

IL PIANO S.R.L..

PIANO URBANISTICO ATTUATIVO AREA DI TRASFORMAZIONE AREA AT 4.7

**LOCALITA' IL PIANO
COMUNE DI CASOLE D'ELSA (SI)**

**INDAGINE GEOGNOSTICA DI SUPPORTO
CARATTERISTICHE STRATIGRAFICHE
E GEOTECNICHE DELL'AREA
INTEGRAZIONI**

Colle di Val d'Elsa, Agosto 2014

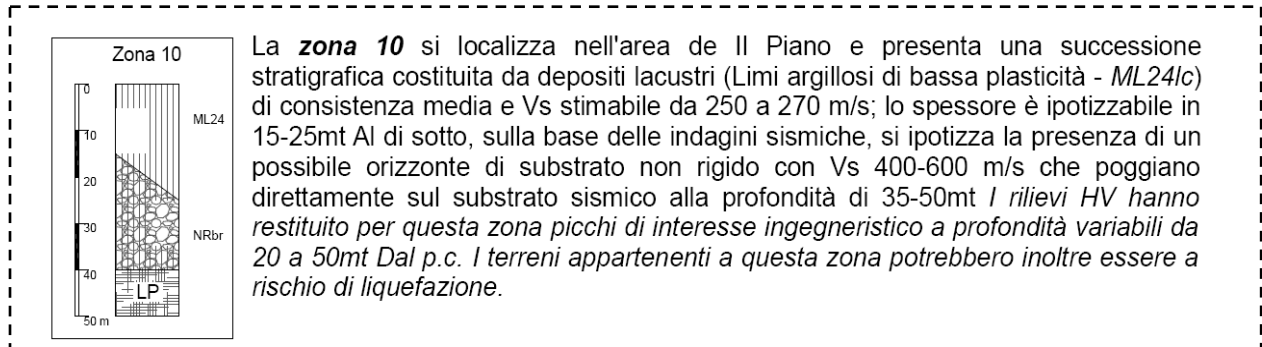
Dr. Claudio Bimbi

INTRODUZIONE

La presente viene redatta come integrazione a seguito delle richieste dell'Ufficio del Genio Civile di Siena.

In adempimento alle prescrizioni contenute negli elaborati grafici del R.U. e nella relazione descrittiva delle corrispondenti N.T.A. (Marzo 2014), ed in conseguenza dell'assegnazione della fattibilità sismica 3 (condizionata) definita in particolare da:

- Relazione MOPS, che definisce l'appartenenza dell'area alla c.d. "zona 10" (pag. 24), con la descrizione di seguito riportata:



- Tavole di MS 1.4 e 2.4 (V)
- Tavola G3.4 (V)
- N.T.A Art.93.2 e 100.3 par 3/b (V)

Viene pertanto eseguito l'approfondimento richiesto relativamente alla determinazione della suscettibilità alla liquefazione dinamica.

SUSCETTIBILITÀ DEL PROFILO ALLA LIQUEFAZIONE

L'analisi del potenziale di liquefazione in condizioni di deformazioni cicliche viene condotta con procedure deterministiche (Robertson & Wride, 1998; Idriss & Boulanger, 2004), basandosi sui risultati delle prove in sito disponibili CPT.

Le prove CPT utilizzate sono le 01V, 02V, 03V, 04V dell'indagine PUA, ai cui grafici si rimanda.

Il metodo utilizzato, il cui output è riportato in allegato, valuta separatamente le sollecitazioni max. di taglio proprie di un dato input sismico ($f(a_{max}, Magnitudo \ max. \ attesa)$) ed il livello di resistenza mobilizzabile dal profilo sottoposto ($f(NSPT, CPT)$); il rapporto così determinato tra la resistenza e la sollecitazione **CRR/CRS** costituisce il fattore di resistenza (o margine di sicurezza) al fenomeno, relativamente alle assunzioni con le quali è stato definito.

Rimandando alla letteratura specializzata per i dettagli teorici ed operativi della nota procedura, qui tradotti in semplici codici automatici dedicati, le sollecitazioni max. di taglio in condizioni dinamiche (o domanda sismica) **CRS**, rese adimensionali, sono valutate alla generica profondità (z) con un'espressione del tipo:

$$CRS = \frac{\tau_{av}}{\sigma'v0} = 0.65 \frac{a_{max}}{g} \frac{\sigma'v0}{\sigma'v0} \frac{r_d}{MWF}$$

Da Seed & Idriss
In cui:

| | | | | | |
|-----------|---------------------------------|------------|-------------------------------|------------|--|
| a_{max} | Accelerazione max in superficie | $\sigma'v$ | Tensione litostatica totale | r_d | Fattore correttivo $f(z)$ |
| g | Accelerazione di gravità | $\sigma'v$ | Tensione litostatica efficace | MWF | Fattore scala di magnitudo (espressione) |

Il valore di Magnitudo di momento max. attesa è derivato da tabelle INGV (2004, zonazione ZS9, cluster 921), mentre la PGA è quella corrispondente allo SLC calcolato; essi valgono rispettivamente **M = 6.14** e **$a_{max} = 0.25 \ g$** , la circolazione di falda viene arbitrariamente assunta per tutte le prove di riferimento alla profondità di 3.2 m.

Ad ogni profondità corrispondente al dato noto, il livello di resistenza mobilizzato, anch'esso in forma adimensionale, è valutato dalle espressioni:

$$\begin{aligned} \text{CRR a)} &= 0.833 [((qc_{1n})_{cs})/1000] + 0.05 && \text{per } (qc_{1n})_{cs} < 50 \\ \text{b)} &= 93 [((qc_{1n})_{cs})/1000]^3 && \text{per } 50 < (qc_{1n})_{cs} < 160 \end{aligned} \quad \text{Dove:}$$

$(qc_{1n})_{cs}$ Resistenza di punta equivalente (sabbie pulite), normalizzata $f(qc, \sigma'v0, lc)$ con iterazione

Il risultato è riportato in allegato per la continuità e la numerosità del dato, e filtrato automaticamente in funzione della parte sotto carico idrostatico, dell'intervallo granulometricamente ammissibile derivato dall'indice I_c e della resistenza $(qc_{1n})_{cs}$.

In tutti i casi il confronto **CRR/CRS**, specie quando si evidenzi che si è ottenuto con valori arbitrari (*maggior, seppure di poco, della PGA da normativa e più sollevati per quanto riguarda la falda*) offre risultati accettabili.

Colle di Val d'Elsa, 6 Agosto 2014

Dr. Claudio Bimbi

| | |
|--------|-----------|
| ID. | 20-02CU14 |
| CPT N° | CPT 01 |

| | |
|-------------------|------------|
| amax | 0.25 g |
| Magnitudo Momento | 6.14 |
| Falda | 3.2 (m) |
| Peso di volume | 19 (kN/mc) |

| | |
|---------|-------|
| MSF (1) | 1.668 |
| MSF (2) | 1.935 |
| MSF | 1.802 |
| MWF | 0.555 |

NL = Non soggetto a liquefazione

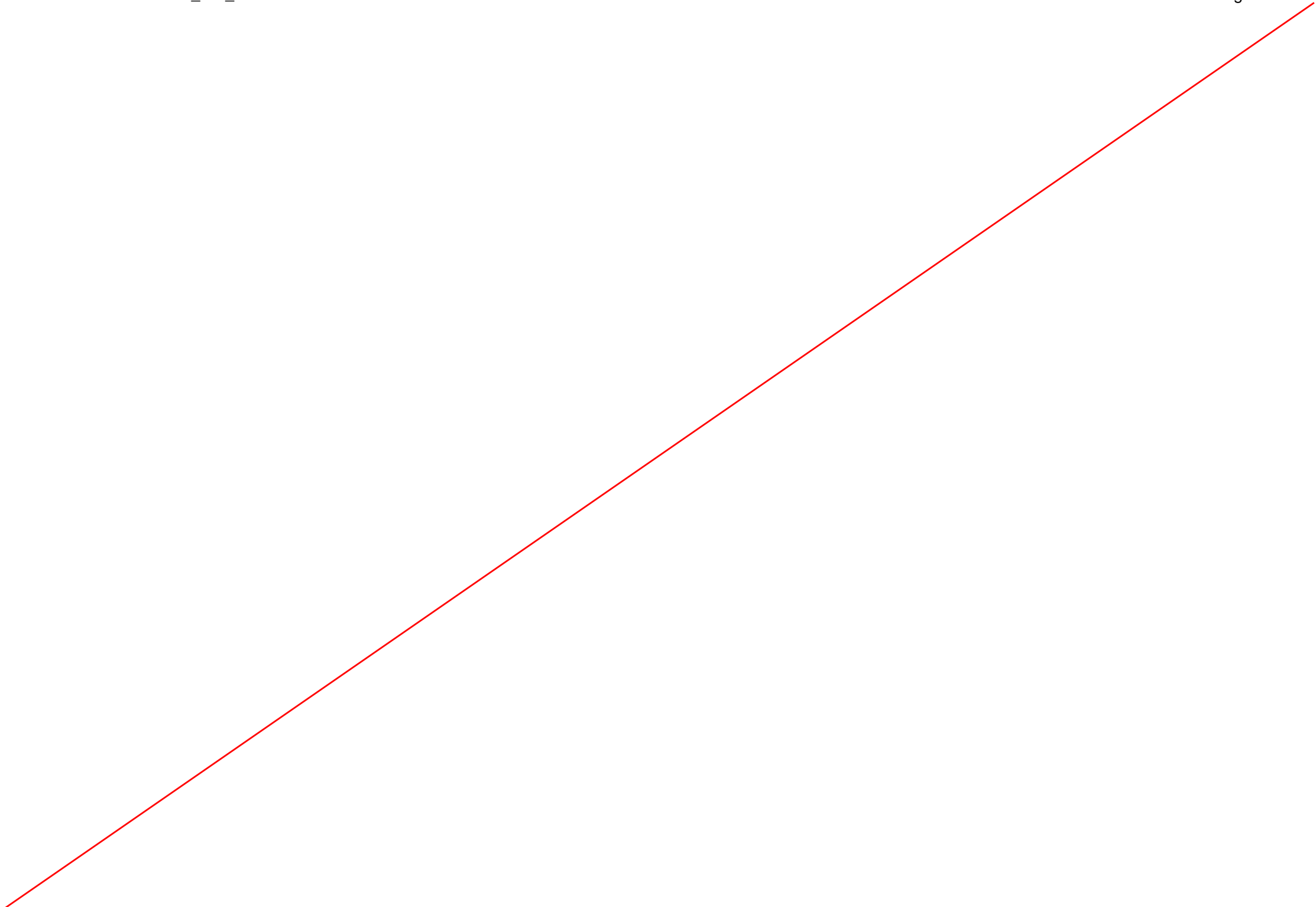
* Per $I_c > 2.6$

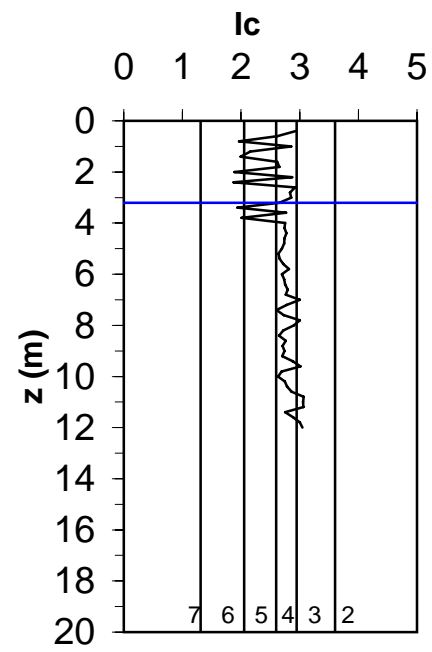
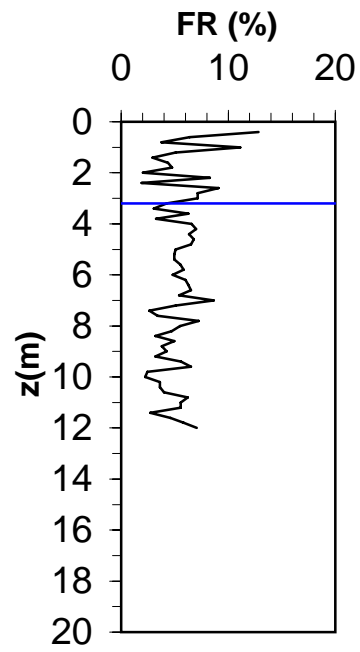
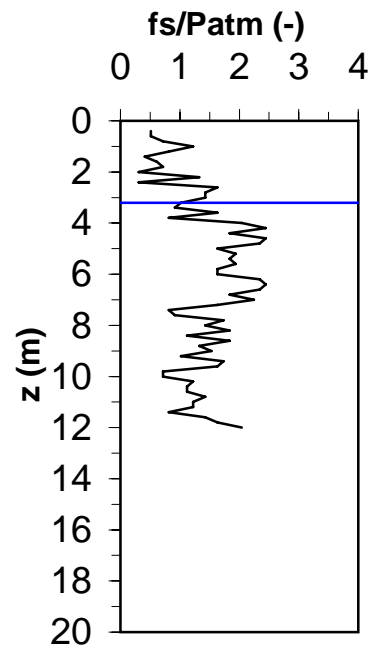
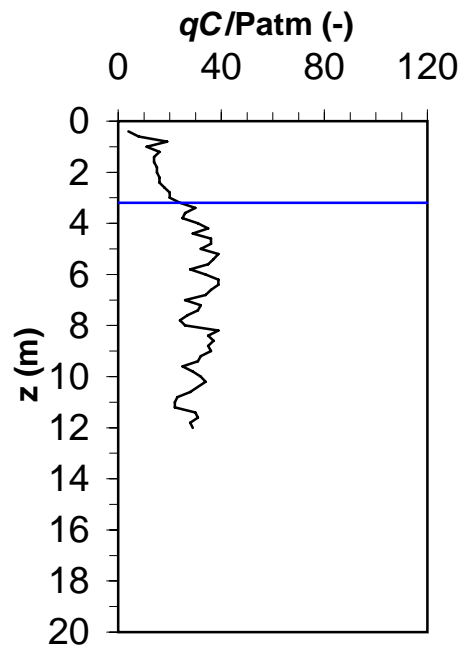
** Per $I_c > 2.6$ o sopra falda

