



COMUNE DI LUZZARA

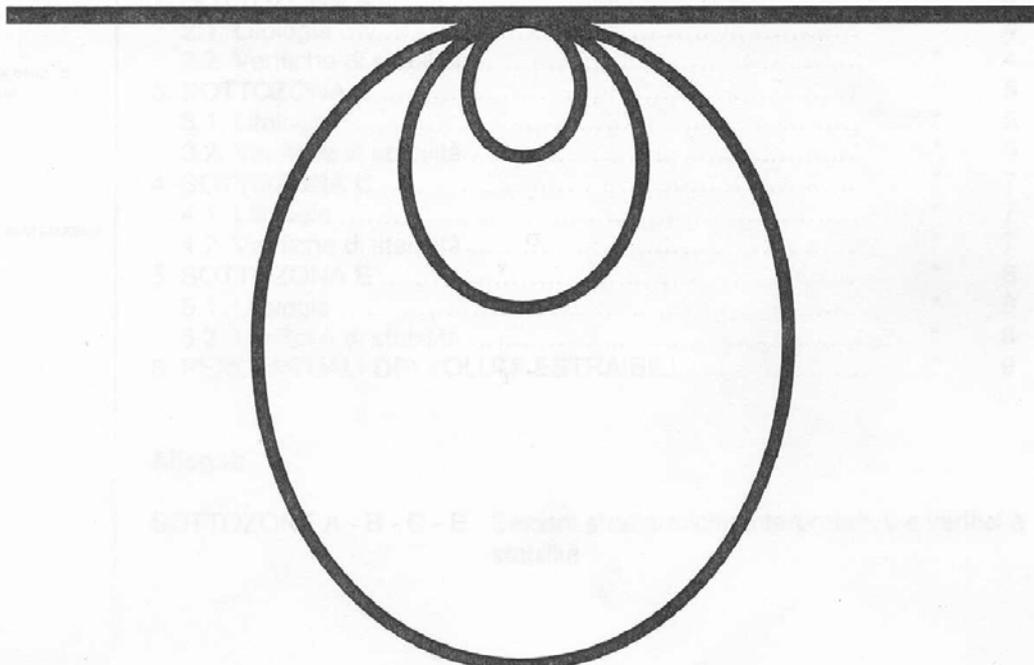
PROVINCIA DI REGGIO EMILIA

**VARIANTE GENERALE
AL PIANO COMUNALE DELLE ATTIVITA' ESTRATTIVE
IN ADEGUAMENTO ALLA VARIANTE GENERALE 2002 AL P.I.A.E.
DELLA PROVINCIA DI REGGIO EMILIA**

**Relazione geologico-tecnica a supporto
del Piano di Coordinamento Attuativo**

Stratimetrie, verifiche di stabilità e stime sulle percentuali dei volumi estraibili

Febbraio 2005





1. PREMESSA

In questo rapporto si argomenta circa la litologia delle sottozone A, B, C ed E del polo di P.I.A.E. PO015 Belgrado-Fogarino, e si espone una serie di verifiche mirata a valutare gli equilibri delle scarpate degli invasi.

Lo scopo è contribuire ad una programmazione organica delle varie fasi di coltivazione tenendo conto dei riflessi e delle interferenze imputabili all'asportazione del materiale.

Per redarre un documento sintetico e non ripetitivo rispetto alla relazione a supporto della Variante al PAE, si tralasciano le informazioni di carattere generale inerenti la geologia, la geomorfologia, l'idrologia e l'idrogeologia, affrontando direttamente i temi d'interesse, sottozona per sottozona.

La trattazione è preceduta da brevi note relative ad alcune sezioni geologiche che si è ritenuto necessario aggiungere, e dall'esposizione delle linee di metodo seguite per le verifiche di stabilità.

Una parte conclusiva è dedicata al calcolo percentuale dei materiali che saranno estratti.

1.1. Analisi litologica

Limitatamente ai sondaggi disponibili, si aggiungono alcune sezioni stratigrafiche interpretative, utili per una comprensione immediata dell'assetto geologico del primo sottosuolo.

Gli elaborati sono in allegato a fondo testo; la loro preparazione ha seguito i medesimi criteri che hanno portato al disegno della tavola P.03 degli elaborati di progetto, criteri di cui si parla nel capitolo 5 della relazione geologico-tecnica generale.

1.2. Verifiche di stabilità

Le analisi sono condotte lungo sezioni distribuite ai bordi delle aree d'estrazione e lungo i settori di confine tra le varie sottozone; per questi ultimi lo studio riguarda sia la stabilità delle scarpate temporanee sia quella dei setti che resteranno al termine della coltivazione. Nel caso della sottozona A un calcolo è stato riservato ad un settore centrale dell'area per valutare l'effetto di una coltivazione differenziata in termini di quote di fondo scavo.

L'ubicazione dei profili (figura 1) è stata scelta in modo da contemplare situazioni geometriche diversificate ed una casistica sufficientemente ampia per quanto riguarda gli assetti stratigrafici.

Particolare attenzione è stata rivolta alle aree che bordano gli argini intragolenali (Intercomunale e Lorenzini) ed alle scarpate della sottozona B, più acclivi rispetto a quelle previste per le restanti zone.

Quanto all'assetto idrogeologico, nelle verifiche si è imposto un livello statico a -4.5 m dal piano campagna, ritenendo che questo stato di cose rispecchi sostanzialmente le condizioni "normali" dell'acquifero.

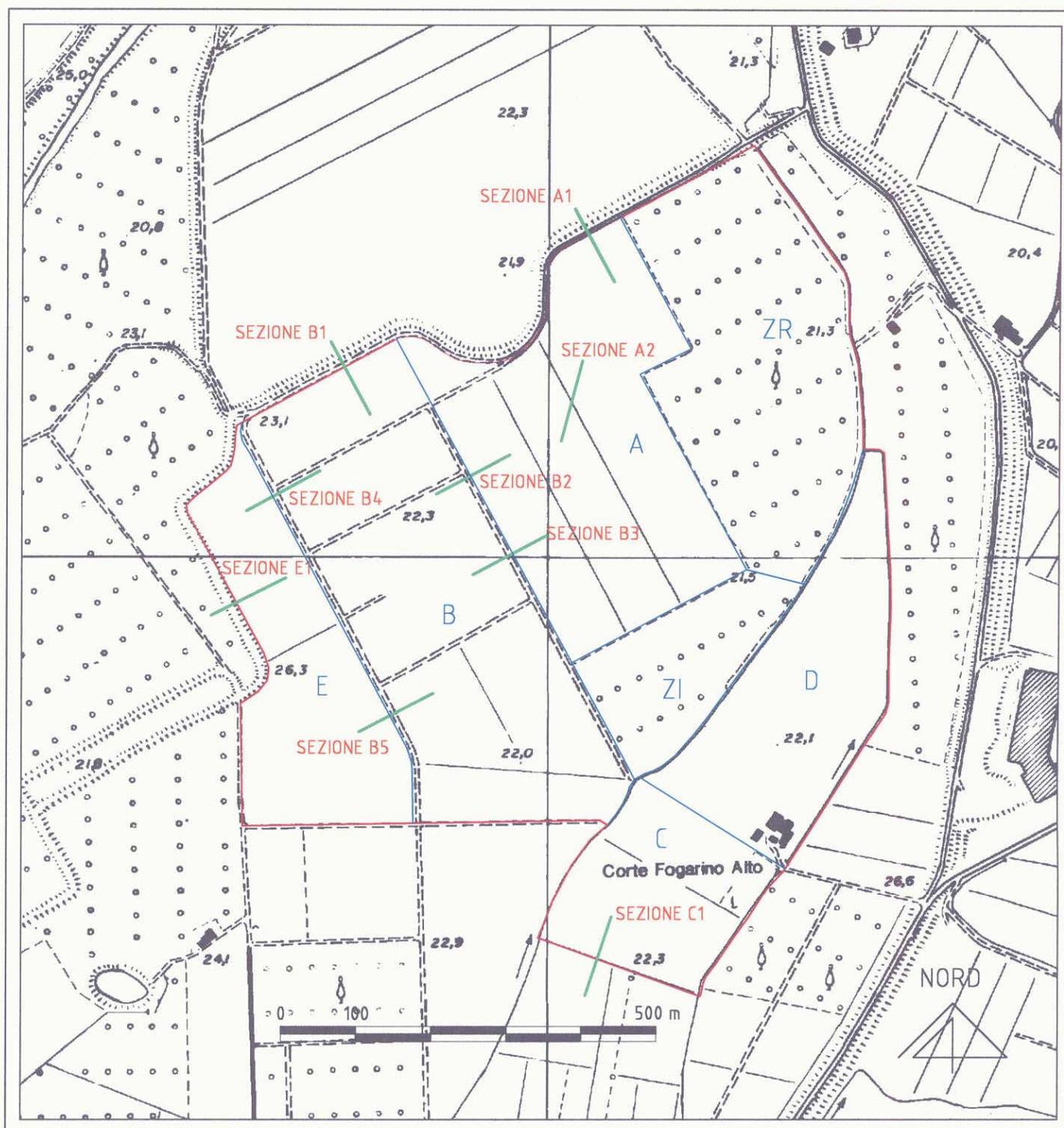


Figura 1 – Posizione dei profili considerati nelle verifiche di stabilità

-  Limite polo di P.I.A.E. P0015 Belgrado-Fogarino
-  Limite di sottozona



Le analisi riguardanti gli argini sono state poi ripetute ipotizzando condizioni "di piena" tali da immergere il paramento a fiume e provocare la parziale saturazione del manufatto, fermo restando condizioni "normali" entro i bacini di cava.

In quest'ultimo scenario non è preso in esame il fenomeno del sifonamento, tema trattato in un'apposito allegato di questo stesso studio.

L'equilibrio per condizioni "normali" relativamente alle aree lontane dai manufatti arginali, e per condizioni "di piena", è stato infine verificato imponendo una sollecitazione sismica.

Le geometrie considerate sono quelle di progetto, cioè:

- pendenze 1 / 2 per le sottozone A, C, E e per l' approfondimento della sottozona B;
- pendenze 1 / 1 e 2 / 3 per le scarpate attuali della sottozona B poste rispettivamente sopra e sotto la banca intermedia.

Le verifiche numeriche sono condotte sulla scorta delle caratteristiche di resistenza al taglio indicate nel capitolo 6 della relazione generale.

A riguardo si sottolinea che l'angolo di attrito interno delle sabbie è stato stimato pari a 36°, che grosso modo media i valori di picco della compagine.

Per non complicare eccessivamente le condizioni stratigrafiche al contorno, le sabbie limose sono state omesse quando subordinate alla frazione argillosa.

Quanto alla sollecitazione sismica di progetto, dato che l'analisi riguarda paramenti in terra e considerato che un eventuale collasso delle scarpate non metterebbe a repentaglio vite umane, si è ritenuto di considerare la minima accelerazione imposta (0.05g).

Il calcolo del fattore di stabilità è eseguito tramite STABL della Purdue University, Indiana; questo codice utilizza il metodo Bishop-Modificato, adottando una originale tecnica statistica per individuare le più critiche superfici di rottura potenziale.

Per ogni sottozona, gli elaborati di sintesi sono in allegato dopo la tavola delle sezioni stratigrafiche; essi espongono i dati in ingresso, i risultati e due disegni di cui quello superiore mostra tutte le superfici di verifica e quello inferiore riporta le 10 superfici più critiche con evidenziato il piano di scorrimento a fattore minimo.



2. SOTTOZONA A

2.1. Litologia

Le sezioni 2-2', 3-3', 4-4' e 5-5' dell'elaborato P.03, unitamente a quelle allegate, mostrano una marcata variabilità della coltre argilloso limosa di superficie.

Nei settori centrale ed orientale, la copertura fine raggiunge una potenza di 5÷6 m e solo saltuariamente risulta interrotta da sottili episodi sabbioso limosi.

Nel settore NW, l'assetto descritto cambia radicalmente per l'intrusione di spesse lingue di sabbia e sabbia limosa, il cui tetto giunge fino a circa 1÷3 m dal piano campagna.

Eterogeneità litologiche in senso laterale sono presenti anche nell'intorno del CPT 18, dove un innalzamento localizzato del tetto delle sabbie riduce la cotica coesiva a soli 2 m di spessore.

2.2. Verifiche di stabilità

In esame è l'equilibrio delle scarpate in corrispondenza dell'argine Lorenzini (sezione A1) e di un'area centrale (sezione A2) entro la quale differenti fasi della coltivazione creeranno quote di fondo sfalsate.

SEZIONE A1

La verifica considera uno scavo esteso a - 4.5 m dal piano campagna ed uno spessore di copertura fine pari a 4 m.

Risultati:

condizioni "normali"	F = 2.106
condizioni "di piena"	F = 1.913
condizioni "di piena" con sisma	F = 1.642

Le restituzioni grafiche delle verifiche mostrano che i cerchi di rottura a minor coefficiente di sicurezza si estendono per alcuni metri oltre il ciglio della scarpata ma non raggiungono l'argine.

SEZIONE A2

Si ipotizza una scarpata 1 / 2 che raccorda un dislivello di 6.1 m. Lo spessore della parte argillosa superficiale è stimato in 1.5 m.

Risultati:

condizioni "normali"	F = 1.459
condizioni "normali" con sisma	F = 1.204



3. SOTTOZONA B

3.1. Litologia

Le sezioni d'interesse riportate nell'elaborato P.03 e la sezione C-C' allegata, mostrano che i volumi sottostanti l'attuale approfondimento sono costituiti da sabbie. Fa eccezione il settore SE (sezione D-D'), dove le sabbie sono frammiste a porzioni limose apprezzabili.

Gli schemi stratigrafici evidenziano altresì che gli assetti litologici a bordo invaso sono estremamente vari: nell'immediato sottosuolo si notano infatti interdigitazioni tra livelli coesivi e sabbioso limosi, rastremazioni della cotica coesiva e lenti di sabbia che si insinuano entro le compagini più superficiali.

3.2. Verifiche di stabilità

Le verifiche riguardano la fascia rivolta verso l'argine Lorenzini (sezione B1) e le aree di confine con le sottozone A ed E (sezioni B2, B3, B4 e B5).

SEZIONE B1

Si ipotizza l'approfondimento della sottozona a - 10.6 m dal piano campagna; la stratigrafia è stata schematizzata come segue:

dal piano campagna a - 2.5 m:	argilla
da - 2.5 m a - 5 m:	sabbia
da - 5 m a - 7.5 m:	argilla
da - 7.5 m a fondo scavo:	sabbia

Risultati:

condizioni "normali"	F = 1.254
condizioni "di piena"	F = 1.192
condizioni "di piena" con sisma	F = 1.048

SEZIONE B2

Si ipotizza un approfondimento della sottozona B a - 10.6 m dal piano campagna e si valuta la stabilità nel caso di sottozona A non coltivata; l'assetto litologico contempla uno spessore della copertura fine pari a 6 m.

Risultati:

condizioni "normali"	F = 1.250
condizioni "normali" con sisma	F = 1.100



SEZIONE B3

L'analisi è stata effettuata per il paramento rivolto alla sottozona B, essendo quello più ripido; le geometrie della scarpata opposta sono state definite secondo le recenti linee progettuali. Per entrambi gli invasi si è considerata una quota di fondo pari a - 10.6 m dal p.c. L'assetto litologico contempla uno spessore della copertura fine pari a 3 m.

