



PROTEZIONE CIVILE  
Presidenza del Consiglio dei Ministri  
Dipartimento della Protezione Civile



Regione Emilia-Romagna



CONFERENZA DELLE REGIONI E  
DELLE PROVINCE AUTONOME

Attuazione dell'articolo 11 della legge 24 giugno 2009, n. 77

# MICROZONAZIONE SISMICA

## Verifiche liquefazione

Regione Emilia-Romagna  
Comune di Busseto



Regione Emilia-Romagna	<p>Soggetto realizzatore</p>  <p>ENGEO S.r.l. ENGINEERING GEOLOGY www.engeo.it</p> <p>Direzione tecnica Dott. Geol. Carlo Caleffi Dott. Geol. Francesco Cerutti Collaboratori Dott. Geol. Matteo Baisi Dott.ssa Geol. Alessandra Cantoni Dott. Geol. Andrea Conti Dott.ssa Geol. Melinda Raimondo</p>	<p>Data Maggio 2022</p> <p><b>MS3</b></p>
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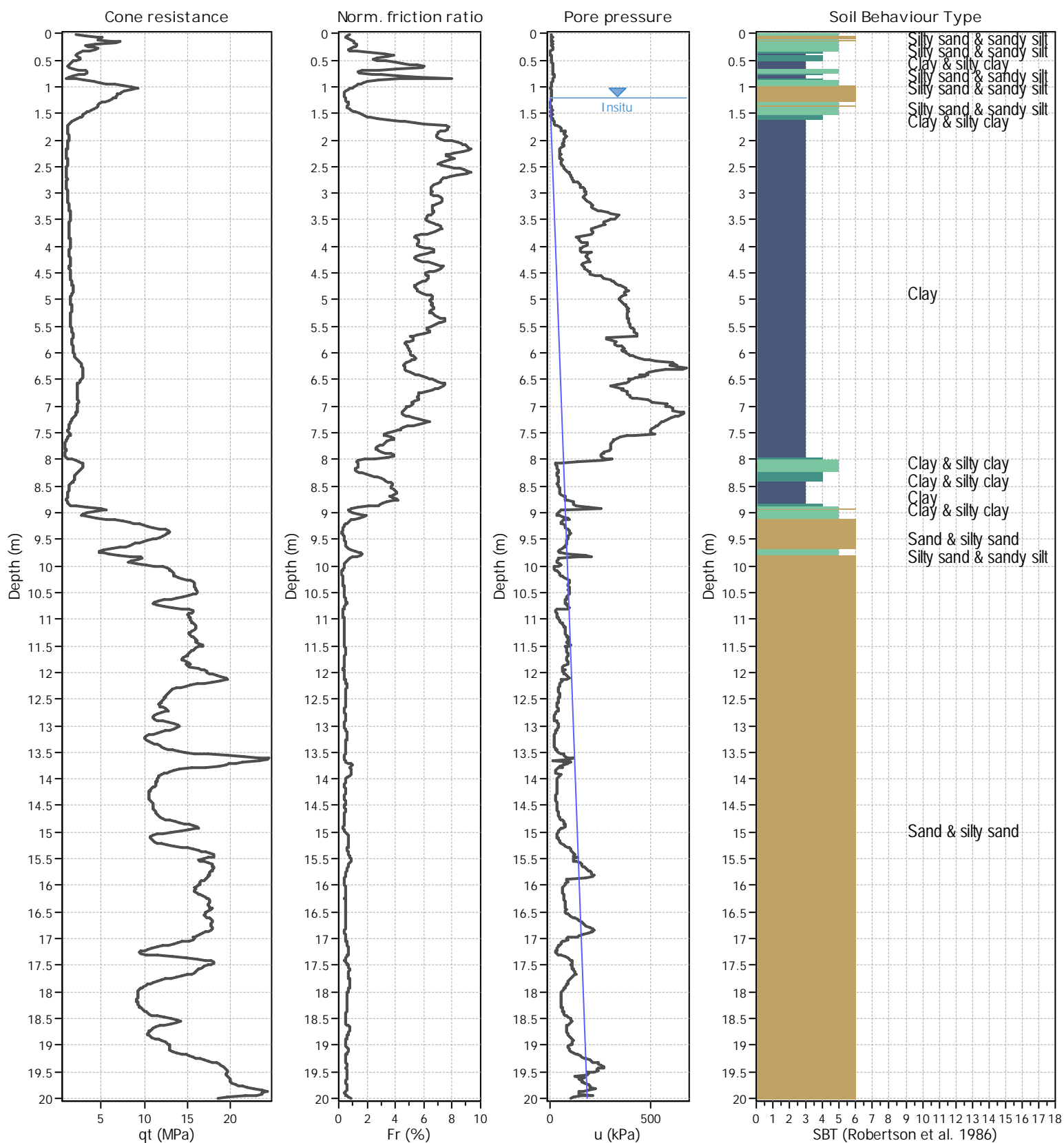


Project: Microzonazione Sismica III livello

Location: Busseto

CPT: cptu1\_Busseto

Total depth: 20.00 m



Analysis method:	Robertson (2009)	G.W.T. (in-situ):	1.20 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on $I_c$ value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	$I_c$ cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.18	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based



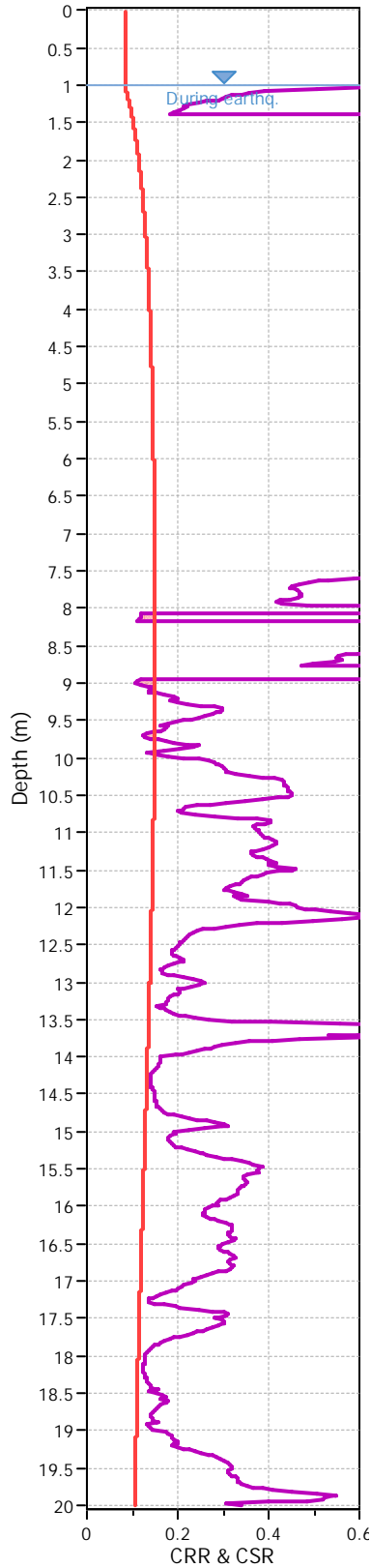
Project: Microzonazione Sismica III livello