*** Per $I_c > 2.6$ o sopra falda o $(q_{c1N})_{cs} > 160$

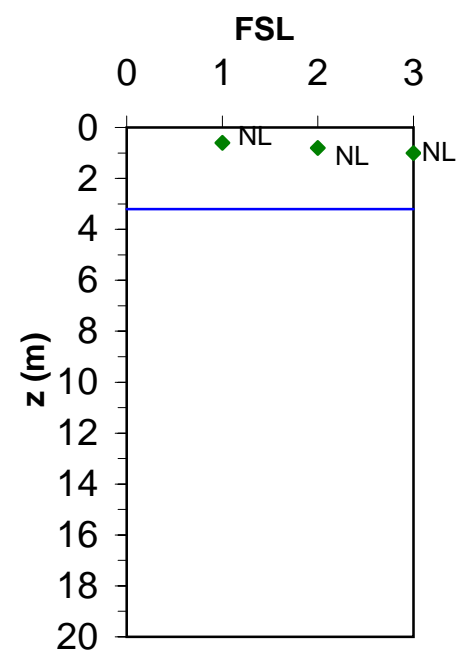
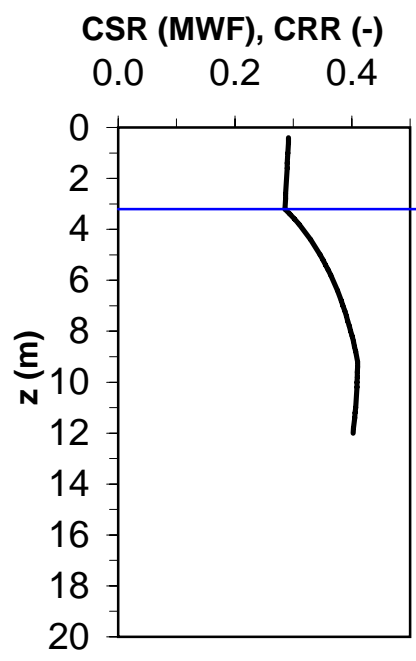
| z | q _c | f _s | q _c /Pa | f _s /Pa | R _f | σ _{v0} | σ' _{v0} | u ₀ | r _d | CSR | F _{norm} | Q _{norm} | q _{c1N} (0.75) | q _{c1N} (0.5) | q _{c1N} | I _{c(1)} | I _{c(0.5)} | I _c | SBT | F _c | K _c | (q _{c1N}) _{cs} | CRR | FSL |
|-----|----------------|----------------|--------------------|--------------------|----------------|-----------------|------------------|----------------|----------------|-------|-------------------|-------------------|----------------------------|---------------------------|------------------|-------------------|---------------------|----------------|-----|----------------|----------------|-----------------------------------|-----|-----|
| (m) | (kPa) | (kPa) | (-) | (-) | (%) | (kPa) | (kPa) | (kPa) | (-) | (-) | (-) | (-) | (-) | (-) | (-) | | | | (%) | * | (-) | ** | *** | |
| 0.4 | 390 | 50 | 3.98 | 0.51 | 12.82 | 7.60 | 7.60 | 0.00 | 0.997 | 0.292 | 13.08 | 50 | 85 | 141 | 50 | 2.93 | 2.68 | 2.93 | (4) | 40.33 | NL | NL | NL | NL |
| 0.6 | 780 | 50 | 7.95 | 0.51 | 6.41 | 11.40 | 11.40 | 0.00 | 0.995 | 0.291 | 6.51 | 67 | 126 | 231 | 67 | 2.61 | 2.31 | 2.61 | (4) | 27.52 | NL | NL | NL | NL |
| 0.8 | 1860 | 70 | 18.96 | 0.71 | 3.76 | 15.20 | 15.20 | 0.00 | 0.994 | 0.291 | 3.79 | 121 | 242 | 477 | 477 | 2.27 | 1.97 | 1.97 | (6) | 9.59 | 1.26 | NL | NL | NL |
| 1 | 1080 | 120 | 11.01 | 1.22 | 11.11 | 19.00 | 19.00 | 0.00 | 0.992 | 0.291 | 11.31 | 56 | 119 | 248 | 56 | 2.85 | 2.52 | 2.85 | (4) | 36.92 | NL | NL | NL | NL |
| 1.2 | 1570 | 80 | 16.00 | 0.82 | 5.10 | 22.80 | 22.80 | 0.00 | 0.991 | 0.290 | 5.17 | 68 | 150 | 329 | 329 | 2.53 | 2.16 | 2.16 | (5) | 13.83 | 1.56 | NL | NL | NL |
| 1.4 | 1370 | 40 | 13.97 | 0.41 | 2.92 | 26.60 | 26.60 | 0.00 | 0.989 | 0.290 | 2.98 | 51 | 117 | 266 | 266 | 2.45 | 1.99 | 1.99 | (6) | 10.10 | 1.29 | NL | NL | NL |
| 1.6 | 1370 | 60 | 13.97 | 0.61 | 4.38 | 30.40 | 30.40 | 0.00 | 0.988 | 0.289 | 4.48 | 44 | 106 | 248 | 44 | 2.61 | 2.16 | 2.61 | (4) | 27.57 | NL | NL | NL | NL |
| 1.8 | 1470 | 70 | 14.98 | 0.71 | 4.76 | 34.20 | 34.20 | 0.00 | 0.986 | 0.289 | 4.88 | 42 | 104 | 251 | 42 | 2.66 | 2.19 | 2.66 | (4) | 29.07 | NL | NL | NL | NL |
| 2 | 1470 | 30 | 14.98 | 0.31 | 2.04 | 38.00 | 38.00 | 0.00 | 0.985 | 0.288 | 2.09 | 38 | 96 | 238 | 238 | 2.44 | 1.89 | 1.89 | (6) | 8.10 | 1.18 | NL | NL | NL |
| 2.2 | 1570 | 130 | 16.00 | 1.33 | 8.28 | 41.80 | 41.80 | 0.00 | 0.983 | 0.288 | 8.51 | 37 | 96 | 243 | 37 | 2.87 | 2.41 | 2.87 | (4) | 37.83 | NL | NL | NL | NL |
| 2.4 | 1570 | 30 | 16.00 | 0.31 | 1.91 | 45.60 | 45.60 | 0.00 | 0.982 | 0.287 | 1.97 | 33 | 89 | 232 | 232 | 2.47 | 1.87 | 1.87 | (6) | 7.81 | 1.16 | NL | NL | NL |
| 2.6 | 1760 | 160 | 17.94 | 1.63 | 9.09 | 49.40 | 49.40 | 0.00 | 0.980 | 0.287 | 9.35 | 35 | 94 | 250 | 35 | 2.92 | 2.44 | 2.92 | (4) | 39.88 | NL | NL | NL | NL |
| 2.8 | 1960 | 140 | 19.98 | 1.43 | 7.14 | 53.20 | 53.20 | 0.00 | 0.979 | 0.287 | 7.34 | 36 | 99 | 269 | 36 | 2.83 | 2.33 | 2.83 | (4) | 36.05 | NL | NL | NL | NL |
| 3 | 1960 | 140 | 19.98 | 1.43 | 7.14 | 57.00 | 57.00 | 0.00 | 0.977 | 0.286 | 7.36 | 33 | 94 | 260 | 33 | 2.85 | 2.34 | 2.85 | (4) | 36.96 | NL | NL | NL | NL |
| 3.2 | 2350 | 100 | 23.96 | 1.02 | 4.26 | 60.80 | 60.80 | 0.00 | 0.976 | 0.286 | 4.37 | 38 | 108 | 301 | 38 | 2.65 | 2.11 | 2.65 | (4) | 29.05 | NL | NL | NL | NL |
| 3.4 | 2940 | 90 | 29.97 | 0.92 | 3.06 | 64.60 | 62.64 | 0.00 | 0.974 | 0.294 | 3.13 | 46 | 132 | 371 | 371 | 2.49 | 1.94 | 1.94 | (6) | 9.02 | 1.23 | 455 | NL | NL |
| 3.6 | 2550 | 160 | 25.99 | 1.63 | 6.27 | 68.40 | 64.48 | 0.00 | 0.972 | 0.302 | 6.45 | 38 | 112 | 318 | 38 | 2.77 | 2.25 | 2.77 | (4) | 33.48 | NL | NL | NL | NL |
| 3.8 | 2450 | 80 | 24.97 | 0.82 | 3.27 | 72.20 | 66.31 | 0.00 | 0.971 | 0.310 | 3.36 | 36 | 105 | 301 | 301 | 2.59 | 2.01 | 2.01 | (6) | 10.48 | 1.31 | 395 | NL | NL |
| 4 | 3040 | 200 | 30.99 | 2.04 | 6.58 | 76.00 | 68.15 | 0.00 | 0.969 | 0.317 | 6.75 | 43 | 128 | 368 | 43 | 2.75 | 2.24 | 2.75 | (4) | 32.63 | NL | NL | NL | NL |
| 4.2 | 3430 | 240 | 34.96 | 2.45 | 7.00 | 79.80 | 69.99 | 0.00 | 0.968 | 0.323 | 7.16 | 48 | 142 | 410 | 48 | 2.74 | 2.25 | 2.74 | (4) | 32.32 | NL | NL | NL | NL |
| 4.4 | 2840 | 180 | 28.95 | 1.83 | 6.34 | 83.60 | 71.83 | 0.00 | 0.966 | 0.329 | 6.53 | 38 | 115 | 335 | 38 | 2.77 | 2.24 | 2.77 | (4) | 33.68 | NL | NL | NL | NL |
| 4.6 | 3530 | 240 | 35.98 | 2.45 | 6.80 | 87.40 | 73.67 | 0.00 | 0.965 | 0.335 | 6.97 | 47 | 140 | 411 | 47 | 2.74 | 2.23 | 2.74 | (4) | 32.23 | NL | NL | NL | NL |
| 4.8 | 3530 | 230 | 35.98 | 2.34 | 6.52 | 91.20 | 75.50 | 0.00 | 0.963 | 0.341 | 6.69 | 46 | 138 | 406 | 46 | 2.73 | 2.22 | 2.73 | (4) | 31.99 | NL | NL | NL | NL |
| 5 | 3140 | 160 | 32.01 | 1.63 | 5.10 | 95.00 | 77.34 | 0.00 | 0.962 | 0.346 | 5.25 | 39 | 120 | 357 | 39 | 2.70 | 2.15 | 2.70 | (4) | 30.68 | NL | NL | NL | NL |
| 5.2 | 3820 | 190 | 38.94 | 1.94 | 4.97 | 98.80 | 79.18 | 0.00 | 0.960 | 0.351 | 5.11 | 47 | 144 | 429 | 47 | 2.64 | 2.10 | 2.64 | (4) | 28.36 | NL | NL | NL | NL |
| 5.4 | 3630 | 180 | 37.00 | 1.83 | 4.96 | 102.60 | 81.02 | 0.00 | 0.959 | 0.355 | 5.10 | 44 | 134 | 403 | 44 | 2.66 | 2.11 | 2.66 | (4) | 29.19 | NL | NL | NL | NL |
| 5.6 | 3430 | 190 | 34.96 | 1.94 | 5.54 | 106.40 | 82.86 | 0.00 | 0.957 | 0.360 | 5.72 | 40 | 125 | 377 | 40 | 2.72 | 2.17 | 2.72 | (4) | 31.48 | NL | NL | NL | NL |
| 5.8 | 2740 | 160 | 27.93 | 1.63 | 5.84 | 110.20 | 84.69 | 0.00 | 0.956 | 0.364 | 6.08 | 31 | 98 | 298 | 31 | 2.82 | 2.24 | 2.82 | (4) | 35.37 | NL | NL | NL | NL |
| 6 | 3330 | 160 | 33.94 | 1.63 | 4.80 | 114.00 | 86.53 | 0.00 | 0.954 | 0.368 | 4.98 | 37 | 117 | 358 | 37 | 2.70 | 2.12 | 2.70 | (4) | 30.70 | NL | NL | NL | NL |
| 6.2 | 3820 | 230 | 38.94 | 2.34 | 6.02 | 117.80 | 88.37 | 0.98 | 0.953 | 0.372 | 6.21 | 42 | 133 | 406 | 42 | 2.73 | 2.19 | 2.73 | (4) | 32.01 | NL | NL | NL | NL |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|------|------|-----|-------|------|------|--------|--------|-------|-------|-------|------|----|-----|-----|----|------|------|------|-----|-------|----|----|----|----|
| 6.4 | 3820 | 240 | 38.94 | 2.45 | 6.28 | 121.60 | 90.21 | 2.94 | 0.951 | 0.375 | 6.49 | 41 | 131 | 402 | 41 | 2.75 | 2.21 | 2.75 | (4) | 32.81 | NL | NL | NL | NL |
| 6.6 | 3530 | 230 | 35.98 | 2.34 | 6.52 | 125.40 | 92.05 | 4.91 | 0.950 | 0.379 | 6.76 | 37 | 119 | 368 | 37 | 2.80 | 2.24 | 2.80 | (4) | 34.56 | NL | NL | NL | NL |
| 6.8 | 3330 | 180 | 33.94 | 1.83 | 5.41 | 129.20 | 93.88 | 6.87 | 0.948 | 0.382 | 5.62 | 34 | 110 | 344 | 34 | 2.76 | 2.18 | 2.76 | (4) | 33.21 | NL | NL | NL | NL |
| 7 | 2550 | 220 | 25.99 | 2.24 | 8.63 | 133.00 | 95.72 | 8.83 | 0.946 | 0.385 | 9.10 | 25 | 83 | 261 | 25 | 3.00 | 2.42 | 3.00 | (3) | 43.74 | NL | NL | NL | NL |
| 7.2 | 3140 | 160 | 32.01 | 1.63 | 5.10 | 136.80 | 97.56 | 10.79 | 0.945 | 0.388 | 5.33 | 31 | 101 | 318 | 31 | 2.78 | 2.17 | 2.78 | (4) | 33.81 | NL | NL | NL | NL |
| 7.4 | 3040 | 80 | 30.99 | 0.82 | 2.63 | 140.60 | 99.40 | 12.75 | 0.943 | 0.391 | 2.76 | 29 | 97 | 305 | 29 | 2.60 | 1.93 | 2.60 | (4) | 27.18 | NL | NL | NL | NL |
| 7.6 | 2650 | 90 | 27.01 | 0.92 | 3.40 | 144.40 | 101.24 | 14.72 | 0.942 | 0.393 | 3.59 | 25 | 83 | 263 | 25 | 2.73 | 2.06 | 2.73 | (4) | 31.98 | NL | NL | NL | NL |
| 7.8 | 2350 | 170 | 23.96 | 1.73 | 7.23 | 148.20 | 103.07 | 16.68 | 0.940 | 0.396 | 7.72 | 21 | 73 | 231 | 21 | 3.00 | 2.38 | 3.00 | (3) | 43.73 | NL | NL | NL | NL |
| 8 | 2550 | 140 | 25.99 | 1.43 | 5.49 | 152.00 | 104.91 | 18.64 | 0.939 | 0.398 | 5.84 | 23 | 78 | 249 | 23 | 2.90 | 2.26 | 2.90 | (4) | 38.92 | NL | NL | NL | NL |
| 8.2 | 3820 | 180 | 38.94 | 1.83 | 4.71 | 155.80 | 106.75 | 20.60 | 0.937 | 0.401 | 4.91 | 34 | 115 | 370 | 34 | 2.72 | 2.11 | 2.72 | (4) | 31.49 | NL | NL | NL | NL |
| 8.4 | 3430 | 110 | 34.96 | 1.12 | 3.21 | 159.60 | 108.59 | 22.56 | 0.936 | 0.403 | 3.36 | 30 | 102 | 329 | 30 | 2.65 | 1.99 | 2.65 | (4) | 28.82 | NL | NL | NL | NL |
| 8.6 | 3630 | 180 | 37.00 | 1.83 | 4.96 | 163.40 | 110.43 | 24.53 | 0.934 | 0.405 | 5.19 | 31 | 107 | 345 | 31 | 2.76 | 2.15 | 2.76 | (4) | 33.25 | NL | NL | NL | NL |
| 8.8 | 3430 | 130 | 34.96 | 1.33 | 3.79 | 167.20 | 112.26 | 26.49 | 0.933 | 0.407 | 3.98 | 29 | 99 | 324 | 29 | 2.71 | 2.06 | 2.71 | (4) | 31.10 | NL | NL | NL | NL |
| 9 | 3530 | 150 | 35.98 | 1.53 | 4.25 | 171.00 | 114.10 | 28.45 | 0.931 | 0.409 | 4.47 | 29 | 101 | 330 | 29 | 2.74 | 2.10 | 2.74 | (4) | 32.25 | NL | NL | NL | NL |
| 9.2 | 3140 | 100 | 32.01 | 1.02 | 3.18 | 174.80 | 115.94 | 30.41 | 0.928 | 0.410 | 3.37 | 26 | 89 | 292 | 26 | 2.70 | 2.02 | 2.70 | (4) | 30.87 | NL | NL | NL | NL |
| 9.4 | 3040 | 170 | 30.99 | 1.73 | 5.59 | 178.60 | 117.78 | 32.37 | 0.923 | 0.410 | 5.94 | 24 | 85 | 280 | 24 | 2.88 | 2.24 | 2.88 | (4) | 38.30 | NL | NL | NL | NL |
| 9.6 | 2450 | 160 | 24.97 | 1.63 | 6.53 | 182.40 | 119.62 | 34.34 | 0.918 | 0.410 | 7.06 | 19 | 68 | 224 | 19 | 3.01 | 2.35 | 3.01 | (3) | 44.22 | NL | NL | NL | NL |
| 9.8 | 2840 | 70 | 28.95 | 0.71 | 2.46 | 186.20 | 121.45 | 36.30 | 0.912 | 0.410 | 2.64 | 22 | 78 | 258 | 22 | 2.69 | 1.95 | 2.69 | (4) | 30.34 | NL | NL | NL | NL |
| 10 | 3140 | 70 | 32.01 | 0.71 | 2.23 | 190.00 | 123.29 | 38.26 | 0.907 | 0.409 | 2.37 | 24 | 85 | 283 | 24 | 2.63 | 1.89 | 2.63 | (4) | 28.14 | NL | NL | NL | NL |
| 10.2 | 3330 | 120 | 33.94 | 1.22 | 3.60 | 193.80 | 125.13 | 40.22 | 0.902 | 0.409 | 3.83 | 25 | 89 | 298 | 25 | 2.75 | 2.06 | 2.75 | (4) | 32.52 | NL | NL | NL | NL |
| 10.4 | 3040 | 110 | 30.99 | 1.12 | 3.62 | 197.60 | 126.97 | 42.18 | 0.896 | 0.408 | 3.87 | 22 | 80 | 270 | 22 | 2.79 | 2.09 | 2.79 | (4) | 34.15 | NL | NL | NL | NL |
| 10.6 | 2740 | 110 | 27.93 | 1.12 | 4.01 | 201.40 | 128.81 | 44.15 | 0.891 | 0.408 | 4.33 | 20 | 72 | 241 | 20 | 2.86 | 2.15 | 2.86 | (4) | 37.24 | NL | NL | NL | NL |
| 10.8 | 2250 | 140 | 22.94 | 1.43 | 6.22 | 205.20 | 130.64 | 46.11 | 0.886 | 0.407 | 6.85 | 16 | 58 | 197 | 16 | 3.07 | 2.37 | 3.07 | (3) | 46.76 | NL | NL | NL | NL |
| 11 | 2160 | 120 | 22.02 | 1.22 | 5.56 | 209.00 | 132.48 | 48.07 | 0.880 | 0.407 | 6.15 | 15 | 55 | 188 | 15 | 3.06 | 2.34 | 3.06 | (3) | 46.21 | NL | NL | NL | NL |
| 11.2 | 2160 | 120 | 22.02 | 1.22 | 5.56 | 212.80 | 134.32 | 50.03 | 0.875 | 0.406 | 6.16 | 14 | 55 | 186 | 14 | 3.06 | 2.34 | 3.06 | (3) | 46.49 | NL | NL | NL | NL |
| 11.4 | 2940 | 80 | 29.97 | 0.82 | 2.72 | 216.60 | 136.16 | 51.99 | 0.870 | 0.405 | 2.94 | 20 | 74 | 252 | 20 | 2.75 | 2.00 | 2.75 | (4) | 32.63 | NL | NL | NL | NL |
| 11.6 | 3040 | 140 | 30.99 | 1.43 | 4.61 | 220.40 | 138.00 | 53.96 | 0.864 | 0.404 | 4.97 | 20 | 76 | 259 | 20 | 2.89 | 2.19 | 2.89 | (4) | 38.41 | NL | NL | NL | NL |
| 11.8 | 2740 | 160 | 27.93 | 1.63 | 5.84 | 224.20 | 139.83 | 55.92 | 0.859 | 0.403 | 6.36 | 18 | 67 | 232 | 18 | 3.00 | 2.31 | 3.00 | (3) | 43.55 | NL | NL | NL | NL |
| 12 | 2840 | 200 | 28.95 | 2.04 | 7.04 | 228.00 | 141.67 | 57.88 | 0.854 | 0.402 | 7.66 | 18 | 69 | 239 | 18 | 3.05 | 2.37 | 3.05 | (3) | 45.82 | NL | NL | NL | NL |





