	2.2249694162E+001	0.047	12.010	3.140
10.475	2.444	3.698	1.163	3.0382205898E+002	7.5383980512E+000	1.8661809499E+001	0.048	8.193	2.395
10.631	2.630	3.890	1.191	3.0641354433E+002	8.0221664286E+000	1.2745098389E+001	0.049	5.810	1.971
10.836	2.849	4.128	1.153	3.0798118370E+002	8.5255168816E+000	3.0487442592E+000	0.049	3.913	1.609
10.905	2.921	4.206	1.079	3.0808519193E+002	8.6697085160E+000	4.2002989325E-002	0.049	3.464	1.521
11.110	3.106	4.423	1.039	3.0719229012E+002	9.0066756124E+000	-8.9042755686E+000	0.048	2.560	1.336
11.143	3.132	4.454	0.853	3.0687190236E+002	9.0449194872E+000	-1.0447961514E+001	0.048	2.454	1.315
11.348	3.254	4.627	0.838	3.0370388036E+002	9.1945158007E+000	-2.0258369407E+001	0.047	1.967	1.220
11.353	3.256	4.630	0.675	3.0361061824E+002	9.1958231128E+000	-2.0435464629E+001	0.047	1.959	1.218
11.540	3.320	4.756	0.657	2.9926100766E+002	9.2168292232E+000	-2.7143615085E+001	0.045	1.680	1.166
11.585	3.332	4.783	0.537	2.9798658725E+002	9.2073435297E+000	-2.9024269236E+001	0.045	1.625	1.156
11.791	3.354	4.891	0.525	2.9115439710E+002	9.1010472415E+000	-3.9827461367E+001	0.045	1.431	1.121
11.794	3.354	4.892	0.443	2.9102957159E+002	9.0984631168E+000	-3.9991766754E+001	0.045	1.428	1.121
11.999	3.342	4.983	0.434	2.8194830421E+002	8.8622170547E+000	-4.4511334567E+001	0.044	1.297	1.100
12.023	3.338	4.992	0.379	2.8086642680E+002	8.8308433811E+000	-4.5732048200E+001	0.044	1.285	1.099
12.229	3.299	5.070	0.369	2.6941591581E+002	8.4560528647E+000	-5.6211739775E+001	0.044	1.201	1.090
12.275	3.288	5.085	0.336	2.6681232752E+002	8.3648525460E+000	-5.8202100329E+001	0.044	1.188	1.089
12.480	3.229	5.154	0.334	2.5313859707E+002	7.8564975282E+000	-6.8370466333E+001	0.044	1.142	1.090
12.582	3.199	5.188	0.334	2.4608403316E+002	7.5853996935E+000	-7.0349077647E+001	0.044	1.127	1.093
12.787	3.134	5.257	0.339	2.3118536855E+002	7.0003673101E+000	-7.3068181539E+001	0.044	1.111	1.104
12.851	3.114	5.279	0.341	2.2653620477E+002	6.8190327440E+000	-7.2864276859E+001	0.044	1.108	1.108
13.056	3.042	5.348	0.342	2.1181477505E+002	6.2500888188E+000	-7.1740622563E+001	0.044	1.105	1.123
13.102	3.026	5.365	0.346	2.0852516362E+002	6.1269322007E+000	-7.1385862739E+001	0.044	1.106	1.127
13.307	2.946	5.435	0.346	1.9420272895E+002	5.5984560639E+000	-6.9550465874E+001	0.044	1.110	1.145
13.340	2.933	5.447	0.356	1.9191231451E+002	5.5173519557E+000	-6.9404831135E+001	0.044	1.111	1.148
13.546	2.846	5.520	0.362	1.7780610258E+002	5.0234899278E+000	-7.3169552367E+001	0.044	1.121	1.169
13.584	2.832	5.535	0.383	1.7500062996E+002	4.9277284354E+000	-7.3368246348E+001	0.044	1.123	1.173
13.789	2.741	5.613	0.382	1.6063272317E+002	4.4472999949E+000	-7.0181100684E+001	0.044	1.137	1.197
13.817	2.729	5.624	0.406	1.5863522994E+002	4.3816404195E+000	-7.0335711966E+001	0.044	1.140	1.201
14.023	2.636	5.708	0.415	1.4400650824E+002	3.9091377636E+000	-7.7375171167E+001	0.044	1.160	1.229
14.057	2.622	5.724	0.443	1.4129207812E+002	3.8222748053E+000	-7.7589916715E+001	0.044	1.164	1.234
14.263	2.527	5.814	0.446	1.2635779307E+002	3.3531904338E+000	-7.6126163782E+001	0.044	1.190	1.266
14.303	2.510	5.834	0.471	1.2325999230E+002	3.2567195161E+000	-7.6202300421E+001	0.044	1.195	1.273
14.508	2.414	5.930	0.476	1.0823051878E+002	2.7977267097E+000	-7.4769214064E+001	0.044	1.227	1.310
14.566	2.389	5.959	0.493	1.0389584391E+002	2.6668164755E+000	-7.4412272372E+001	0.044	1.237	1.321
14.771	2.298	6.060	0.498	8.9200709876E+001	2.2332901939E+000	-7.2658280280E+001	0.044	1.273	1.361
14.824	2.276	6.087	0.506	8.5323239843E+001	2.1208943439E+000	-7.1887584554E+001	0.044	1.283	1.371
15.030	2.187	6.191	0.502	7.1397444074E+001	1.7280702937E+000	-6.4803018788E+001	0.044	1.317	1.408
15.078	2.166	6.215	0.505	6.8303234342E+001	1.6434743642E+000	-6.3894288115E+001	0.044	1.324	1.415
15.283	2.077	6.319	0.504	5.5357445645E+001	1.2982002237E+000	-5.9354353686E+001	0.044	1.347	1.440
15.330	2.057	6.342	0.505	5.2616308461E+001	1.2278704268E+000	-5.8407769067E+001	0.044	1.349	1.442
15.535	1.969	6.446	0.509	4.0716555951E+001	9.3047595829E-001	-5.6524245653E+001	0.044	1.350	1.443
15.578	1.950	6.468	0.515	3.8297710081E+001	8.7226249737E-001	-5.5799739889E+001	0.044	1.347	1.439
15.784	1.864	6.574	0.517	2.7256570075E+001	6.1502822053E-001	-5.2973383506E+001	0.044	1.319	1.410
15.828	1.846	6.597	0.524	2.4901347711E+001	5.6222378205E-001	-5.2245840498E+001	0.044	1.311	1.400
16.034	1.761	6.705	0.526	1.4697080955E+001	3.4156499703E-001	-4.9018888114E+001	0.044	1.262	1.349
16.077	1.743	6.728	0.532	1.2555642296E+001	2.9708892952E-001	-4.8304510418E+001	0.044	1.251	1.337

16.283	1.660	6.837	0.535	3.1852981976E+000	1.1002284900E-001	-4.5323928627E+001	0.044	1.196	1.278
16.327	1.643	6.862	0.541	1.1794538090E+000	7.1669964377E-002	-4.4604403985E+001	0.044	1.185	1.266
16.532	1.561	6.972	0.543	-7.3588651710E+000	-8.4203459074E-002	-4.1414083274E+001	0.044	1.139	1.216
16.575	1.546	6.997	0.550	-9.1196351467E+000	-1.1481832051E-001	-4.0711193014E+001	0.044	1.131	1.208
16.780	1.465	7.109	0.552	-1.6817369266E+001	-2.4138797333E-001	-3.7148963378E+001	0.044	1.102	1.177
16.824	1.449	7.134	0.559	-1.8438646612E+001	-2.6654939044E-001	-3.6434135664E+001	0.044	1.098	1.173
17.029	1.370	7.248	0.561	-2.5300559166E+001	-3.6603894618E-001	-3.2995255761E+001	0.044	1.088	1.162
17.073	1.355	7.273	0.568	-2.6722931967E+001	-3.8525151196E-001	-3.2285248505E+001	0.044	1.087	1.161
17.278	1.277	7.389	0.570	-3.2746699214E+001	-4.5979976037E-001	-2.8753936553E+001	0.044	1.092	1.167
17.322	1.262	7.415	0.577	-3.4001167611E+001	-4.7394796271E-001	-2.8031978600E+001	0.044	1.094	1.169
17.527	1.186	7.533	0.579	-3.9182195458E+001	-5.2570070221E-001	-2.4521314909E+001	0.044	1.106	1.182
17.570	1.171	7.559	0.587	-4.0226001587E+001	-5.3480835511E-001	-2.3804253231E+001	0.044	1.109	1.185
17.775	1.096	7.679	0.588	-4.4554045229E+001	-5.6588125364E-001	-2.0127442841E+001	0.044	1.122	1.198
17.819	1.082	7.706	0.596	-4.5428043048E+001	-5.7079130700E-001	-1.9389165301E+001	0.044	1.124	1.201
18.024	1.009	7.827	0.597	-4.8895086542E+001	-5.8338178270E-001	-1.5746471310E+001	0.044	1.131	1.209
18.068	0.995	7.854	0.605	-4.9566804308E+001	-5.8439330415E-001	-1.5009477921E+001	0.044	1.132	1.210
18.273	0.923	7.977	0.607	-5.2165407442E+001	-5.8078866553E-001	-1.1320902716E+001	0.044	1.133	1.211
18.317	0.909	8.005	0.614	-5.2650043542E+001	-5.7845271724E-001	-1.0568893731E+001	0.044	1.133	1.211
18.522	0.839	8.130	0.616	-5.4372465864E+001	-5.6104289786E-001	-6.8720707031E+000	0.044	1.128	1.205
18.565	0.825	8.158	0.624	-5.4653513397E+001	-5.5601626014E-001	-6.1285159183E+000	0.044	1.126	1.203
18.770	0.757	8.285	0.622	-5.5492229709E+001	-5.2733099780E-001	-2.5192932394E+000	0.044	1.117	1.193
18.815	0.743	8.313	0.624	-5.5588735139E+001	-5.2011817701E-001	-1.7629303603E+000	0.044	1.114	1.191
19.020	0.674	8.441	0.620	-5.5551297132E+001	-4.8273184233E-001	1.5190740235E+000	0.044	1.102	1.178
19.064	0.659	8.468	0.620	-5.5472623325E+001	-4.7432465557E-001	2.2581847482E+000	0.044	1.100	1.176
19.269	0.591	8.595	0.618	-5.4569378756E+001	-4.3028199272E-001	5.3230023408E+000	0.044	1.088	1.163
19.313	0.575	8.622	0.597	-5.4324838290E+001	-4.2078959710E-001	5.9320485880E+000	0.044	1.086	1.160
19.518	0.501	8.744	0.593	-5.2716805790E+001	-3.7420928719E-001	8.5852987846E+000	0.044	1.076	1.151
19.561	0.485	8.769	0.652	-5.2341386187E+001	-3.6455634316E-001	9.6093060278E+000	0.044	1.075	1.149
19.767	0.425	8.906	0.668	-4.9517894363E+001	-3.0881091409E-001	1.5431334740E+001	0.044	1.076	1.150
19.842	0.403	8.957	0.673	-4.8306773715E+001	-2.8817083870E-001	1.6637683747E+001	0.044	1.079	1.154
20.047	0.345	9.095	0.659	-4.4561785312E+001	-2.3165696996E-001	1.9142643640E+001	0.044	1.100	1.176
20.153	0.310	9.162	0.666	-4.2487517521E+001	-2.0521686771E-001	2.0922926489E+001	0.044	1.121	1.199
20.359	0.254	9.302	0.688	-3.7667654003E+001	-1.5256416410E-001	2.4474959244E+001	0.044	1.197	1.280
20.564	0.199	9.444	0.701	-3.2437568804E+001	-1.0072127294E-001	2.9167508763E+001	0.044	1.295	1.385
20.590	0.194	9.464	0.684	-3.1667806734E+001	-9.3645528202E-002	2.9539765070E+001	0.044	1.313	1.405
20.795	0.135	9.603	0.744	-2.5757189938E+001	-5.2107450049E-002	3.4303924423E+001	0.044	1.538	1.644
21.000	0.105	9.770	0.764	-1.7581871890E+001	-1.8977997571E-002	3.9232333594E+001	0.044	2.458	2.629
21.206	0.054	9.916	0.715	-9.6475434750E+000	-5.4428805274E-003	4.0869064475E+001	0.044	6.555	7.008
21.411	0.004	10.063	0.715	-8.0014825377E-001	-2.7361622019E-004	4.5185109514E+001	0.044	50.000	50.000