Location: Busseto

CPT: cptu1\_Busseto

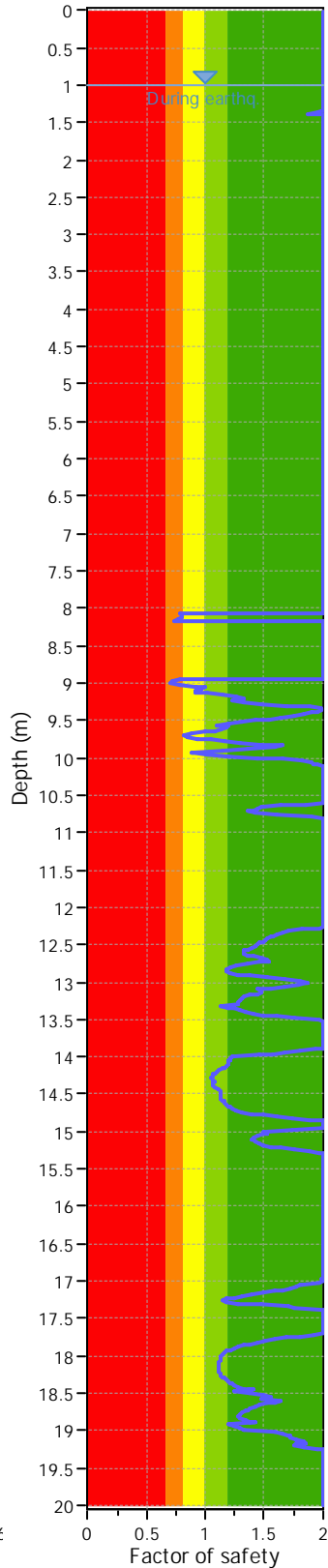
Total depth: 20.00 m

CRR plot



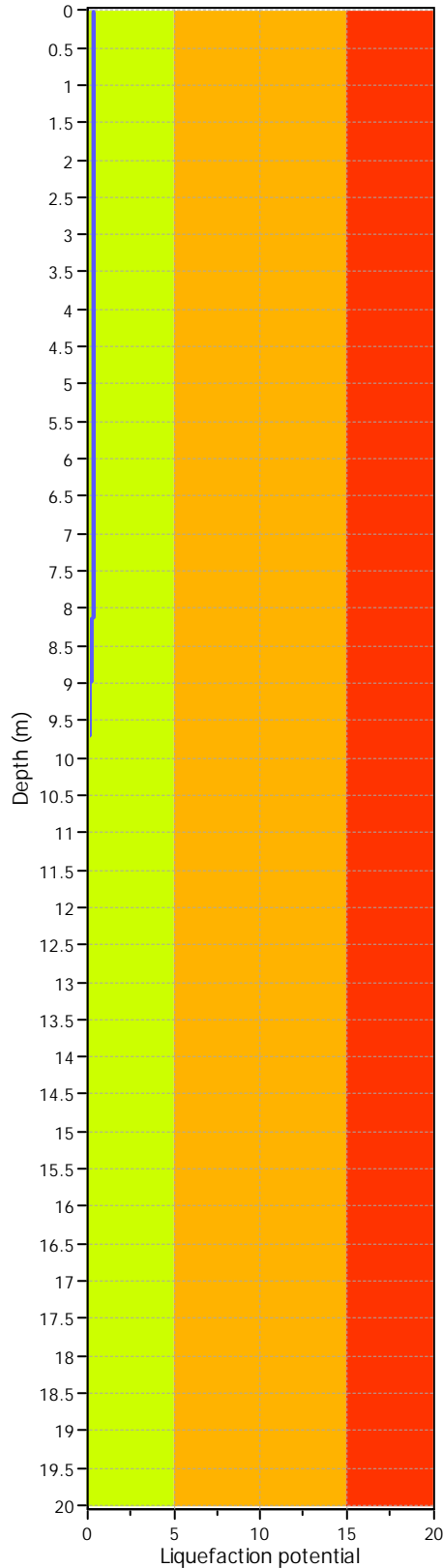
CRR & CSR

FS Plot



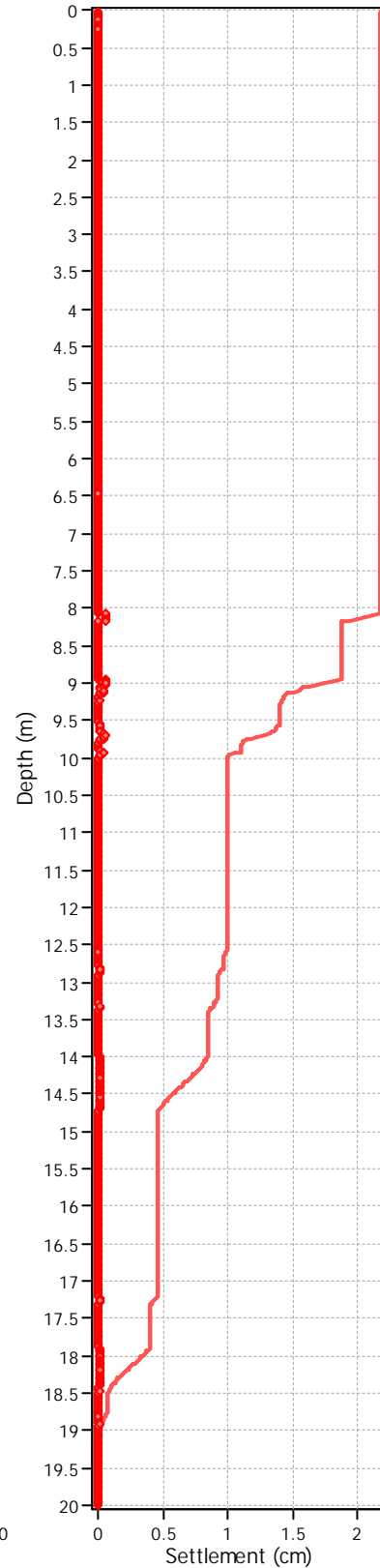
Factor of safety

LPI



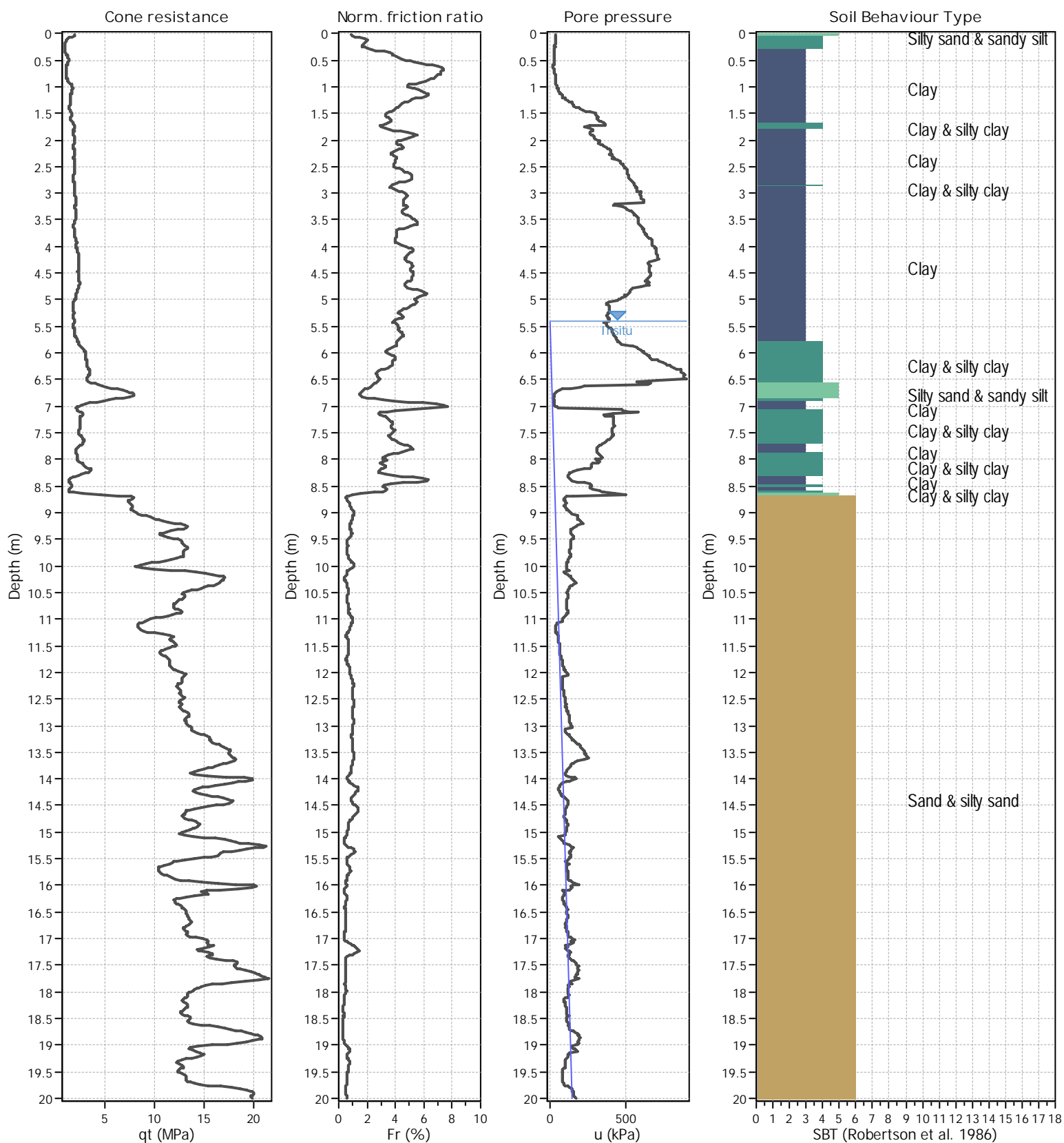
Liquefaction potential

Vertical settlements



Settlement (cm)

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	1.20 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.18	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based



Analysis method:	Robertson (2009)	G.W.T. (in-situ):	5.40 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.18	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based



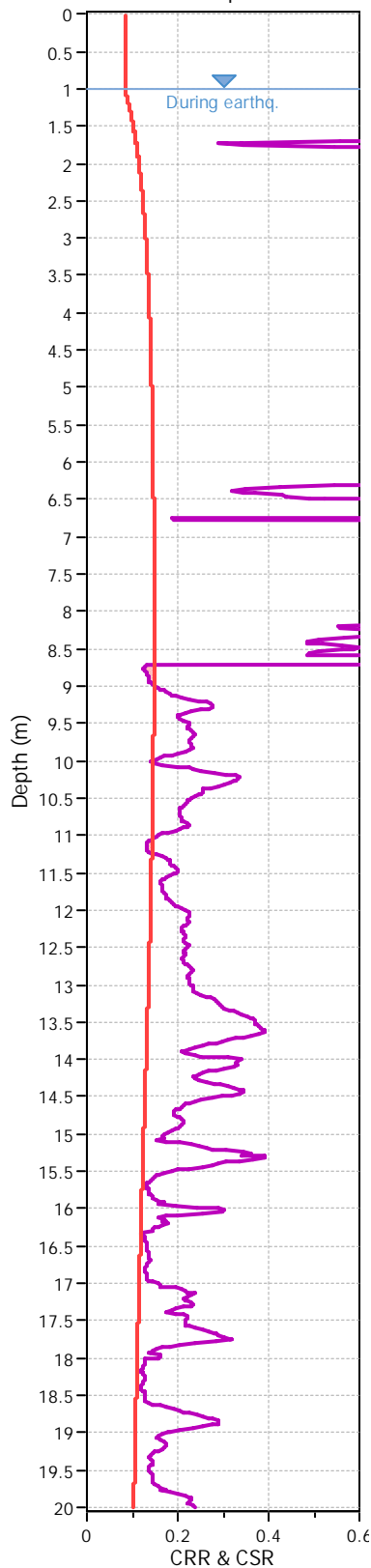
Project: Microzonazione Sismica III livello