- (2) terreni organici, torbe
- (3) argille
- (4) argille limose e limi argillosi
- (5) limi sabbiosi e sabbie limose
- (6) sabbie
- (7) sabbie ghiaiose



| | |
|--------|-----------|
| ID. | 20-02CU14 |
| CPT N° | CPT 02 |

| | |
|-------------------|------------|
| amax | 0.25 g |
| Magnitudo Momento | 6.14 |
| Falda | 3.2 (m) |
| Peso di volume | 19 (kN/mc) |

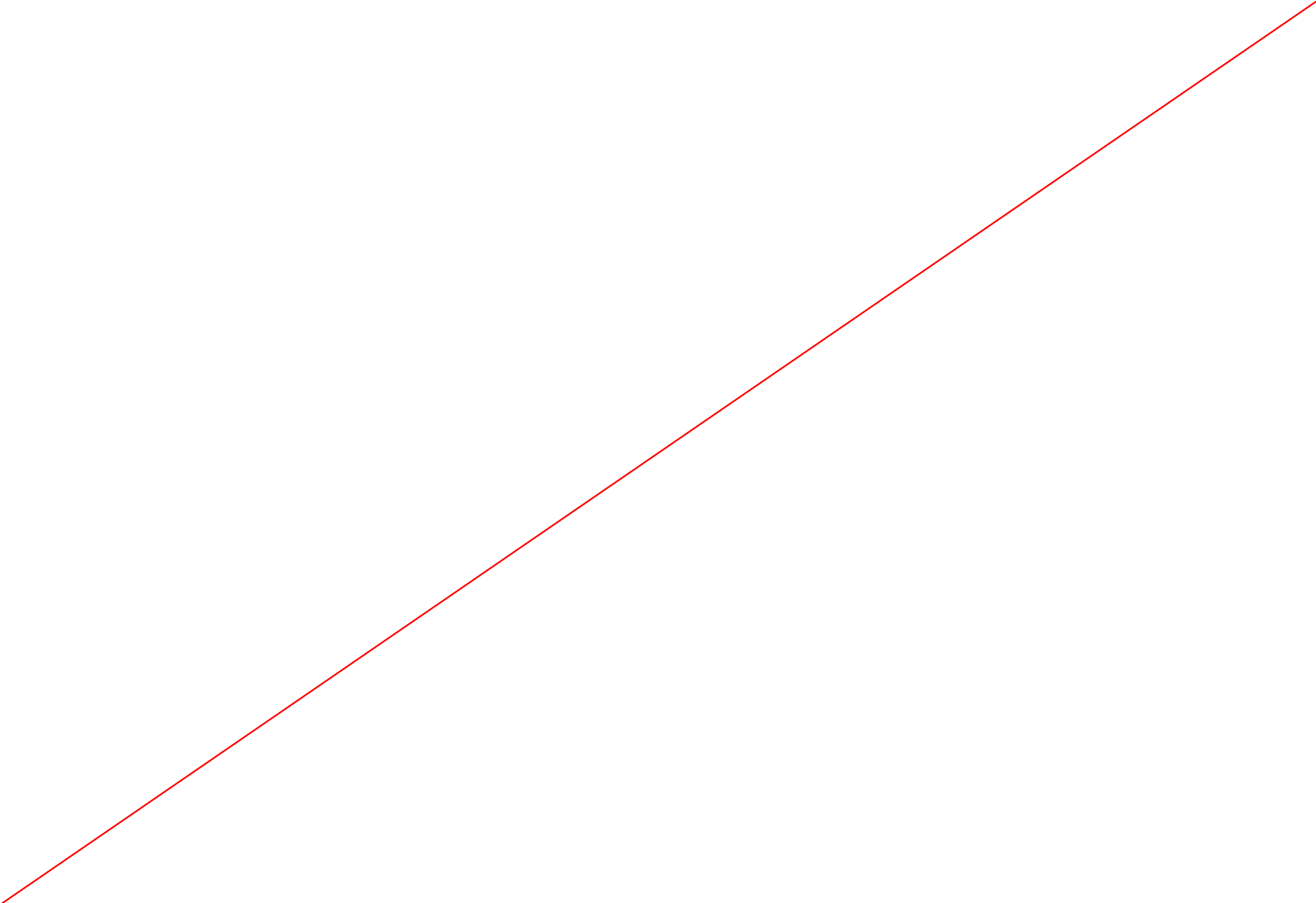
| | |
|---------|-------|
| MSF (1) | 1.668 |
| MSF (2) | 1.935 |
| MSF | 1.802 |
| MWF | 0.555 |

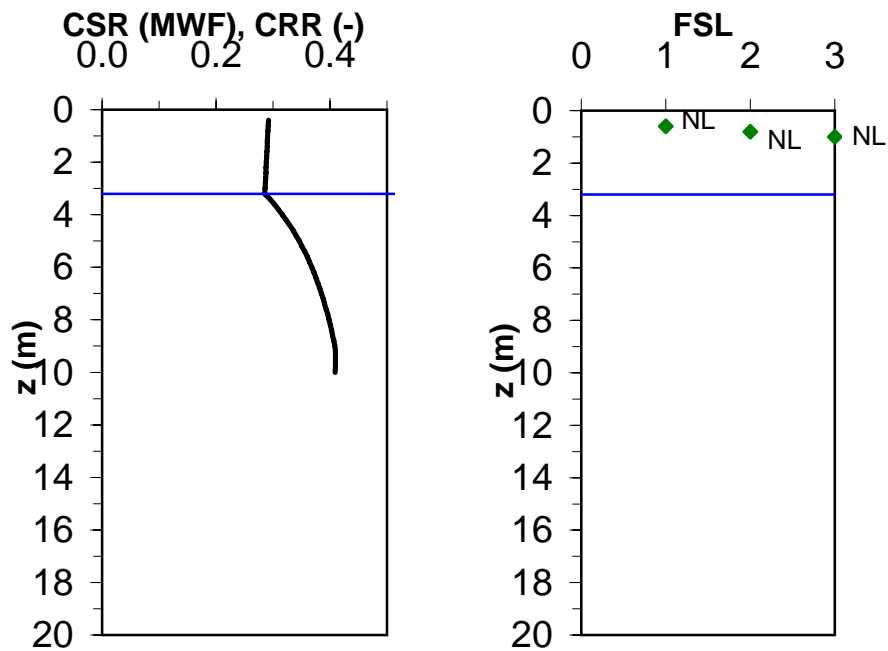
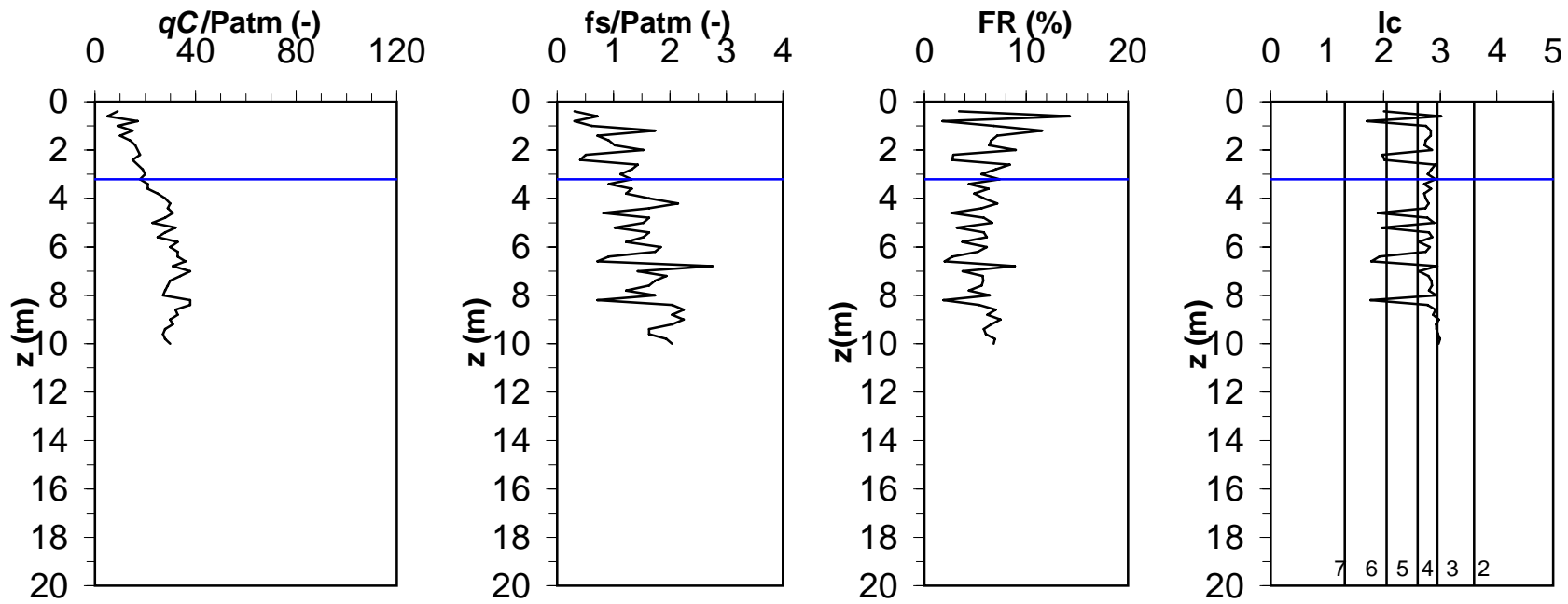
NL = Non soggetto a liquefazione