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 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)
5.497	0.205	0.279	-42.551	-0.915	-0.255	31.509	8.782
5.702	0.205	0.279	-42.551	-2.746	-0.765	31.545	8.791
5.907	0.205	0.279	-42.551	-4.577	-1.276	31.664	8.825
6.113	0.205	0.279	-42.551	-6.408	-1.786	31.756	8.850
6.318	0.033	0.044	-42.551	-7.468	-0.330	31.792	1.403
6.351	0.205	0.277	-42.233	-8.510	-2.360	31.812	8.821
6.556	0.205	0.277	-42.233	-10.319	-2.861	31.848	8.831
6.761	0.024	0.033	-42.233	-11.331	-0.375	31.828	1.053
6.786	0.205	0.275	-41.633	-12.297	-3.378	31.929	8.771
6.991	0.101	0.136	-41.633	-13.617	-1.848	31.953	4.336
7.092	0.205	0.272	-40.979	-14.873	-4.045	32.035	8.712
7.298	0.067	0.089	-40.979	-16.016	-1.431	32.049	2.864
7.365	0.205	0.269	-40.145	-17.057	-4.581	32.074	8.615
7.571	0.041	0.054	-40.145	-18.056	-0.971	32.040	1.723
7.612	0.205	0.266	-39.441	-18.948	-5.037	32.171	8.553
7.817	0.045	0.058	-39.441	-19.934	-1.164	32.104	1.875
7.862	0.205	0.263	-38.764	-20.797	-5.476	32.349	8.518
8.067	0.056	0.072	-38.764	-21.795	-1.562	32.369	2.320
8.123	0.205	0.261	-38.116	-22.656	-5.912	32.536	8.490
8.329	0.075	0.095	-38.116	-23.697	-2.261	32.535	3.105
8.404	0.205	0.259	-37.555	-24.600	-6.371	32.591	8.440
8.609	0.106	0.134	-37.555	-25.727	-3.435	32.679	4.363
8.715	0.205	0.251	-35.169	-26.107	-6.557	32.658	8.202
8.920	0.010	0.012	-35.169	-26.803	-0.325	32.525	0.394
8.930	0.031	0.038	-35.169	-27.233	-1.024	32.547	1.224
8.961	0.205	0.241	-31.397	-28.522	-6.860	32.822	7.895
9.166	0.014	0.016	-31.397	-31.110	-0.501	32.723	0.527
9.180	0.192	0.213	-25.949	-29.583	-6.310	32.914	7.021
9.372	0.205	0.218	-19.936	-27.250	-5.951	32.715	7.145
9.577	0.019	0.020	-19.936	-28.983	-0.573	32.787	0.648
9.595	0.189	0.194	-13.232	-21.213	-4.122	32.439	6.303
9.785	0.205	0.207	-6.192	-11.150	-2.303	32.001	6.609
9.990	0.018	0.018	-6.192	-11.670	-0.215	31.913	0.587
10.008	0.205	0.205	-0.792	-1.568	-0.322	31.559	6.480
10.214	0.056	0.056	-0.792	-1.643	-0.092	31.553	1.762
10.269	0.205	0.206	2.488	5.388	1.107	31.319	6.436
10.475	0.156	0.156	2.488	5.705	0.890	31.321	4.887
10.631	0.205	0.206	5.085	12.246	2.524	31.212	6.434
10.836	0.069	0.069	5.085	12.724	0.878	31.254	2.158
10.905	0.205	0.208	8.983	23.042	4.790	31.163	6.478
11.110	0.033	0.034	8.983	23.744	0.799	31.264	1.052
11.143	0.205	0.211	13.718	36.478	7.709	31.277	6.610
11.348	0.005	0.005	13.718	37.360	0.176	31.413	0.148
11.353	0.187	0.197	18.415	49.603	9.773	31.455	6.197
11.540	0.045	0.048	18.415	50.532	2.417	31.583	1.511
11.585	0.205	0.222	22.665	59.601	13.261	31.745	7.063



11.791	0.003	0.003	22.665	59.298	0.201	31.891	0.108
11.794	0.205	0.230	26.662	66.464	15.269	32.114	7.378
11.999	0.024	0.027	26.662	66.012	1.794	32.189	0.875
12.023	0.205	0.236	29.747	70.368	16.640	32.546	7.696
12.229	0.046	0.053	29.747	69.763	3.715	32.630	1.738
12.275	0.205	0.242	31.899	71.975	17.406	32.977	7.975
12.480	0.102	0.120	31.899	71.137	8.536	33.087	3.970
12.582	0.205	0.245	33.197	71.764	17.608	33.236	8.155
12.787	0.063	0.076	33.197	70.976	5.385	33.240	2.522
12.851	0.205	0.250	34.724	71.687	17.907	33.225	8.300
13.056	0.046	0.056	34.724	70.891	3.955	33.172	1.850
13.102	0.205	0.255	36.335	71.420	18.202	33.134	8.445
13.307	0.033	0.041	36.335	70.603	2.888	33.062	1.352
13.340	0.205	0.260	37.931	70.848	18.442	33.051	8.603
13.546	0.038	0.048	37.931	69.950	3.362	33.128	1.592
13.584	0.205	0.266	39.369	69.798	18.537	33.026	8.771
13.789	0.028	0.037	39.369	68.879	2.535	33.005	1.215
13.817	0.205	0.271	40.765	68.498	18.568	33.013	8.949
14.023	0.035	0.046	40.765	67.499	3.085	33.150	1.515
14.057	0.205	0.276	42.021	66.831	18.470	33.011	9.123
14.263	0.040	0.054	42.021	65.756	3.571	33.081	1.796
14.303	0.205	0.281	43.115	64.857	18.241	32.983	9.277
14.508	0.058	0.079	43.115	63.658	5.026	33.007	2.606
14.566	0.205	0.281	43.116	62.458	17.567	32.901	9.254
14.771	0.053	0.073	43.116	61.279	4.463	32.903	2.396
14.824	0.205	0.281	43.117	60.101	16.904	32.769	9.217
15.030	0.048	0.066	43.117	58.944	3.898	32.662	2.160
15.078	0.205	0.281	43.119	57.787	16.254	32.616	9.174
15.283	0.047	0.064	43.119	56.637	3.635	32.496	2.086
15.330	0.205	0.281	43.120	55.487	15.607	32.461	9.130
15.535	0.043	0.059	43.120	54.354	3.204	32.398	1.910
15.578	0.205	0.281	43.121	53.221	14.970	32.331	9.094
15.784	0.045	0.061	43.121	52.081	3.183	32.285	1.973
15.828	0.205	0.281	43.122	50.940	14.329	32.213	9.061
16.034	0.044	0.060	43.122	49.804	2.990	32.173	1.931
16.077	0.205	0.281	43.124	48.667	13.690	32.104	9.031
16.283	0.044	0.061	43.124	47.528	2.886	32.074	1.948
16.327	0.205	0.281	43.125	46.389	13.049	32.004	9.003
16.532	0.043	0.058	43.125	45.258	2.639	31.977	1.864
16.575	0.205	0.282	43.186	44.131	12.426	31.909	8.985
16.780	0.044	0.060	43.186	42.992	2.578	31.882	1.912
16.824	0.205	0.282	43.246	41.857	11.798	31.822	8.969
17.029	0.043	0.059	43.246	40.718	2.416	31.795	1.887
17.073	0.205	0.282	43.307	39.582	11.168	31.741	8.955
17.278	0.044	0.060	43.307	38.437	2.315	31.714	1.910
17.322	0.205	0.282	43.367	37.295	10.533	31.667	8.944
17.527	0.043	0.059	43.367	36.153	2.130	31.641	1.864
17.570	0.205	0.283	43.428	35.013	9.898	31.600	8.934
17.775	0.044	0.060	43.428	33.863	2.045	31.574	1.907
17.819	0.205	0.283	43.488	32.715	9.258	31.541	8.926
18.024	0.043	0.060	43.488	31.565	1.885	31.516	1.882
18.068	0.205	0.283	43.548	30.416	8.616	31.488	8.920
18.273	0.044	0.061	43.548	29.261	1.773	31.465	1.907