Location: Busseto

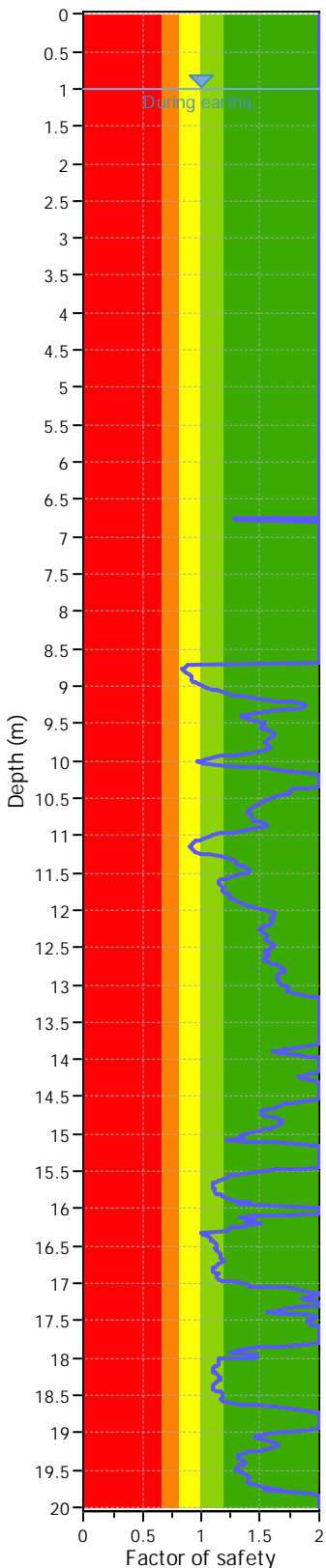
CPT: cptu2\_Busseto

Total depth: 20.00 m

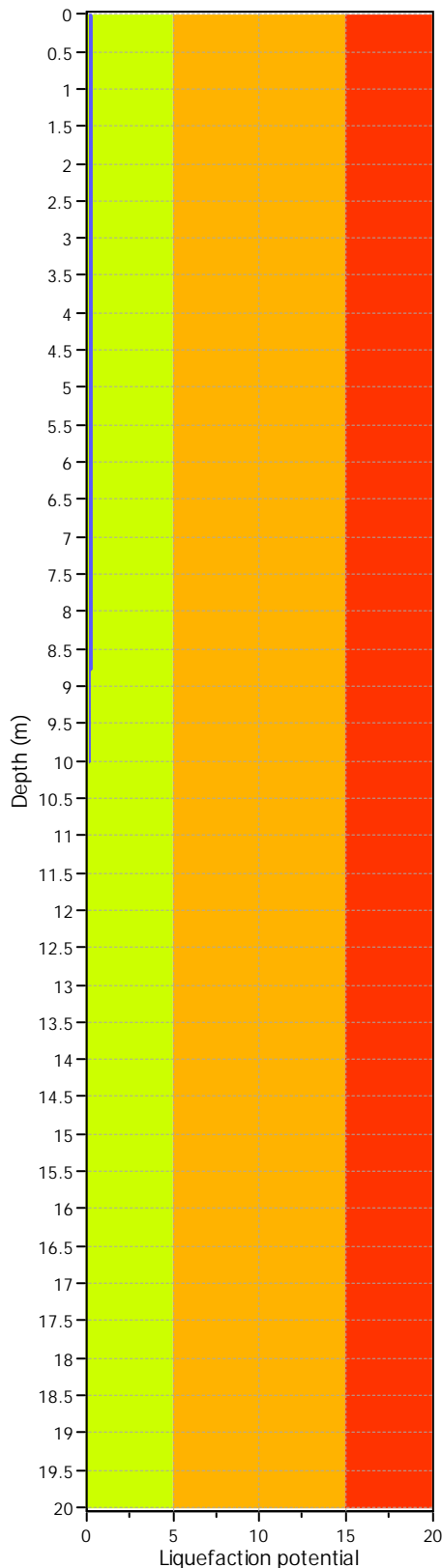
CRR plot



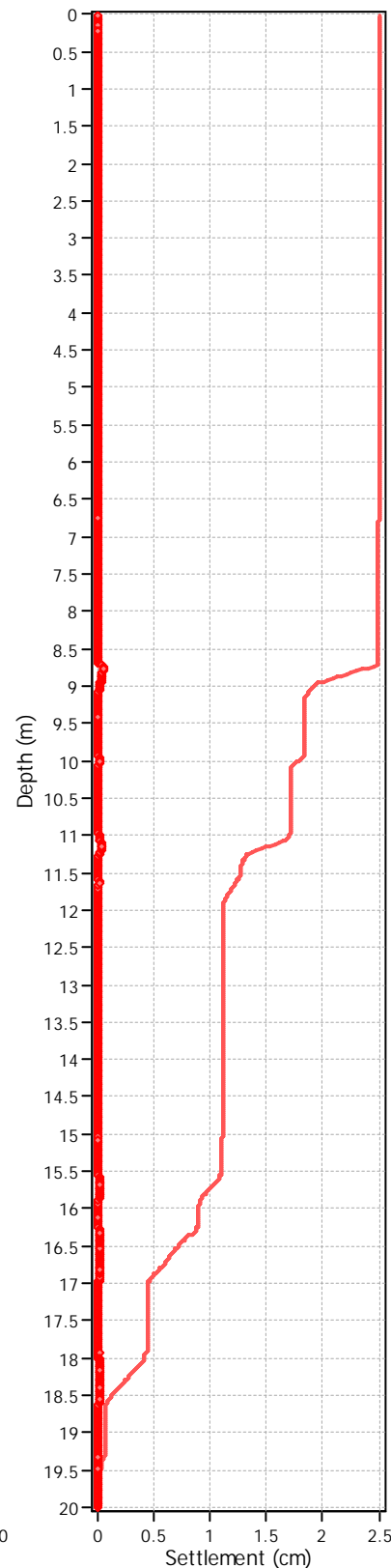
FS Plot



LPI



Vertical settlements



Analysis method: Robertson (2009)  
Fines correction method: Robertson (2009)  
Points to test: Based on Ic value  
Earthquake magnitude  $M_w$ : 6.14  
Peak ground acceleration: 0.18

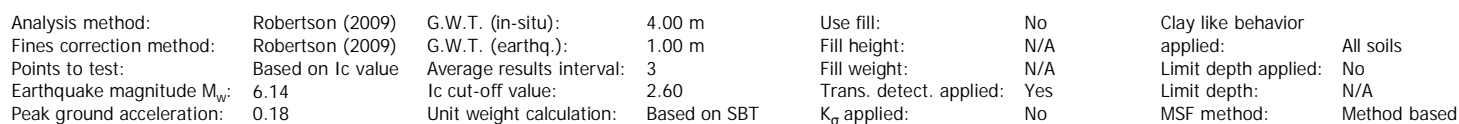
G.W.T. (in-situ): 5.40 m  
G.W.T. (earthq.): 1.00 m  
Average results interval: 3  
Ic cut-off value: 2.60  
Unit weight calculation: Based on SBT

Use fill: No  
Fill height: N/A  
Fill weight: N/A  
Trans. detect. applied: Yes  
 $K_\sigma$  applied: No

Clay like behavior applied: All soils  
Limit depth applied: No  
Limit depth: N/A  
MSF method: Method based



Total depth: 20.00 m







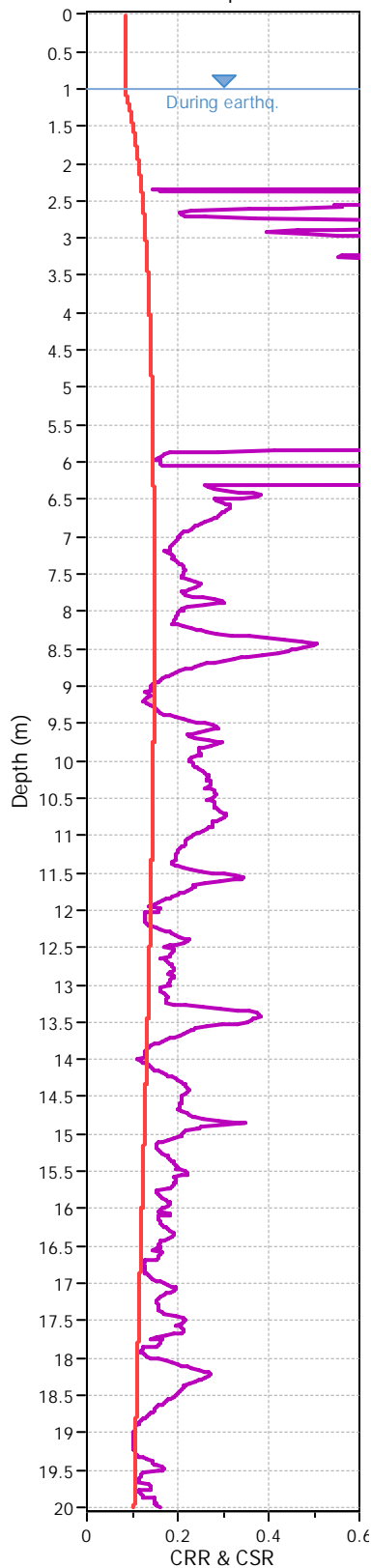
Project: Microzonazione Sismica III livello