* Per $I_c > 2.6$ ** Per $I_c > 2.6$ o sopra falda*** Per $I_c > 2.6$ o sopra falda o $(q_{c1N})_{cs} > 160$

| z | q _c | f _s | q _c /Pa | f _s /Pa | R _f | σ _{v0} | σ' _{v0} | u ₀ | r _d | CSR | F _{norm} | Q _{norm} | q _{c1N} (0.75) | q _{c1N} (0.5) | q _{c1N} | I _{c(1)} | I _{c(0.5)} | I _c | SBT | F _c | K _c | (q _{c1N}) _{cs} | CRR | FSL |
|-----|----------------|----------------|--------------------|--------------------|----------------|-----------------|------------------|----------------|----------------|-------|-------------------|-------------------|----------------------------|---------------------------|------------------|-------------------|---------------------|----------------|-----|----------------|----------------|-----------------------------------|-----|-----|
| (m) | (kPa) | (kPa) | (-) | (-) | (%) | (kPa) | (kPa) | (kPa) | (-) | (-) | (-) | (-) | (-) | (-) | (-) | | | | (%) | * | (-) | ** | *** | |
| 0.4 | 880 | 30 | 8.97 | 0.31 | 3.41 | 7.60 | 7.60 | 0.00 | 0.997 | 0.292 | 3.44 | 115 | 192 | 319 | 319 | 2.25 | 2.00 | 2.00 | (6) | 10.39 | 1.31 | NL | NL | NL |
| 0.6 | 490 | 70 | 4.99 | 0.71 | 14.29 | 11.40 | 11.40 | 0.00 | 0.995 | 0.291 | 14.63 | 42 | 79 | 145 | 42 | 3.02 | 2.72 | 3.02 | (3) | 44.34 | NL | NL | NL | NL |
| 0.8 | 1670 | 30 | 17.02 | 0.31 | 1.80 | 15.20 | 15.20 | 0.00 | 0.994 | 0.291 | 1.81 | 109 | 217 | 428 | 428 | 2.06 | 1.70 | 1.70 | (6) | 4.89 | 1.04 | NL | NL | NL |
| 1 | 880 | 60 | 8.97 | 0.61 | 6.82 | 19.00 | 19.00 | 0.00 | 0.992 | 0.291 | 6.97 | 45 | 97 | 202 | 45 | 2.75 | 2.37 | 2.75 | (4) | 32.58 | NL | NL | NL | NL |
| 1.2 | 1470 | 170 | 14.98 | 1.73 | 11.56 | 22.80 | 22.80 | 0.00 | 0.991 | 0.290 | 11.75 | 63 | 141 | 308 | 63 | 2.83 | 2.49 | 2.83 | (4) | 36.08 | NL | NL | NL | NL |
| 1.4 | 980 | 70 | 9.99 | 0.71 | 7.14 | 26.60 | 26.60 | 0.00 | 0.989 | 0.290 | 7.34 | 36 | 84 | 190 | 36 | 2.83 | 2.40 | 2.83 | (4) | 36.05 | NL | NL | NL | NL |
| 1.6 | 1370 | 90 | 13.97 | 0.92 | 6.57 | 30.40 | 30.40 | 0.00 | 0.988 | 0.289 | 6.72 | 44 | 106 | 248 | 44 | 2.74 | 2.31 | 2.74 | (4) | 32.43 | NL | NL | NL | NL |
| 1.8 | 1570 | 100 | 16.00 | 1.02 | 6.37 | 34.20 | 34.20 | 0.00 | 0.986 | 0.289 | 6.51 | 45 | 111 | 268 | 45 | 2.73 | 2.28 | 2.73 | (4) | 31.81 | NL | NL | NL | NL |
| 2 | 1670 | 150 | 17.02 | 1.53 | 8.98 | 38.00 | 38.00 | 0.00 | 0.985 | 0.288 | 9.19 | 43 | 109 | 271 | 43 | 2.85 | 2.42 | 2.85 | (4) | 36.96 | NL | NL | NL | NL |
| 2.2 | 1760 | 50 | 17.94 | 0.51 | 2.84 | 41.80 | 41.80 | 0.00 | 0.983 | 0.288 | 2.91 | 41 | 107 | 272 | 272 | 2.51 | 1.98 | 1.98 | (6) | 9.81 | 1.27 | NL | NL | NL |
| 2.4 | 1470 | 40 | 14.98 | 0.41 | 2.72 | 45.60 | 45.60 | 0.00 | 0.982 | 0.287 | 2.81 | 31 | 84 | 218 | 218 | 2.59 | 2.02 | 2.02 | (6) | 10.65 | 1.32 | NL | NL | NL |
| 2.6 | 1670 | 140 | 17.02 | 1.43 | 8.38 | 49.40 | 49.40 | 0.00 | 0.980 | 0.287 | 8.64 | 33 | 90 | 238 | 33 | 2.91 | 2.42 | 2.91 | (4) | 39.43 | NL | NL | NL | NL |
| 2.8 | 1860 | 130 | 18.96 | 1.33 | 6.99 | 53.20 | 53.20 | 0.00 | 0.979 | 0.287 | 7.20 | 34 | 94 | 255 | 34 | 2.84 | 2.33 | 2.84 | (4) | 36.45 | NL | NL | NL | NL |
| 3 | 1960 | 110 | 19.98 | 1.12 | 5.61 | 57.00 | 57.00 | 0.00 | 0.977 | 0.286 | 5.78 | 33 | 94 | 260 | 33 | 2.78 | 2.25 | 2.78 | (4) | 33.81 | NL | NL | NL | NL |
| 3.2 | 1760 | 130 | 17.94 | 1.33 | 7.39 | 60.80 | 60.80 | 0.00 | 0.976 | 0.286 | 7.65 | 28 | 81 | 226 | 28 | 2.92 | 2.38 | 2.92 | (4) | 39.83 | NL | NL | NL | NL |
| 3.4 | 2060 | 90 | 21.00 | 0.92 | 4.37 | 64.60 | 62.64 | 0.00 | 0.974 | 0.294 | 4.51 | 32 | 93 | 260 | 32 | 2.72 | 2.15 | 2.72 | (4) | 31.39 | NL | NL | NL | NL |
| 3.6 | 2060 | 130 | 21.00 | 1.33 | 6.31 | 68.40 | 64.48 | 0.98 | 0.972 | 0.302 | 6.53 | 31 | 91 | 257 | 31 | 2.84 | 2.29 | 2.84 | (4) | 36.35 | NL | NL | NL | NL |
| 3.8 | 2450 | 120 | 24.97 | 1.22 | 4.90 | 72.20 | 66.31 | 2.94 | 0.971 | 0.310 | 5.05 | 36 | 105 | 301 | 36 | 2.71 | 2.16 | 2.71 | (4) | 31.29 | NL | NL | NL | NL |
| 4 | 2740 | 160 | 27.93 | 1.63 | 5.84 | 76.00 | 68.15 | 4.91 | 0.969 | 0.317 | 6.01 | 39 | 116 | 332 | 39 | 2.74 | 2.21 | 2.74 | (4) | 32.40 | NL | NL | NL | NL |
| 4.2 | 2940 | 210 | 29.97 | 2.14 | 7.14 | 79.80 | 69.99 | 6.87 | 0.968 | 0.323 | 7.34 | 41 | 121 | 351 | 41 | 2.79 | 2.28 | 2.79 | (4) | 34.46 | NL | NL | NL | NL |
| 4.4 | 2840 | 160 | 28.95 | 1.63 | 5.63 | 83.60 | 71.83 | 8.83 | 0.966 | 0.329 | 5.80 | 38 | 115 | 335 | 38 | 2.74 | 2.20 | 2.74 | (4) | 32.19 | NL | NL | NL | NL |
| 4.6 | 3040 | 80 | 30.99 | 0.82 | 2.63 | 87.40 | 73.67 | 10.79 | 0.965 | 0.335 | 2.71 | 40 | 121 | 354 | 354 | 2.49 | 1.89 | 1.89 | (6) | 8.15 | 1.18 | 418 | NL | NL |
| 4.8 | 2740 | 160 | 27.93 | 1.63 | 5.84 | 91.20 | 75.50 | 12.75 | 0.963 | 0.341 | 6.04 | 35 | 107 | 315 | 35 | 2.78 | 2.22 | 2.78 | (4) | 33.76 | NL | NL | NL | NL |
| 5 | 2250 | 150 | 22.94 | 1.53 | 6.67 | 95.00 | 77.34 | 14.72 | 0.962 | 0.346 | 6.96 | 28 | 86 | 256 | 28 | 2.89 | 2.32 | 2.89 | (4) | 38.56 | NL | NL | NL | NL |
| 5.2 | 3140 | 100 | 32.01 | 1.02 | 3.18 | 98.80 | 79.18 | 16.68 | 0.960 | 0.351 | 3.29 | 38 | 118 | 353 | 353 | 2.56 | 1.97 | 1.97 | (6) | 9.61 | 1.26 | 444 | NL | NL |
| 5.4 | 2740 | 160 | 27.93 | 1.63 | 5.84 | 102.60 | 81.02 | 18.64 | 0.959 | 0.355 | 6.07 | 33 | 101 | 304 | 33 | 2.80 | 2.23 | 2.80 | (4) | 34.74 | NL | NL | NL | NL |
| 5.6 | 2450 | 150 | 24.97 | 1.53 | 6.12 | 106.40 | 82.86 | 20.60 | 0.957 | 0.360 | 6.40 | 28 | 89 | 269 | 28 | 2.86 | 2.28 | 2.86 | (4) | 37.24 | NL | NL | NL | NL |
| 5.8 | 3230 | 120 | 32.93 | 1.22 | 3.72 | 110.20 | 84.69 | 22.56 | 0.956 | 0.364 | 3.85 | 37 | 116 | 351 | 37 | 2.62 | 2.03 | 2.62 | (4) | 27.90 | NL | NL | NL | NL |
| 6 | 2940 | 180 | 29.97 | 1.83 | 6.12 | 114.00 | 86.53 | 24.53 | 0.954 | 0.368 | 6.37 | 33 | 104 | 316 | 33 | 2.81 | 2.24 | 2.81 | (4) | 35.33 | NL | NL | NL | NL |
| 6.2 | 3230 | 170 | 32.93 | 1.73 | 5.26 | 117.80 | 88.37 | 26.49 | 0.953 | 0.372 | 5.46 | 35 | 112 | 344 | 35 | 2.74 | 2.17 | 2.74 | (4) | 32.46 | NL | NL | NL | NL |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|------|-----|-------|------|------|--------|--------|-------|-------|-------|------|----|-----|-----|-----|------|------|------|-----|-------|------|-----|----|----|
| 6.4 | 3230 | 90 | 32.93 | 0.92 | 2.79 | 121.60 | 90.21 | 28.45 | 0.951 | 0.375 | 2.90 | 34 | 110 | 340 | 340 | 2.56 | 1.93 | 1.93 | (6) | 8.80 | 1.21 | 413 | NL | NL |
| 6.6 | 3530 | 70 | 35.98 | 0.71 | 1.98 | 125.40 | 92.05 | 30.41 | 0.950 | 0.379 | 2.06 | 37 | 119 | 368 | 368 | 2.44 | 1.78 | 1.78 | (6) | 6.17 | 1.09 | 402 | NL | NL |
| 6.8 | 3040 | 270 | 30.99 | 2.75 | 8.88 | 129.20 | 93.88 | 32.37 | 0.948 | 0.382 | 9.28 | 31 | 101 | 314 | 31 | 2.95 | 2.39 | 2.95 | (4) | 41.20 | NL | NL | NL | NL |
| 7 | 3720 | 140 | 37.92 | 1.43 | 3.76 | 133.00 | 95.72 | 34.34 | 0.946 | 0.385 | 3.90 | 37 | 122 | 380 | 37 | 2.62 | 2.02 | 2.62 | (4) | 27.86 | NL | NL | NL | NL |
| 7.2 | 3330 | 190 | 33.94 | 1.94 | 5.71 | 136.80 | 97.56 | 36.30 | 0.945 | 0.388 | 5.95 | 33 | 107 | 337 | 33 | 2.79 | 2.21 | 2.79 | (4) | 34.42 | NL | NL | NL | NL |
| 7.4 | 2940 | 170 | 29.97 | 1.73 | 5.78 | 140.60 | 99.40 | 38.26 | 0.943 | 0.391 | 6.07 | 28 | 93 | 295 | 28 | 2.85 | 2.24 | 2.85 | (4) | 36.61 | NL | NL | NL | NL |
| 7.6 | 2840 | 160 | 28.95 | 1.63 | 5.63 | 144.40 | 101.24 | 40.22 | 0.942 | 0.393 | 5.94 | 27 | 89 | 282 | 27 | 2.86 | 2.24 | 2.86 | (4) | 37.05 | NL | NL | NL | NL |
| 7.8 | 2740 | 120 | 27.93 | 1.22 | 4.38 | 148.20 | 103.07 | 42.18 | 0.940 | 0.396 | 4.63 | 25 | 85 | 270 | 25 | 2.80 | 2.15 | 2.80 | (4) | 34.70 | NL | NL | NL | NL |
| 8 | 2650 | 170 | 27.01 | 1.73 | 6.42 | 152.00 | 104.91 | 44.15 | 0.939 | 0.398 | 6.81 | 24 | 81 | 259 | 24 | 2.93 | 2.31 | 2.93 | (4) | 40.40 | NL | NL | NL | NL |
| 8.2 | 3720 | 70 | 37.92 | 0.71 | 1.88 | 155.80 | 106.75 | 46.11 | 0.937 | 0.401 | 1.96 | 33 | 112 | 360 | 360 | 2.47 | 1.77 | 1.77 | (6) | 5.96 | 1.08 | 390 | NL | NL |
| 8.4 | 3720 | 200 | 37.92 | 2.04 | 5.38 | 159.60 | 108.59 | 48.07 | 0.936 | 0.403 | 5.62 | 33 | 111 | 357 | 33 | 2.77 | 2.17 | 2.77 | (4) | 33.68 | NL | NL | NL | NL |
| 8.6 | 3140 | 220 | 32.01 | 2.24 | 7.01 | 163.40 | 110.43 | 50.03 | 0.934 | 0.405 | 7.39 | 27 | 92 | 299 | 27 | 2.92 | 2.31 | 2.92 | (4) | 39.83 | NL | NL | NL | NL |
| 8.8 | 3230 | 200 | 32.93 | 2.04 | 6.19 | 167.20 | 112.26 | 51.99 | 0.933 | 0.407 | 6.53 | 27 | 94 | 305 | 27 | 2.88 | 2.26 | 2.88 | (4) | 37.98 | NL | NL | NL | NL |
| 9 | 2940 | 220 | 29.97 | 2.24 | 7.48 | 171.00 | 114.10 | 53.96 | 0.931 | 0.409 | 7.95 | 24 | 84 | 275 | 24 | 2.97 | 2.36 | 2.97 | (3) | 42.31 | NL | NL | NL | NL |
| 9.2 | 3040 | 200 | 30.99 | 2.04 | 6.58 | 174.80 | 115.94 | 55.92 | 0.928 | 0.410 | 6.98 | 25 | 86 | 282 | 25 | 2.93 | 2.30 | 2.93 | (4) | 40.23 | NL | NL | NL | NL |
| 9.4 | 2740 | 160 | 27.93 | 1.63 | 5.84 | 178.60 | 117.78 | 57.88 | 0.923 | 0.410 | 6.25 | 22 | 77 | 252 | 22 | 2.93 | 2.28 | 2.93 | (4) | 40.52 | NL | NL | NL | NL |
| 9.6 | 2650 | 160 | 27.01 | 1.63 | 6.04 | 182.40 | 119.62 | 59.84 | 0.918 | 0.410 | 6.48 | 21 | 73 | 242 | 21 | 2.96 | 2.30 | 2.96 | (3) | 41.79 | NL | NL | NL | NL |
| 9.8 | 2740 | 190 | 27.93 | 1.94 | 6.93 | 186.20 | 121.45 | 61.80 | 0.912 | 0.410 | 7.44 | 21 | 75 | 249 | 21 | 3.00 | 2.35 | 3.00 | (3) | 43.43 | NL | NL | NL | NL |
| 10 | 2940 | 200 | 29.97 | 2.04 | 6.80 | 190.00 | 123.29 | 63.77 | 0.907 | 0.409 | 7.27 | 22 | 79 | 265 | 22 | 2.97 | 2.33 | 2.97 | (3) | 42.25 | NL | NL | NL | NL |