18.317	0.205	0.284	43.608	28.107	7.970	31.444	8.916
18.522	0.043	0.059	43.608	26.954	1.596	31.422	1.861
18.565	0.205	0.284	43.637	25.801	7.320	31.407	8.910
18.770	0.044	0.061	43.637	24.641	1.506	31.392	1.918
18.815	0.205	0.284	43.666	23.481	6.664	31.379	8.906
19.020	0.044	0.060	43.666	22.322	1.346	31.372	1.892
19.064	0.205	0.284	43.696	21.163	6.010	31.358	8.904
19.269	0.044	0.061	43.696	20.000	1.225	31.358	1.921
19.313	0.205	0.284	43.725	18.837	5.352	31.349	8.906
19.518	0.043	0.059	43.725	17.679	1.050	31.351	1.863
19.561	0.205	0.284	43.763	16.521	4.697	31.320	8.904
19.767	0.075	0.104	43.763	15.209	1.589	31.318	3.273
19.842	0.205	0.284	43.794	13.897	3.953	31.317	8.908
20.047	0.106	0.147	43.794	12.442	1.823	31.334	4.592
20.153	0.205	0.285	43.824	10.986	3.126	31.330	8.916
20.359	0.205	0.285	43.824	9.064	2.579	31.332	8.916
20.564	0.026	0.036	43.824	7.981	0.287	31.319	1.128
20.590	0.205	0.285	43.841	6.898	1.964	31.366	8.928
20.795	0.205	0.285	43.841	4.974	1.416	31.393	8.936
21.000	0.205	0.285	43.841	3.051	0.868	31.456	8.954
21.206	0.205	0.285	43.841	1.127	0.321	31.483	8.962
21.411	0.018	0.024	43.841	0.083	0.002	31.490	0.770

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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

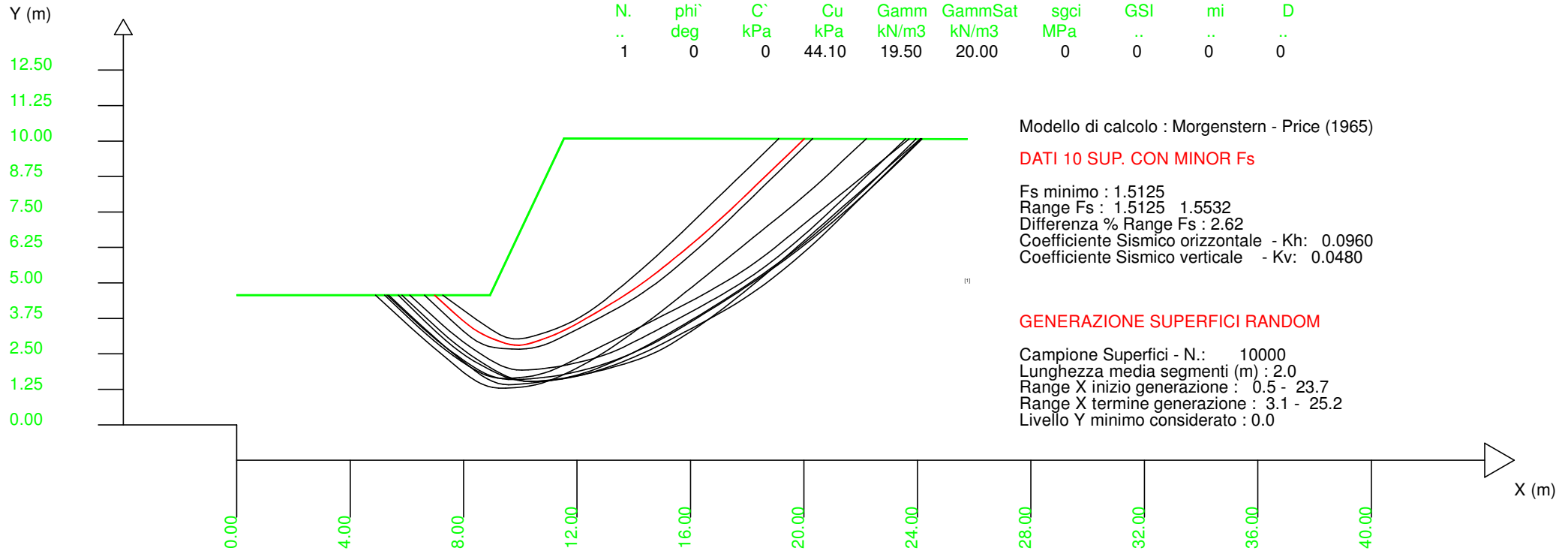
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SSAP 5.0 (2020) - Slope Stability Analysis Program  
 Software by Dr. Geol. L. Borselli - [www.lorenzo-borselli.eu](http://www.lorenzo-borselli.eu)  
 SSAP/DXF generator rel. 2.0 (2020)

Data : 6/11/2020  
 Localita' : San Sebastiano. S. Maria a Monte  
 Descrizione : Verifica di stabilita' fronte di scavo in condizioni sismiche non drenate  
 [n] = N. strato o lente

# Parametri Geotecnici degli strati # -----

N.	phi` deg	C` kPa	Cu kPa	Gamm kN/m3	GammSat kN/m3	sgci MPa	GSI	mi	D
1	0	0	44.10	19.50	20.00	0	0	0	0



Modello di calcolo : Morgenstern - Price (1965)

DATI 10 SUP. CON MINOR Fs

Fs minimo : 1.5125  
 Range Fs : 1.5125 - 1.5532  
 Differenza % Range Fs : 2.62  
 Coefficiente Sismico orizzontale - Kh: 0.0960  
 Coefficiente Sismico verticale - Kv: 0.0480

GENERAZIONE SUPERFICI RANDOM

Campione Superfici - N.: 10000  
 Lunghezza media segmenti (m) : 2.0  
 Range X inizio generazione : 0.5 - 23.7  
 Range X termine generazione : 3.1 - 25.2  
 Livello Y minimo considerato : 0.0

# Report elaborazioni #

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SSAP 5.0 - Slope Stability Analysis Program (1991,2020)

WWW.SSAP.EU

Build No. 11716

BY

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\*\* Gia' Ricercatore CNR-IRPI fino a Luglio 2011  
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Ultima Revisione struttura tabelle del report: 12 settembre 2020  
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File report: D:\ssp2010prove\lavori\smontemuro\frontescavosisma.txt

Data: 6/11/2020

Localita' : San Sebastiano. S.Maria a Monte

Descrizione: Verifica di stabilit  fronte di scavo in condizioni sismiche non drenate

Modello pendio: modcantiere.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	4.57	-	-	-	-	-	-
8.93	4.57	-	-	-	-	-	-
11.54	10.09	-	-	-	-	-	-
25.76	10.07	-	-	-	-	-	-

## ASSENZA DI FALDA ##

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

STRATO	1	fi`	C`	Cu	Gamm	Gamm_sat	STR_IDX	sgci	GSI	mi	D
		0.00	0.00	44.10	19.50	20.00	2.755	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

METODO DI RICERCA: CONVEX RANDOM - Chen (1992)  
FILTRAGGIO SUPERFICI : ATTIVATO  
COORDINATE X1,X2,Y OSTACOLO : 0.00 0.00 0.00  
LUNGHEZZA MEDIA SEGMENTI (m): 2.0 (+/-) 50%  
INTERVALLO ASCISSE RANDOM STARTING POINT (Xmin .. Xmax): 0.52 23.70  
LIVELLO MINIMO CONSIDERATO (Ymin): 0.00  
INTERVALLO ASCISSE AMMESSO PER LA TERMINAZIONE (Xmin .. Xmax): 3.09 25.24

\*\*\* TOTALE SUPERFICI GENERATE : 10000

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

METODO DI CALCOLO : MORGENSTERN - PRICE (Morgenstern & Price, 1965)  
METODO DI ESPLORAZIONE CAMPO VALORI (lambda0,Fs0) ADOTTATO : A (rapido)  
COEFFICIENTE SISMICO UTILIZZATO Kh : 0.0960  
COEFFICIENTE SISMICO UTILIZZATO Kv (assunto Positivo): 0.0480  
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 le tutte le verifiche globali.  
I valori >0 impostati dall'utente sono utilizzati solo in caso di verifica singola

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

\* DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs \*

Fattore di sicurezza (FS)	1.5125	- Min. -	X	Y	Lambda=	0.0452
			6.97	4.57		
			7.63	3.98		
			7.94	3.70		
			8.16	3.53		
			8.34	3.40		
			8.51	3.28		
			8.67	3.19		
			8.85	3.11		
			9.05	3.02		
			9.30	2.93		
			9.48	2.87		
			9.65	2.83		
			9.79	2.81		
			9.95	2.81		
			10.09	2.82		
			10.25	2.85		
			10.43	2.90		
			10.67	2.97		
			10.87	3.04		
			11.06	3.11		