Risultati:

condizioni "normali"	F = 1.149
condizioni "normali" con sisma	F = 1.019

SEZIONE B4

Questa verifica ricalca le geometrie della B2 limitando lo spessore della copertura a - 2 m.

Risultati:

condizioni "normali"	F = 1.236
condizioni "normali" con sisma	F = 1.098

SEZIONE B5

Si tratta di una verifica analoga alla B3 ad esclusione dell'assetto litologico, che considera un franco di coltre argillosa superficiale pari a 2 m.

Risultati:

condizioni "normali"	F = 1.175
condizioni "normali" con sisma	F = 1.027

Le verifiche dunque indicano che i fronti di scavo, così come progettati, potranno sostenersi a lungo termine; quanto al manufatto arginale, i calcoli mostrano che l'attività estrattiva non andrà ad intaccare l'equilibrio dello stesso.



4. SOTTOZONA C

4.1. Litologia

Gli schemi di tavola P.03 e la sezione G-G' allegata, indicano che il quadro litologico non si discosta nella sostanza da quelli già visti: il substrato è costituito da sabbie con lamine argillose e limo sabbiose in subordine, la copertura, spessa 3 ÷ 4 m è prevalentemente sabbioso limosa a SW, mentre è sostituita da materiali limo argillosi procedendo in direzione della sottozona D.

4.2. Verifiche di stabilità

L'analisi riguarda il fronte che sarà realizzato sul lato SW del comparto (sezione C1).

SEZIONE C1

Si ipotizza l'approfondimento della sottozona a - 7.5 m dal piano campagna; la stratigrafia considera una bancata superficiale spessa 3.5 m costituita da sabbie limose.

Risultati:

condizioni "normali"	F = 1.646
condizioni "normali" con sisma	F = 1.399



5. SOTTOZONA E

5.1. Litologia

Le sezioni dell'elaborato P.03 e quelle allegate mostrano che la copertura fine ha spessori intorno a $2 \div 3$ m sull'intero settore. Sotto questa bancata sono presenti sabbie con sabbie limose in subordine e rari livelletti coesivi.

5.2. Verifiche di stabilità

Il caso analizzato prende in esame la stabilità delle scarpate in fregio all'argine Intragolenale (sezione E1).

SEZIONE E1

Si è considerato uno scavo esteso a - 10.9 m dal piano campagna; l'assetto stratigrafico, delineato con riferimento al CPT 28, è mostrato di seguito:

dal piano campagna a - 2 m:	argilla
da - 2 m a - 4.5 m:	sabbia
da - 4.5 m a - 5.5 m:	argilla
da - 5.5 m a fondo scavo:	sabbia

Risultati:

condizioni "normali"	F = 1.537
condizioni "di piena"	F = 1.475
condizioni "di piena" con sisma	F = 1.246

Come per le scarpate vicine all'argine Lorenzini, i cerchi a minor coefficiente di sicurezza non raggiungono il manufatto.



6. CALCOLO DEI VOLUMI

Il calcolo delle percentuali dei materiali estraibili segue in parte i criteri che hanno portato al disegno delle sezioni stratigrafiche.

Tre le classi granulometriche contemplate:

- argille, limi e limi argilloso-sabbiosi
- sabbie limose
- sabbie

Le quantità sono definite discretizzando il sottosuolo in strati di spessore decimetrico; le attribuzioni litologiche ricalcano le indicazioni delle tavole interpretative con una sola eccezione: si sono cioè considerati sabbioso-limosi i livelli con $q_c < 3$ MPa anche se in alcuni casi il rapporto q_c/f_s avrebbe corrisposto a quelle resistenze depositi francamente sabbiosi.

Le stime riguardano le seguenti coltivazioni:

- | | |
|---------------|------------------------------------|
| - sottozona A | da 21.70 m s.l.m. a 17.20 m s.l.m. |
| - sottozona A | da 17.20 m s.l.m. a 11.10 m s.l.m. |
| - sottozona B | da 13.20 m s.l.m. a 11.10 m s.l.m. |
| - sottozona C | da 21.70 m s.l.m. a 14.70 m s.l.m. |
| - sottozona E | da 22.00 m s.l.m. a 11.10 m s.l.m. |

Inoltre sono state calcolate le percentuali provenienti dalle opere di rimozione/modellamento dei setti posti al confine tra le sottozone A, B ed E, nel caso specifico:

Setto A-B

- | | |
|----------------------|------------------------------------|
| - parte rimossa (NW) | da 21.70 m s.l.m. a 11.10 m s.l.m. |
| - sella centrale | da 21.70 m s.l.m. a 19.20 m s.l.m. |
| - parte rimossa (SE) | da 21.70 m s.l.m. a 11.10 m s.l.m. |

Setto B-E

- | | |
|----------------------|------------------------------------|
| - parte rimossa (NW) | da 21.70 m s.l.m. a 11.10 m s.l.m. |
| - sella NW | da 21.70 m s.l.m. a 16.70 m s.l.m. |
| - sella centrale | da 21.70 m s.l.m. a 19.20 m s.l.m. |
| - sella SE | da 21.70 m s.l.m. a 16.70 m s.l.m. |

Le tabelle che seguono evidenziano i sondaggi geognostici presi a riferimento, le frazioni attribuite ad ogni verticale e le percentuali, queste ultime ricavate da semplici proporzioni.

Si specifica che la copertura agraria non è computata.

I tabulati sono preceduti dalla planimetria di figura 2 che illustra le parti dei setti da asportare integralmente e da modellare.

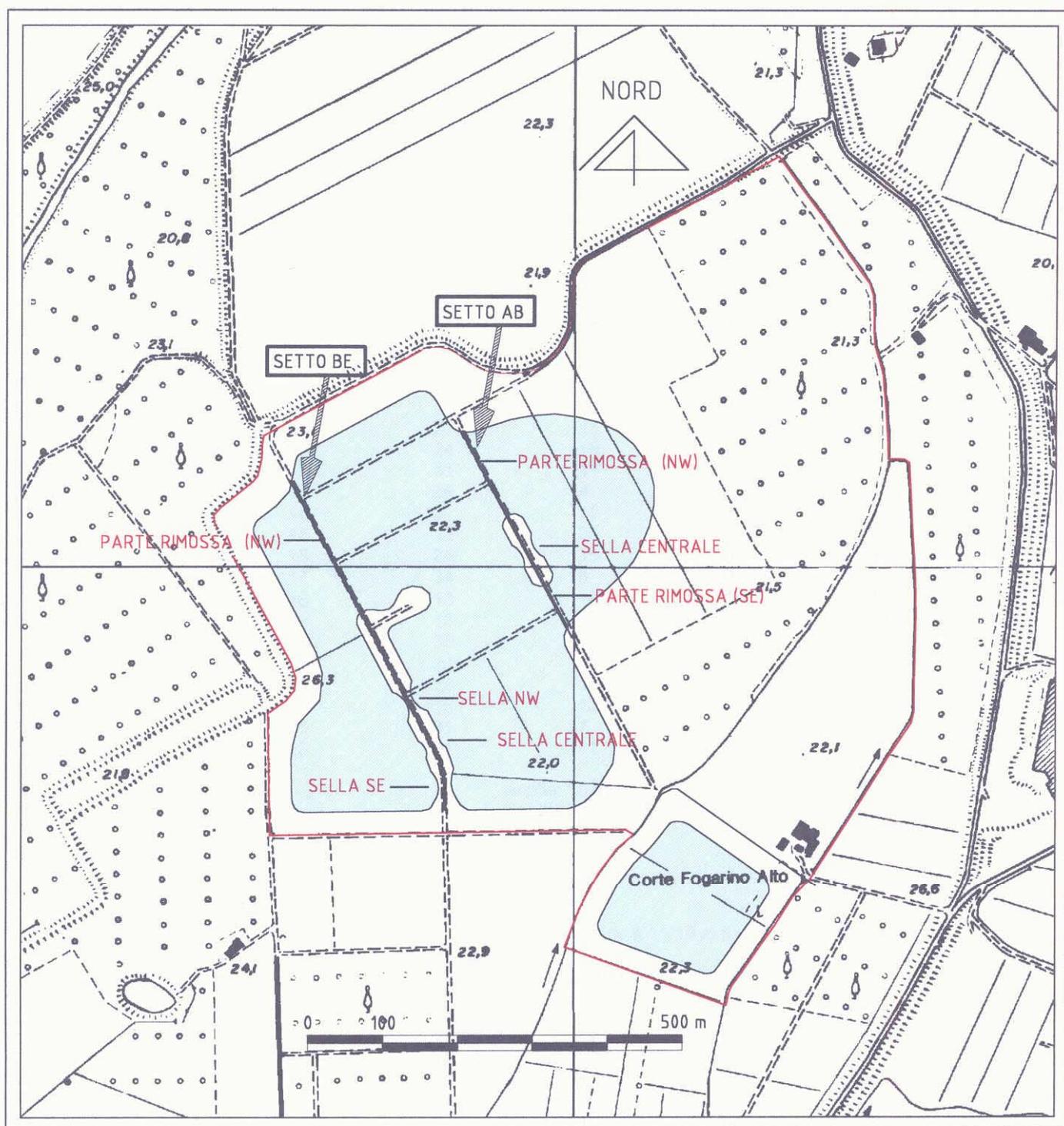
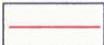


Figura 2 - Schema modellamento e rimozione setti

-  Limite polo di P.I.A.E. P0015 Belgrado-Fogarino
-  Bacini di cava



SOTTOZONA A

Escavazione da 21.70 m s.l.m. a 17.20 m s.l.m.

CPT	argilla	sabbia limosa	sabbia	totale
1	21	4	17	42
2	29	5	8	42
3	27	13	2	42
4	15	20	7	42
5	17	13	12	42
6	32	10	0	42
7	27	15	0	42
8	37	5	0	42
9	26	16	0	42
10	27	15	0	42
11	24	18	0	42
12	41	1	0	42
13	38	4	0	42
14	9	18	15	42
15	13	20	9	42
16	24	18	0	42
17	34	8	0	42
18	13	12	17	42
19	13	18	11	42
20	35	7	0	42
21	28	14	0	42
22	23	15	4	42
23	25	12	5	42
24	31	7	4	42
25	31	11	0	42

Argilla: 60.95%
Sabbia limosa: 28.50%
Sabbia: 10.55%

Escavazione da 17.20 m s.l.m. a 11.00 m s.l.m.

CPT	argilla	sabbia limosa	sabbia	totale
4	4	2	55	61
5	2	17	42	61
9	13	4	44	61
10	10	11	40	61
11	5	10	46	61
14	4	4	53	61
15	0	2	59	61
16	9	6	46	61
18	0	4	57	61
19	6	26	29	61
20	0	5	56	61

Argilla: 7.90%
Sabbia limosa: 13.60%
Sabbia: 78.50%



SOTTOZONA B

Escavazione da 17.20 m s.l.m. a 11.10 m s.l.m.

CPT	argilla	sabbia limosa	sabbia	totale
1	0	2	19	21
4	0	0	21	21
9	0	0	21	21
14	0	2	19	21
18	0	2	19	21
22	0	8	13	21
26	0	0	21	21
27	0	6	15	21
29	0	0	21	21
35	0	0	21	21
32	0	10	11	21
33	0	8	13	21
34	1	9	11	21
3*	2	5	14	21

Argilla: 1.00%
 Sabbia limosa: 17.70%
 Sabbia: 81.30%

* eseguito nella campagna geognostica 1992-1993



SOTTOZONA C

Escavazione da 21.70 m s.l.m. a 14.70 m s.l.m.

CPT	argilla	sabbia limosa	sabbia	totale
34	29	28	10	67
5*	7	38	22	67
SAGGIO				
5	32	10	25	67
6	30	10	25	67
7	32	10	25	67

Argilla: 39.00%
 Sabbia limosa: 29.00%
 Sabbia: 32.00%

* eseguito nella campagna geognostica 1992-1993



SOTTOZONA E

Escavazione da 22.00 m s.l.m. a 11.10 m s.l.m.

CPT	argilla	sabbia limosa	sabbia	totale
27	22	16	68	106
28	25	10	71	106
29	19	16	71	106
30	27	26	53	106
31	31	12	63	106
32	29	28	49	106
35	17	24	65	106
36	21	8	77	106

Argilla: 22.50%
 Sabbia limosa: 16.50%
 Sabbia: 61.00%

SETTO B-A

PARTE RIMOSSA VERSO NW (escavazione da 21.70 m s.l.m. a 11.10 m s.l.m.)

CPT	1				4				9				14				Totale	% per strato		
	a	sl	s		a	sl	s		a	sl	s		a	sl	s			a	sl	s
da 0.3 a 1 m	5	2	0		7	0	0		7	0	0		5	2	0		28	85.7	14.3	0
da 1 a 2 m	8	2	0		2	8	0		10	0	0		0	10	0		40	50	50	0
da 2 a 3 m	6	2	2		0	10	0		4	6	0		4	6	0		40	35	60	5
da 3 a 4 m	0	0	10		6	2	2		4	6	0		0	0	10		40	25	20	55
da 4 a 5 m	0	0	10		0	0	10		6	4	0		0	0	10		40	15	10	75
da 5 a 6 m	4	6	0		4	2	4		8	2	0		0	2	8		40	40	30	30
da 6 a 7 m	2	8	0		0	0	10		0	2	8		0	0	10		40	5	25	70
da 7 a 8 m	4	4	2		0	0	10		0	0	10		2	0	8		40	15	10	75
da 8 a 9 m	0	0	10		0	0	10		0	0	10		2	0	8		40	5	0	95
da 9 a 10 m	0	0	10		0	0	10		0	0	10		0	0	10		40	0	0	100
da 10 a 10.6 m	0	0	6		0	0	6		0	0	6		0	2	4		24	0	8.3	91.7

SELLA CENTRALE (escavazione da 21.70 m s.l.m. a 19.20 m s.l.m.)

CPT	14				Totale	% per strato		
	a	sl	s			a	sl	s
da 0.3 a 1 m	5	2	0		7	71.5	28.5	0
da 1 a 2 m	0	10	0		10	0	100	0
da 2 a 2.5 m	2	3	0		5	40	60	0

PARTE RIMOSSA VERSO SE (escavazione da 21.70 m s.l.m. a 11.10 m s.l.m.)

CPT	14				18				22				Totale	% per strato		
	a	sl	s		a	sl	s		a	sl	s			a	sl	s
da 0.3 a 1 m	5	2	0		5	2	0		7	0	0		21	81	19	0
da 1 a 2 m	0	10	0		6	4	0		4	6	0		30	33	67	0
da 2 a 3 m	4	6	0		0	2	8		4	6	0		30	26.7	46.6	26.7
da 3 a 4 m	0	0	10		0	4	6		8	2	0		30	26.7	20	53.3
da 4 a 5 m	0	0	10		0	2	8		0	6	4		30	0	26.6	73.4
da 5 a 6 m	0	2	8		0	0	10		0	4	6		30	0	20	80
da 6 a 7 m	0	0	10		0	2	8		0	2	8		30	0	13.3	86.7
da 7 a 8 m	2	0	8		0	0	10		0	0	10		30	6.6	0	93.4
da 8 a 9 m	2	0	8		0	0	10		0	0	10		30	6.6	0	93.4
da 9 a 10 m	0	0	10		0	2	8		0	4	6		30	0	20	80
da 10 a 10.6 m	0	2	4		0	0	6		0	4	2		18	0	33.3	66.7

SETTO E - B

PARTE RIMOSSA VERSO NW (escavazione da 21.70 m s.l.m. a 11.10 m s.l.m.)