Location: Busseto

CPT: Cptu3\_Spigarolo

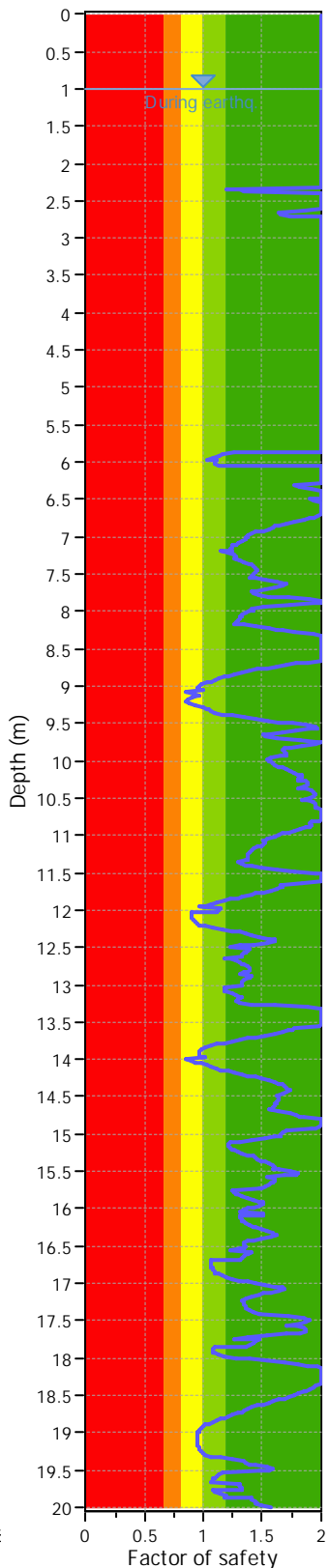
Total depth: 20.00 m

CRR plot



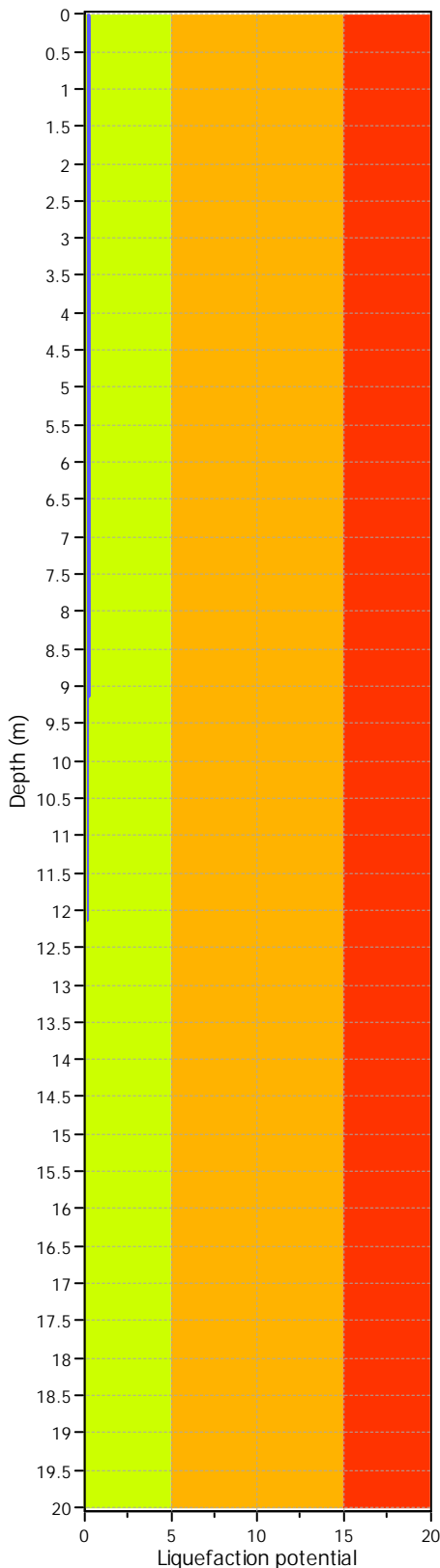
CRR & CSR

FS Plot



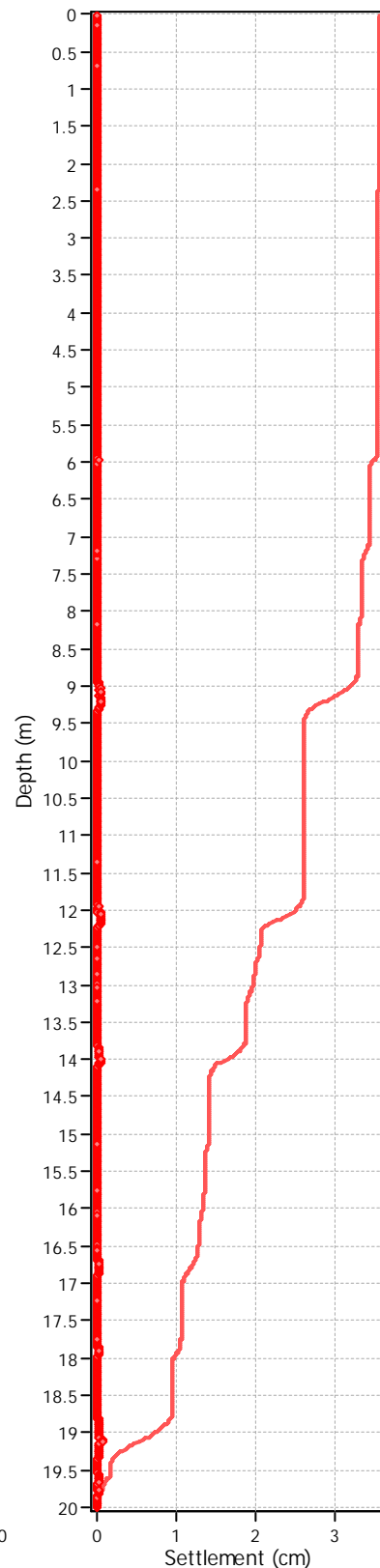
Factor of safety

LPI



Liquefaction potential

Vertical settlements



Settlement (cm)

Analysis method: Robertson (2009)  
Fines correction method: Robertson (2009)  
Points to test: Based on Ic value  
Earthquake magnitude  $M_w$ : 6.14  
Peak ground acceleration: 0.18

G.W.T. (in-situ): 4.00 m  
G.W.T. (earthq.): 1.00 m  
Average results interval: 3  
Ic cut-off value: 2.60  
Unit weight calculation: Based on SBT

Use fill: No  
Fill height: N/A  
Fill weight: N/A  
Trans. detect. applied: Yes  
 $K_g$  applied: No

Clay like behavior applied: All soils  
Limit depth applied: No  
Limit depth: N/A  
MSF method: Method based





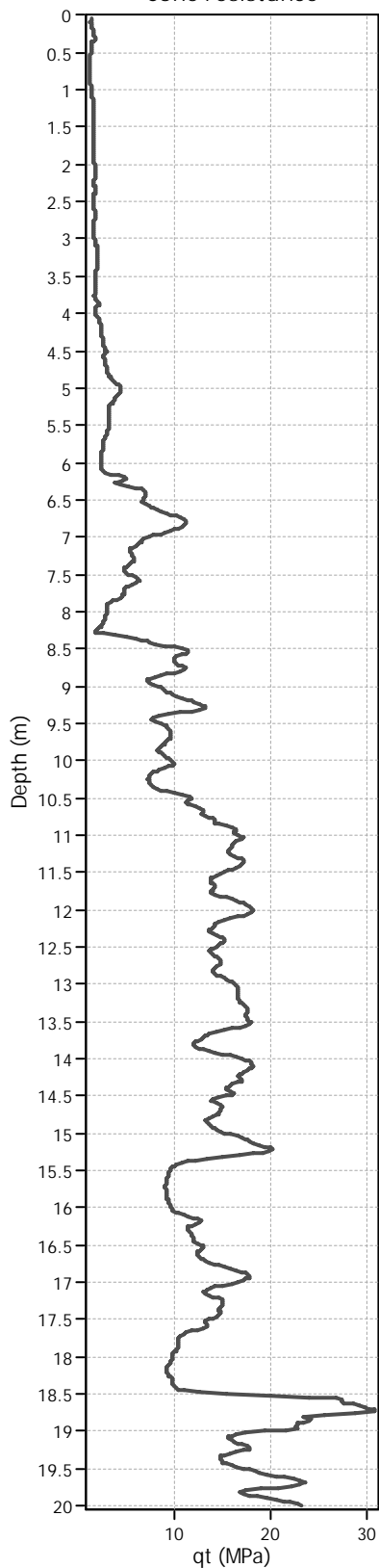
Project: Microzonazione Sismica III livello

Location: Busseto

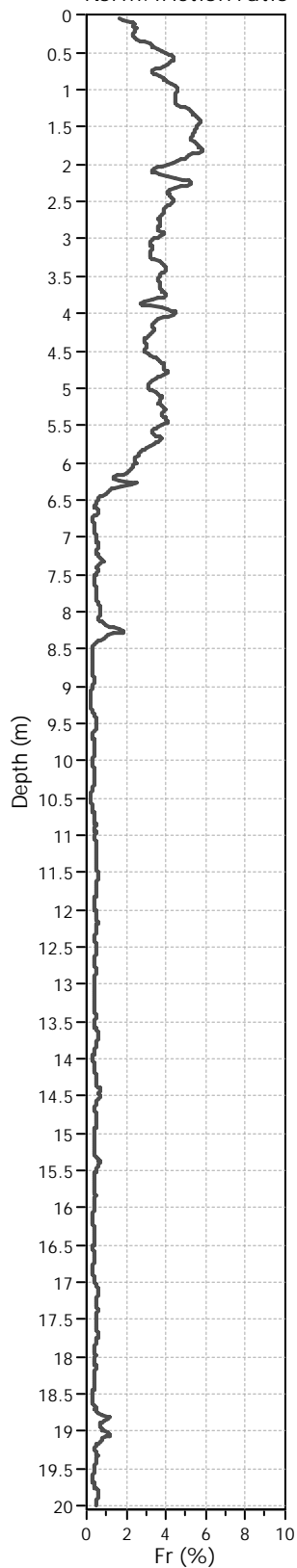
CPT: cptu4\_Frescarolo

Total depth: 20.00 m

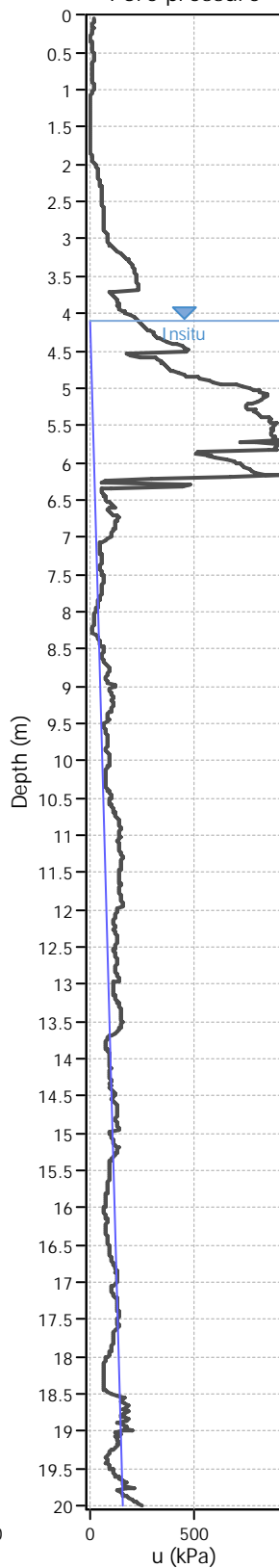
Cone resistance



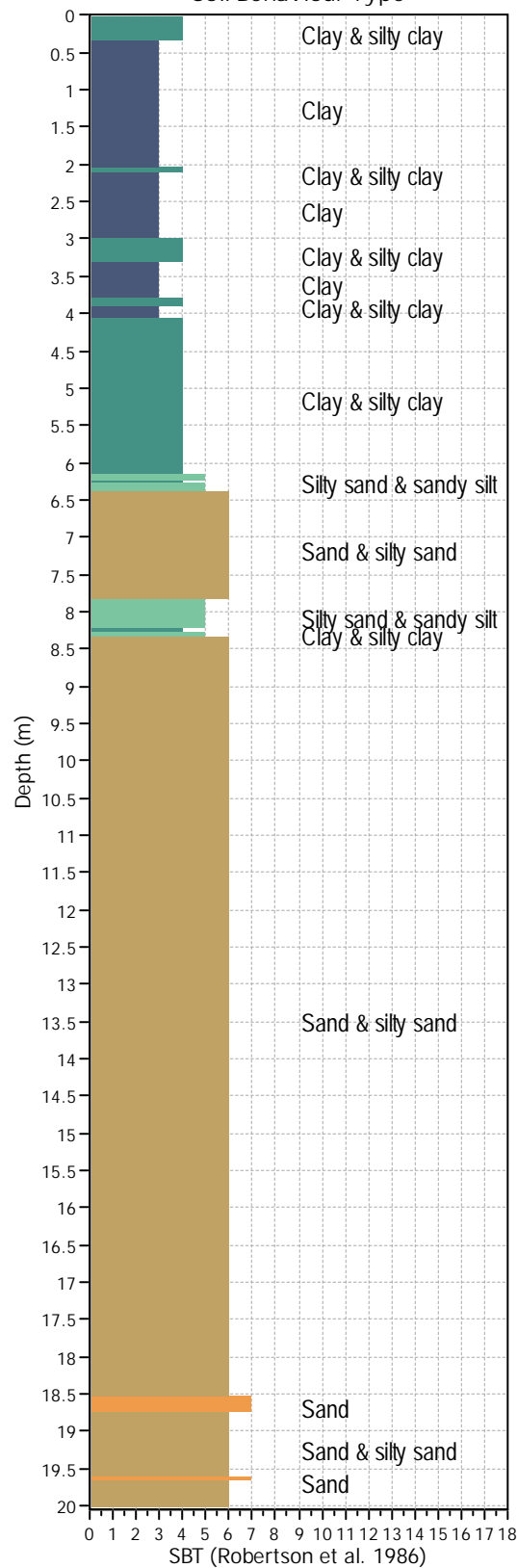
Norm. friction ratio



Pore pressure



Soil Behaviour Type



Analysis method: Robertson (2009)  
Fines correction method: Robertson (2009)  
Points to test: Based on Ic value  
Earthquake magnitude  $M_w$ : 6.14  
Peak ground acceleration: 0.17