11.23	3.19
11.41	3.26
11.58	3.34
11.75	3.43
11.93	3.53
12.13	3.64
12.31	3.75
12.50	3.85
12.68	3.96
12.86	4.06
13.04	4.17
13.22	4.28
13.40	4.39
13.59	4.51
13.77	4.63
13.95	4.75
14.13	4.87
14.31	4.99
14.48	5.12
14.66	5.25
14.84	5.39
15.03	5.54
15.21	5.69
15.39	5.84
15.58	5.98
15.76	6.13
15.93	6.28
16.12	6.43
16.30	6.59
16.48	6.75
16.67	6.91
16.85	7.06
17.02	7.22
17.20	7.39
17.38	7.55
17.56	7.72
17.74	7.89
17.92	8.07
18.11	8.25
18.29	8.42
18.47	8.60
18.65	8.77
18.86	8.97
19.08	9.18
19.40	9.49
20.01	10.08

Fattore di sicurezza (FS)	1.5379	- N.2	--	X	Y	Lambda=	0.2912
				5.21	4.57		
				6.02	3.80		
				6.42	3.43		
				6.70	3.18		

6.95	2.97
7.17	2.78
7.40	2.61
7.64	2.44
7.89	2.26
8.19	2.07
8.42	1.92
8.63	1.82
8.81	1.74
9.02	1.68
9.20	1.65
9.40	1.63
9.64	1.64
9.96	1.66
10.22	1.69
10.44	1.73
10.65	1.77
10.87	1.84
11.07	1.91
11.29	1.99
11.51	2.09
11.77	2.22
12.02	2.35
12.26	2.47
12.49	2.58
12.73	2.70
12.96	2.81
13.19	2.93
13.42	3.04
13.65	3.16
13.88	3.27
14.11	3.39
14.34	3.51
14.57	3.62
14.81	3.74
15.04	3.86
15.27	3.97
15.51	4.09
15.74	4.21
15.97	4.33
16.19	4.45
16.42	4.58
16.65	4.71
16.88	4.84
17.12	4.97
17.37	5.12
17.60	5.26
17.82	5.41
18.05	5.55
18.27	5.71
18.49	5.87
18.72	6.04
18.95	6.22

19.19	6.42
19.43	6.61
19.66	6.80
19.89	6.99
20.12	7.17
20.36	7.36
20.59	7.55
20.82	7.73
21.05	7.92
21.28	8.11
21.51	8.30
21.74	8.48
21.97	8.67
22.23	8.88
22.52	9.11
22.93	9.44
23.71	10.07

Fattore di sicurezza (FS)    1.5437    - N.3    --    X    Y    Lambda= 0.2976

5.30	4.57
6.12	3.81
6.53	3.43
6.82	3.18
7.07	2.97
7.30	2.78
7.53	2.61
7.78	2.43
8.04	2.25
8.33	2.05
8.57	1.91
8.78	1.80
8.97	1.72
9.18	1.66
9.37	1.62
9.58	1.60
9.81	1.60
10.11	1.61
10.37	1.62
10.62	1.64
10.85	1.67
11.08	1.70
11.30	1.74
11.53	1.78
11.77	1.83
12.04	1.88
12.28	1.94
12.51	2.00
12.73	2.07
12.96	2.14
13.19	2.22
13.42	2.31
13.66	2.40



13.92	2.51
14.16	2.62
14.39	2.73
14.62	2.84
14.85	2.96
15.08	3.08
15.30	3.21
15.54	3.34
15.79	3.49
16.03	3.64
16.27	3.79
16.50	3.93
16.74	4.08
16.97	4.23
17.21	4.38
17.45	4.53
17.69	4.68
17.93	4.84
18.16	4.99
18.39	5.15
18.62	5.31
18.86	5.47
19.09	5.64
19.33	5.82
19.57	6.00
19.81	6.18
20.05	6.36
20.28	6.55
20.51	6.73
20.74	6.92
20.98	7.12
21.21	7.32
21.46	7.53
21.70	7.74
21.93	7.95
22.16	8.16
22.40	8.37
22.66	8.62
22.95	8.89
23.36	9.29
24.17	10.07

Fattore di sicurezza (FS)	1.5452	- N.4 --	X	Y	Lambda=	0.2465
			4.89	4.57		
			5.71	3.82		
			6.13	3.44		
			6.43	3.17		
			6.69	2.94		
			6.93	2.73		
			7.18	2.53		
			7.43	2.31		
			7.70	2.09		

8.00	1.85
8.24	1.67
8.45	1.54
8.63	1.44
8.84	1.36
9.02	1.32
9.23	1.30
9.48	1.29
9.82	1.31
10.09	1.34
10.33	1.37
10.54	1.41
10.77	1.47
10.98	1.54
11.21	1.63
11.45	1.73
11.73	1.87
11.99	2.00
12.23	2.12
12.46	2.25
12.69	2.39
12.92	2.53
13.16	2.68
13.40	2.85
13.65	3.03
13.90	3.20
14.14	3.38
14.38	3.55
14.62	3.73
14.85	3.91
15.09	4.09
15.33	4.28
15.58	4.47
15.82	4.67
16.06	4.86
16.30	5.05
16.54	5.25
16.78	5.44
17.02	5.63
17.26	5.83
17.50	6.02
17.74	6.22
17.98	6.41
18.22	6.61
18.46	6.80
18.70	7.00
18.95	7.19
19.19	7.39
19.43	7.59
19.67	7.79
19.91	7.99
20.15	8.19
20.38	8.40

20.65	8.63
20.94	8.91
21.36	9.30
22.19	10.08

Fattore di sicurezza (FS)    1.5483    - N.5 --    X    Y    Lambda= 0.2989

5.83	4.57
6.71	3.74
7.15	3.34
7.45	3.07
7.72	2.85
7.96	2.66
8.20	2.49
8.46	2.32
8.74	2.14
9.06	1.95
9.31	1.81
9.54	1.70
9.74	1.63
9.97	1.57
10.17	1.54
10.39	1.53
10.65	1.54
10.98	1.57
11.26	1.60
11.51	1.64
11.74	1.69
11.99	1.75
12.22	1.81
12.46	1.89
12.71	1.99
13.00	2.10
13.26	2.21
13.51	2.32
13.76	2.44
14.00	2.56
14.25	2.68
14.49	2.81
14.74	2.94
15.01	3.09
15.27	3.24
15.52	3.39
15.77	3.54
16.02	3.69
16.27	3.84
16.52	3.99
16.78	4.15
17.03	4.31
17.29	4.47
17.54	4.63
17.78	4.79
18.03	4.96

18.28	5.13
18.53	5.30
18.79	5.48
19.05	5.67
19.30	5.86
19.55	6.05
19.80	6.24
20.05	6.44
20.29	6.64
20.54	6.85
20.79	7.07
21.05	7.31
21.31	7.54
21.56	7.77
21.81	8.00
22.06	8.23
22.34	8.50
22.65	8.80
23.09	9.23
23.95	10.07

Fattore di sicurezza (FS)    1.5488   - N.6 --    X    Y    Lambda=   0.0447

7.27	4.57
8.46	3.71
8.97	3.36
9.28	3.18
9.51	3.08
9.76	3.03
9.96	3.03
10.21	3.06
10.51	3.14
10.95	3.28
11.29	3.40
11.59	3.52
11.86	3.65
12.14	3.81
12.40	3.98
12.68	4.17
12.97	4.39
13.31	4.67
13.63	4.93
13.93	5.18
14.22	5.43
14.52	5.69
14.80	5.95
15.10	6.22
15.39	6.49
15.69	6.78
15.99	7.07
16.29	7.36
16.59	7.64
16.88	7.93

17.22	8.25
17.59	8.61
18.11	9.11
19.10	10.08

Fattore di sicurezza (FS)    1.5491    - N.7    --    X    Y    Lambda=    0.2772

5.36	4.57
6.16	3.82
6.57	3.44
6.86	3.18
7.12	2.95
7.35	2.75
7.59	2.55
7.83	2.35
8.10	2.14
8.40	1.91
8.63	1.74
8.83	1.62
9.01	1.54
9.21	1.46
9.38	1.43
9.58	1.41
9.81	1.42
10.12	1.45
10.38	1.47
10.63	1.50
10.86	1.53
11.10	1.57
11.32	1.60
11.56	1.64
11.79	1.69
12.04	1.73
12.28	1.78
12.51	1.84
12.74	1.89
12.97	1.95
13.20	2.01
13.43	2.08
13.68	2.15
13.94	2.23
14.17	2.31
14.40	2.39
14.61	2.48
14.84	2.59
15.05	2.70
15.28	2.83
15.51	2.97
15.77	3.13
16.02	3.29
16.25	3.45
16.48	3.61
16.71	3.78

16.94	3.94
17.17	4.12
17.41	4.30
17.65	4.49
17.89	4.68
18.12	4.87
18.36	5.06
18.59	5.26
18.82	5.45
19.05	5.65
19.29	5.85
19.52	6.06
19.76	6.27
19.99	6.47
20.23	6.68
20.46	6.89
20.70	7.09
20.93	7.30
21.17	7.50
21.40	7.71
21.63	7.91
21.87	8.12
22.10	8.33
22.34	8.53
22.60	8.76
22.89	9.02
23.30	9.38
24.09	10.07

Fattore di sicurezza (FS)    1.5510   - N.8   --    X    Y    Lambda=   0.2980

5.69	4.57
6.61	3.68
7.05	3.26
7.36	2.98
7.62	2.76
7.87	2.58
8.10	2.41
8.36	2.25
8.63	2.09
8.96	1.92
9.23	1.79
9.46	1.69
9.67	1.63
9.91	1.57
10.12	1.54
10.35	1.53
10.61	1.53
10.93	1.56
11.21	1.58
11.47	1.62
11.71	1.65
11.96	1.70