CPT	27		29		Totale	% per strato		
	a	sl	s	a		sl	s	
da 0.3 a 1 m	7	0	0	7	0	0	0	100
da 1 a 2 m	10	0	0	4	0	6	30	70
da 2 a 3 m	2	2	6	0	0	10	80	10
da 3 a 4 m	0	0	10	0	4	6	80	0
da 4 a 5 m	0	0	10	2	6	2	60	10
da 5 a 6 m	0	0	10	4	0	6	80	20
da 6 a 7 m	0	4	6	0	4	6	60	0
da 7 a 8 m	0	2	8	0	0	10	90	0
da 8 a 9 m	0	2	8	0	0	10	90	0
da 9 a 10 m	0	2	8	0	0	10	90	0
da 10 a 10.6 m	0	2	4	0	0	6	83.4	0

SELLA NW (escavazione da ≈ 21.70 m s.l.m. a ≈ 16.70 m s.l.m.)

CPT	29		35		Totale	% per strato		
	a	sl	s	a		sl	s	
da 0.3 a 1 m	7	0	0	7	0	0	0	100
da 1 a 2 m	4	0	6	6	4	0	30	50
da 2 a 3 m	0	0	10	2	2	6	80	10
da 3 a 4 m	0	4	6	2	8	0	30	10
da 4 a 5 m	2	6	2	0	6	4	30	10

SELLA CENTRALE (escavazione da ≈ 21.70 m s.l.m. a ≈ 19.20 m s.l.m.)

CPT	35		Totale	% per strato			
	a	sl		s			
da 0.3 a 1 m	7	0	0	7	0	0	100
da 1 a 2 m	6	4	0	10	40	0	60
da 2 a 2.5 m	1	2	2	5	40	40	20

SELLA SE (escavazione da ≈ 21.70 m s.l.m. a ≈ 16.70 m s.l.m.)

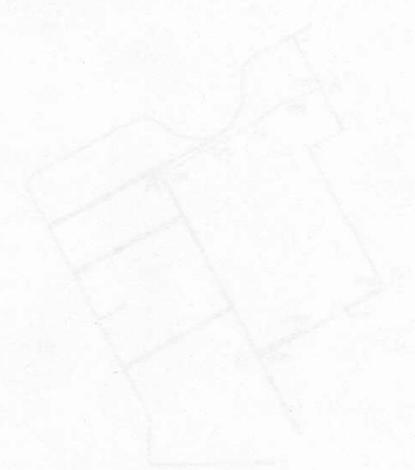
CPT	32		35		Totale	% per strato		
	a	sl	s	a		sl	s	
da 0.3 a 1 m	7	0	0	7	0	0	0	100
da 1 a 2 m	10	0	0	6	4	0	0	80
da 2 a 3 m	2	8	0	2	2	6	30	20
da 3 a 4 m	2	2	6	2	8	0	30	20
da 4 a 5 m	6	4	0	0	6	4	20	30

ALLEGATI SOTTOZONA A

Sezioni stratigrafiche interpretative
e
verifiche di stabilità

SEZIONE A - A'

SEZIONE B - B'



COMITENTE: COMUNE DI LUZZARA

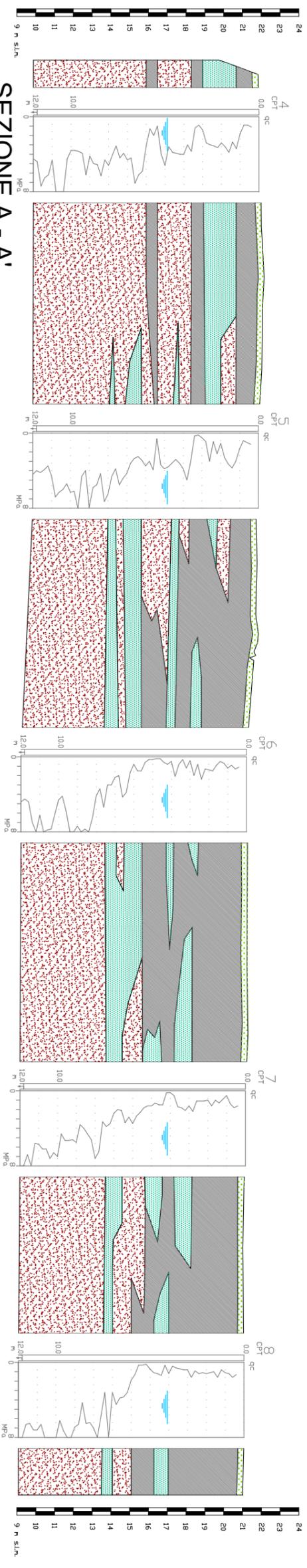
LAVORO: PIANO DI COORDINAMENTO ATTUATIVO

LOCALITA': POLO DI P.I.A.E. P0015 BELGRADO-FOGARINO

SOTTOZONA A

SEZIONI STRATIGRAFICHE INTERPRETATIVE

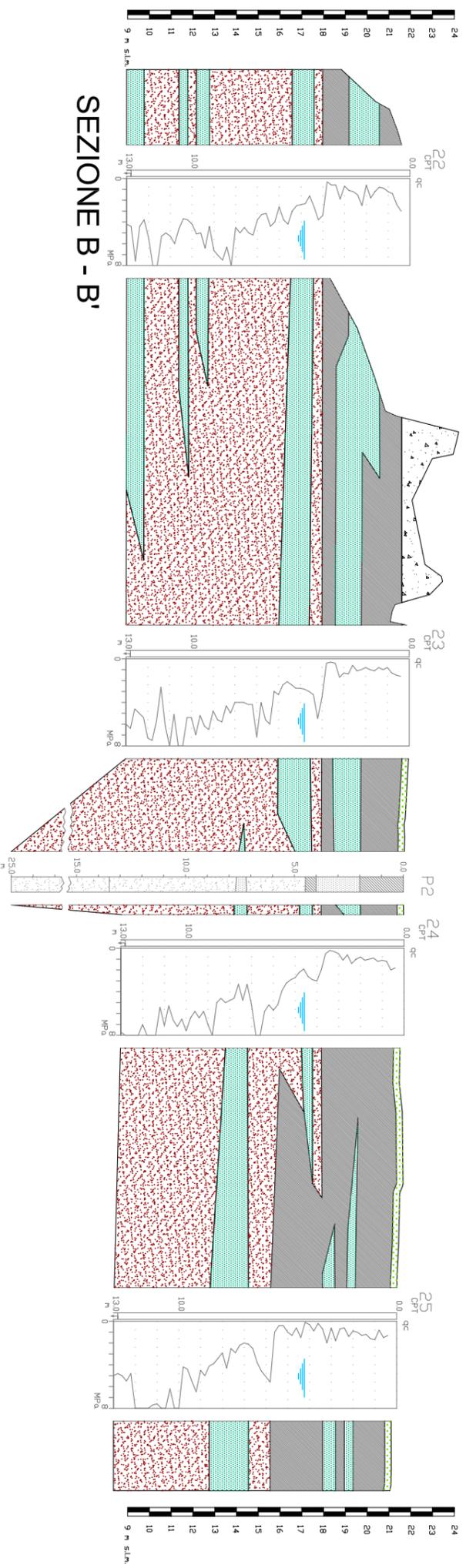
LEGENDA	
	Riporto
	Terreno vegetale
	Argille limi e limi argilloso sabbiosi prevalenti
	Sabbie limose prevalenti
	Sabbie prevalenti
	piezometrica (quota indicativa)



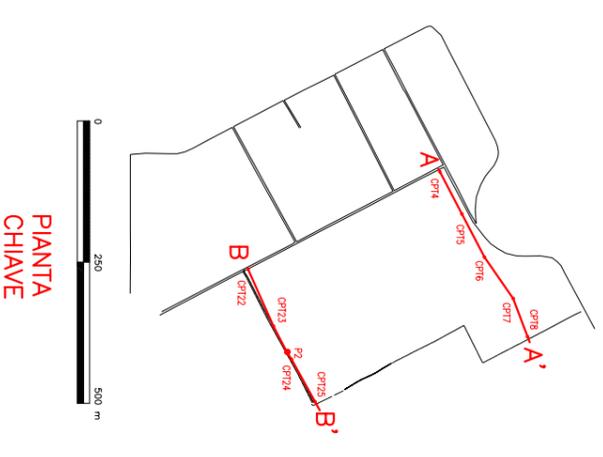
SEZIONE A - A'



Scala distanze
planimetriche



SEZIONE B - B'



PIANTA
CHIAVE

geOLOG

VARIANTE PAE LUZZARA - SEZIONE A1 - CONDIZIONI "NORMALI"
 Input file : a1

BOUNDARY COORDINATES
 10 TOP BOUNDARIES
 11 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	32.80	10.00	1
2	32.80	10.00	33.80	10.50	1
3	33.80	10.50	36.80	12.00	2
4	36.80	12.00	39.80	12.00	2
5	39.80	12.00	44.80	14.50	2
6	44.80	14.50	59.80	14.50	2
7	59.80	14.50	66.50	18.50	2
8	66.50	18.50	69.40	18.50	2
9	69.40	18.50	75.80	14.50	2
10	75.80	14.50	85.00	14.50	2
11	33.80	10.50	85.00	10.50	1

ISOTROPIC SOIL PARAMETERS

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MC)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER (T/MC)	PRESSURE CONSTANT (T/MC)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 2 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	10.00
2	85.00	10.00

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED. 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED ALONG THE GROUND SURFACE BETWEEN X = 30.00 MT.

AND X = 35.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 40.00 MT.

AND X = 69.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION AT WHICH A SURFACE EXTENDS IS Y = .00 MT.

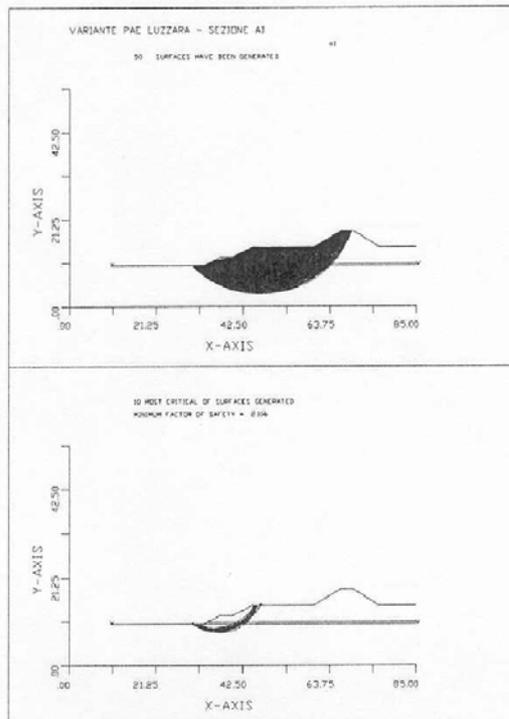
1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

FOLLOWING IS DISPLAYED THE MOST CRITICAL OF THE TRIAL FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY 21 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	30.00	10.00
2	30.89	9.53
3	31.80	9.14
4	32.75	8.82
5	33.72	8.59
6	34.71	8.43
7	35.71	8.35
8	36.71	8.35
9	37.71	8.44
10	38.69	8.60
11	39.66	8.85
12	40.61	9.17
13	41.52	9.57
14	42.41	10.04
15	43.25	10.58
16	44.04	11.19
17	44.78	11.86
18	45.47	12.59
19	46.09	13.37
20	46.65	14.20
21	46.81	14.50

*** 2.106 ***



geOLOG

VARIANTE PAE LUZZARA - SEZIONE A1 - CONDIZIONI "DI PIENA"

Input file : A1P

BOUNDARY COORDINATES

10 TOP BOUNDARIES

11 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	32.80	10.00	1
2	32.80	10.00	33.80	10.50	1
3	33.80	10.50	36.80	12.00	2
4	36.80	12.00	39.80	12.00	2
5	39.80	12.00	44.80	14.50	2
6	44.80	14.50	59.80	14.50	2
7	59.80	14.50	66.50	18.50	2
8	66.50	18.50	69.40	18.50	2
9	69.40	18.50	75.80	14.50	2
10	75.80	14.50	85.00	14.50	2
11	33.80	10.50	85.00	10.50	1

ISOTROPIC SOIL PARAMETERS

2 TYPE(S) OF SOIL

SOIL NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER (T/MQ)	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 5 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	10.00
2	32.80	10.00
3	59.80	13.00
4	69.40	18.50
5	85.00	18.50

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED. 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED

ALONG THE GROUND SURFACE BETWEEN X = 30.00 MT.

AND X = 35.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 40.00 MT.

AND X = 69.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION

AT WHICH A SURFACE EXTENDS IS Y = .00 MT.

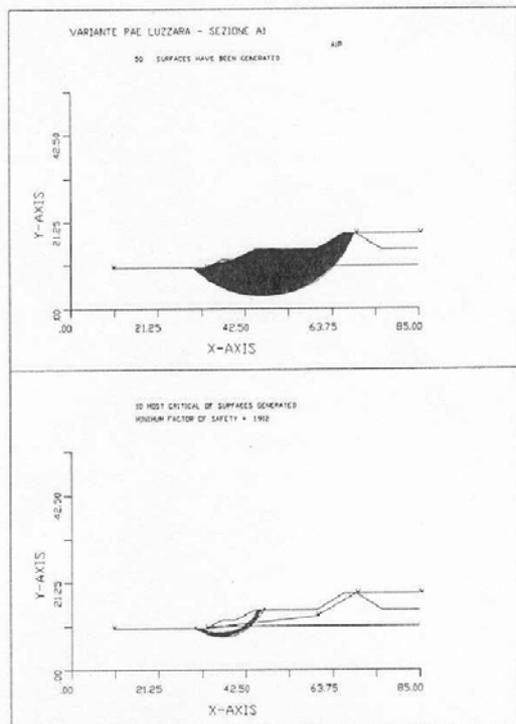
1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

FOLLOWING IS DISPLAYED THE MOST CRITICAL OF THE TRIAL FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	30.00	10.00
2	30.89	9.53
3	31.80	9.14
4	32.75	8.82
5	33.72	8.59
6	34.71	8.43
7	35.71	8.35
8	36.71	8.35
9	37.71	8.44
10	38.69	8.60
11	39.66	8.85
12	40.61	9.17
13	41.52	9.57
14	42.41	10.04
15	43.25	10.58
16	44.04	11.19
17	44.78	11.86
18	45.47	12.59
19	46.09	13.37
20	46.65	14.20
21	46.81	14.50

*** 1.913 ***



gEOLOG

VARIANTE PAE LUZZARA - SEZIONE A1 - CONDIZIONI "DI PIENA" CON SISMA
 Input file : alps

BOUNDARY COORDINATES

10 TOP BOUNDARIES

11 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	32.80	10.00	1
2	32.80	10.00	33.80	10.50	1
3	33.80	10.50	36.80	12.00	2
4	36.80	12.00	39.80	12.00	2
5	39.80	12.00	44.80	14.50	2
6	44.80	14.50	59.80	14.50	2
7	59.80	14.50	66.50	18.50	2
8	66.50	18.50	69.40	18.50	2
9	69.40	18.50	75.80	14.50	2
10	75.80	14.50	85.00	14.50	2
11	33.80	10.50	85.00	10.50	1

ISOTROPIC SOIL PARAMETERS

2 TYPE(S) OF SOIL

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER (T/MQ)	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 5 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	10.00
2	32.80	10.00
3	59.80	13.00
4	69.40	18.50
5	85.00	18.50

A HORIZONTAL EARTHQUAKE LOADING COEFFICIENT

OF .050 HAS BEEN ASSIGNED

A VERTICAL EARTHQUAKE LOADING COEFFICIENT

OF .000 HAS BEEN ASSIGNED

CAVITATION PRESSURE = .0 T/MQ

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED. 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED

ALONG THE GROUND SURFACE BETWEEN X = 30.00 MT.