G.W.T. (in-situ): 4.10 m  
G.W.T. (earthq.): 1.00 m  
Average results interval: 3  
Ic cut-off value: 2.60  
Unit weight calculation: Based on SBT

Use fill: No  
Fill height: N/A  
Fill weight: N/A  
Trans. detect. applied: Yes  
 $K_\sigma$  applied: No

Clay like behavior applied: All soils  
Limit depth applied: No  
Limit depth: N/A  
MSF method: Method based



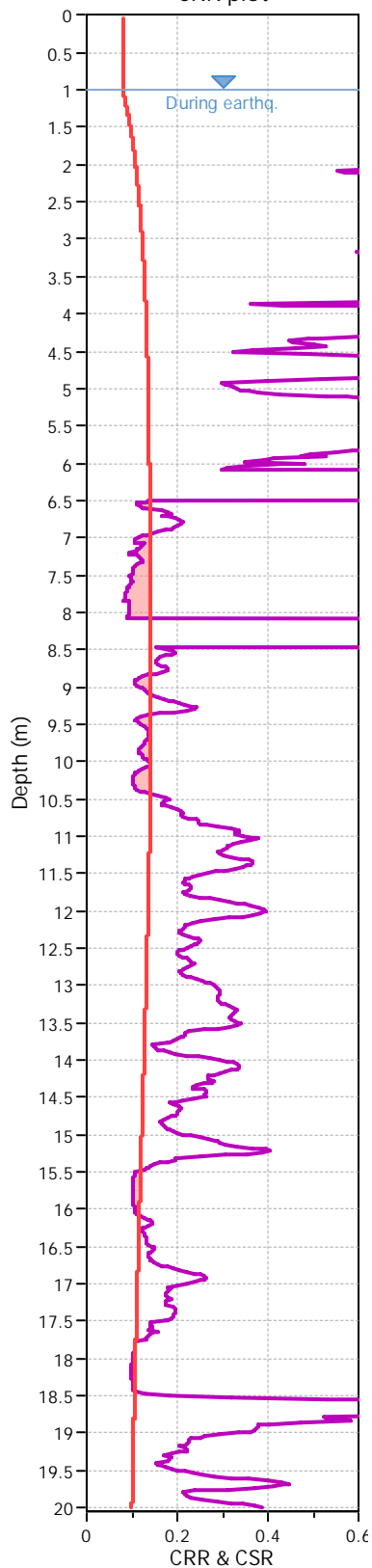
Project: Microzonazione Sismica III livello

Location: Busseto

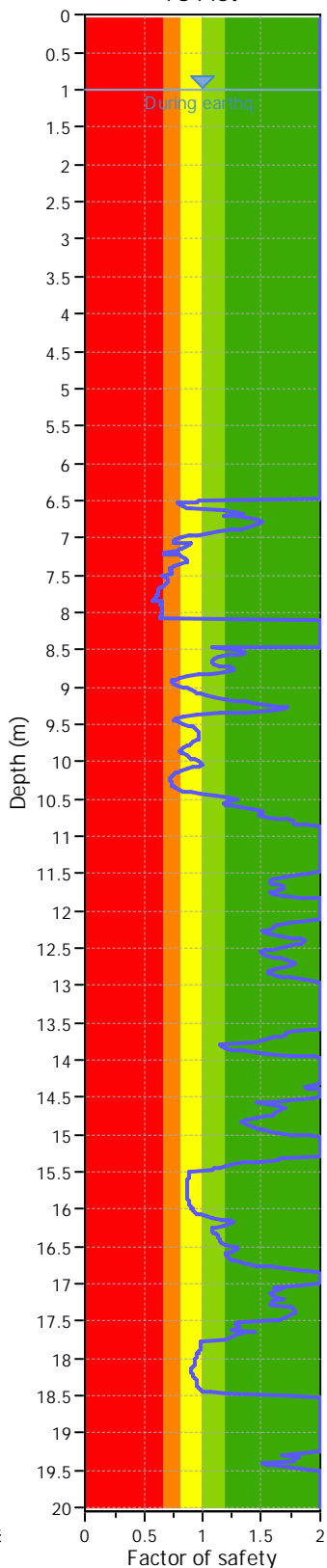
CPT: cptu4\_Frescarolo

Total depth: 20.00 m

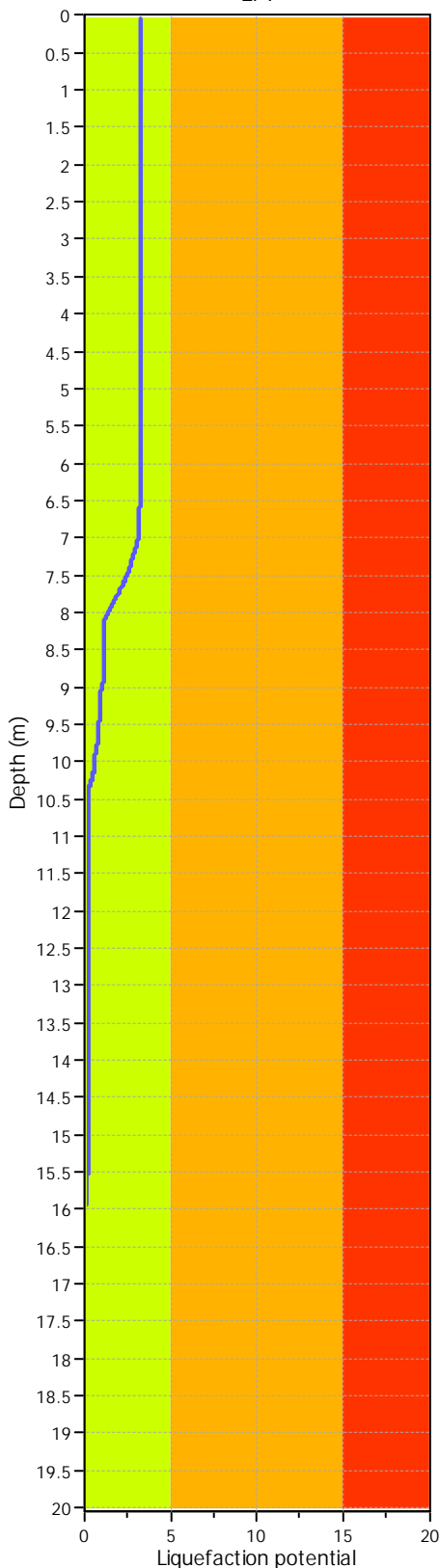
CRR plot



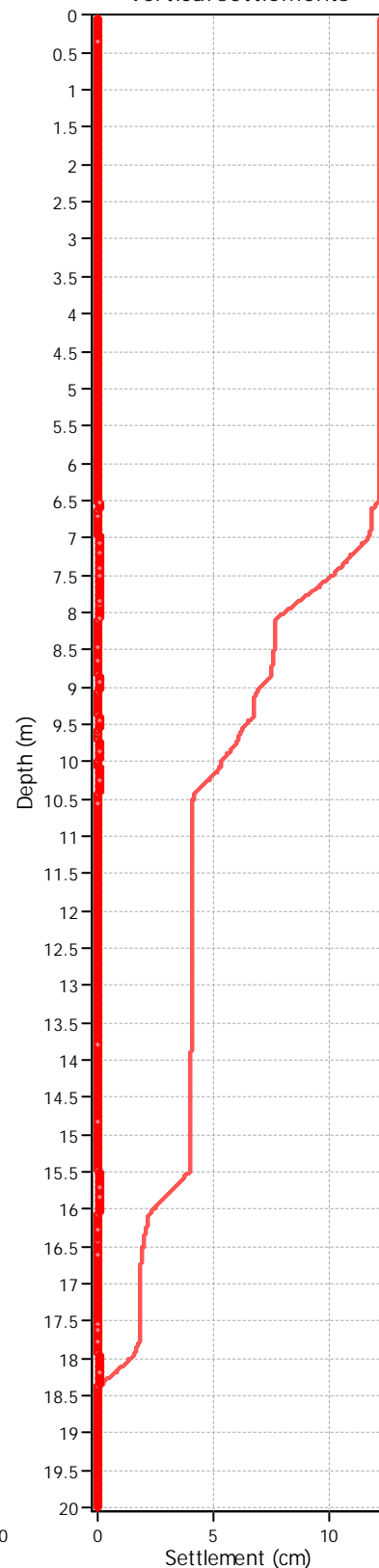
FS Plot



LPI



Vertical settlements



Analysis method: Robertson (2009)  
Fines correction method: Robertson (2009)  
Points to test: Based on Ic value  
Earthquake magnitude  $M_w$ : 6.14  
Peak ground acceleration: 0.17

G.W.T. (in-situ): 4.10 m  
G.W.T. (earthq.): 1.00 m  
Average results interval: 3  
Ic cut-off value: 2.60  
Unit weight calculation: Based on SBT

Use fill: No  
Fill height: N/A  
Fill weight: N/A  
Trans. detect. applied: Yes  
 $K_\sigma$  applied: No

Clay like behavior applied: All soils  
Limit depth applied: No  
Limit depth: N/A  
MSF method: Method based