12.20	1.76
12.44	1.83
12.70	1.90
12.99	2.00
13.26	2.09
13.51	2.18
13.76	2.28
14.01	2.39
14.25	2.49
14.50	2.61
14.76	2.73
15.03	2.87
15.29	3.00
15.55	3.14
15.80	3.27
16.06	3.40
16.31	3.54
16.57	3.68
16.83	3.82
17.10	3.97
17.36	4.12
17.61	4.27
17.85	4.43
18.10	4.59
18.35	4.76
18.60	4.94
18.86	5.14
19.13	5.36
19.39	5.57
19.65	5.78
19.90	5.99
20.15	6.21
20.40	6.44
20.65	6.67
20.90	6.91
21.16	7.17
21.43	7.43
21.68	7.68
21.94	7.94
22.20	8.19
22.49	8.47
22.81	8.79
23.26	9.23
24.12	10.07

Fattore di sicurezza (FS)	1.5529	- N.9 --	X	Y	Lambda= 0.2165
			6.62	4.57	
			7.56	3.69	
			7.99	3.30	
			8.26	3.09	
			8.47	2.94	
			8.69	2.83	

8.88	2.77
9.09	2.72
9.35	2.69
9.70	2.67
9.97	2.67
10.21	2.68
10.41	2.71
10.64	2.76
10.84	2.82
11.07	2.90
11.30	3.01
11.59	3.15
11.86	3.29
12.11	3.42
12.36	3.55
12.61	3.67
12.85	3.80
13.10	3.94
13.35	4.07
13.61	4.22
13.85	4.36
14.09	4.50
14.32	4.65
14.56	4.82
14.79	4.99
15.02	5.17
15.27	5.36
15.53	5.58
15.79	5.79
16.03	6.01
16.27	6.22
16.51	6.43
16.75	6.65
16.99	6.88
17.24	7.11
17.48	7.35
17.73	7.59
17.98	7.83
18.22	8.07
18.47	8.30
18.74	8.57
19.05	8.87
19.48	9.28
20.30	10.08

Fattore di sicurezza (FS) 1.5532 - N.10 --

X	Y
6.10	4.57
6.86	3.87
7.25	3.53
7.51	3.30
7.74	3.11
7.96	2.95

Lambda= 0.3186



8.17	2.79
8.39	2.64
8.63	2.48
8.91	2.30
9.13	2.18
9.33	2.08
9.50	2.02
9.70	1.96
9.87	1.94
10.06	1.93
10.27	1.93
10.55	1.96
10.80	1.98
11.02	2.01
11.24	2.04
11.45	2.08
11.66	2.11
11.88	2.16
12.10	2.21
12.35	2.27
12.57	2.33
12.78	2.40
12.98	2.47
13.20	2.55
13.40	2.63
13.61	2.73
13.83	2.83
14.06	2.95
14.29	3.07
14.51	3.18
14.73	3.29
14.95	3.41
15.17	3.52
15.38	3.64
15.60	3.75
15.83	3.87
16.05	3.99
16.26	4.11
16.48	4.23
16.70	4.35
16.91	4.48
17.13	4.61
17.36	4.74
17.59	4.88
17.80	5.01
18.02	5.15
18.23	5.29
18.44	5.44
18.65	5.59
18.87	5.76
19.09	5.93
19.32	6.12
19.54	6.30

19.76	6.48
19.97	6.67
20.19	6.86
20.40	7.05
20.62	7.24
20.83	7.45
21.06	7.66
21.28	7.87
21.50	8.09
21.72	8.30
21.94	8.50
22.19	8.74
22.46	9.00
22.84	9.37
23.58	10.07

----- 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	1.512	715.7	473.2	147.9	Surplus
2	1.538	1033.7	672.2	227.1	Surplus
3	1.544	1066.6	690.9	237.4	Surplus
4	1.545	1022.4	661.7	228.4	Surplus
5	1.548	1054.9	681.3	237.3	Surplus
6	1.549	661.2	426.9	148.9	Surplus
7	1.549	1075.9	694.6	242.5	Surplus
8	1.551	1065.5	687.0	241.1	Surplus
9	1.553	774.6	498.8	176.0	Surplus
10	1.553	992.8	639.2	225.8	Surplus

Esito analisi: SURPLUS di RESISTENZA!

Valore minimo di SURPLUS di RESISTENZA (kN/m): 147.9

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)
6.973	0.179	-42.14	0.30	0.00	0.00	0.00	44.10
7.152	0.179	-42.14	0.89	0.00	0.00	0.00	44.10

7.332	0.179	-42.14	1.49	0.00	0.00	0.00	44.10
7.511	0.119	-42.14	1.31	0.00	0.00	0.00	44.10
7.630	0.179	-41.18	2.47	0.00	0.00	0.00	44.10
7.809	0.136	-41.18	2.25	0.00	0.00	0.00	44.10
7.945	0.179	-39.06	3.46	0.00	0.00	0.00	44.10
8.124	0.033	-39.06	0.70	0.00	0.00	0.00	44.10
8.158	0.179	-36.33	4.05	0.00	0.00	0.00	44.10
8.336	0.173	-32.65	4.35	0.00	0.00	0.00	44.10
8.510	0.162	-29.37	4.40	0.00	0.00	0.00	44.10
8.672	0.178	-25.97	5.17	0.00	0.00	0.00	44.10
8.850	0.080	-22.92	2.43	0.00	0.00	0.00	44.10
8.930	0.118	-22.92	3.99	0.00	0.00	0.00	44.10
9.048	0.179	-20.65	7.41	0.00	0.00	0.00	44.10
9.228	0.069	-20.65	3.29	0.00	0.00	0.00	44.10
9.297	0.179	-17.96	9.66	0.00	0.00	0.00	44.10
9.476	0.008	-17.96	0.49	0.00	0.00	0.00	44.10
9.485	0.163	-13.62	10.23	0.00	0.00	0.00	44.10
9.648	0.141	-7.66	9.83	0.00	0.00	0.00	44.10
9.789	0.164	-1.45	12.55	0.00	0.00	0.00	44.10
9.952	0.139	4.66	11.58	0.00	0.00	0.00	44.10
10.092	0.160	10.71	14.28	0.00	0.00	0.00	44.10
10.252	0.179	15.20	17.16	0.00	0.00	0.00	44.10
10.431	0.001	15.20	0.13	0.00	0.00	0.00	44.10
10.432	0.179	18.06	18.36	0.00	0.00	0.00	44.10
10.612	0.056	18.06	5.97	0.00	0.00	0.00	44.10
10.668	0.179	19.25	19.90	0.00	0.00	0.00	44.10
10.847	0.023	19.25	2.62	0.00	0.00	0.00	44.10
10.870	0.179	20.72	21.20	0.00	0.00	0.00	44.10
11.049	0.006	20.72	0.76	0.00	0.00	0.00	44.10
11.055	0.175	22.30	21.79	0.00	0.00	0.00	44.10
11.230	0.177	23.92	23.13	0.00	0.00	0.00	44.10
11.407	0.133	25.38	18.07	0.00	0.00	0.00	44.10
11.540	0.037	25.38	5.16	0.00	0.00	0.00	44.10
11.577	0.175	26.82	23.99	0.00	0.00	0.00	44.10
11.753	0.179	28.14	24.22	0.00	0.00	0.00	44.10
11.932	0.001	28.14	0.10	0.00	0.00	0.00	44.10
11.933	0.179	29.29	23.85	0.00	0.00	0.00	44.10
12.112	0.015	29.29	1.98	0.00	0.00	0.00	44.10
12.127	0.179	29.60	23.45	0.00	0.00	0.00	44.10
12.306	0.008	29.60	1.03	0.00	0.00	0.00	44.10
12.314	0.179	29.93	23.06	0.00	0.00	0.00	44.10
12.494	0.004	29.93	0.46	0.00	0.00	0.00	44.10
12.497	0.179	30.26	22.67	0.00	0.00	0.00	44.10
12.676	0.001	30.26	0.17	0.00	0.00	0.00	44.10
12.678	0.179	30.60	22.28	0.00	0.00	0.00	44.10
12.857	0.001	30.60	0.07	0.00	0.00	0.00	44.10
12.858	0.179	30.93	21.89	0.00	0.00	0.00	44.10
13.037	0.001	30.93	0.08	0.00	0.00	0.00	44.10
13.038	0.179	31.26	21.49	0.00	0.00	0.00	44.10
13.217	0.002	31.26	0.26	0.00	0.00	0.00	44.10
13.219	0.179	31.57	21.08	0.00	0.00	0.00	44.10
13.398	0.005	31.57	0.61	0.00	0.00	0.00	44.10
13.404	0.179	31.88	20.66	0.00	0.00	0.00	44.10