AND X = 35.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 40.00 MT.

AND X = 69.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION

AT WHICH A SURFACE EXTENDS IS Y = .00 MT.

1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

FOLLOWING IS DISPLAYED THE

MOST CRITICAL OF THE TRIAL

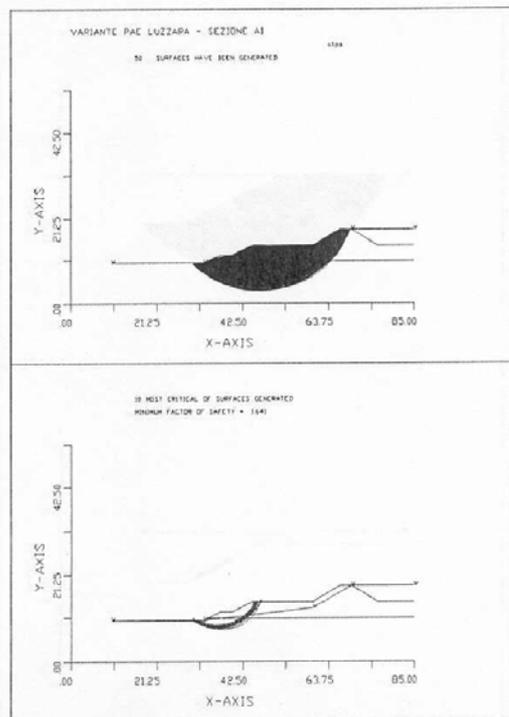
FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY

21 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	30.00	10.00
2	30.89	9.53
3	31.80	9.14
4	32.75	8.82
5	33.72	8.59
6	34.71	8.43
7	35.71	8.35
8	36.71	8.35
9	37.71	8.44
10	38.69	8.60
11	39.66	8.85
12	40.61	9.17
13	41.52	9.57
14	42.41	10.04
15	43.25	10.58
16	44.04	11.19
17	44.78	11.86
18	45.47	12.59
19	46.09	13.37
20	46.65	14.20
21	46.81	14.50

*** 1.642 ***



gEOLOG

VARIANTE PAE LUZZARA - SEZIONE A2 - CONDIZIONI "NORMALI"
 Input file : A2

BOUNDARY COORDINATES
 4 TOP BOUNDARIES
 5 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	15.00	10.00	1
2	15.00	10.00	24.20	14.60	1
3	24.20	14.60	27.20	16.10	2
4	27.20	16.10	42.20	16.10	2
5	24.20	14.60	42.20	14.60	1

ISOTROPIC SOIL PARAMETERS

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER	PRESSURE CONSTANT (T/MO)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 2 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	16.10
2	42.20	16.10

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED.
 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT.
 AND X = 18.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 20.00 MT.
 AND X = 40.00 MT.

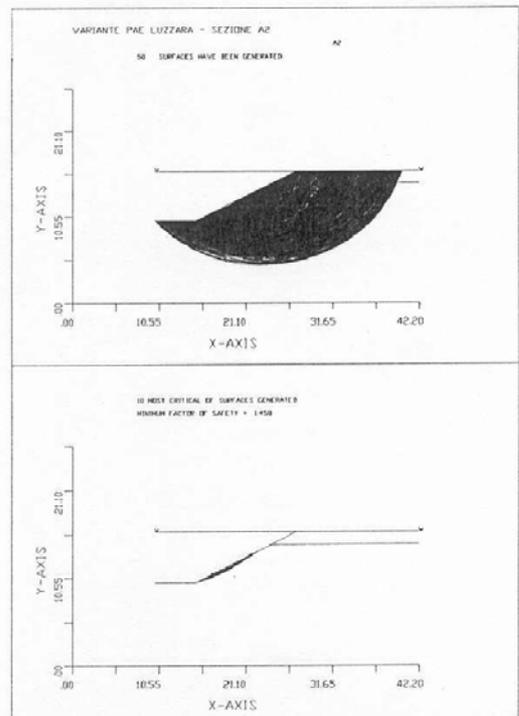
UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION AT WHICH A SURFACE EXTENDS IS Y = .00 MT.
 1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

FOLLOWING IS DISPLAYED THE MOST CRITICAL OF THE TRIAL FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY 7 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	16.86	10.93
2	17.79	11.29
3	18.71	11.69
4	19.61	12.13
5	20.48	12.61
6	21.34	13.13
7	21.56	13.28

*** 1.459 ***



geOLOG

VARIANTE PAE LUZZARA - SEZIONE A2 - CONDIZIONI "NORMALI" CON SISMA
 Input file : A2S

BOUNDARY COORDINATES

4 TOP BOUNDARIES

5 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	15.00	10.00	1
2	15.00	10.00	24.20	14.60	1
3	24.20	14.60	27.20	16.10	2
4	27.20	16.10	42.20	16.10	2
5	24.20	14.60	42.20	14.60	1

ISOTROPIC SOIL PARAMETERS

2 TYPE(S) OF SOIL

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 2 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	16.10
2	42.20	16.10

A HORIZONTAL EARTHQUAKE LOADING COEFFICIENT

OF .050 HAS BEEN ASSIGNED

A VERTICAL EARTHQUAKE LOADING COEFFICIENT

OF .000 HAS BEEN ASSIGNED

CAVITATION PRESSURE = .0 T/MQ

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED. 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED

ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT.

AND X = 18.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 20.00 MT.

AND X = 40.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION

AT WHICH A SURFACE EXTENDS IS Y = .00 MT.

1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

FOLLOWING IS DISPLAYED THE

MOST CRITICAL OF THE TRIAL

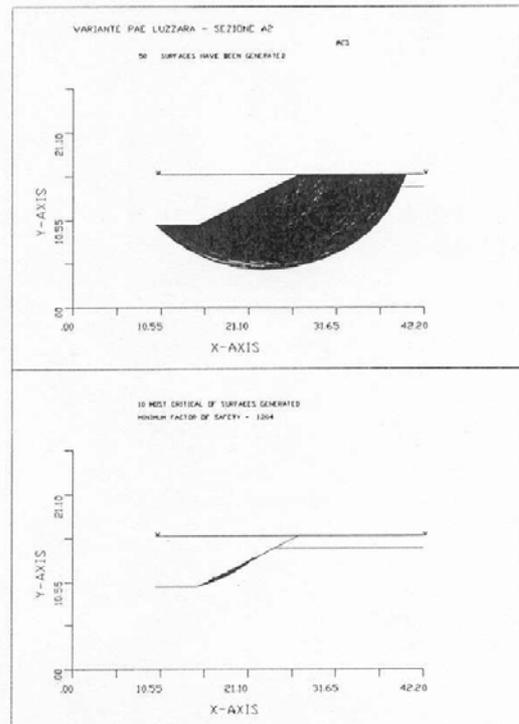
FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY

7 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	16.86	10.93
2	17.79	11.29
3	18.71	11.69
4	19.61	12.13
5	20.48	12.61
6	21.34	13.13
7	21.56	13.28

*** 1.204 ***



ALLEGATI SOTTOZONA B

Sezioni stratigrafiche interpretative
e
verifiche di stabilità

SEZIONE C-C'

PIRELLA
C-14/15

SEZIONE D-D'

COMITENTE: COMUNE DI LUZZARA

LAVORO: PIANO DI COORDINAMENTO ATTUATIVO

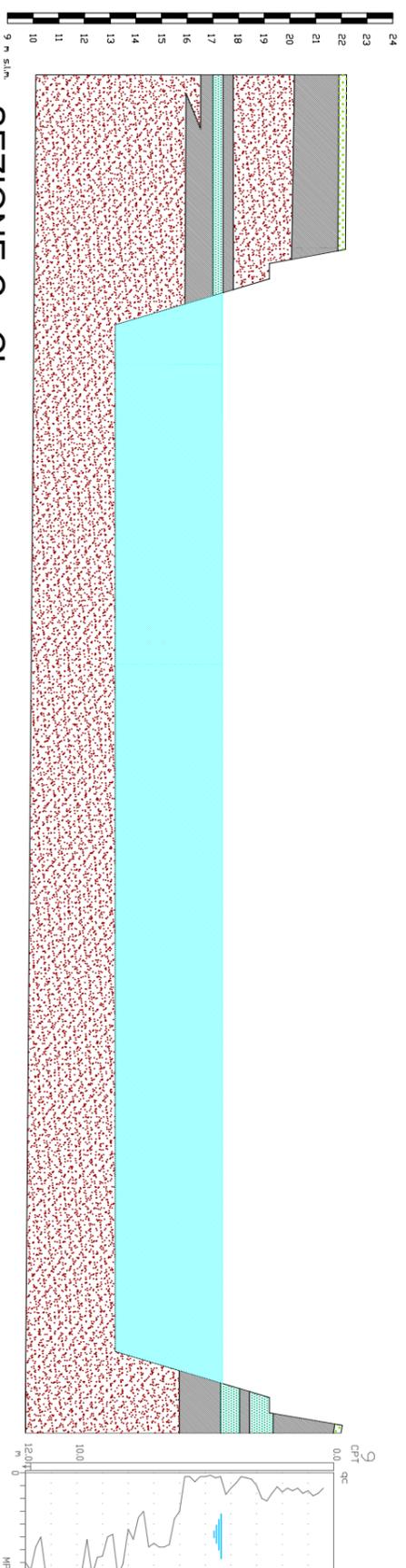
LOCALITA': POLO DI P.I.A.E. P0015 BELGRADO-FOGARINO

SOTTOZONA B

SEZIONI STRATIGRAFICHE INTERPRETATIVE

LEGENDA

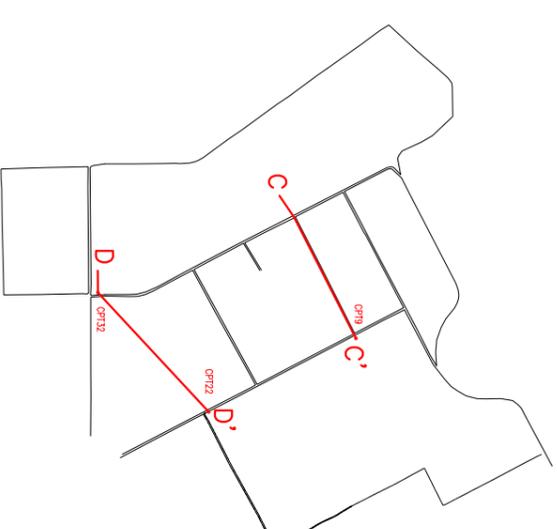
	Terreno vegetale		Sabbie prevalenti
	Argille limi e limi argilloso sabbiosi prevalenti		piezometrica (quota indicativa)
	Sabbie limose prevalenti		



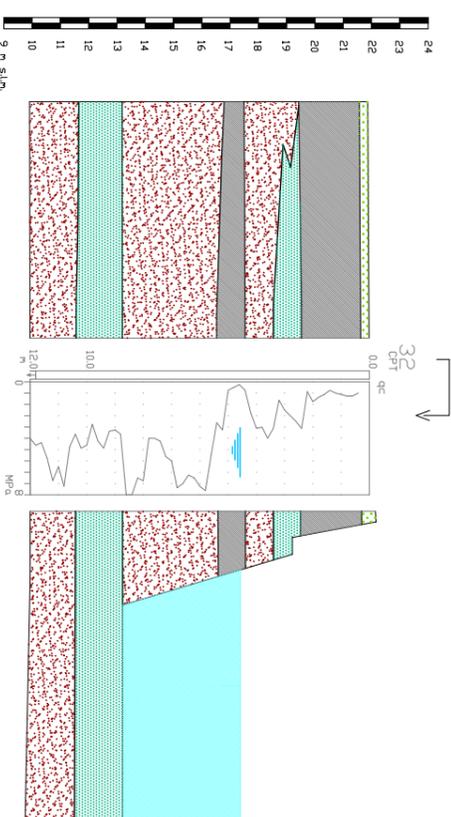
SEZIONE C - C'

Scala, distanze
planimetriche

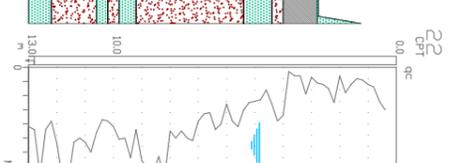
0 250 500 m



PIANTA
CHIAVE



SEZIONE D - D'



0 250 500 m

gEOLOG

VARIANTE PAE LUZZARA - SEZIONE B1 - CONDIZIONI "NORMALI"

Input file : B1

BOUNDARY COORDINATES

12 TOP BOUNDARIES

15 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	26.10	10.00	1
2	26.10	10.00	30.30	12.10	1
3	30.30	12.10	31.80	13.10	1
4	31.80	13.10	35.55	15.60	2
5	35.55	15.60	39.30	18.10	3
6	39.30	18.10	42.30	18.10	3
7	42.30	18.10	44.80	20.60	4
8	44.80	20.60	59.80	20.60	4
9	59.80	20.60	66.50	24.60	4
10	66.50	24.60	69.40	24.60	4
11	69.40	24.60	75.80	20.60	4
12	75.80	20.60	85.00	20.60	4
13	42.30	18.10	85.00	18.10	3
14	35.55	15.60	85.00	15.60	2
15	31.80	13.10	85.00	13.10	1

ISOTROPIC SOIL PARAMETERS

4 TYPE(S) OF SOIL

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER (T/MQ)	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1
3	1.9	1.9	.0	36.0	.00	.0	1
4	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 2 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	16.10
2	85.00	16.10

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED. 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT.

AND X = 32.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 45.00 MT.

AND X = 69.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION AT WHICH A SURFACE EXTENDS IS Y = .00 MT.