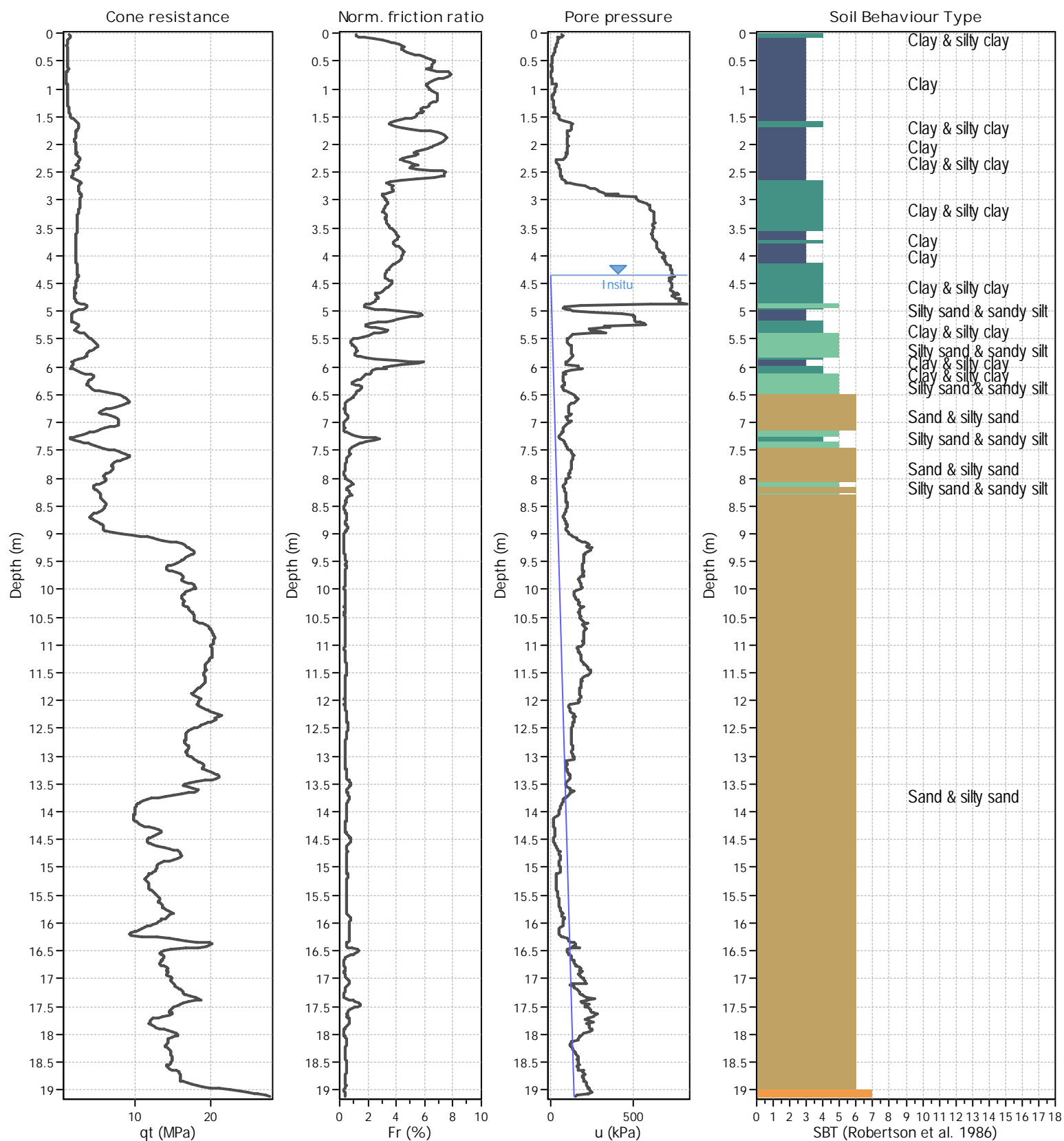


Project: Microzonazione Sismica III livello

Location: Busseto

CPT: cptu5\_Madonna dei Prati

Total depth: 19.12 m



Analysis method:	Robertson (2009)	G.W.T. (in-situ):	4.35 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.17	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based



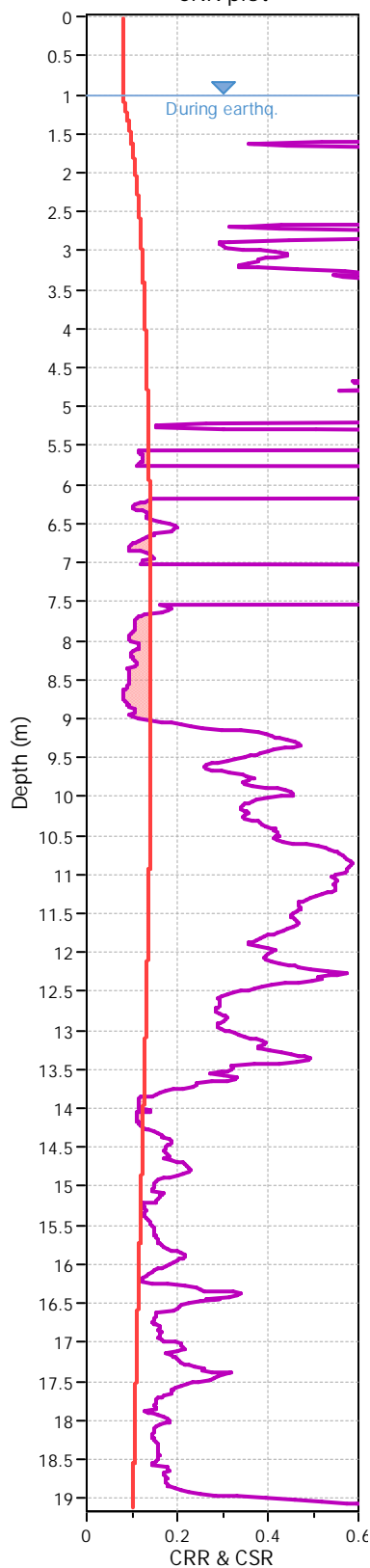
Project: Microzonazione Sismica III livello