- (2) terreni organici, torbe
- (3) argille
- (4) argille limose e limi argillosi
- (5) limi sabbiosi e sabbie limose
- (6) sabbie
- (7) sabbie ghiaiose

| | |
|--------|-----------|
| ID. | 20-02CU14 |
| CPT N° | CPT 03 |

| | |
|-------------------|------------|
| amax | 0.25 g |
| Magnitudo Momento | 6.14 |
| Falda | 3.2 (m) |
| Peso di volume | 19 (kN/mc) |

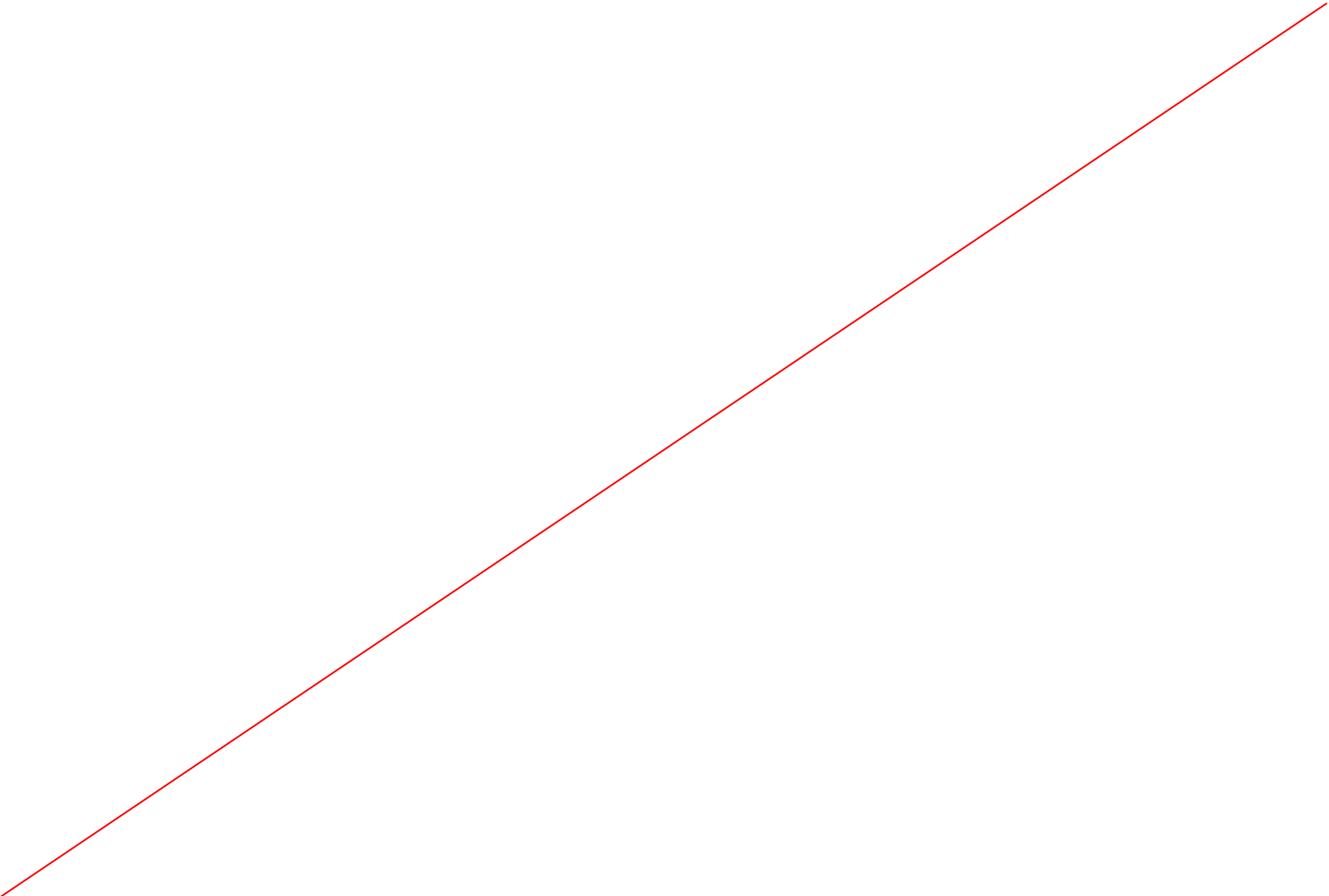
| | |
|---------|-------|
| MSF (1) | 1.668 |
| MSF (2) | 1.935 |
| MSF | 1.802 |
| MWF | 0.555 |

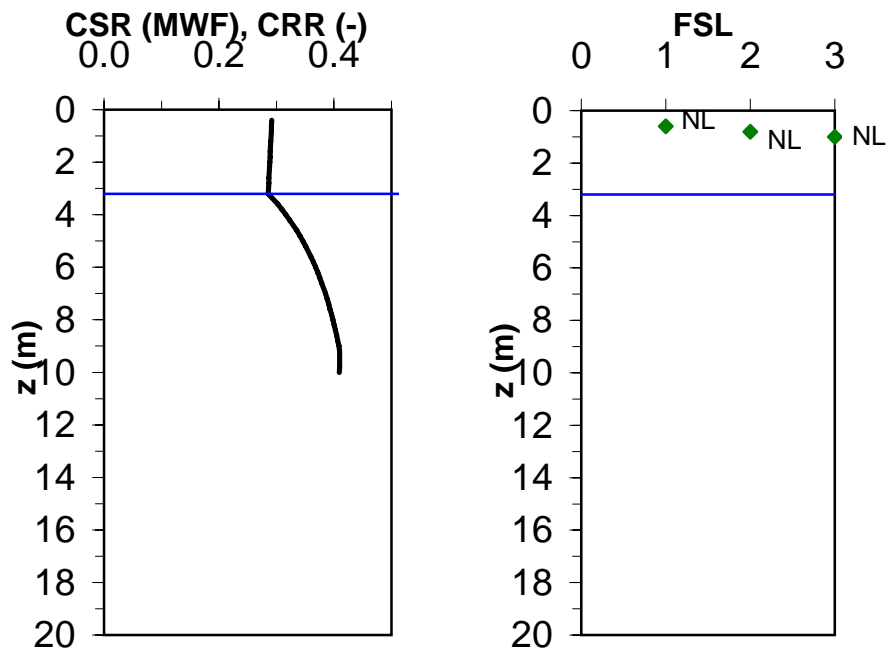
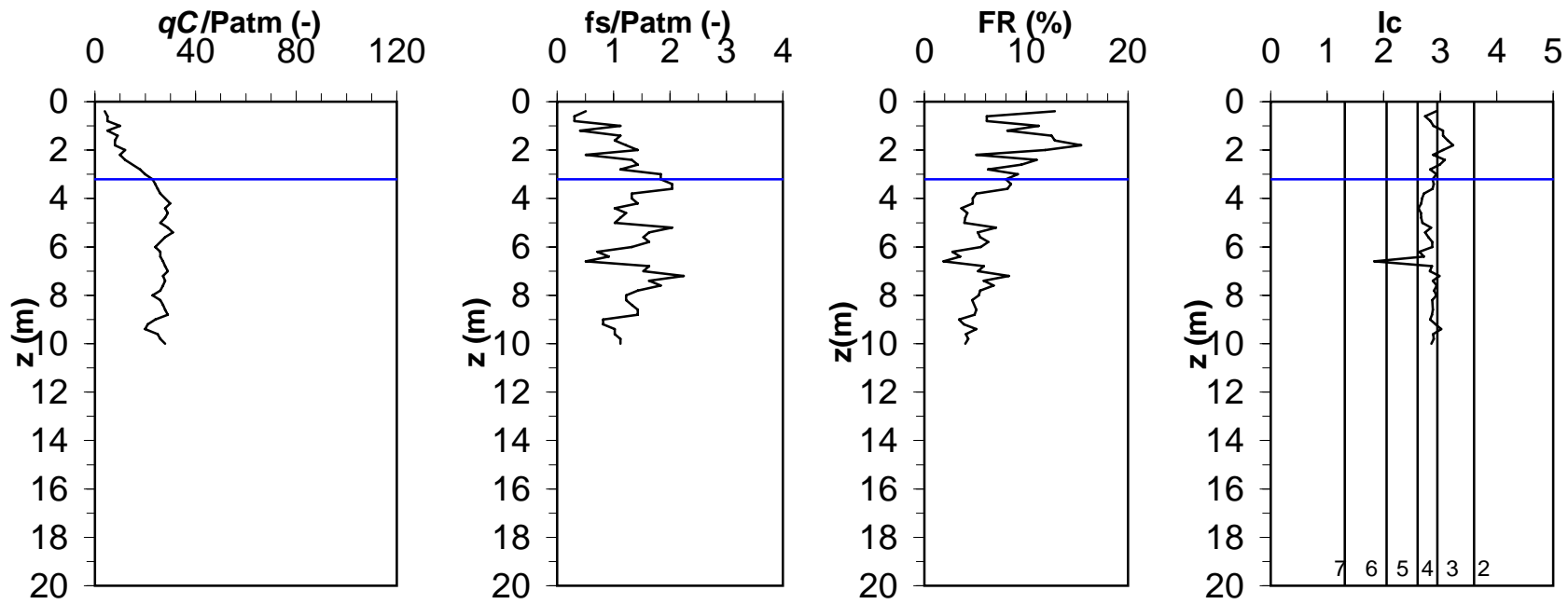
NL = Non soggetto a liquefazione