1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

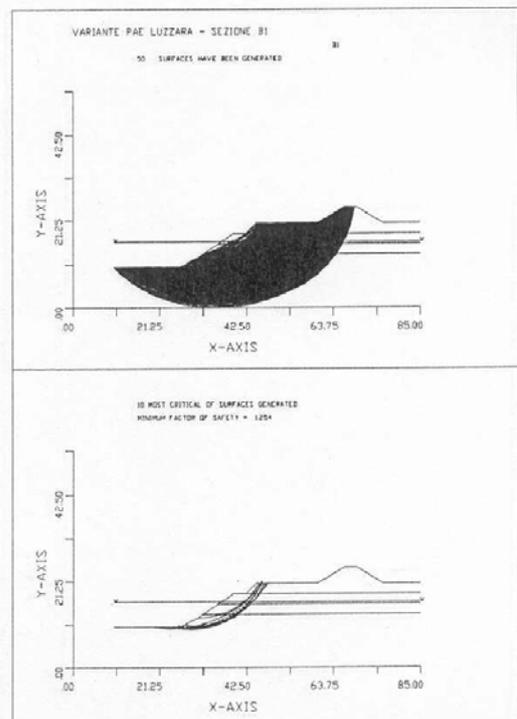
FOLLOWING IS DISPLAYED THE MOST CRITICAL OF THE TRIAL FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY

26 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	25.71	10.00
2	26.71	9.87
3	27.70	9.78
4	28.70	9.75
5	29.70	9.78
6	30.70	9.85
7	31.69	9.98
8	32.68	10.15
9	33.65	10.38
10	34.61	10.66
11	35.55	10.99
12	36.48	11.37
13	37.39	11.79
14	38.27	12.26
15	39.12	12.78
16	39.95	13.34
17	40.75	13.94
18	41.51	14.59
19	42.24	15.27
20	42.94	15.99
21	43.59	16.74
22	44.21	17.53
23	44.78	18.35
24	45.31	19.20
25	45.80	20.07
26	46.06	20.60

*** 1.254 ***



geOLOG

VARIANTE PAE LUZZARA - SEZIONE B1 - CONDIZIONI "DI PIENA"
Input file : B1P

BOUNDARY COORDINATES
12 TOP BOUNDARIES
15 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	26.10	10.00	1
2	26.10	10.00	30.30	12.10	1
3	30.30	12.10	31.80	13.10	1
4	31.80	13.10	35.55	15.60	2
5	35.55	15.60	39.30	18.10	3
6	39.30	18.10	42.30	18.10	3
7	42.30	18.10	44.80	20.60	4
8	44.80	20.60	59.80	20.60	4
9	59.80	20.60	66.50	24.60	4
10	66.50	24.60	69.40	24.60	4
11	69.40	24.60	75.80	20.60	4
12	75.80	20.60	85.00	20.60	4
13	42.30	18.10	85.00	18.10	3
14	35.55	15.60	85.00	15.60	2
15	31.80	13.10	85.00	13.10	1

ISOTROPIC SOIL PARAMETERS

4 TYPE(S) OF SOIL

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE CONSTANT	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	1
2	2.0	2.0	.7	24.0	.00	1
3	1.9	1.9	.0	36.0	.00	1
4	2.0	2.0	.7	24.0	.00	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 5 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	16.10
2	36.30	16.10
3	59.80	19.10
4	69.40	24.60
5	85.00	24.60

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED. 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT. AND X = 32.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 45.00 MT. AND X = 69.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION AT WHICH A SURFACE EXTENDS IS Y = .00 MT. 1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

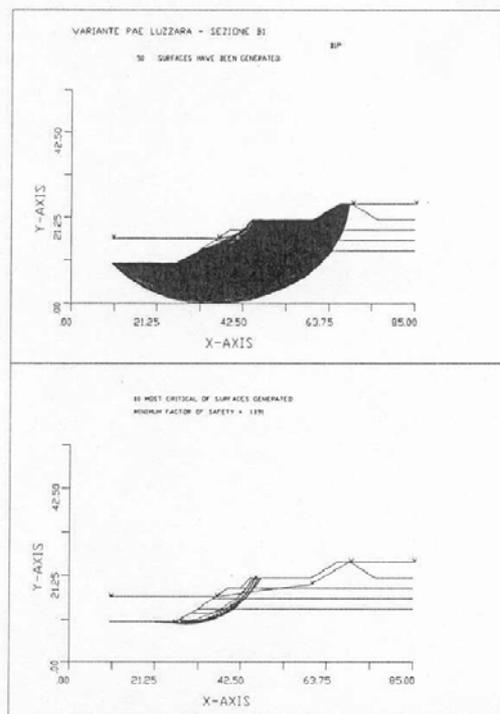
FOLLOWING IS DISPLAYED THE MOST CRITICAL OF THE TRIAL FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY

26 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	25.71	10.00
2	26.71	9.87
3	27.70	9.78
4	28.70	9.75
5	29.70	9.78
6	30.70	9.85
7	31.69	9.98
8	32.68	10.15
9	33.65	10.38
10	34.61	10.66
11	35.55	10.99
12	36.48	11.37
13	37.39	11.79
14	38.27	12.26
15	39.12	12.78
16	39.95	13.34
17	40.75	13.94
18	41.51	14.59
19	42.24	15.27
20	42.94	15.99
21	43.59	16.74
22	44.21	17.53
23	44.78	18.35
24	45.31	19.20
25	45.80	20.07
26	46.06	20.60

*** 1.192 ***



geOLOG

VARIANTE PAE LUZZARA - SEZIONE B1 - CONDIZIONI "DI PIENA" CON SISMA
 Input file : BIPS

BOUNDARY COORDINATES
 12 TOP BOUNDARIES
 15 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	26.10	10.00	1
2	26.10	10.00	30.30	12.10	1
3	30.30	12.10	31.80	13.10	1
4	31.80	13.10	35.55	15.60	2
5	35.55	15.60	39.30	18.10	3
6	39.30	18.10	42.30	19.10	3
7	42.30	18.10	44.80	20.60	4
8	44.80	20.60	59.80	20.60	4
9	59.80	20.60	66.50	24.60	4
10	66.50	24.60	69.40	24.60	4
11	69.40	24.60	75.80	20.60	4
12	75.80	20.60	85.00	20.60	4
13	42.30	18.10	85.00	18.10	3
14	35.55	15.60	85.00	15.60	2
15	31.80	13.10	85.00	13.10	1

ISOTROPIC SOIL PARAMETERS

4 TYPE(S) OF SOIL

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MO)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER (T/MQ)	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1
3	1.9	1.9	.0	36.0	.00	.0	1
4	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 5 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	16.10
2	36.30	16.10
3	59.80	19.10
4	69.40	24.60
5	85.00	24.60

A HORIZONTAL EARTHQUAKE LOADING COEFFICIENT

OF .050 HAS BEEN ASSIGNED

A VERTICAL EARTHQUAKE LOADING COEFFICIENT

OF .000 HAS BEEN ASSIGNED

CAVITATION PRESSURE = .0 T/MQ

CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED. 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED

ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT.

AND X = 32.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 45.00 MT.

AND X = 69.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION

AT WHICH A SURFACE EXTENDS IS Y = .00 MT.

1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

FOLLOWING IS DISPLAYED THE

MOST CRITICAL OF THE TRIAL

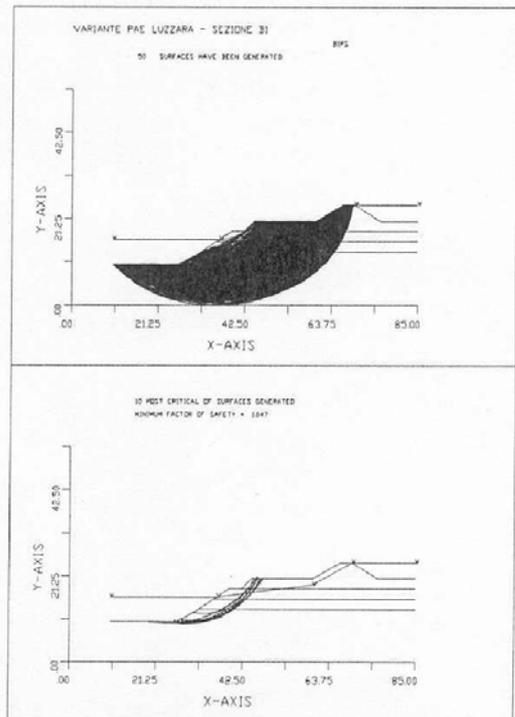
FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY

26 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	25.71	10.00
2	26.71	9.87
3	27.70	9.78
4	28.70	9.75
5	29.70	9.78
6	30.70	9.85
7	31.69	9.98
8	32.68	10.15
9	33.65	10.38
10	34.61	10.66
11	35.55	10.99
12	36.48	11.37
13	37.39	11.79
14	38.27	12.26
15	39.12	12.78
16	39.95	13.34
17	40.75	13.94
18	41.51	14.59
19	42.24	15.27
20	42.94	15.99
21	43.59	16.74
22	44.21	17.53
23	44.78	18.35
24	45.31	19.20
25	45.80	20.07
26	46.06	20.60

*** 1.048 ***



gEOLOG

VARIANTE PAE LUZZARA - SEZIONE B2 - CONDIZIONI "NORMALI"

Input file : B2

BOUNDARY COORDINATES

7 TOP BOUNDARIES

8 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	26.10	10.00	1
2	26.10	10.00	30.30	12.10	1
3	30.30	12.10	34.05	14.60	1
4	34.05	14.60	39.30	18.10	2
5	39.30	18.10	42.30	18.10	2
6	42.30	18.10	44.80	20.60	2
7	44.80	20.60	85.00	20.60	2
8	34.05	14.60	85.00	14.60	1

ISOTROPIC SOIL PARAMETERS

2 TYPE(S) OF SOIL

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER (T/MQ)	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 2 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	16.10
2	85.00	16.10

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED. 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED

ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT.

AND X = 32.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 45.00 MT.

AND X = 69.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION

AT WHICH A SURFACE EXTENDS IS Y = .00 MT.

1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

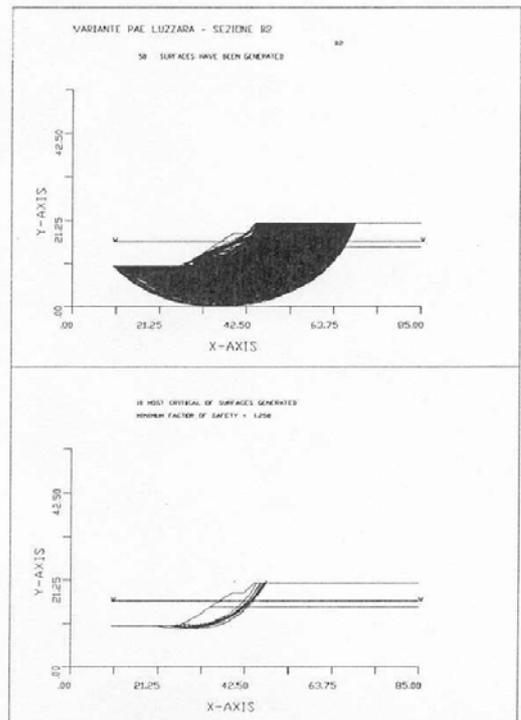
FOLLOWING IS DISPLAYED THE MOST CRITICAL OF THE TRIAL FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY

27 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	25.71	10.00
2	26.71	9.90
3	27.71	9.85
4	28.71	9.84
5	29.71	9.88
6	30.70	9.96
7	31.70	10.08
8	32.68	10.25
9	33.66	10.46
10	34.63	10.72
11	35.58	11.02
12	36.52	11.36
13	37.44	11.75
14	38.35	12.17
15	39.23	12.64
16	40.10	13.14
17	40.94	13.68
18	41.75	14.26
19	42.54	14.88
20	43.30	15.53
21	44.03	16.21
22	44.73	16.93
23	45.40	17.67
24	46.03	18.45
25	46.62	19.25
26	47.18	20.08
27	47.50	20.60

*** 1.250 ***



geOLOG

VARIANTE PAF LUZZARA - SEZIONE B2 - CONDIZIONI "NORMALI" CON SISMA
Input file : B2S

BOUNDARY COORDINATES

7 TOP BOUNDARIES

8 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	26.10	10.00	1
2	26.10	10.00	30.30	12.10	1
3	30.30	12.10	34.05	14.60	1
4	34.05	14.60	39.30	18.10	2
5	39.30	18.10	42.30	18.10	2
6	42.30	18.10	44.80	20.60	2
7	44.80	20.60	85.00	20.60	2
8	34.05	14.60	85.00	14.60	1

ISOTROPIC SOIL PARAMETERS

2 TYPE(S) OF SOIL

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 2 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	16.10
2	85.00	16.10

A HORIZONTAL EARTHQUAKE LOADING COEFFICIENT

OF .050 HAS BEEN ASSIGNED

A VERTICAL EARTHQUAKE LOADING COEFFICIENT

OF .000 HAS BEEN ASSIGNED

CAVITATION PRESSURE = .0 T/MQ

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED. 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED

ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT.

AND X = 32.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 45.00 MT.

AND X = 69.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION

AT WHICH A SURFACE EXTENDS IS Y = .00 MT.

1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

FOLLOWING IS DISPLAYED THE

MOST CRITICAL OF THE TRIAL

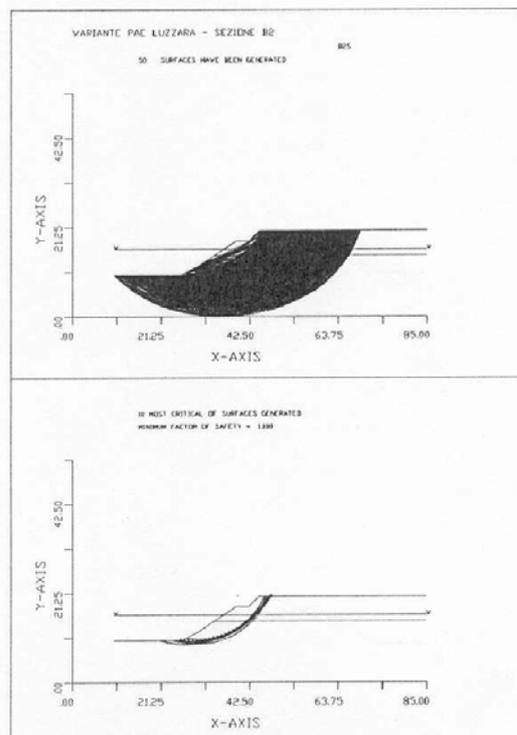
FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY

27 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	25.71	10.00
2	26.71	9.90
3	27.71	9.85
4	28.71	9.84
5	29.71	9.88
6	30.70	9.96
7	31.70	10.08
8	32.68	10.25
9	33.66	10.46
10	34.63	10.72
11	35.58	11.02
12	36.52	11.36
13	37.44	11.75
14	38.35	12.17
15	39.23	12.64
16	40.10	13.14
17	40.94	13.68
18	41.75	14.26
19	42.54	14.88
20	43.30	15.53
21	44.03	16.21
22	44.73	16.93
23	45.40	17.67
24	46.03	18.45
25	46.62	19.25
26	47.18	20.08
27	47.50	20.60

*** 1.100 ***



geOLOG

VARIANTE PAE LUZZARA - SEZIONE B3 - CONDIZIONI "NORMALI"

Input file : B3

BOUNDARY COORDINATES

12 TOP BOUNDARIES

13 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	26.10	10.00	1
2	26.10	10.00	30.30	12.10	1
3	30.30	12.10	38.55	17.60	1
4	38.55	17.60	39.30	18.10	2
5	39.30	18.10	42.30	18.10	2
6	42.30	18.10	44.80	20.60	2
7	44.80	20.60	49.80	20.60	2
8	49.80	20.60	54.80	18.10	2
9	54.80	18.10	57.80	18.10	2
10	57.80	18.10	58.80	17.60	2
11	58.80	17.60	74.00	10.00	1
12	74.00	10.00	85.00	10.00	1
13	38.55	17.60	58.80	17.60	1

ISOTROPIC SOIL PARAMETERS

2 TYPE(S) OF SOIL

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER (T/MQ)	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 2 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	16.10
2	85.00	16.10

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED. 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT.

AND X = 32.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 40.00 MT.