Location: Busseto

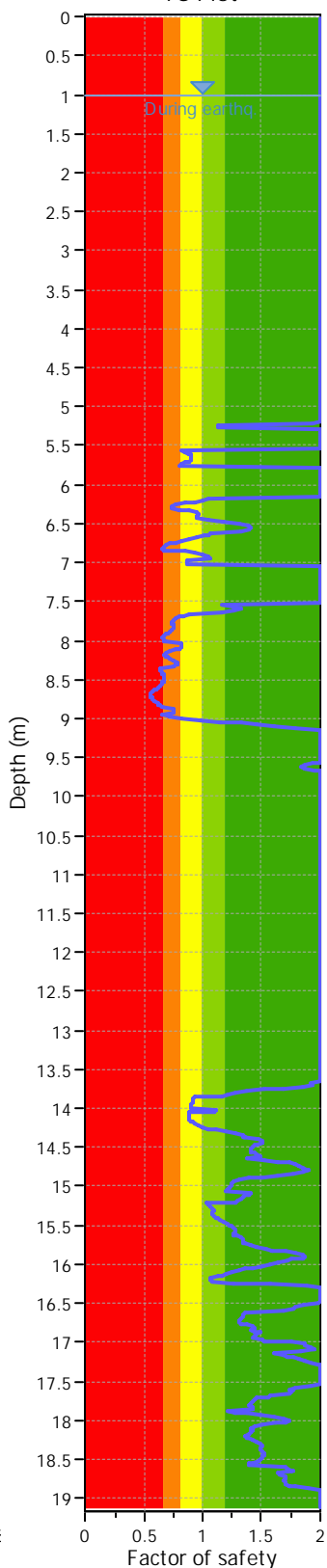
CPT: cptu5\_Madonna dei Prati

Total depth: 19.12 m

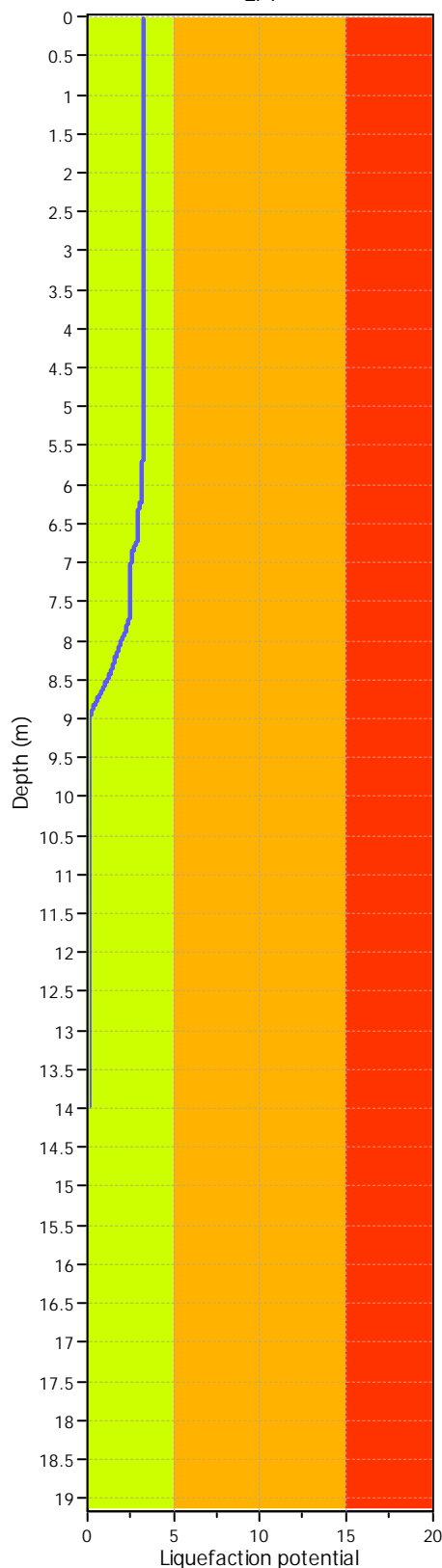
CRR plot



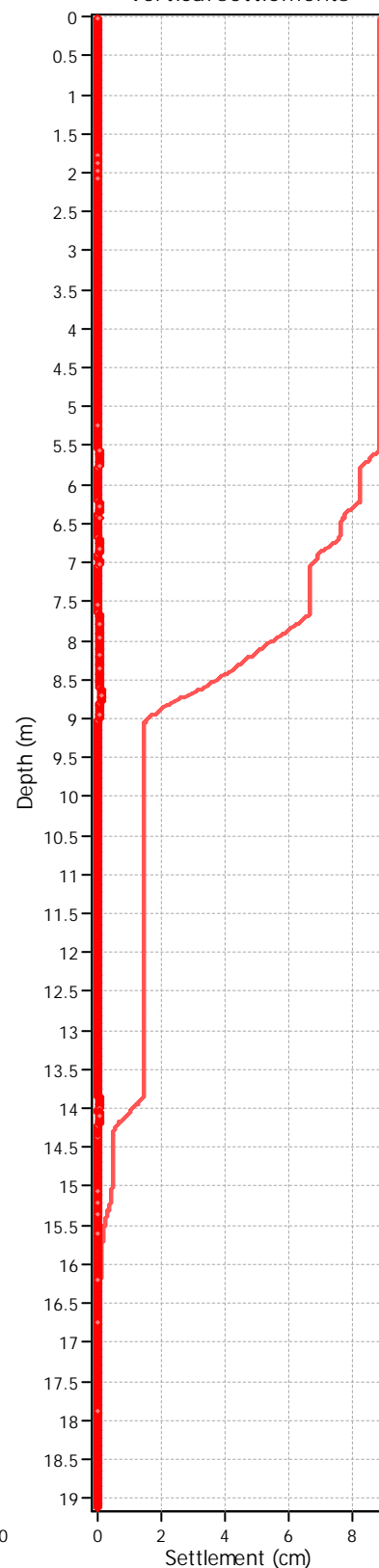
FS Plot



LPI



Vertical settlements

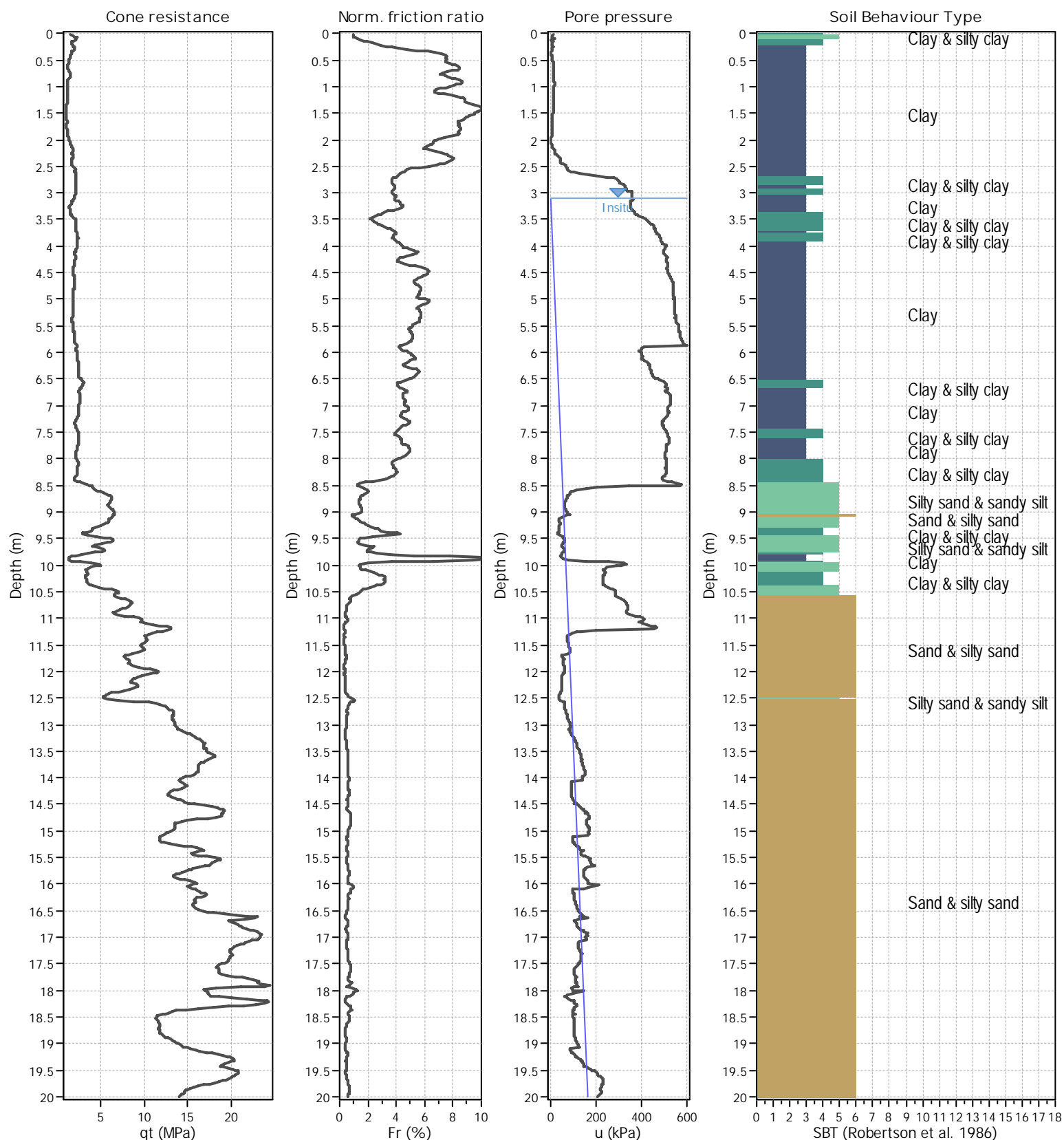


Analysis method: Robertson (2009)  
Fines correction method: Robertson (2009)  
Points to test: Based on Ic value  
Earthquake magnitude  $M_w$ : 6.14  
Peak ground acceleration: 0.17

G.W.T. (in-situ): 4.35 m  
G.W.T. (earthq.): 1.00 m  
Average results interval: 3  
Ic cut-off value: 2.60  
Unit weight calculation: Based on SBT

Use fill: No  
Fill height: N/A  
Fill weight: N/A  
Trans. detect. applied: Yes  
 $K_\sigma$  applied: No

Clay like behavior applied: All soils  
Limit depth applied: No  
Limit depth: N/A  
MSF method: Method based



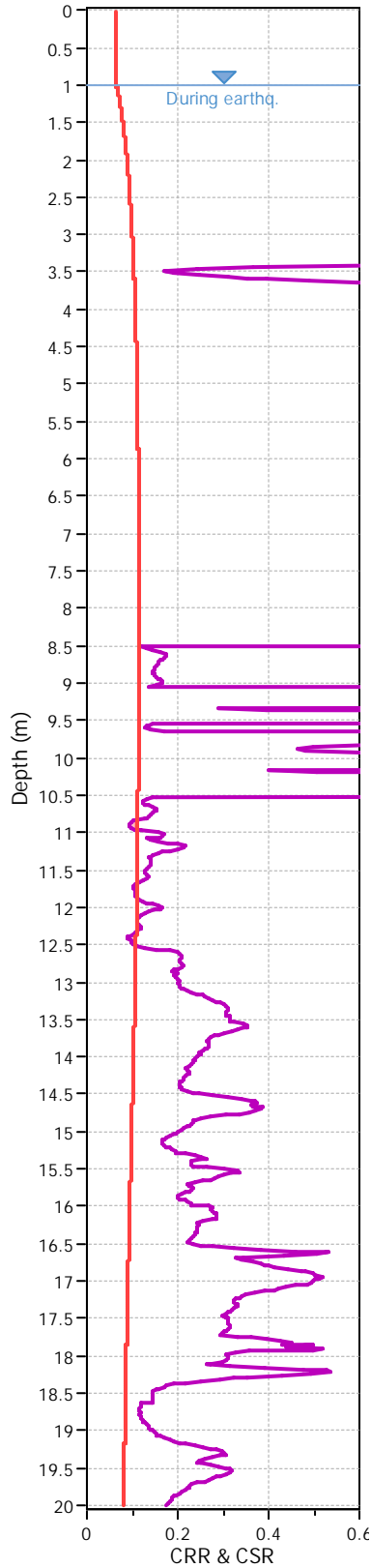
Analysis method:	Robertson (2009)	G.W.T. (in-situ):	3.10 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.14	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based



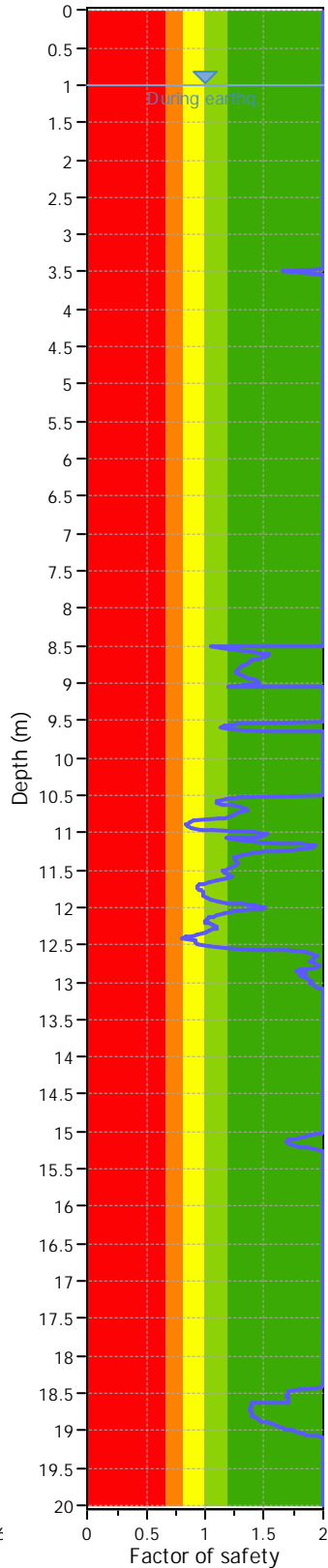
Project: Microzonazione Sismica III livello  
Location: Busseto