* Per $I_c > 2.6$ ** Per $I_c > 2.6$ o sopra falda*** Per $I_c > 2.6$ o sopra falda o $(q_{c1N})_{cs} > 160$

| z | q_c | f_s | $q_{c/Pa}$ | $f_{s/Pa}$ | Rf | σ_{v0} | σ'_{v0} | u_0 | r_d | CSR | Fnorm | Qnorm | q_{c1N} (0.75) | q_{c1N} (0.5) | q_{c1N} | $I_{c(1)}$ | $I_{c(0.5)}$ | Ic | SBT | Fc | Kc | $(q_{c1N})_{cs}$ | CRR | FSL |
|-----|-------|-------|------------|------------|-------|---------------|----------------|-------|-------|-------|-------|-------|---------------------|--------------------|-----------|------------|--------------|------|-----|-------|-----|------------------|-----|-----|
| (m) | (kPa) | (kPa) | (-) | (-) | (%) | (kPa) | (kPa) | (kPa) | (-) | (-) | (-) | (-) | (-) | (-) | (-) | | | | (%) | * | (-) | ** | *** | |
| 0.4 | 390 | 50 | 3.98 | 0.51 | 12.82 | 7.60 | 7.60 | 0.00 | 0.997 | 0.292 | 13.08 | 50 | 85 | 141 | 50 | 2.93 | 2.68 | 2.93 | (4) | 40.33 | NL | NL | NL | NL |
| 0.6 | 490 | 30 | 4.99 | 0.31 | 6.12 | 11.40 | 11.40 | 0.00 | 0.995 | 0.291 | 6.27 | 42 | 79 | 145 | 42 | 2.73 | 2.40 | 2.73 | (4) | 32.10 | NL | NL | NL | NL |
| 0.8 | 490 | 30 | 4.99 | 0.31 | 6.12 | 15.20 | 15.20 | 0.00 | 0.994 | 0.291 | 6.32 | 31 | 64 | 126 | 31 | 2.83 | 2.44 | 2.83 | (4) | 35.79 | NL | NL | NL | NL |
| 1 | 980 | 110 | 9.99 | 1.12 | 11.22 | 19.00 | 19.00 | 0.00 | 0.992 | 0.291 | 11.45 | 51 | 108 | 225 | 51 | 2.88 | 2.54 | 2.88 | (4) | 38.23 | NL | NL | NL | NL |
| 1.2 | 490 | 40 | 4.99 | 0.41 | 8.16 | 22.80 | 22.80 | 0.00 | 0.991 | 0.290 | 8.56 | 20 | 47 | 103 | 20 | 3.05 | 2.60 | 3.05 | (3) | 45.87 | NL | NL | NL | NL |
| 1.4 | 880 | 110 | 8.97 | 1.12 | 12.50 | 26.60 | 26.60 | 0.00 | 0.989 | 0.290 | 12.89 | 32 | 75 | 171 | 32 | 3.05 | 2.64 | 3.05 | (3) | 45.82 | NL | NL | NL | NL |
| 1.6 | 780 | 100 | 7.95 | 1.02 | 12.82 | 30.40 | 30.40 | 0.00 | 0.988 | 0.289 | 13.34 | 25 | 60 | 141 | 25 | 3.13 | 2.69 | 3.13 | (3) | 50.14 | NL | NL | NL | NL |
| 1.8 | 780 | 120 | 7.95 | 1.22 | 15.38 | 34.20 | 34.20 | 0.00 | 0.986 | 0.289 | 16.09 | 22 | 55 | 133 | 22 | 3.23 | 2.77 | 3.23 | (3) | 55.26 | NL | NL | NL | NL |
| 2 | 1180 | 140 | 12.03 | 1.43 | 11.86 | 38.00 | 38.00 | 0.00 | 0.985 | 0.288 | 12.26 | 30 | 77 | 191 | 30 | 3.05 | 2.60 | 3.05 | (3) | 45.91 | NL | NL | NL | NL |
| 2.2 | 980 | 50 | 9.99 | 0.51 | 5.10 | 41.80 | 41.80 | 0.00 | 0.983 | 0.288 | 5.33 | 22 | 60 | 152 | 22 | 2.88 | 2.33 | 2.88 | (4) | 37.99 | NL | NL | NL | NL |
| 2.4 | 1180 | 130 | 12.03 | 1.33 | 11.02 | 45.60 | 45.60 | 0.00 | 0.982 | 0.287 | 11.46 | 25 | 67 | 175 | 25 | 3.08 | 2.59 | 3.08 | (3) | 47.52 | NL | NL | NL | NL |
| 2.6 | 1470 | 140 | 14.98 | 1.43 | 9.52 | 49.40 | 49.40 | 0.00 | 0.980 | 0.287 | 9.85 | 29 | 79 | 209 | 29 | 2.99 | 2.49 | 2.99 | (3) | 43.12 | NL | NL | NL | NL |
| 2.8 | 1760 | 110 | 17.94 | 1.12 | 6.25 | 53.20 | 53.20 | 0.00 | 0.979 | 0.287 | 6.44 | 32 | 89 | 241 | 32 | 2.82 | 2.30 | 2.82 | (4) | 35.70 | NL | NL | NL | NL |
| 3 | 1960 | 180 | 19.98 | 1.83 | 9.18 | 57.00 | 57.00 | 0.00 | 0.977 | 0.286 | 9.46 | 33 | 94 | 260 | 33 | 2.93 | 2.44 | 2.93 | (4) | 40.51 | NL | NL | NL | NL |
| 3.2 | 2250 | 180 | 22.94 | 1.83 | 8.00 | 60.80 | 60.80 | 0.00 | 0.976 | 0.286 | 8.22 | 36 | 103 | 289 | 36 | 2.87 | 2.36 | 2.87 | (4) | 37.54 | NL | NL | NL | NL |
| 3.4 | 2350 | 200 | 23.96 | 2.04 | 8.51 | 64.60 | 62.64 | 0.00 | 0.974 | 0.294 | 8.75 | 36 | 106 | 297 | 36 | 2.88 | 2.38 | 2.88 | (4) | 38.26 | NL | NL | NL | NL |
| 3.6 | 2450 | 200 | 24.97 | 2.04 | 8.16 | 68.40 | 64.48 | 0.00 | 0.972 | 0.302 | 8.40 | 37 | 108 | 305 | 37 | 2.87 | 2.36 | 2.87 | (4) | 37.52 | NL | NL | NL | NL |
| 3.8 | 2550 | 130 | 25.99 | 1.33 | 5.10 | 72.20 | 66.31 | 0.00 | 0.971 | 0.310 | 5.25 | 37 | 110 | 313 | 37 | 2.71 | 2.17 | 2.71 | (4) | 31.27 | NL | NL | NL | NL |
| 4 | 2740 | 130 | 27.93 | 1.33 | 4.74 | 76.00 | 68.15 | 0.00 | 0.969 | 0.317 | 4.88 | 39 | 116 | 332 | 39 | 2.68 | 2.13 | 2.68 | (4) | 29.89 | NL | NL | NL | NL |
| 4.2 | 2940 | 140 | 29.97 | 1.43 | 4.76 | 79.80 | 69.99 | 0.00 | 0.968 | 0.323 | 4.89 | 41 | 121 | 351 | 41 | 2.66 | 2.12 | 2.66 | (4) | 29.42 | NL | NL | NL | NL |
| 4.4 | 2740 | 100 | 27.93 | 1.02 | 3.65 | 83.60 | 71.83 | 0.00 | 0.966 | 0.329 | 3.76 | 37 | 111 | 323 | 37 | 2.62 | 2.04 | 2.62 | (4) | 27.62 | NL | NL | NL | NL |
| 4.6 | 2840 | 120 | 28.95 | 1.22 | 4.23 | 87.40 | 73.67 | 0.00 | 0.965 | 0.335 | 4.36 | 37 | 113 | 331 | 37 | 2.66 | 2.09 | 2.66 | (4) | 29.11 | NL | NL | NL | NL |
| 4.8 | 2740 | 110 | 27.93 | 1.12 | 4.01 | 91.20 | 75.50 | 0.00 | 0.963 | 0.341 | 4.15 | 35 | 107 | 315 | 35 | 2.66 | 2.08 | 2.66 | (4) | 29.30 | NL | NL | NL | NL |
| 5 | 2550 | 100 | 25.99 | 1.02 | 3.92 | 95.00 | 77.34 | 0.00 | 0.962 | 0.346 | 4.07 | 32 | 98 | 290 | 32 | 2.69 | 2.09 | 2.69 | (4) | 30.27 | NL | NL | NL | NL |
| 5.2 | 2840 | 200 | 28.95 | 2.04 | 7.04 | 98.80 | 79.18 | 0.00 | 0.960 | 0.351 | 7.30 | 35 | 107 | 319 | 35 | 2.84 | 2.30 | 2.84 | (4) | 36.39 | NL | NL | NL | NL |
| 5.4 | 3040 | 160 | 30.99 | 1.63 | 5.26 | 102.60 | 81.02 | 0.00 | 0.959 | 0.355 | 5.45 | 36 | 113 | 338 | 36 | 2.73 | 2.17 | 2.73 | (4) | 32.08 | NL | NL | NL | NL |
| 5.6 | 2740 | 150 | 27.93 | 1.53 | 5.47 | 106.40 | 82.86 | 0.00 | 0.957 | 0.360 | 5.70 | 32 | 100 | 301 | 32 | 2.79 | 2.21 | 2.79 | (4) | 34.24 | NL | NL | NL | NL |
| 5.8 | 2550 | 160 | 25.99 | 1.63 | 6.27 | 110.20 | 84.69 | 1.96 | 0.956 | 0.364 | 6.56 | 29 | 91 | 277 | 29 | 2.86 | 2.28 | 2.86 | (4) | 37.32 | NL | NL | NL | NL |
| 6 | 2350 | 130 | 23.96 | 1.33 | 5.53 | 114.00 | 86.53 | 3.92 | 0.954 | 0.368 | 5.81 | 26 | 83 | 253 | 26 | 2.86 | 2.25 | 2.86 | (4) | 37.18 | NL | NL | NL | NL |
| 6.2 | 2550 | 70 | 25.99 | 0.71 | 2.75 | 117.80 | 88.37 | 5.89 | 0.953 | 0.372 | 2.88 | 28 | 88 | 271 | 28 | 2.63 | 1.97 | 2.63 | (4) | 28.31 | NL | NL | NL | NL |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|------|-----|-------|------|------|--------|--------|-------|-------|-------|------|----|----|-----|-----|------|------|------|-----|-------|------|-----|----|----|
| 6.4 | 2550 | 90 | 25.99 | 0.92 | 3.53 | 121.60 | 90.21 | 7.85 | 0.951 | 0.375 | 3.71 | 27 | 87 | 268 | 27 | 2.71 | 2.07 | 2.71 | (4) | 31.25 | NL | NL | NL | NL |
| 6.6 | 2650 | 50 | 27.01 | 0.51 | 1.89 | 125.40 | 92.05 | 9.81 | 0.950 | 0.379 | 1.98 | 27 | 89 | 276 | 276 | 2.54 | 1.83 | 1.83 | (6) | 7.07 | 1.13 | 312 | NL | NL |
| 6.8 | 2740 | 160 | 27.93 | 1.63 | 5.84 | 129.20 | 93.88 | 11.77 | 0.948 | 0.382 | 6.13 | 28 | 91 | 283 | 28 | 2.85 | 2.25 | 2.85 | (4) | 36.89 | NL | NL | NL | NL |
| 7 | 2840 | 150 | 28.95 | 1.53 | 5.28 | 133.00 | 95.72 | 13.73 | 0.946 | 0.385 | 5.54 | 28 | 93 | 290 | 28 | 2.82 | 2.21 | 2.82 | (4) | 35.38 | NL | NL | NL | NL |
| 7.2 | 2650 | 220 | 27.01 | 2.24 | 8.30 | 136.80 | 97.56 | 15.70 | 0.945 | 0.388 | 8.75 | 26 | 85 | 268 | 26 | 2.99 | 2.40 | 2.99 | (3) | 42.88 | NL | NL | NL | NL |
| 7.4 | 2740 | 160 | 27.93 | 1.63 | 5.84 | 140.60 | 99.40 | 17.66 | 0.943 | 0.391 | 6.16 | 26 | 87 | 275 | 26 | 2.87 | 2.26 | 2.87 | (4) | 37.77 | NL | NL | NL | NL |
| 7.6 | 2650 | 180 | 27.01 | 1.83 | 6.79 | 144.40 | 101.24 | 19.62 | 0.942 | 0.393 | 7.18 | 25 | 83 | 263 | 25 | 2.94 | 2.33 | 2.94 | (4) | 40.61 | NL | NL | NL | NL |
| 7.8 | 2550 | 140 | 25.99 | 1.43 | 5.49 | 148.20 | 103.07 | 21.58 | 0.940 | 0.396 | 5.83 | 23 | 79 | 251 | 23 | 2.89 | 2.26 | 2.89 | (4) | 38.63 | NL | NL | NL | NL |
| 8 | 2250 | 120 | 22.94 | 1.22 | 5.33 | 152.00 | 104.91 | 23.54 | 0.939 | 0.398 | 5.72 | 20 | 69 | 220 | 20 | 2.94 | 2.28 | 2.94 | (4) | 40.55 | NL | NL | NL | NL |
| 8.2 | 2550 | 120 | 25.99 | 1.22 | 4.71 | 155.80 | 106.75 | 25.51 | 0.937 | 0.401 | 5.01 | 22 | 77 | 247 | 22 | 2.86 | 2.20 | 2.86 | (4) | 37.22 | NL | NL | NL | NL |
| 8.4 | 2650 | 130 | 27.01 | 1.33 | 4.91 | 159.60 | 108.59 | 27.47 | 0.936 | 0.403 | 5.22 | 23 | 79 | 254 | 23 | 2.86 | 2.21 | 2.86 | (4) | 37.43 | NL | NL | NL | NL |
| 8.6 | 2740 | 140 | 27.93 | 1.43 | 5.11 | 163.40 | 110.43 | 29.43 | 0.934 | 0.405 | 5.43 | 23 | 80 | 261 | 23 | 2.87 | 2.22 | 2.87 | (4) | 37.70 | NL | NL | NL | NL |
| 8.8 | 2840 | 140 | 28.95 | 1.43 | 4.93 | 167.20 | 112.26 | 31.39 | 0.933 | 0.407 | 5.24 | 24 | 82 | 268 | 24 | 2.85 | 2.20 | 2.85 | (4) | 36.96 | NL | NL | NL | NL |
| 9 | 2350 | 80 | 23.96 | 0.82 | 3.40 | 171.00 | 114.10 | 33.35 | 0.931 | 0.409 | 3.67 | 19 | 67 | 220 | 19 | 2.82 | 2.11 | 2.82 | (4) | 35.73 | NL | NL | NL | NL |
| 9.2 | 2060 | 80 | 21.00 | 0.82 | 3.88 | 174.80 | 115.94 | 35.32 | 0.928 | 0.410 | 4.24 | 16 | 58 | 191 | 16 | 2.92 | 2.20 | 2.92 | (4) | 39.80 | NL | NL | NL | NL |
| 9.4 | 1960 | 100 | 19.98 | 1.02 | 5.10 | 178.60 | 117.78 | 37.28 | 0.923 | 0.410 | 5.61 | 15 | 55 | 181 | 15 | 3.02 | 2.31 | 3.02 | (3) | 44.52 | NL | NL | NL | NL |
| 9.6 | 2450 | 100 | 24.97 | 1.02 | 4.08 | 182.40 | 119.62 | 39.24 | 0.918 | 0.410 | 4.41 | 19 | 68 | 224 | 19 | 2.88 | 2.17 | 2.88 | (4) | 38.01 | NL | NL | NL | NL |
| 9.8 | 2550 | 110 | 25.99 | 1.12 | 4.31 | 186.20 | 121.45 | 41.20 | 0.912 | 0.410 | 4.65 | 19 | 70 | 231 | 19 | 2.88 | 2.19 | 2.88 | (4) | 38.29 | NL | NL | NL | NL |
| 10 | 2740 | 110 | 27.93 | 1.12 | 4.01 | 190.00 | 123.29 | 43.16 | 0.907 | 0.409 | 4.31 | 21 | 74 | 247 | 21 | 2.84 | 2.15 | 2.84 | (4) | 36.51 | NL | NL | NL | NL |