AND X = 55.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION AT WHICH A SURFACE EXTENDS IS Y = .00 MT.

1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

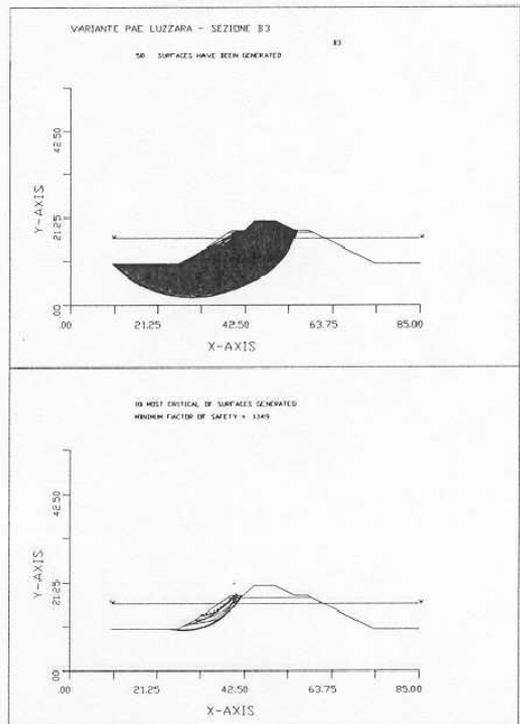
FOLLOWING IS DISPLAYED THE MOST CRITICAL OF THE TRIAL FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY

11 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	32.00	13.23
2	32.99	13.40
3	33.96	13.64
4	34.90	13.97
5	35.81	14.38
6	36.69	14.86
7	37.52	15.41
8	38.31	16.04
9	39.03	16.72
10	39.70	17.47
11	40.18	18.10

*** 1.149 ***



gEOLOG

VARIANTE PAE LUZZARA - SEZIONE B3 - CONDIZIONI "NORMALI" CON SISMA
 Input file : B3S

BOUNDARY COORDINATES

12 TOP BOUNDARIES

13 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	26.10	10.00	1
2	26.10	10.00	30.30	12.10	1
3	30.30	12.10	38.55	17.60	1
4	38.55	17.60	39.30	18.10	2
5	39.30	18.10	42.30	18.10	2
6	42.30	18.10	44.80	20.60	2
7	44.80	20.60	49.80	20.60	2
8	49.80	20.60	54.80	18.10	2
9	54.80	18.10	57.80	18.10	2
10	57.80	18.10	58.80	17.60	2
11	58.80	17.60	74.00	10.00	1
12	74.00	10.00	85.00	10.00	1
13	38.55	17.60	58.80	17.60	1

ISOTROPIC SOIL PARAMETERS

2 TYPE(S) OF SOIL

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER (T/MQ)	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 2 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	16.10
2	85.00	16.10

A HORIZONTAL EARTHQUAKE LOADING COEFFICIENT

OF .050 HAS BEEN ASSIGNED

A VERTICAL EARTHQUAKE LOADING COEFFICIENT

OF .000 HAS BEEN ASSIGNED

CAVITATION PRESSURE = .0 T/MQ

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED. 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED

ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT.

AND X = 32.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 40.00 MT.

AND X = 55.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION

AT WHICH A SURFACE EXTENDS IS Y = .00 MT.

1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

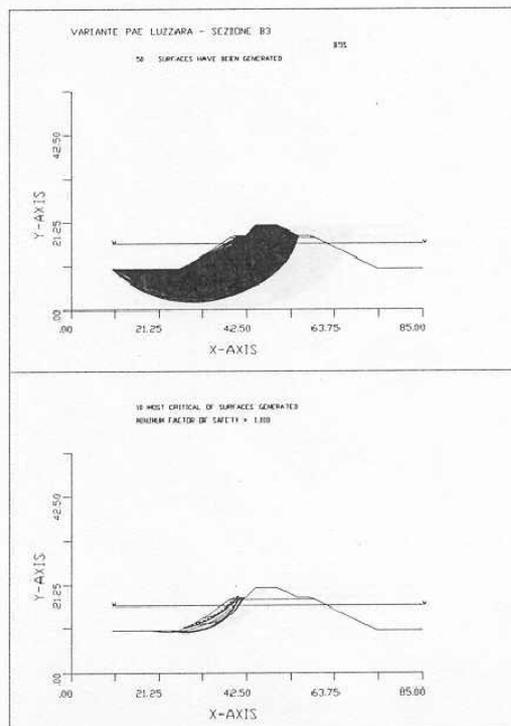
FOLLOWING IS DISPLAYED THE MOST CRITICAL OF THE TRIAL FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY

17 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	27.29	10.59
2	28.25	10.84
3	29.21	11.13
4	30.16	11.46
5	31.09	11.82
6	32.00	12.22
7	32.91	12.66
8	33.79	13.13
9	34.65	13.63
10	35.49	14.17
11	36.32	14.74
12	37.11	15.34
13	37.89	15.98
14	38.64	16.64
15	39.36	17.33
16	40.05	18.05
17	40.09	18.10

*** 1.019 ***



geOLOG

VARIANTE PAE LUZZARA - SEZIONE B4 - CONDIZIONI "NORMALI"

Input file : B4

BOUNDARY COORDINATES

6 TOP BOUNDARIES

7 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	26.10	10.00	1
2	26.10	10.00	30.30	12.10	1
3	30.30	12.10	42.30	18.10	1
4	42.30	18.10	42.80	18.60	1
5	42.80	18.60	44.80	20.60	2
6	44.80	20.60	85.00	20.60	2
7	42.80	18.60	85.00	18.60	1

ISOTROPIC SOIL PARAMETERS

2 TYPE(S) OF SOIL

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER (T/MQ)	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 2 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	16.10
2	85.00	16.10

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED. 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED

ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT.

AND X = 32.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 45.00 MT.

AND X = 69.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION

AT WHICH A SURFACE EXTENDS IS Y = .00 MT.

1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

FOLLOWING IS DISPLAYED THE

MOST CRITICAL OF THE TRIAL

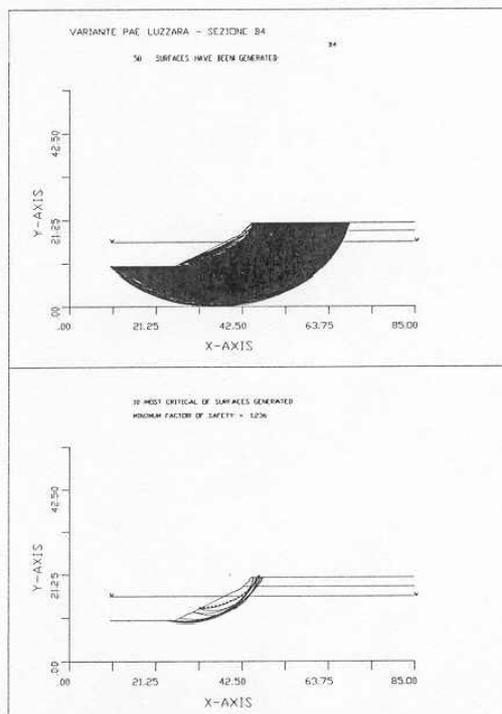
FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY

19 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	32.00	12.95
2	33.00	12.97
3	34.00	13.05
4	34.99	13.18
5	35.97	13.37
6	36.94	13.62
7	37.89	13.92
8	38.83	14.27
9	39.74	14.68
10	40.63	15.14
11	41.49	15.65
12	42.32	16.20
13	43.12	16.80
14	43.88	17.45
15	44.61	18.14
16	45.29	18.87
17	45.93	19.64
18	46.53	20.44
19	46.63	20.60

*** 1.236 ***



geOLOG

VARIANTE PAF LUZZARA - SEZIONE B4 - CONDIZIONI "NORMALI" CON SISMA
 Input file : B4S

BOUNDARY COORDINATES

6 TOP BOUNDARIES

7 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	26.10	10.00	1
2	26.10	10.00	30.30	12.10	1
3	30.30	12.10	42.30	18.10	1
4	42.30	18.10	42.80	18.60	1
5	42.80	18.60	44.80	20.60	2
6	44.80	20.60	85.00	20.60	2
7	42.80	18.60	85.00	18.60	1

ISOTROPIC SOIL PARAMETERS

2 TYPE(S) OF SOIL

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER (T/MQ)	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 2 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	16.10
2	85.00	16.10

A HORIZONTAL EARTHQUAKE LOADING COEFFICIENT

OF .050 HAS BEEN ASSIGNED

A VERTICAL EARTHQUAKE LOADING COEFFICIENT

OF .000 HAS BEEN ASSIGNED

CAVITATION PRESSURE = .0 T/MQ

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED. 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED

ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT.

AND X = 32.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 45.00 MT.

AND X = 69.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION

AT WHICH A SURFACE EXTENDS IS Y = .00 MT.

1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

FOLLOWING IS DISPLAYED THE

MOST CRITICAL OF THE TRIAL

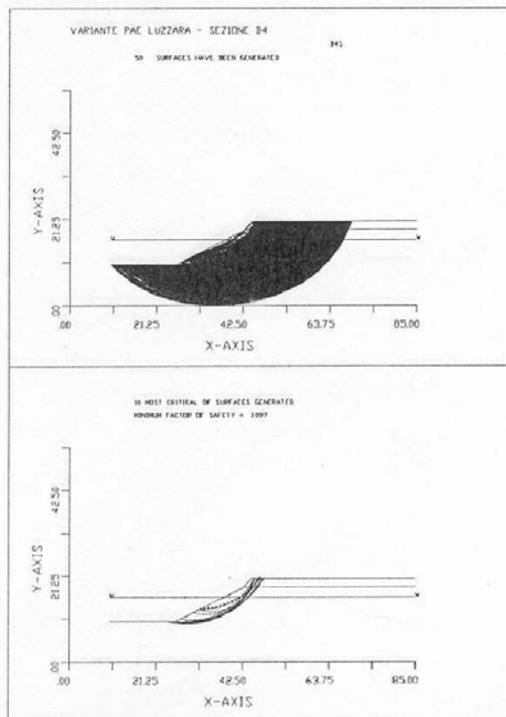
FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY

19 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	32.00	12.95
2	33.00	12.97
3	34.00	13.05
4	34.99	13.18
5	35.97	13.37
6	36.94	13.62
7	37.89	13.92
8	38.83	14.27
9	39.74	14.68
10	40.63	15.14
11	41.49	15.65
12	42.32	16.20
13	43.12	16.80
14	43.88	17.45
15	44.61	18.14
16	45.29	18.87
17	45.93	19.64
18	46.53	20.44
19	46.63	20.60

*** 1.098 ***



geOLOG

VARIANTE PAE LUZZARA - SEZIONE B5 - CONDIZIONI "NORMALI"
Input file : B5

BOUNDARY COORDINATES
12 TOP BOUNDARIES
13 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	26.10	10.00	1
2	26.10	10.00	30.30	12.10	1
3	30.30	12.10	39.30	18.10	2
4	39.30	18.10	42.30	18.10	2
5	42.30	18.10	42.80	18.60	2
6	42.80	18.60	44.80	20.60	2
7	44.80	20.60	49.80	20.60	2
8	49.80	20.60	53.80	18.60	2
9	53.80	18.60	54.80	18.10	1
10	54.80	18.10	57.80	18.10	1
11	57.80	18.10	74.60	9.70	1
12	74.60	9.70	85.00	9.70	1
13	42.80	18.60	53.80	18.60	1

ISOTROPIC SOIL PARAMETERS
2 TYPE(S) OF SOIL

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER (T/MQ)	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED
UNITWEIGHT OF WATER = 1.00
PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 2 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	16.10
2	85.00	16.10

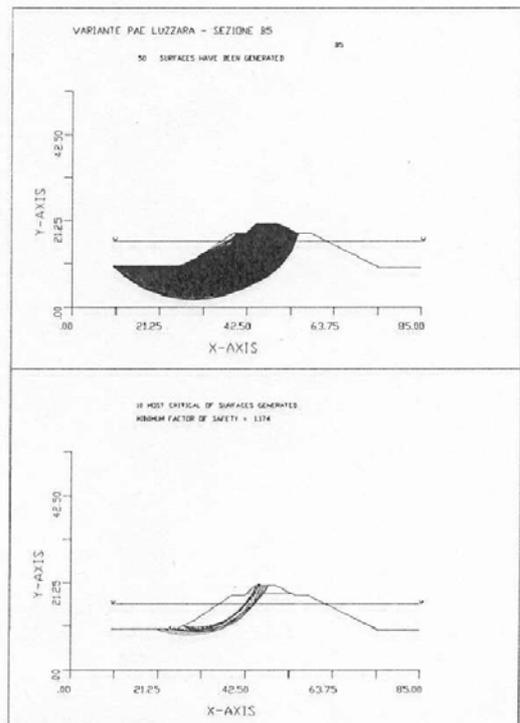
A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED.
750 TRIAL SURFACES HAVE BEEN GENERATED.
50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT. AND X = 32.00 MT.
EACH SURFACE TERMINATES BETWEEN X = 40.00 MT. AND X = 55.00 MT.
UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION AT WHICH A SURFACE EXTENDS IS Y = .00 MT.
1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

FOLLOWING IS DISPLAYED THE MOST CRITICAL OF THE TRIAL FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY
28 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	24.14	10.00
2	25.12	9.78
3	26.10	9.61
4	27.10	9.50
5	28.10	9.44
6	29.10	9.44
7	30.10	9.49
8	31.09	9.59
9	32.08	9.75
10	33.06	9.96
11	34.02	10.22
12	34.97	10.53
13	35.90	10.90
14	36.81	11.31
15	37.70	11.78
16	38.56	12.29
17	39.39	12.85
18	40.18	13.45
19	40.95	14.09
20	41.68	14.78
21	42.37	15.50
22	43.02	16.26
23	43.63	17.05
24	44.20	17.88
25	44.72	18.73
26	45.19	19.61
27	45.61	20.52
28	45.65	20.60

*** 1.175 ***



gEOLOG

VARIANTE PAE LUZZARA - SEZTONE B5 - CONDIZIONI "NORMALI" CON SISMA
 Input file : B55

BOUNDARY COORDINATES
 12 TOP BOUNDARIES
 13 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	26.10	10.00	1
2	26.10	10.00	30.30	12.10	1
3	30.30	12.10	39.30	18.10	2
4	39.30	18.10	42.30	18.10	2
5	42.30	18.10	42.80	18.60	2
6	42.80	18.60	44.80	20.60	2
7	44.80	20.60	49.00	20.60	2
8	49.00	20.60	53.80	18.60	2
9	53.80	18.60	54.80	18.10	1
10	54.80	18.10	57.80	18.10	1
11	57.80	18.10	74.60	9.70	1
12	74.60	9.70	85.00	9.70	1
13	42.80	18.60	53.80	18.60	1

ISOTROPIC SOIL PARAMETERS

TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00
 PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 2 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	16.10
2	85.00	16.10

A HORIZONTAL EARTHQUAKE LOADING COEFFICIENT

OF .050 HAS BEEN ASSIGNED
 A VERTICAL EARTHQUAKE LOADING COEFFICIENT
 OF .000 HAS BEEN ASSIGNED
 CAVITATION PRESSURE = .0 T/MQ

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED.
 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT. AND X = 32.00 MT.
 EACH SURFACE TERMINATES BETWEEN X = 40.00 MT. AND X = 55.00 MT.