13.583	0.010	31.88	1.16	0.00	0.00	0.00	44.10
13.593	0.179	32.68	20.22	0.00	0.00	0.00	44.10
13.772	0.002	32.68	0.17	0.00	0.00	0.00	44.10
13.774	0.178	33.53	19.63	0.00	0.00	0.00	44.10
13.952	0.175	34.39	18.90	0.00	0.00	0.00	44.10
14.127	0.179	35.23	18.83	0.00	0.00	0.00	44.10
14.306	0.175	36.05	18.02	0.00	0.00	0.00	44.10
14.481	0.178	36.86	17.82	0.00	0.00	0.00	44.10
14.659	0.179	37.62	17.46	0.00	0.00	0.00	44.10
14.838	0.002	37.62	0.16	0.00	0.00	0.00	44.10
14.840	0.179	38.32	16.94	0.00	0.00	0.00	44.10
15.019	0.010	38.32	0.90	0.00	0.00	0.00	44.10
15.029	0.179	38.61	16.39	0.00	0.00	0.00	44.10
15.208	0.005	38.61	0.46	0.00	0.00	0.00	44.10
15.213	0.179	38.91	15.84	0.00	0.00	0.00	44.10
15.393	0.002	38.91	0.20	0.00	0.00	0.00	44.10
15.395	0.179	39.21	15.30	0.00	0.00	0.00	44.10
15.574	0.001	39.21	0.07	0.00	0.00	0.00	44.10
15.575	0.179	39.51	14.76	0.00	0.00	0.00	44.10
15.754	0.001	39.51	0.05	0.00	0.00	0.00	44.10
15.755	0.179	39.81	14.21	0.00	0.00	0.00	44.10
15.934	0.000	39.81	0.03	0.00	0.00	0.00	44.10
15.935	0.179	40.10	13.66	0.00	0.00	0.00	44.10
16.114	0.001	40.10	0.10	0.00	0.00	0.00	44.10
16.115	0.179	40.38	13.10	0.00	0.00	0.00	44.10
16.295	0.003	40.38	0.24	0.00	0.00	0.00	44.10
16.298	0.179	40.66	12.53	0.00	0.00	0.00	44.10
16.477	0.006	40.66	0.44	0.00	0.00	0.00	44.10
16.484	0.179	41.07	11.94	0.00	0.00	0.00	44.10
16.663	0.002	41.07	0.15	0.00	0.00	0.00	44.10
16.665	0.179	41.49	11.35	0.00	0.00	0.00	44.10
16.845	0.000	41.49	0.03	0.00	0.00	0.00	44.10
16.845	0.179	41.91	10.72	0.00	0.00	0.00	44.10
17.024	0.179	42.32	10.17	0.00	0.00	0.00	44.10
17.203	0.000	42.32	0.02	0.00	0.00	0.00	44.10
17.204	0.178	42.73	9.52	0.00	0.00	0.00	44.10
17.382	0.179	43.14	8.95	0.00	0.00	0.00	44.10
17.561	0.179	43.53	8.34	0.00	0.00	0.00	44.10
17.740	0.001	43.53	0.05	0.00	0.00	0.00	44.10
17.741	0.179	43.91	7.70	0.00	0.00	0.00	44.10
17.921	0.004	43.91	0.16	0.00	0.00	0.00	44.10
17.925	0.179	43.91	7.06	0.00	0.00	0.00	44.10
18.104	0.004	43.91	0.15	0.00	0.00	0.00	44.10
18.108	0.179	43.91	6.41	0.00	0.00	0.00	44.10
18.287	0.003	43.91	0.09	0.00	0.00	0.00	44.10
18.290	0.179	43.91	5.77	0.00	0.00	0.00	44.10
18.469	0.003	43.91	0.09	0.00	0.00	0.00	44.10
18.472	0.179	43.92	5.12	0.00	0.00	0.00	44.10
18.651	0.001	43.92	0.04	0.00	0.00	0.00	44.10
18.653	0.179	43.92	4.48	0.00	0.00	0.00	44.10
18.832	0.025	43.92	0.58	0.00	0.00	0.00	44.10
18.857	0.179	43.92	3.76	0.00	0.00	0.00	44.10
19.037	0.047	43.92	0.88	0.00	0.00	0.00	44.10

19.084	0.179	43.92	2.96	0.00	0.00	0.00	44.10
19.263	0.138	43.92	1.85	0.00	0.00	0.00	44.10
19.401	0.179	43.93	1.84	0.00	0.00	0.00	44.10
19.581	0.179	43.93	1.20	0.00	0.00	0.00	44.10
19.760	0.179	43.93	0.57	0.00	0.00	0.00	44.10
19.939	0.072	43.93	0.05	0.00	0.00	0.00	44.10

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 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

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X (m)	ht (m)	yt (m)	yt' (--)	E(x) (kN/m)	T(x) (kN/m)	E' (kN)	rho(x) (--)	FS_qFEM (--)	FS_srmFEM (--)
6.973	0.000	4.570	-0.719	0.000000000E+000	0.000000000E+000	4.2829593550E-001	0.050	5.895	6.358
7.152	0.041	4.448	-0.719	2.7887089048E+000	7.0381069389E-004	3.0675247882E+001	0.050	5.895	6.358
7.332	0.067	4.312	-0.705	1.1001233483E+001	1.6743852740E-002	5.1169267915E+001	0.050	2.849	3.069
7.511	0.112	4.196	-0.664	2.1139825925E+001	6.0199665216E-002	6.2199213576E+001	0.050	2.091	2.246
7.630	0.139	4.114	-0.627	2.8983916032E+001	1.1515350981E-001	6.3575992024E+001	0.050	1.816	1.939
7.809	0.190	4.009	-0.563	3.9741611165E+001	2.1282073507E-001	5.6623265198E+001	0.050	1.608	1.687
7.945	0.237	3.937	-0.512	4.7082985675E+001	2.8637614228E-001	5.4335873616E+001	0.050	1.508	1.560
8.124	0.293	3.847	-0.507	5.6888777977E+001	4.0826647263E-001	6.0663600014E+001	0.050	1.447	1.459
8.158	0.302	3.829	-0.488	5.8944922932E+001	4.3858943161E-001	6.1296596951E+001	0.050	1.445	1.446
8.336	0.348	3.744	-0.432	6.9452331776E+001	6.2192669954E-001	5.7907184636E+001	0.050	1.489	1.424
8.510	0.392	3.677	-0.333	7.9342589148E+001	8.3748184312E-001	5.6862883638E+001	0.050	1.609	1.459
8.672	0.438	3.632	-0.186	8.8512226759E+001	1.0787892204E+000	5.6047817829E+001	0.050	1.814	1.548
8.850	0.507	3.614	-0.066	9.8389146247E+001	1.3980370436E+000	5.2647449065E+001	0.050	2.207	1.741
8.930	0.542	3.615	0.097	1.0251131713E+002	1.5456453791E+000	4.8766984607E+001	0.050	2.451	1.859
9.048	0.610	3.633	0.224	1.0782716701E+002	1.7623511050E+000	4.2634516425E+001	0.050	2.883	2.077
9.228	0.726	3.681	0.298	1.1486728685E+002	2.0914150167E+000	3.7856544255E+001	0.050	3.788	2.525
9.297	0.778	3.707	0.436	1.1744724671E+002	2.2281950081E+000	3.6811353016E+001	0.050	4.262	2.747
9.476	0.918	3.790	0.464	1.2381385701E+002	2.6070417096E+000	3.5225960106E+001	0.050	5.928	3.476
9.485	0.926	3.794	0.632	1.2410906671E+002	2.6263579494E+000	3.5075674226E+001	0.050	6.028	3.516
9.648	1.069	3.898	0.728	1.2939843828E+002	3.0236074095E+000	3.1538112989E+001	0.050	7.925	4.284
9.789	1.205	4.015	0.922	1.3373150028E+002	3.4252913971E+000	2.7307825754E+001	0.050	9.008	4.766
9.952	1.373	4.179	1.059	1.3753923317E+002	3.9114107238E+000	2.0077199468E+001	0.050	8.066	4.479
10.092	1.519	4.336	1.144	1.3995970860E+002	4.3279457632E+000	1.2886115710E+001	0.050	6.577	3.896
10.252	1.674	4.521	1.140	1.4119672230E+002	4.7408137423E+000	3.6004649100E+000	0.050	4.955	3.161
10.431	1.827	4.723	1.126	1.4101400932E+002	5.1011559975E+000	-5.2445268098E+000	0.050	3.784	2.559
10.432	1.828	4.724	1.006	1.4100731145E+002	5.1032327148E+000	-5.2904208624E+000	0.050	3.778	2.556
10.612	1.950	4.905	0.989	1.3965426786E+002	5.3429631266E+000	-9.9756883495E+000	0.050	3.104	2.187
10.668	1.984	4.957	1.045	1.3905343888E+002	5.3962356157E+000	-1.1970530317E+001	0.050	2.955	2.108