- (2) terreni organici, torbe
- (3) argille
- (4) argille limose e limi argillosi
- (5) limi sabbiosi e sabbie limose
- (6) sabbie
- (7) sabbie ghiaiose

| | |
|--------|-----------|
| ID. | 20-02CU14 |
| CPT N° | CPT 04 |

| | |
|-------------------|------------|
| amax | 0.25 g |
| Magnitudo Momento | 6.14 |
| Falda | 3.2 (m) |
| Peso di volume | 19 (kN/mc) |

| | |
|---------|-------|
| MSF (1) | 1.668 |
| MSF (2) | 1.935 |
| MSF | 1.802 |
| MWF | 0.555 |

NL = Non soggetto a liquefazione

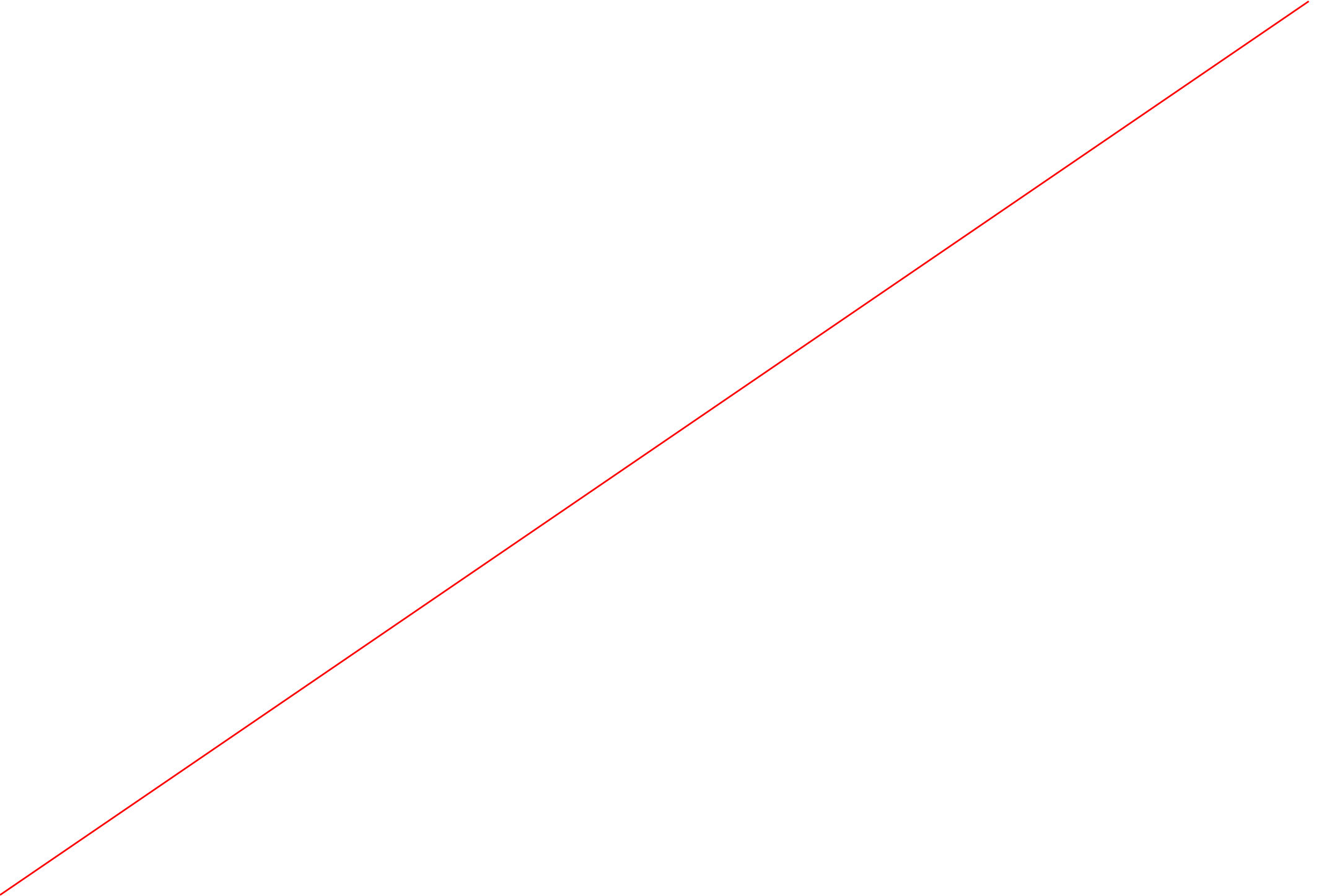
* Per $I_c > 2.6$

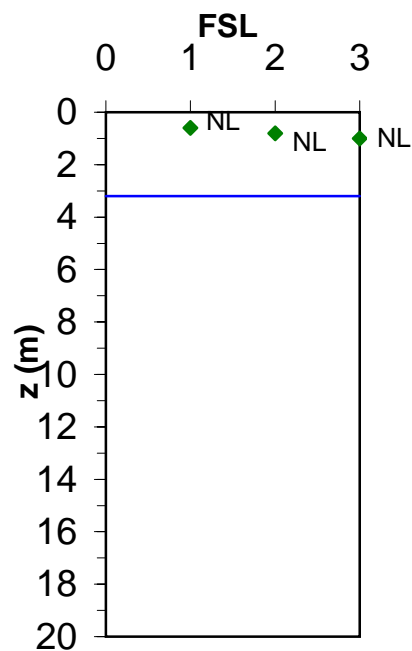
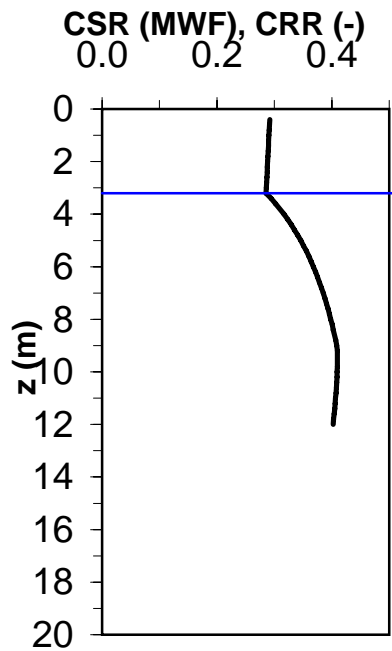
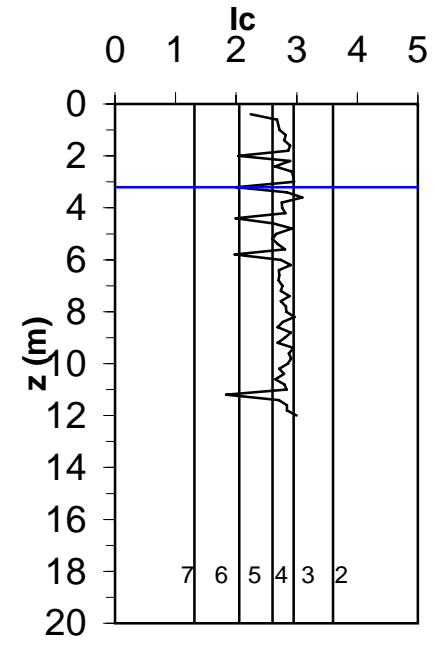
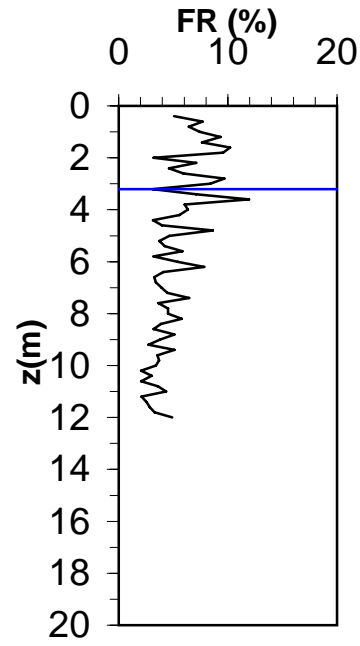
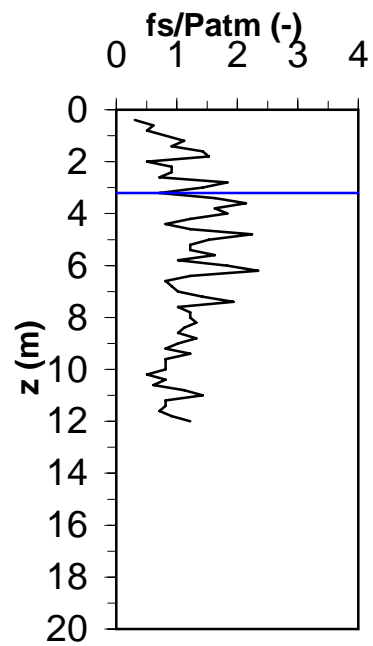
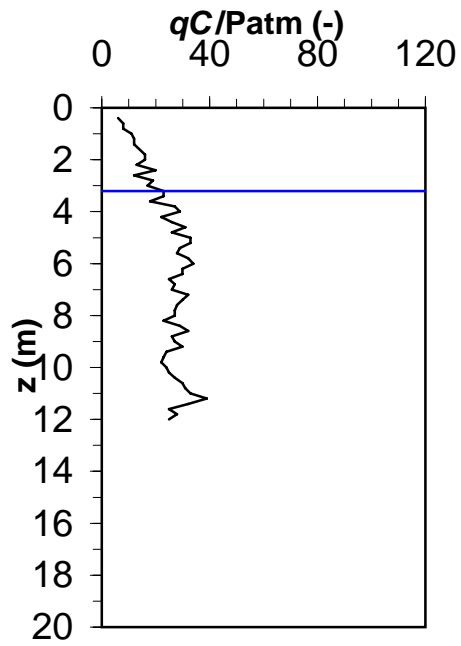
** Per $I_c > 2.6$ o sopra falda