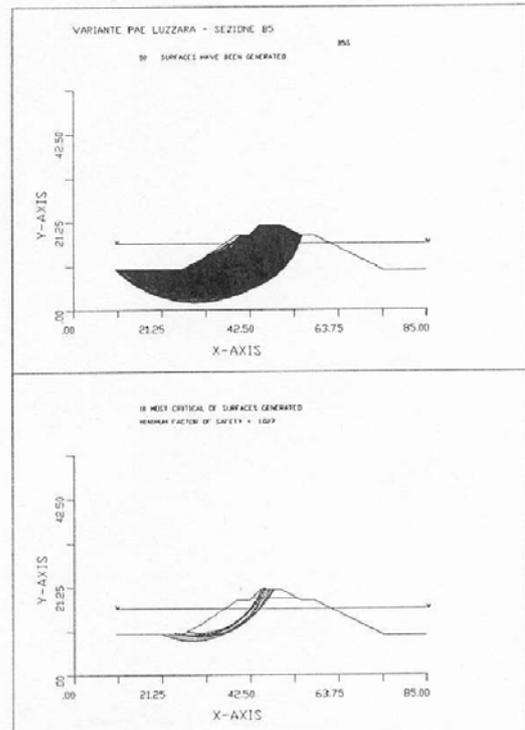
UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION AT WHICH A SURFACE EXTENDS IS Y = .00 MT.
 1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

FOLLOWING IS DISPLAYED THE MOST CRITICAL OF THE TRIAL FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY 28 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	24.14	10.00
2	25.12	9.78
3	26.10	9.61
4	27.10	9.50
5	28.10	9.44
6	29.10	9.44
7	30.10	9.49
8	31.09	9.59
9	32.08	9.75
10	33.06	9.96
11	34.02	10.22
12	34.97	10.53
13	35.90	10.90
14	36.81	11.31
15	37.70	11.78
16	38.56	12.29
17	39.39	12.85
18	40.18	13.45
19	40.95	14.09
20	41.68	14.78
21	42.37	15.50
22	43.02	16.26
23	43.63	17.05
24	44.20	17.88
25	44.72	18.73
26	45.19	19.61
27	45.61	20.52
28	45.65	20.60

*** 1.027 ***



ALLEGATI SOTTOZONA C

Sezione stratigrafica interpretativa
e
verifiche di stabilità

COMITENTE: COMUNE DI LUZZARA

LAVORO: PIANO DI COORDINAMENTO ATTUATIVO

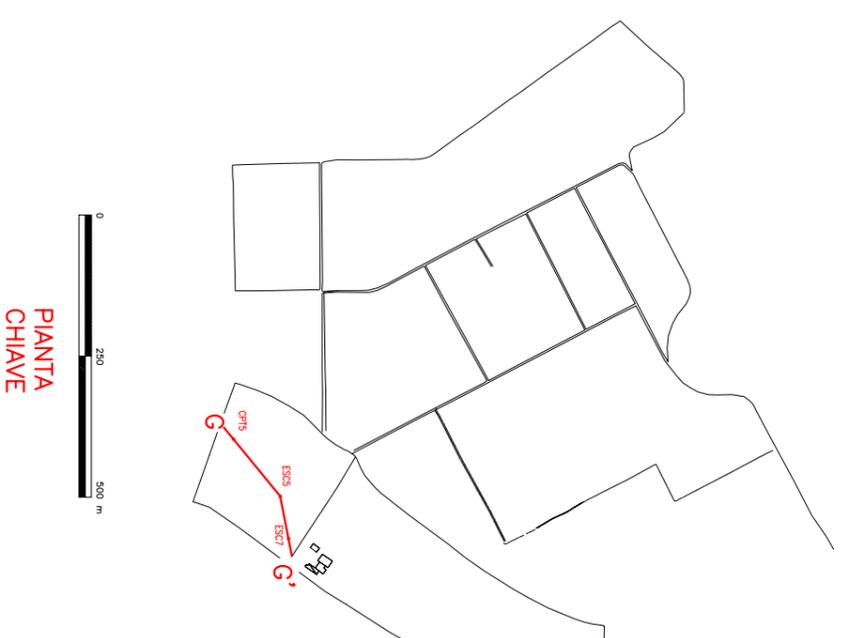
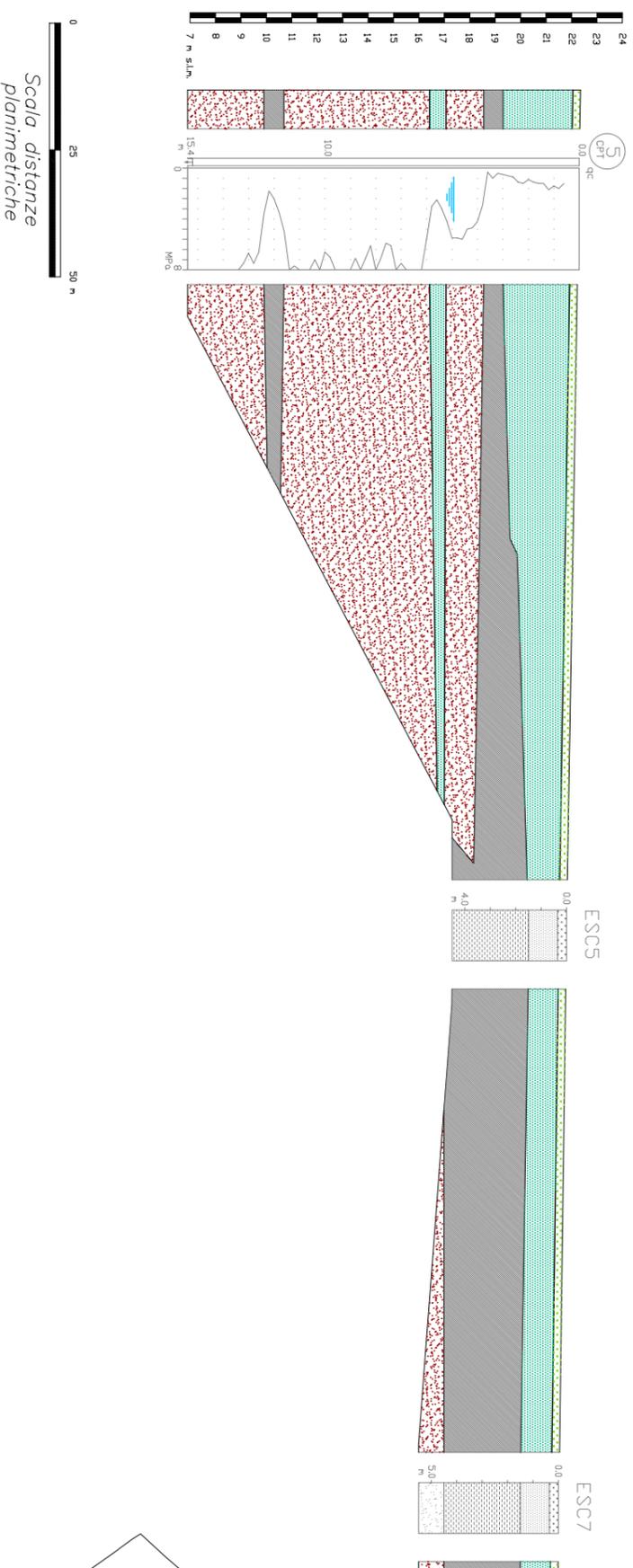
LOCALITA': POLO DI P.I.A.E. P0015 BELGRADO-FOGARINO

SOTTOZONA C

SEZIONI STRATIGRAFICHE INTERPRETATIVE

LEGENDA

	Terreno vegetale		Sabbie prevalenti
	Argille limi e limi argilloso sabbiosi prevalenti		piezometrica (quota indicativa)
	Sabbie limose prevalenti		



gEOLOG

VARIANTE AL PAE DI LUZZARA - SEZIONE C1 - CONDIZIONI "NORMALI"
Input file : c1

BOUNDARY COORDINATES

6 TOP BOUNDARIES

7 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	26.80	10.00	1
2	26.80	10.00	34.80	14.00	1
3	34.80	14.00	36.80	15.00	2
4	36.80	15.00	39.80	15.00	2
5	39.80	15.00	44.80	17.50	2
6	44.80	17.50	85.00	17.50	2
7	34.80	14.00	85.00	14.00	1

ISOTROPIC SOIL PARAMETERS

2 TYPE(S) OF SOIL

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER (T/MQ)	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.2	30.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 2 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	13.00
2	85.00	13.00

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED. 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED

ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT.

AND X = 28.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 40.00 MT.

AND X = 69.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION AT WHICH A SURFACE EXTENDS IS Y = .00 MT.

1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

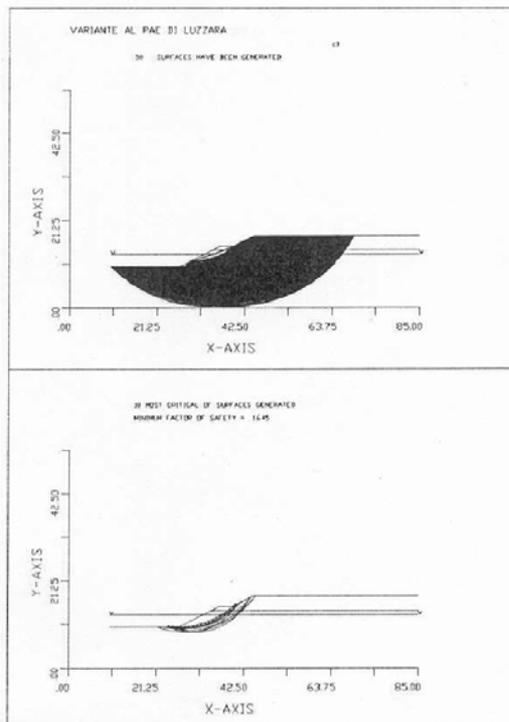
FOLLOWING IS DISPLAYED THE MOST CRITICAL OF THE TRIAL FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY

19 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	24.14	10.00
2	25.13	9.84
3	26.13	9.74
4	27.12	9.69
5	28.12	9.70
6	29.12	9.77
7	30.11	9.89
8	31.10	10.07
9	32.07	10.30
10	33.03	10.59
11	33.97	10.94
12	34.88	11.34
13	35.78	11.78
14	36.64	12.28
15	37.48	12.83
16	38.29	13.42
17	39.06	14.06
18	39.79	14.74
19	40.25	15.22

*** 1.646 ***



gEOLOG

VARIANTE PAE LUZZARA - SEZIONE C1 - CONDIZIONI "NORMALI" CON SISMA
Input file : C1S

BOUNDARY COORDINATES
6 TOP BOUNDARIES
7 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	26.80	10.00	1
2	26.80	10.00	34.80	14.00	1
3	34.80	14.00	36.80	15.00	2
4	36.80	15.00	39.80	15.00	2
5	39.80	15.00	44.80	17.50	2
6	44.80	17.50	85.00	17.50	2
7	34.80	14.00	85.00	14.00	1

ISOTROPIC SOIL PARAMETERS

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER (T/MQ)	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.2	30.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 2 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	13.00
2	85.00	13.00

A HORIZONTAL EARTHQUAKE LOADING COEFFICIENT

OF .050 HAS BEEN ASSIGNED

A VERTICAL EARTHQUAKE LOADING COEFFICIENT

OF .000 HAS BEEN ASSIGNED

CAVITATION PRESSURE = .0 T/MQ

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED. 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED

ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT.

AND X = 28.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 40.00 MT.

AND X = 69.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION

AT WHICH A SURFACE EXTENDS IS Y = .00 MT.

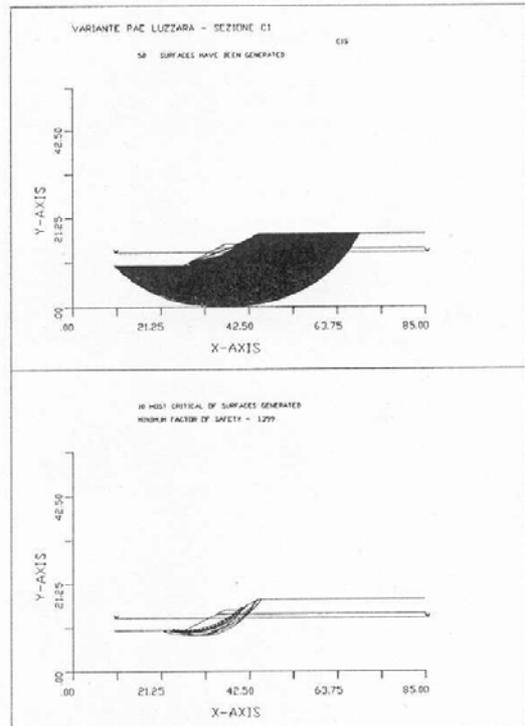
1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

FOLLOWING IS DISPLAYED THE MOST CRITICAL OF THE TRIAL FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY 19 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	24.14	10.00
2	25.13	9.84
3	26.13	9.74
4	27.12	9.69
5	28.12	9.70
6	29.12	9.77
7	30.11	9.89
8	31.10	10.07
9	32.07	10.30
10	33.03	10.59
11	33.97	10.94
12	34.88	11.34
13	35.78	11.78
14	36.64	12.28
15	37.48	12.83
16	38.29	13.42
17	39.06	14.06
18	39.79	14.74
19	40.25	15.22

*** 1.399 ***



COMPARTI	3	3	3
STRATI	1	1	1
STRATI	1	1	1
STRATI	1	1	1

30000
30000
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SOTTOZONA E

ALLEGATI SOTTOZONA E

Sezioni stratigrafiche interpretative
e
verifiche di stabilità

SEZIONE E - E'

SEZIONE F - F'

COMITENTE: COMUNE DI LUZZARA

LAVORO: PIANO DI COORDINAMENTO ATTUATIVO

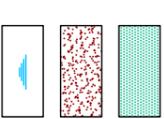
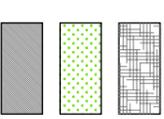
LOCALITA': POLO DI P.I.A.E. P0015 BELGRADO-FOGARINO

SOTTOZONA E

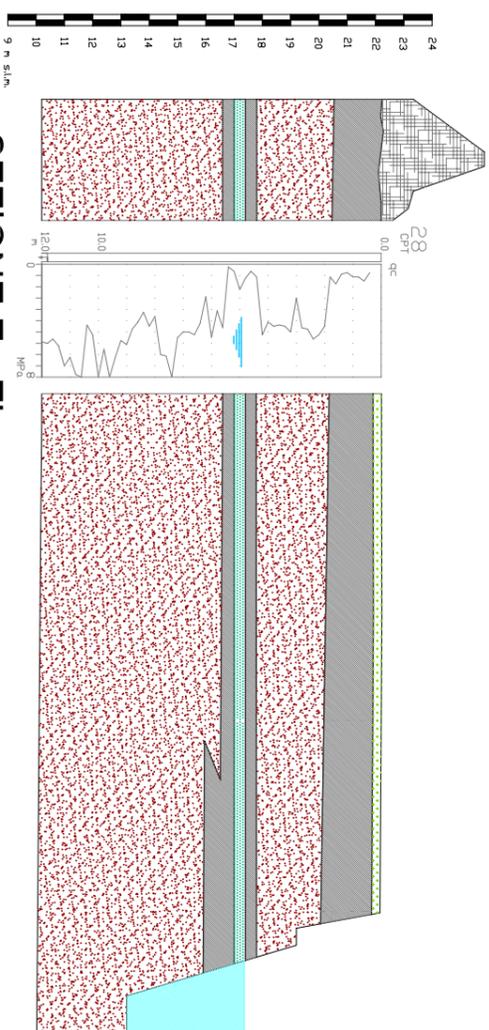
SEZIONI STRATIGRAFICHE INTERPRETATIVE

LEGENDA

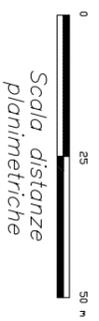
	Argine
	Terreno vegetale
	Argille limi e limi argillosi sabbiosi prevalenti