10.847	2.115	5.151	1.074	1.3619670698E+002	5.5361709393E+000	-1.7500678571E+001	0.050	2.533	1.884
10.870	2.131	5.174	1.063	1.3579192711E+002	5.5488171420E+000	-1.8072245204E+001	0.050	2.489	1.862
11.049	2.254	5.366	1.066	1.3202901338E+002	5.6087129312E+000	-2.2271202773E+001	0.050	2.201	1.715
11.055	2.258	5.372	1.162	1.3188933423E+002	5.6099677263E+000	-2.2603964732E+001	0.050	2.193	1.711
11.230	2.390	5.576	1.141	1.2653449499E+002	5.5739335357E+000	-3.4572451069E+001	0.050	1.960	1.598
11.407	2.509	5.774	1.052	1.1971183981E+002	5.4295487782E+000	-4.0885582364E+001	0.050	1.786	1.518
11.540	2.575	5.902	0.929	1.1404749693E+002	5.2588154015E+000	-4.3484101075E+001	0.050	1.695	1.478
11.577	2.587	5.932	0.732	1.1241346671E+002	5.2005937816E+000	-4.4329680009E+001	0.050	1.674	1.470
11.753	2.624	6.057	0.606	1.0414913772E+002	4.8765108247E+000	-4.6480183277E+001	0.050	1.600	1.446
11.932	2.617	6.146	0.495	9.5942032043E+001	4.5111151025E+000	-4.0124249589E+001	0.050	1.563	1.441
11.933	2.617	6.147	0.322	9.5911846787E+001	4.5096808788E+000	-4.0112038728E+001	0.050	1.563	1.441
12.112	2.574	6.204	0.318	8.8228543763E+001	4.1395249369E+000	-4.1440606832E+001	0.050	1.553	1.450
12.127	2.570	6.208	0.282	8.7609140739E+001	4.1090638665E+000	-4.1569207233E+001	0.050	1.553	1.451
12.306	2.519	6.259	0.282	7.9626905419E+001	3.7138595671E+000	-4.3322744856E+001	0.050	1.555	1.467
12.314	2.516	6.261	0.260	7.9281791788E+001	3.6966751974E+000	-4.3255686896E+001	0.050	1.555	1.468
12.494	2.460	6.308	0.260	7.1581926621E+001	3.3131822731E+000	-4.0066582777E+001	0.050	1.565	1.488
12.497	2.458	6.309	0.265	7.1439093173E+001	3.3060683874E+000	-4.0072929206E+001	0.050	1.565	1.489
12.676	2.401	6.356	0.265	6.3680927904E+001	2.9223213826E+000	-4.3043192898E+001	0.050	1.581	1.512
12.678	2.401	6.357	0.278	6.3624182691E+001	2.9195282885E+000	-4.3048664930E+001	0.050	1.581	1.512
12.857	2.345	6.407	0.278	5.5731575272E+001	2.5355338336E+000	-4.1947921117E+001	0.050	1.598	1.536
12.858	2.345	6.407	0.284	5.5708539255E+001	2.5344260606E+000	-4.1945331037E+001	0.050	1.598	1.536
13.037	2.288	6.458	0.284	4.7968030537E+001	2.1687035614E+000	-4.1143111404E+001	0.050	1.614	1.560
13.038	2.288	6.458	0.280	4.7941696462E+001	2.1674831583E+000	-4.1134996117E+001	0.050	1.614	1.560
13.217	2.229	6.508	0.279	4.0610260899E+001	1.8328592214E+000	-3.7052087133E+001	0.050	1.624	1.579
13.219	2.228	6.508	0.270	4.0530586845E+001	1.8292933863E+000	-3.7017256120E+001	0.050	1.624	1.579
13.398	2.167	6.557	0.270	3.3725595140E+001	1.5294333240E+000	-3.4635665068E+001	0.050	1.624	1.589
13.404	2.165	6.558	0.269	3.3546046047E+001	1.5216684568E+000	-3.4588969003E+001	0.050	1.624	1.589
13.583	2.101	6.607	0.269	2.7038270224E+001	1.2428075785E+000	-3.3751200229E+001	0.050	1.604	1.581
13.593	2.098	6.609	0.279	2.6695232364E+001	1.2282705509E+000	-3.3747172887E+001	0.050	1.602	1.580
13.772	2.033	6.659	0.280	2.0200865376E+001	9.5251829442E-001	-3.4109118653E+001	0.050	1.553	1.545
13.774	2.032	6.660	0.307	2.0148156858E+001	9.5027493917E-001	-3.4125319748E+001	0.050	1.552	1.545
13.952	1.969	6.715	0.351	1.3374611134E+001	6.5864149625E-001	-4.2369006177E+001	0.050	1.470	1.479
14.127	1.919	6.784	0.434	5.2163659915E+000	3.0380918188E-001	-4.9635305839E+001	0.050	1.355	1.380
14.306	1.877	6.868	0.484	-4.2026348595E+000	-1.0023908739E-001	-5.2305800524E+001	0.050	1.233	1.271
14.481	1.836	6.955	0.474	-1.3297053747E+001	-4.7155447230E-001	-4.7925341205E+001	0.050	1.143	1.189
14.659	1.783	7.036	0.419	-2.1111444468E+001	-7.6172687835E-001	-3.8885533828E+001	0.050	1.092	1.143
14.838	1.714	7.104	0.384	-2.7176195656E+001	-9.5623881149E-001	-2.9383517562E+001	0.050	1.074	1.129
14.840	1.713	7.105	0.375	-2.7226170326E+001	-9.5770036809E-001	-2.9348450114E+001	0.050	1.074	1.129
15.019	1.639	7.172	0.374	-3.2622597961E+001	-1.1051776609E+000	-2.7188965485E+001	0.050	1.075	1.133
15.029	1.635	7.176	0.382	-3.2884673394E+001	-1.11117605763E+000	-2.7086264533E+001	0.050	1.075	1.133
15.208	1.560	7.244	0.383	-3.7922064122E+001	-1.2311163433E+000	-2.5858943978E+001	0.050	1.086	1.147
15.213	1.558	7.246	0.402	-3.8054880699E+001	-1.2340695303E+000	-2.5830837241E+001	0.050	1.086	1.148
15.393	1.485	7.319	0.403	-4.2911707063E+001	-1.3367314972E+000	-2.5482916470E+001	0.050	1.101	1.166
15.395	1.485	7.320	0.437	-4.2969911891E+001	-1.3379050856E+000	-2.5481287357E+001	0.050	1.101	1.166
15.574	1.417	7.398	0.437	-4.7803530070E+001	-1.4306507807E+000	-2.5967316022E+001	0.050	1.117	1.185
15.575	1.416	7.398	0.464	-4.7826404951E+001	-1.4310709771E+000	-2.5962774107E+001	0.050	1.117	1.185
15.754	1.352	7.482	0.464	-5.2493451395E+001	-1.5109097990E+000	-2.3514712649E+001	0.050	1.130	1.201
15.755	1.351	7.482	0.473	-5.2508120697E+001	-1.5111416339E+000	-2.3506126681E+001	0.050	1.130	1.201
15.934	1.287	7.567	0.473	-5.6731238188E+001	-1.5714215044E+000	-2.1104169509E+001	0.050	1.138	1.211
15.935	1.287	7.567	0.488	-5.6740538468E+001	-1.5715386044E+000	-2.1098437324E+001	0.050	1.138	1.211
16.114	1.223	7.654	0.488	-6.0544494277E+001	-1.6125280103E+000	-1.8734260290E+001	0.050	1.140	1.216
16.115	1.223	7.655	0.474	-6.0569705270E+001	-1.6127449830E+000	-1.8710414693E+001	0.050	1.140	1.216
16.295	1.155	7.740	0.474	-6.3800179165E+001	-1.6350073551E+000	-1.5279628705E+001	0.050	1.138	1.216

16.298	1.154	7.742	0.485	-6.3850396909E+001	-1.6352313428E+000	-1.5231862169E+001	0.050	1.138	1.216
16.477	1.087	7.829	0.485	-6.6606511590E+001	-1.6382369059E+000	-1.3375361785E+001	0.050	1.133	1.213
16.484	1.084	7.832	0.488	-6.6691853716E+001	-1.6379962324E+000	-1.3279325473E+001	0.050	1.132	1.212
16.663	1.016	7.919	0.488	-6.8949352915E+001	-1.6233271507E+000	-1.0488135107E+001	0.050	1.125	1.207
16.665	1.015	7.920	0.483	-6.8974296195E+001	-1.6230473281E+000	-1.0451354436E+001	0.050	1.125	1.207
16.845	0.943	8.007	0.483	-7.0729233430E+001	-1.5924092864E+000	-7.9762405912E+000	0.050	1.117	1.200
16.845	0.943	8.007	0.549	-7.0733066708E+001	-1.5923111749E+000	-7.9696527580E+000	0.050	1.117	1.200
17.024	0.880	8.105	0.592	-7.2041450696E+001	-1.5357714078E+000	-5.9352127254E+000	0.050	1.108	1.193
17.203	0.831	8.219	0.635	-7.2855292172E+001	-1.4505320995E+000	-2.4409178303E+000	0.050	1.098	1.184
17.204	0.831	8.219	0.691	-7.2856098069E+001	-1.4503643952E+000	-2.4334005320E+000	0.050	1.098	1.184
17.382	0.790	8.343	0.701	-7.2939137301E+001	-1.3402807534E+000	1.5127108429E+000	0.050	1.086	1.173
17.561	0.749	8.470	0.678	-7.2312047312E+001	-1.2166432555E+000	5.2122796334E+000	0.050	1.071	1.159
17.740	0.694	8.586	0.644	-7.1070122479E+001	-1.0998898162E+000	7.9931685336E+000	0.050	1.056	1.143
17.741	0.694	8.586	0.593	-7.1061438379E+001	-1.0992780889E+000	8.0128701050E+000	0.050	1.056	1.143
17.921	0.628	8.693	0.593	-6.9232411197E+001	-9.9124079408E-001	1.1199310077E+001	0.050	1.040	1.126
17.925	0.626	8.695	0.582	-6.9188899445E+001	-9.8901403479E-001	1.1263436325E+001	0.050	1.040	1.126
18.104	0.558	8.799	0.581	-6.6816627070E+001	-8.8410753270E-001	1.3932395491E+001	0.050	1.023	1.108
18.108	0.556	8.801	0.547	-6.6761687580E+001	-8.8203946543E-001	1.3983441247E+001	0.050	1.023	1.108
18.287	0.482	8.900	0.548	-6.3963557009E+001	-7.8481674314E-001	1.8288385207E+001	0.050	1.011	1.094
18.290	0.481	8.901	0.578	-6.3913384030E+001	-7.8324872435E-001	1.8340083252E+001	0.050	1.010	1.094
18.469	0.412	9.005	0.578	-6.0498690322E+001	-6.8087437019E-001	2.0918135007E+001	0.050	1.004	1.087
18.472	0.411	9.007	0.601	-6.0438101915E+001	-6.7918559540E-001	2.0972770155E+001	0.050	1.004	1.087
18.651	0.346	9.114	0.600	-5.6406204247E+001	-5.7358243943E-001	2.2865880017E+001	0.050	1.009	1.093
18.653	0.345	9.115	0.592	-5.6375855751E+001	-5.7284653329E-001	2.2885233587E+001	0.050	1.009	1.093
18.832	0.279	9.221	0.591	-5.1871553320E+001	-4.7103870743E-001	2.6028809701E+001	0.050	1.036	1.122
18.857	0.269	9.236	0.611	-5.1212556728E+001	-4.5735284885E-001	2.6576180172E+001	0.050	1.042	1.129
19.037	0.207	9.346	0.618	-4.5911504426E+001	-3.5813915756E-001	3.1290089336E+001	0.050	1.112	1.204
19.084	0.191	9.376	0.704	-4.4415294579E+001	-3.3242301388E-001	3.3115559646E+001	0.050	1.138	1.232
19.263	0.148	9.506	0.760	-3.7541546779E+001	-2.2603855377E-001	4.2344942189E+001	0.050	1.283	1.390
19.401	0.126	9.617	0.813	-3.1255452350E+001	-1.4041953839E-001	4.7482548581E+001	0.050	1.540	1.669
19.581	0.100	9.764	0.782	-2.2266268910E+001	-5.3415438662E-002	5.0023728810E+001	0.050	2.312	2.504
19.760	0.061	9.898	0.732	-1.3315166343E+001	-1.4887171456E-002	5.0990642841E+001	0.050	5.148	5.576
19.939	0.017	10.026	0.732	-3.9792131862E+000	-2.3744754728E-003	5.4465504798E+001	0.050	24.556	26.599