*** Per $I_c > 2.6$ o sopra falda o $(q_{c1N})_{cs} > 160$

| z | q _c | f _s | q _c /Pa | f _s /Pa | R _f | σ _{v0} | σ' _{v0} | u ₀ | r _d | CSR | F _{norm} | Q _{norm} | q _{c1N} (0.75) | q _{c1N} (0.5) | q _{c1N} | I _{c(1)} | I _{c(0.5)} | I _c | SBT | F _c | K _c | (q _{c1N}) _{cs} | CRR | FSL |
|-----|----------------|----------------|--------------------|--------------------|----------------|-----------------|------------------|----------------|----------------|-------|-------------------|-------------------|----------------------------|---------------------------|------------------|-------------------|---------------------|----------------|-----|----------------|----------------|-----------------------------------|-----|-----|
| (m) | (kPa) | (kPa) | (-) | (-) | (%) | (kPa) | (kPa) | (kPa) | (-) | (-) | (-) | (-) | (-) | (-) | (-) | | | | (%) | * | (-) | ** | *** | |
| 0.4 | 590 | 30 | 6.01 | 0.31 | 5.08 | 7.60 | 7.60 | 0.00 | 0.997 | 0.292 | 5.15 | 77 | 129 | 214 | 214 | 2.50 | 2.24 | 2.24 | (5) | 16.05 | 1.78 | NL | NL | NL |
| 0.6 | 780 | 60 | 7.95 | 0.61 | 7.69 | 11.40 | 11.40 | 0.00 | 0.995 | 0.291 | 7.81 | 67 | 126 | 231 | 67 | 2.68 | 2.38 | 2.68 | (4) | 29.80 | NL | NL | NL | NL |
| 0.8 | 780 | 50 | 7.95 | 0.51 | 6.41 | 15.20 | 15.20 | 0.00 | 0.994 | 0.291 | 6.54 | 50 | 101 | 200 | 50 | 2.70 | 2.35 | 2.70 | (4) | 30.60 | NL | NL | NL | NL |
| 1 | 1080 | 80 | 11.01 | 0.82 | 7.41 | 19.00 | 19.00 | 0.00 | 0.992 | 0.291 | 7.54 | 56 | 119 | 248 | 56 | 2.71 | 2.36 | 2.71 | (4) | 31.30 | NL | NL | NL | NL |
| 1.2 | 1180 | 110 | 12.03 | 1.12 | 9.32 | 22.80 | 22.80 | 0.00 | 0.991 | 0.290 | 9.51 | 51 | 113 | 247 | 51 | 2.82 | 2.45 | 2.82 | (4) | 35.49 | NL | NL | NL | NL |
| 1.4 | 1180 | 90 | 12.03 | 0.92 | 7.63 | 26.60 | 26.60 | 0.00 | 0.989 | 0.290 | 7.80 | 43 | 101 | 229 | 43 | 2.80 | 2.39 | 2.80 | (4) | 34.58 | NL | NL | NL | NL |
| 1.6 | 1370 | 140 | 13.97 | 1.43 | 10.22 | 30.40 | 30.40 | 0.00 | 0.988 | 0.289 | 10.45 | 44 | 106 | 248 | 44 | 2.89 | 2.48 | 2.89 | (4) | 38.51 | NL | NL | NL | NL |
| 1.8 | 1570 | 150 | 16.00 | 1.53 | 9.55 | 34.20 | 34.20 | 0.00 | 0.986 | 0.289 | 9.77 | 45 | 111 | 268 | 45 | 2.86 | 2.44 | 2.86 | (4) | 37.29 | NL | NL | NL | NL |
| 2 | 1570 | 50 | 16.00 | 0.51 | 3.18 | 38.00 | 38.00 | 0.00 | 0.985 | 0.288 | 3.26 | 40 | 103 | 255 | 255 | 2.55 | 2.03 | 2.03 | (6) | 11.03 | 1.35 | NL | NL | NL |
| 2.2 | 1270 | 90 | 12.95 | 0.92 | 7.09 | 41.80 | 41.80 | 0.00 | 0.983 | 0.288 | 7.33 | 29 | 77 | 196 | 29 | 2.89 | 2.39 | 2.89 | (4) | 38.56 | NL | NL | NL | NL |
| 2.4 | 1960 | 90 | 19.98 | 0.92 | 4.59 | 45.60 | 45.60 | 0.00 | 0.982 | 0.287 | 4.70 | 42 | 112 | 290 | 42 | 2.64 | 2.14 | 2.64 | (4) | 28.65 | NL | NL | NL | NL |
| 2.6 | 1180 | 70 | 12.03 | 0.71 | 5.93 | 49.40 | 49.40 | 0.00 | 0.980 | 0.287 | 6.19 | 23 | 63 | 168 | 23 | 2.92 | 2.37 | 2.92 | (4) | 39.68 | NL | NL | NL | NL |
| 2.8 | 1860 | 180 | 18.96 | 1.83 | 9.68 | 53.20 | 53.20 | 0.00 | 0.979 | 0.287 | 9.96 | 34 | 94 | 255 | 34 | 2.95 | 2.46 | 2.95 | (4) | 41.06 | NL | NL | NL | NL |
| 3 | 1670 | 140 | 17.02 | 1.43 | 8.38 | 57.00 | 57.00 | 0.00 | 0.977 | 0.286 | 8.68 | 28 | 81 | 221 | 28 | 2.96 | 2.43 | 2.96 | (3) | 41.46 | NL | NL | NL | NL |
| 3.2 | 2250 | 70 | 22.94 | 0.71 | 3.11 | 60.80 | 60.80 | 0.00 | 0.976 | 0.286 | 3.20 | 36 | 103 | 289 | 289 | 2.58 | 2.00 | 2.00 | (6) | 10.27 | 1.30 | NL | NL | NL |
| 3.4 | 2250 | 160 | 22.94 | 1.63 | 7.11 | 64.60 | 62.64 | 0.00 | 0.974 | 0.294 | 7.32 | 35 | 101 | 284 | 35 | 2.84 | 2.32 | 2.84 | (4) | 36.34 | NL | NL | NL | NL |
| 3.6 | 1760 | 210 | 17.94 | 2.14 | 11.93 | 68.40 | 64.48 | 0.00 | 0.972 | 0.302 | 12.41 | 26 | 77 | 219 | 26 | 3.09 | 2.57 | 3.09 | (3) | 48.04 | NL | NL | NL | NL |
| 3.8 | 2650 | 160 | 27.01 | 1.63 | 6.04 | 72.20 | 66.31 | 0.00 | 0.971 | 0.310 | 6.21 | 39 | 114 | 325 | 39 | 2.75 | 2.23 | 2.75 | (4) | 32.87 | NL | NL | NL | NL |
| 4 | 2840 | 180 | 28.95 | 1.83 | 6.34 | 76.00 | 68.15 | 0.00 | 0.969 | 0.317 | 6.51 | 41 | 120 | 344 | 41 | 2.76 | 2.24 | 2.76 | (4) | 32.99 | NL | NL | NL | NL |
| 4.2 | 2160 | 120 | 22.02 | 1.22 | 5.56 | 79.80 | 69.99 | 0.00 | 0.968 | 0.323 | 5.77 | 30 | 89 | 258 | 30 | 2.81 | 2.25 | 2.81 | (4) | 35.25 | NL | NL | NL | NL |
| 4.4 | 2550 | 80 | 25.99 | 0.82 | 3.14 | 83.60 | 71.83 | 0.00 | 0.966 | 0.329 | 3.24 | 34 | 103 | 301 | 301 | 2.60 | 1.99 | 1.99 | (6) | 10.19 | 1.29 | 389 | NL | NL |
| 4.6 | 3040 | 120 | 30.99 | 1.22 | 3.95 | 87.40 | 73.67 | 0.00 | 0.965 | 0.335 | 4.06 | 40 | 121 | 354 | 40 | 2.61 | 2.05 | 2.61 | (4) | 27.54 | NL | NL | NL | NL |
| 4.8 | 2550 | 220 | 25.99 | 2.24 | 8.63 | 91.20 | 75.50 | 0.00 | 0.963 | 0.341 | 8.95 | 33 | 100 | 293 | 33 | 2.92 | 2.39 | 2.92 | (4) | 40.03 | NL | NL | NL | NL |
| 5 | 3230 | 150 | 32.93 | 1.53 | 4.64 | 95.00 | 77.34 | 0.00 | 0.962 | 0.346 | 4.78 | 41 | 124 | 367 | 41 | 2.66 | 2.10 | 2.66 | (4) | 29.25 | NL | NL | NL | NL |
| 5.2 | 3230 | 120 | 32.93 | 1.22 | 3.72 | 98.80 | 79.18 | 0.00 | 0.960 | 0.351 | 3.83 | 40 | 122 | 363 | 40 | 2.60 | 2.02 | 2.60 | (4) | 27.06 | NL | NL | NL | NL |
| 5.4 | 2840 | 120 | 28.95 | 1.22 | 4.23 | 102.60 | 81.02 | 0.00 | 0.959 | 0.355 | 4.38 | 34 | 105 | 316 | 34 | 2.69 | 2.10 | 2.69 | (4) | 30.36 | NL | NL | NL | NL |
| 5.6 | 2740 | 160 | 27.93 | 1.63 | 5.84 | 106.40 | 82.86 | 0.00 | 0.957 | 0.360 | 6.08 | 32 | 100 | 301 | 32 | 2.81 | 2.24 | 2.81 | (4) | 35.06 | NL | NL | NL | NL |
| 5.8 | 3140 | 100 | 32.01 | 1.02 | 3.18 | 110.20 | 84.69 | 1.96 | 0.956 | 0.364 | 3.30 | 36 | 112 | 341 | 341 | 2.59 | 1.98 | 1.98 | (6) | 9.78 | 1.27 | 433 | NL | NL |
| 6 | 3330 | 180 | 33.94 | 1.83 | 5.41 | 114.00 | 86.53 | 3.92 | 0.954 | 0.368 | 5.60 | 37 | 117 | 358 | 37 | 2.74 | 2.17 | 2.74 | (4) | 32.12 | NL | NL | NL | NL |
| 6.2 | 2940 | 230 | 29.97 | 2.34 | 7.82 | 117.80 | 88.37 | 5.89 | 0.953 | 0.372 | 8.15 | 32 | 102 | 313 | 32 | 2.90 | 2.34 | 2.90 | (4) | 38.95 | NL | NL | NL | NL |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|------|------|-----|-------|------|------|--------|--------|-------|-------|-------|------|----|-----|-----|-----|------|------|------|-----|-------|------|-----|----|----|
| 6.4 | 2940 | 120 | 29.97 | 1.22 | 4.08 | 121.60 | 90.21 | 7.85 | 0.951 | 0.375 | 4.26 | 31 | 100 | 310 | 31 | 2.71 | 2.09 | 2.71 | (4) | 30.97 | NL | NL | NL | NL |
| 6.6 | 2450 | 80 | 24.97 | 0.82 | 3.27 | 125.40 | 92.05 | 9.81 | 0.950 | 0.379 | 3.44 | 25 | 82 | 255 | 25 | 2.71 | 2.05 | 2.71 | (4) | 31.25 | NL | NL | NL | NL |
| 6.8 | 2650 | 90 | 27.01 | 0.92 | 3.40 | 129.20 | 93.88 | 11.77 | 0.948 | 0.382 | 3.57 | 27 | 88 | 273 | 27 | 2.70 | 2.05 | 2.70 | (4) | 30.88 | NL | NL | NL | NL |
| 7 | 2550 | 100 | 25.99 | 1.02 | 3.92 | 133.00 | 95.72 | 13.73 | 0.946 | 0.385 | 4.14 | 25 | 83 | 261 | 25 | 2.77 | 2.12 | 2.77 | (4) | 33.32 | NL | NL | NL | NL |
| 7.2 | 3140 | 140 | 32.01 | 1.43 | 4.46 | 136.80 | 97.56 | 15.70 | 0.945 | 0.388 | 4.66 | 31 | 101 | 318 | 31 | 2.74 | 2.12 | 2.74 | (4) | 32.20 | NL | NL | NL | NL |
| 7.4 | 2940 | 190 | 29.97 | 1.94 | 6.46 | 140.60 | 99.40 | 17.66 | 0.943 | 0.391 | 6.79 | 28 | 93 | 295 | 28 | 2.88 | 2.28 | 2.88 | (4) | 38.08 | NL | NL | NL | NL |
| 7.6 | 2740 | 100 | 27.93 | 1.02 | 3.65 | 144.40 | 101.24 | 19.62 | 0.942 | 0.393 | 3.85 | 26 | 86 | 272 | 26 | 2.74 | 2.08 | 2.74 | (4) | 32.31 | NL | NL | NL | NL |
| 7.8 | 2650 | 120 | 27.01 | 1.22 | 4.53 | 148.20 | 103.07 | 21.58 | 0.940 | 0.396 | 4.80 | 24 | 82 | 261 | 24 | 2.82 | 2.17 | 2.82 | (4) | 35.60 | NL | NL | NL | NL |
| 8 | 2650 | 120 | 27.01 | 1.22 | 4.53 | 152.00 | 104.91 | 23.54 | 0.939 | 0.398 | 4.80 | 24 | 81 | 259 | 24 | 2.83 | 2.18 | 2.83 | (4) | 35.88 | NL | NL | NL | NL |
| 8.2 | 2250 | 130 | 22.94 | 1.33 | 5.78 | 155.80 | 106.75 | 25.51 | 0.937 | 0.401 | 6.21 | 20 | 68 | 218 | 20 | 2.97 | 2.31 | 2.97 | (3) | 41.93 | NL | NL | NL | NL |
| 8.4 | 2840 | 110 | 28.95 | 1.12 | 3.87 | 159.60 | 108.59 | 27.47 | 0.936 | 0.403 | 4.10 | 25 | 84 | 273 | 25 | 2.77 | 2.10 | 2.77 | (4) | 33.52 | NL | NL | NL | NL |
| 8.6 | 3140 | 100 | 32.01 | 1.02 | 3.18 | 163.40 | 110.43 | 29.43 | 0.934 | 0.405 | 3.36 | 27 | 92 | 299 | 27 | 2.68 | 2.01 | 2.68 | (4) | 30.17 | NL | NL | NL | NL |
| 8.8 | 2550 | 130 | 25.99 | 1.33 | 5.10 | 167.20 | 112.26 | 31.39 | 0.933 | 0.407 | 5.46 | 21 | 74 | 241 | 21 | 2.90 | 2.24 | 2.90 | (4) | 39.08 | NL | NL | NL | NL |
| 9 | 2650 | 100 | 27.01 | 1.02 | 3.77 | 171.00 | 114.10 | 33.35 | 0.931 | 0.409 | 4.03 | 22 | 76 | 248 | 22 | 2.81 | 2.12 | 2.81 | (4) | 35.03 | NL | NL | NL | NL |
| 9.2 | 2940 | 80 | 29.97 | 0.82 | 2.72 | 174.80 | 115.94 | 35.32 | 0.928 | 0.410 | 2.89 | 24 | 83 | 273 | 24 | 2.68 | 1.97 | 2.68 | (4) | 30.15 | NL | NL | NL | NL |
| 9.4 | 2350 | 120 | 23.96 | 1.22 | 5.11 | 178.60 | 117.78 | 37.28 | 0.923 | 0.410 | 5.53 | 18 | 66 | 217 | 18 | 2.95 | 2.27 | 2.95 | (3) | 41.29 | NL | NL | NL | NL |
| 9.6 | 2250 | 80 | 22.94 | 0.82 | 3.56 | 182.40 | 119.62 | 39.24 | 0.918 | 0.410 | 3.87 | 17 | 62 | 206 | 17 | 2.87 | 2.15 | 2.87 | (4) | 37.77 | NL | NL | NL | NL |
| 9.8 | 2160 | 80 | 22.02 | 0.82 | 3.70 | 186.20 | 121.45 | 41.20 | 0.912 | 0.410 | 4.05 | 16 | 59 | 196 | 16 | 2.91 | 2.17 | 2.91 | (4) | 39.24 | NL | NL | NL | NL |
| 10 | 2350 | 80 | 23.96 | 0.82 | 3.40 | 190.00 | 123.29 | 43.16 | 0.907 | 0.409 | 3.70 | 18 | 64 | 212 | 18 | 2.86 | 2.12 | 2.86 | (4) | 37.07 | NL | NL | NL | NL |
| 10.2 | 2450 | 50 | 24.97 | 0.51 | 2.04 | 193.80 | 125.13 | 45.13 | 0.902 | 0.409 | 2.22 | 18 | 65 | 219 | 18 | 2.71 | 1.93 | 2.71 | (4) | 31.19 | NL | NL | NL | NL |
| 10.4 | 2650 | 80 | 27.01 | 0.82 | 3.02 | 197.60 | 126.97 | 47.09 | 0.896 | 0.408 | 3.26 | 19 | 70 | 235 | 19 | 2.79 | 2.05 | 2.79 | (4) | 34.24 | NL | NL | NL | NL |
| 10.6 | 2940 | 60 | 29.97 | 0.61 | 2.04 | 201.40 | 128.81 | 49.05 | 0.891 | 0.408 | 2.19 | 21 | 77 | 259 | 21 | 2.65 | 1.88 | 2.65 | (4) | 28.89 | NL | NL | NL | NL |
| 10.8 | 3040 | 110 | 30.99 | 1.12 | 3.62 | 205.20 | 130.64 | 51.01 | 0.886 | 0.407 | 3.88 | 22 | 79 | 266 | 22 | 2.80 | 2.09 | 2.80 | (4) | 34.60 | NL | NL | NL | NL |
| 11 | 3230 | 140 | 32.93 | 1.43 | 4.33 | 209.00 | 132.48 | 52.97 | 0.880 | 0.407 | 4.63 | 23 | 83 | 281 | 23 | 2.83 | 2.15 | 2.83 | (4) | 36.03 | NL | NL | NL | NL |
| 11.2 | 3820 | 80 | 38.94 | 0.82 | 2.09 | 212.80 | 134.32 | 54.94 | 0.875 | 0.406 | 2.22 | 27 | 97 | 330 | 330 | 2.57 | 1.83 | 1.83 | (6) | 7.07 | 1.13 | 373 | NL | NL |
| 11.4 | 3140 | 80 | 32.01 | 0.82 | 2.55 | 216.60 | 136.16 | 56.90 | 0.870 | 0.405 | 2.74 | 21 | 79 | 269 | 21 | 2.71 | 1.96 | 2.71 | (4) | 30.94 | NL | NL | NL | NL |
| 11.6 | 2450 | 70 | 24.97 | 0.71 | 2.86 | 220.40 | 138.00 | 58.86 | 0.864 | 0.404 | 3.14 | 16 | 61 | 209 | 16 | 2.84 | 2.07 | 2.84 | (4) | 36.36 | NL | NL | NL | NL |
| 11.8 | 2740 | 90 | 27.93 | 0.92 | 3.28 | 224.20 | 139.83 | 60.82 | 0.859 | 0.403 | 3.58 | 18 | 67 | 232 | 18 | 2.84 | 2.09 | 2.84 | (4) | 36.28 | NL | NL | NL | NL |
| 12 | 2450 | 120 | 24.97 | 1.22 | 4.90 | 228.00 | 141.67 | 62.78 | 0.854 | 0.402 | 5.40 | 16 | 60 | 206 | 16 | 3.00 | 2.27 | 3.00 | (3) | 43.44 | NL | NL | NL | NL |





- (2) terreni organici, torbe
- (3) argille
- (4) argille limose e limi argillosi
- (5) limi sabbiosi e sabbie limose
- (6) sabbie
- (7) sabbie ghiaiose