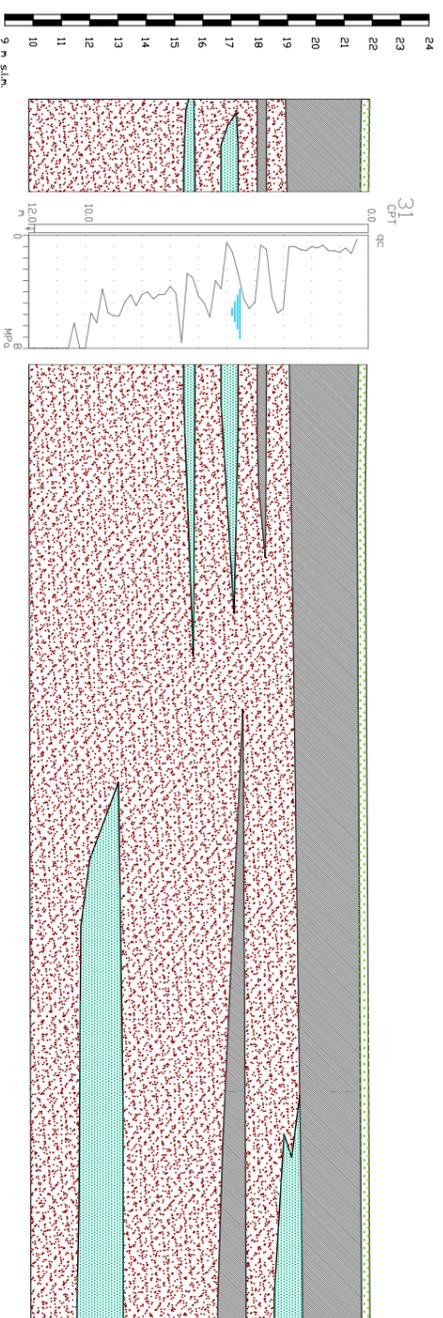
	Sabbie limose prevalenti
	Sabbie prevalenti
	piezometrica (quota indicativa)



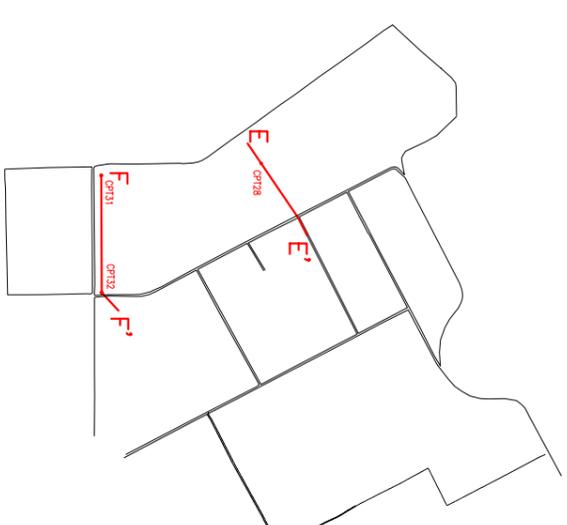
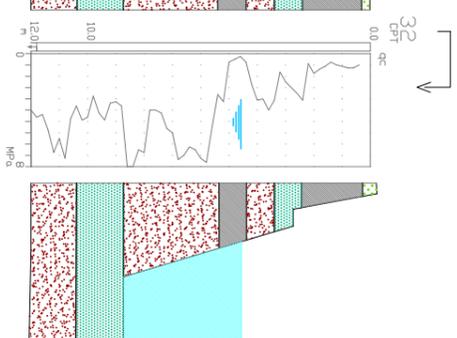
SEZIONE E - E'



Scala distanze
planimetriche



SEZIONE F - F'



PIANTA
CHIAVE

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VARIANTE PAE LUZZARA - SEZIONE E1 - CONDIZIONI "NORMALI"
Input file : E1

BOUNDARY COORDINATES
12 TOP BOUNDARIES
15 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	20.00	10.00	1
2	20.00	10.00	30.80	15.40	1
3	30.80	15.40	32.80	16.40	2
4	32.80	16.40	36.80	18.40	3
5	36.80	18.40	39.80	18.40	3
6	39.80	18.40	40.80	18.90	3
7	40.80	18.90	44.80	20.90	4
8	44.80	20.90	59.80	20.90	4
9	59.80	20.90	66.50	24.90	4
10	66.50	24.90	69.40	24.90	4
11	69.40	24.90	75.80	20.90	4
12	75.80	20.90	85.00	20.90	4
13	40.80	18.90	85.00	18.90	3
14	32.80	16.40	85.00	16.40	2
15	30.80	15.40	85.00	15.40	1

ISOTROPIC SOIL PARAMETERS
4 TYPE(S) OF SOIL

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1
3	1.9	1.9	.0	36.0	.00	.0	1
4	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 2 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	16.40
2	85.00	16.40

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED.
750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED

ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT.

AND X = 25.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 40.00 MT.

AND X = 69.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION

AT WHICH A SURFACE EXTENDS IS Y = .00 MT.

1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

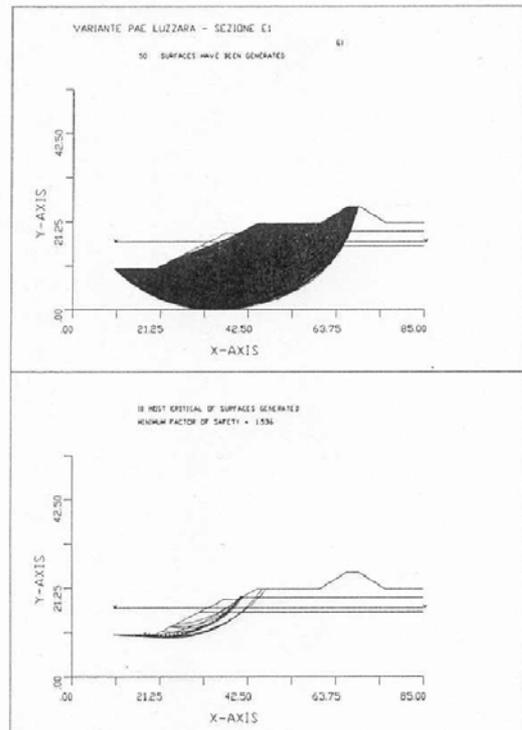
FOLLOWING IS DISPLAYED THE MOST CRITICAL OF THE TRIAL FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY

28 COORDINATE POINTS

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	17.50	10.00
2	18.49	9.85
3	19.48	9.74
4	20.48	9.67
5	21.48	9.64
6	22.48	9.65
7	23.48	9.71
8	24.47	9.80
9	25.46	9.93
10	26.45	10.11
11	27.43	10.33
12	28.39	10.58
13	29.35	10.88
14	30.29	11.21
15	31.22	11.58
16	32.13	11.99
17	33.02	12.44
18	33.90	12.93
19	34.75	13.45
20	35.59	14.00
21	36.40	14.59
22	37.18	15.21
23	37.94	15.86
24	38.67	16.54
25	39.37	17.25
26	40.04	17.99
27	40.68	18.76
28	40.79	18.89

*** 1.537 ***



geOLOG

VARIANTE PAE LUZZARA - SEZIONE E1 - CONDIZIONI "DI PIENA"
 Input file : E1P

BOUNDARY COORDINATES
 12 TOP BOUNDARIES
 15 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	20.00	10.00	1
2	20.00	10.00	30.80	15.40	1
3	30.80	15.40	32.80	16.40	2
4	32.80	16.40	36.80	18.40	3
5	36.80	18.40	39.80	18.40	3
6	39.80	18.40	40.80	18.90	3
7	40.80	18.90	44.80	20.90	4
8	44.80	20.90	59.80	20.90	4
9	59.80	20.90	66.50	24.90	4
10	66.50	24.90	69.40	24.90	4
11	69.40	24.90	75.80	20.90	4
12	75.80	20.90	85.00	20.90	4
13	40.80	18.90	85.00	18.90	3
14	32.80	16.40	85.00	16.40	2
15	30.80	15.40	85.00	15.40	1

ISOTROPIC SOIL PARAMETERS

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER (T/MQ)	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1
3	1.9	1.9	.0	36.0	.00	.0	1
4	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00

PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 5 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	16.40
2	32.80	16.40
3	59.80	19.40
4	69.40	24.90
5	85.00	24.90

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED. 750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED

ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT.

AND X = 25.00 MT.

EACH SURFACE TERMINATES BETWEEN X = 40.00 MT.

AND X = 69.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION

AT WHICH A SURFACE EXTENDS IS Y = .00 MT.

1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

FOLLOWING IS DISPLAYED THE

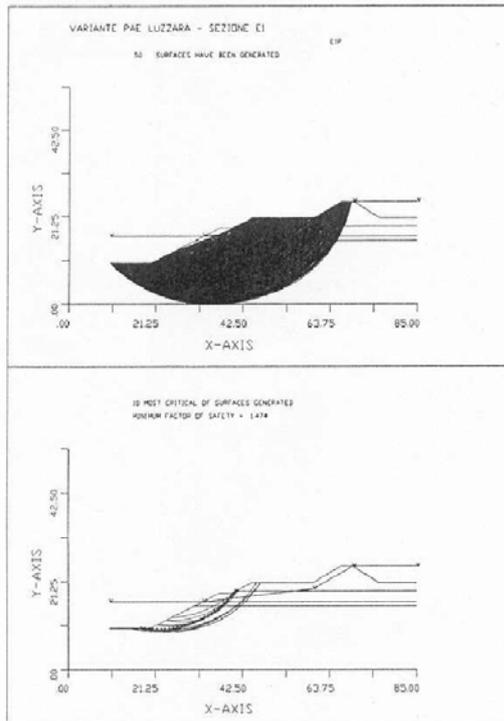
MOST CRITICAL OF THE TRIAL

FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	17.50	10.00
2	18.49	9.85
3	19.48	9.74
4	20.48	9.67
5	21.48	9.64
6	22.48	9.65
7	23.48	9.71
8	24.47	9.80
9	25.46	9.93
10	26.45	10.11
11	27.43	10.33
12	28.39	10.58
13	29.35	10.88
14	30.29	11.21
15	31.22	11.58
16	32.13	11.99
17	33.02	12.44
18	33.90	12.93
19	34.75	13.45
20	35.59	14.00
21	36.40	14.59
22	37.18	15.21
23	37.94	15.86
24	38.67	16.54
25	39.37	17.25
26	40.04	17.99
27	40.68	18.76
28	40.79	18.89

*** 1.475 ***



geOLOG

VARIANTE PAE LUZZARA - SEZIONE E1 - CONDIZIONI "DI PIENA" CON SISMA
Input file : E1PS

BOUNDARY COORDINATES
12 TOP BOUNDARIES
15 TOTAL BOUNDARIES

BOUNDARY NO.	X-LEFT (MT)	Y-LEFT (MT)	X-RIGHT (MT)	Y-RIGHT (MT)	SOIL TYPE BELOW BND
1	10.00	10.00	20.00	10.00	1
2	20.00	10.00	30.80	15.40	1
3	30.80	15.40	32.80	16.40	2
4	32.80	16.40	36.80	18.40	3
5	36.80	18.40	39.80	18.40	3
6	39.80	18.40	40.80	18.90	3
7	40.80	18.90	44.80	20.90	4
8	44.80	20.90	59.80	20.90	4
9	59.80	20.90	66.50	24.90	4
10	66.50	24.90	69.40	24.90	4
11	69.40	24.90	75.80	20.90	4
12	75.80	20.90	85.00	20.90	4
13	40.80	18.90	85.00	18.90	3
14	32.80	16.40	85.00	16.40	2
15	30.80	15.40	85.00	15.40	1

ISOTROPIC SOIL PARAMETERS

SOIL TYPE NO.	TOTAL UNIT WT. (T/MC)	SATURATED UNIT WT. (T/MC)	COHESION INTERCEPT (T/MQ)	FRICTION ANGLE (DEG)	PORE PRESSURE PARAMETER (T/MQ)	PRESSURE CONSTANT (T/MQ)	PIEZOMETRIC SURFACE NO.
1	1.9	1.9	.0	36.0	.00	.0	1
2	2.0	2.0	.7	24.0	.00	.0	1
3	1.9	1.9	.0	36.0	.00	.0	1
4	2.0	2.0	.7	24.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

UNITWEIGHT OF WATER = 1.00
PIEZOMETRIC SURFACE NO. 1 SPECIFIED BY 5 COORDINATE POINTS

POINT NO.	X-WATER (MT)	Y-WATER (MT)
1	10.00	16.40
2	32.80	16.40
3	59.80	19.40
4	69.40	24.90
5	85.00	24.90

A HORIZONTAL EARTHQUAKE LOADING COEFFICIENT OF .050 HAS BEEN ASSIGNED
A VERTICAL EARTHQUAKE LOADING COEFFICIENT OF .000 HAS BEEN ASSIGNED
CAVITATION PRESSURE = .0 T/MQ

A CRITICAL FAILURE SURFACE SEARCHING METHOD, USING A RANDOM TECHNIQUE FOR GENERATING CIRCULAR SURFACES, HAS BEEN SPECIFIED.
750 TRIAL SURFACES HAVE BEEN GENERATED.

50 SURFACES INITIATE FROM EACH OF 15 POINTS EQUALLY SPACED ALONG THE GROUND SURFACE BETWEEN X = 10.00 MT. AND X = 25.00 MT.
EACH SURFACE TERMINATES BETWEEN X = 40.00 MT. AND X = 69.00 MT.

UNLESS FURTHER LIMITATIONS WERE IMPOSED, THE MINIMUM ELEVATION AT WHICH A SURFACE EXTENDS IS Y = .00 MT.
1.00 MT. LINE SEGMENTS DEFINE EACH TRIAL FAILURE SURFACE.

FOLLOWING IS DISPLAYED THE MOST CRITICAL OF THE TRIAL FAILURE SURFACES EXAMINED

FAILURE SURFACE SPECIFIED BY

POINT NO.	X-SURF (MT)	Y-SURF (MT)
1	17.50	10.00
2	18.49	9.85
3	19.48	9.74
4	20.48	9.67
5	21.48	9.64
6	22.48	9.65
7	23.48	9.71
8	24.47	9.80
9	25.46	9.93
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13	29.35	10.88
14	30.29	11.21
15	31.22	11.58
16	32.13	11.99
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18	33.90	12.93
19	34.75	13.45
20	35.59	14.00
21	36.40	14.59
22	37.18	15.21
23	37.94	15.86
24	38.67	16.54
25	39.37	17.25
26	40.04	17.99
27	40.68	18.76
28	40.79	18.89

*** 1.246 ***