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 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  
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X	dx	dl	alpha	TauStress	TauF	TauStrength	TauS
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(m)	(m)	(m)	(°)	(kPa)	(kN/m)	(kPa)	(kN/m)
6.973	0.179	0.242	-42.142	-0.737	-0.178	44.103	10.666
7.152	0.179	0.242	-42.142	-2.212	-0.535	44.167	10.681
7.332	0.179	0.242	-42.142	-3.687	-0.892	44.282	10.709
7.511	0.119	0.160	-42.142	-4.913	-0.788	44.448	7.129
7.630	0.179	0.238	-41.181	-6.066	-1.445	44.508	10.604
7.809	0.136	0.180	-41.181	-7.309	-1.319	44.506	8.029
7.945	0.179	0.231	-39.061	-8.312	-1.920	44.603	10.301
8.124	0.033	0.043	-39.061	-9.073	-0.389	44.774	1.919
8.158	0.179	0.222	-36.332	-9.400	-2.087	44.840	9.958
8.336	0.173	0.206	-32.654	-9.706	-1.996	44.955	9.247
8.510	0.162	0.186	-29.367	-9.640	-1.791	45.063	8.372
8.672	0.178	0.198	-25.968	-9.170	-1.818	45.166	8.956
8.850	0.080	0.087	-22.924	-8.388	-0.730	45.099	3.926
8.930	0.118	0.129	-22.924	-9.336	-1.201	45.092	5.801
9.048	0.179	0.192	-20.648	-10.157	-1.946	45.016	8.626
9.228	0.069	0.074	-20.648	-11.713	-0.865	45.087	3.331
9.297	0.179	0.189	-17.961	-11.121	-2.096	45.037	8.490
9.476	0.008	0.009	-17.961	-12.086	-0.107	45.122	0.398
9.485	0.163	0.168	-13.617	-8.658	-1.454	44.942	7.548
9.648	0.141	0.142	-7.660	-2.641	-0.375	44.670	6.343
9.789	0.164	0.164	-1.452	5.413	0.887	44.214	7.242
9.952	0.139	0.140	4.659	14.659	2.049	43.734	6.112
10.092	0.160	0.163	10.710	24.550	4.001	43.388	7.071
10.252	0.179	0.186	15.198	32.770	6.089	43.331	8.052
10.431	0.001	0.001	15.198	33.934	0.045	43.474	0.057
10.432	0.179	0.189	18.063	39.076	7.370	43.504	8.205
10.612	0.056	0.059	18.063	40.717	2.397	43.676	2.571
10.668	0.179	0.190	19.252	44.038	8.365	43.733	8.307
10.847	0.023	0.024	19.252	45.486	1.102	43.840	1.062
10.870	0.179	0.192	20.715	49.040	9.401	43.933	8.422
11.049	0.006	0.007	20.715	50.406	0.337	44.000	0.294
11.055	0.175	0.189	22.296	54.004	10.200	44.209	8.350
11.230	0.177	0.194	23.917	58.935	11.409	44.557	8.626
11.407	0.133	0.147	25.381	63.315	9.310	44.853	6.595
11.540	0.037	0.041	25.381	64.268	2.658	45.013	1.862
11.577	0.175	0.196	26.822	65.609	12.879	45.227	8.878
11.753	0.179	0.203	28.136	66.238	13.469	45.382	9.228
11.932	0.001	0.001	28.136	65.755	0.056	45.298	0.039
11.933	0.179	0.206	29.285	66.468	13.665	45.432	9.341
12.112	0.015	0.017	29.285	65.910	1.133	45.411	0.780
12.127	0.179	0.206	29.599	65.656	13.540	45.532	9.390
12.306	0.008	0.009	29.599	65.109	0.597	45.500	0.417
12.314	0.179	0.207	29.927	64.868	13.422	45.499	9.414
12.494	0.004	0.004	29.927	64.324	0.265	45.403	0.187
12.497	0.179	0.208	30.261	64.078	13.303	45.509	9.448
12.676	0.001	0.002	30.261	63.531	0.097	45.495	0.069
12.678	0.179	0.208	30.599	63.271	13.181	45.519	9.483
12.857	0.001	0.001	30.599	62.716	0.040	45.437	0.029
12.858	0.179	0.209	30.930	62.431	13.051	45.460	9.503
13.037	0.001	0.001	30.930	61.866	0.046	45.371	0.034
13.038	0.179	0.210	31.256	61.554	12.912	45.352	9.513
13.217	0.002	0.003	31.256	60.974	0.154	45.211	0.114



13.219	0.179	0.210	31.574	60.630	12.761	45.228	9.519
13.398	0.005	0.006	31.574	60.031	0.366	45.108	0.275
13.404	0.179	0.211	31.877	59.645	12.595	45.155	9.535
13.583	0.010	0.012	31.877	59.020	0.709	45.066	0.542
13.593	0.179	0.213	32.682	58.920	12.553	45.157	9.621
13.772	0.002	0.002	32.682	58.299	0.107	45.097	0.083
13.774	0.178	0.213	33.527	58.177	12.414	45.242	9.653
13.952	0.175	0.212	34.387	57.359	12.171	45.529	9.661
14.127	0.179	0.219	35.227	56.420	12.335	45.712	9.994
14.306	0.175	0.217	36.050	55.370	12.005	45.624	9.892
14.481	0.178	0.222	36.858	54.216	12.058	45.284	10.072
14.659	0.179	0.226	37.621	52.937	11.985	44.893	10.163
14.838	0.002	0.002	37.621	52.161	0.112	44.728	0.096
14.840	0.179	0.229	38.322	51.538	11.780	44.705	10.218
15.019	0.010	0.012	38.322	50.704	0.627	44.600	0.551
15.029	0.179	0.229	38.611	49.922	11.456	44.591	10.233
15.208	0.005	0.007	38.611	49.099	0.324	44.523	0.293
15.213	0.179	0.230	38.909	48.323	11.136	44.523	10.260
15.393	0.002	0.003	38.909	47.502	0.140	44.480	0.131
15.395	0.179	0.231	39.209	46.723	10.813	44.483	10.295
15.574	0.001	0.001	39.209	45.899	0.052	44.453	0.051
15.575	0.179	0.232	39.510	45.110	10.485	44.431	10.327
15.754	0.001	0.001	39.510	44.278	0.036	44.376	0.036
15.755	0.179	0.233	39.805	43.474	10.148	44.350	10.352
15.934	0.000	0.001	39.805	42.633	0.024	44.298	0.025
15.935	0.179	0.234	40.097	41.815	9.802	44.270	10.378
16.114	0.001	0.002	40.097	40.961	0.072	44.220	0.078
16.115	0.179	0.235	40.382	40.123	9.445	44.193	10.403
16.295	0.003	0.004	40.382	39.250	0.170	44.151	0.191
16.298	0.179	0.236	40.658	38.389	9.074	44.113	10.427
16.477	0.006	0.008	40.658	37.492	0.317	44.072	0.373
16.484	0.179	0.238	41.068	36.605	8.706	44.039	10.474
16.663	0.002	0.003	41.068	35.714	0.113	44.012	0.139
16.665	0.179	0.239	41.487	34.826	8.337	43.972	10.526
16.845	0.000	0.001	41.487	33.931	0.022	43.947	0.028
16.845	0.179	0.240	41.908	33.035	7.927	43.862	10.526
17.024	0.179	0.243	42.324	31.215	7.571	43.742	10.609
17.203	0.000	0.000	42.324	30.293	0.014	43.718	0.020
17.204	0.178	0.243	42.732	29.360	7.128	43.635	10.593
17.382	0.179	0.246	43.137	27.479	6.746	43.579	10.699
17.561	0.179	0.247	43.529	25.564	6.323	43.608	10.785
17.740	0.001	0.001	43.529	24.599	0.037	43.674	0.065
17.741	0.179	0.249	43.906	23.608	5.876	43.645	10.863
17.921	0.004	0.005	43.906	22.617	0.122	43.666	0.235
17.925	0.179	0.249	43.909	21.625	5.382	43.658	10.866
18.104	0.004	0.005	43.909	20.633	0.113	43.703	0.239
18.108	0.179	0.249	43.911	19.641	4.889	43.690	10.875
18.287	0.003	0.004	43.911	18.656	0.071	43.667	0.166
18.290	0.179	0.249	43.914	17.670	4.398	43.669	10.870
18.469	0.003	0.004	43.914	16.684	0.067	43.659	0.175
18.472	0.179	0.249	43.916	15.697	3.907	43.655	10.867
18.651	0.001	0.002	43.916	14.719	0.027	43.681	0.080
18.653	0.179	0.249	43.920	13.741	3.421	43.671	10.872

18.832	0.025	0.035	43.920	12.634	0.442	43.689	1.528
18.857	0.179	0.249	43.922	11.526	2.870	43.682	10.875
19.037	0.047	0.065	43.922	10.300	0.674	43.688	2.859
19.084	0.179	0.249	43.925	9.074	2.259	43.652	10.868
19.263	0.138	0.192	43.925	7.353	1.412	43.632	8.380
19.401	0.179	0.249	43.926	5.633	1.403	43.733	10.888
19.581	0.179	0.249	43.926	3.691	0.919	43.938	10.939
19.760	0.179	0.249	43.926	1.749	0.435	44.047	10.967
19.939	0.072	0.100	43.926	0.389	0.039	44.075	4.393

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 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  
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