CPT: cptu6\_Semoriva  
Total depth: 20.00 m

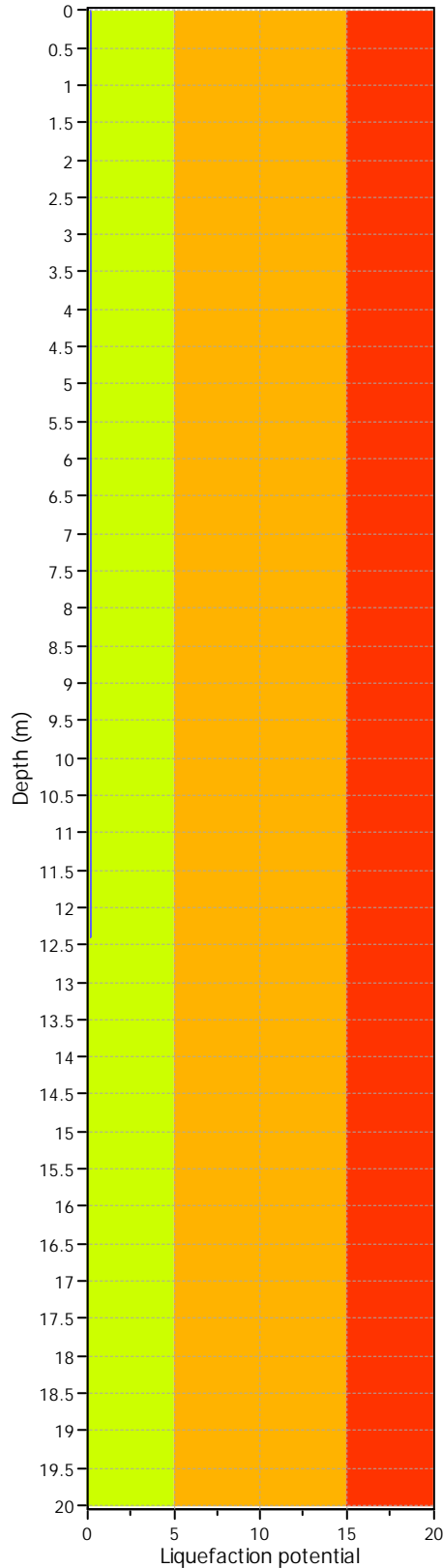
CRR plot



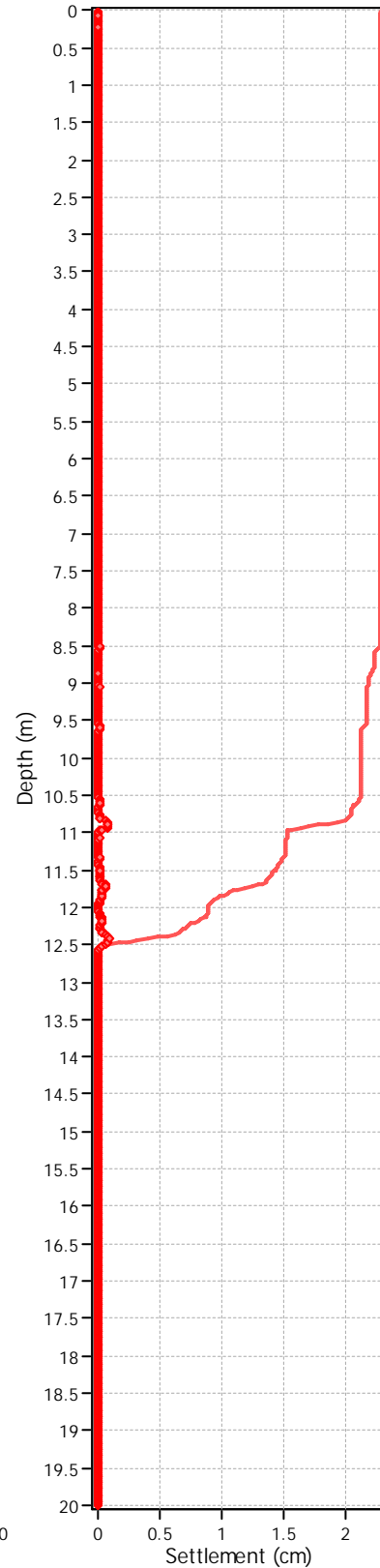
FS Plot



LPI

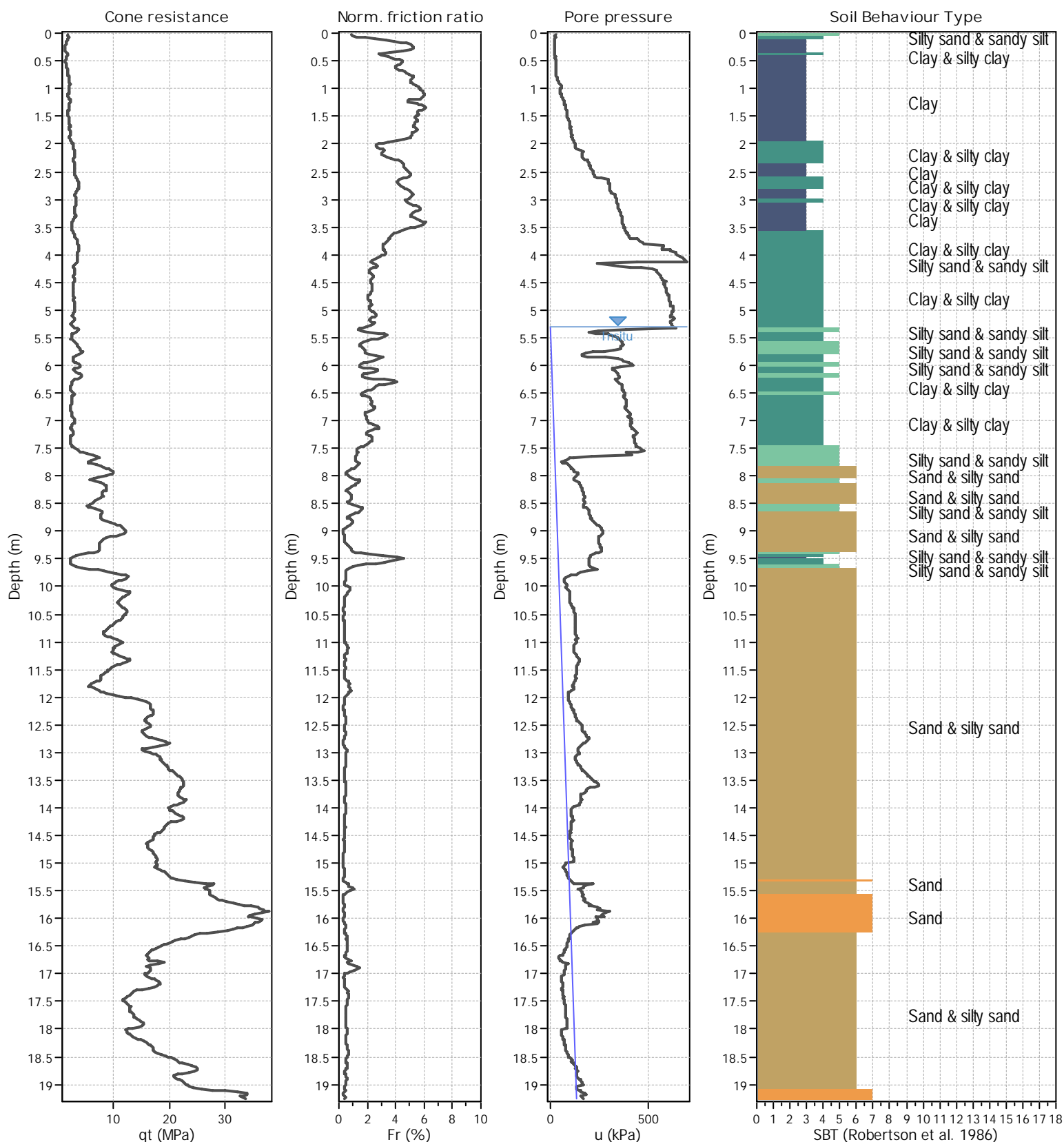


Vertical settlements



Analysis method:	Robertson (2009)	G.W.T. (in-situ):	3.10 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.14	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based





Analysis method:	Robertson (2009)	G.W.T. (in-situ):	5.30 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.14	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based





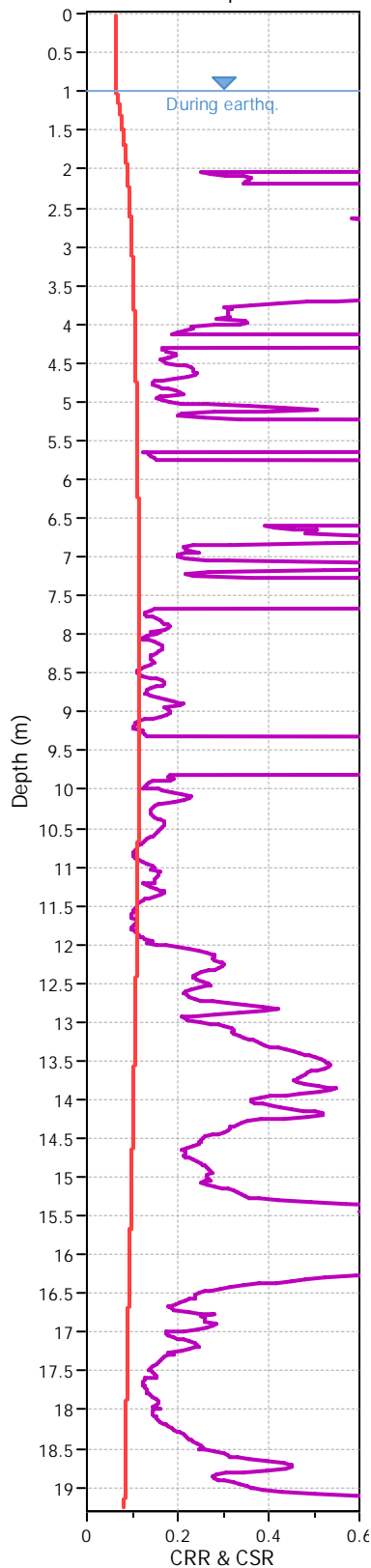
Project: Microzonazione Sismica III livello

Location: Busseto

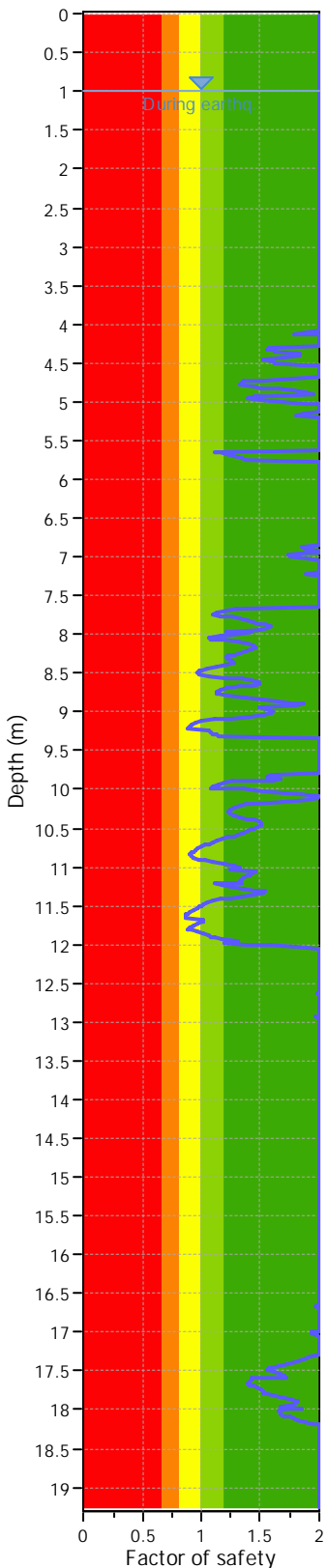
CPT: cptu7\_Roncole\_Verdi

Total depth: 19.26 m

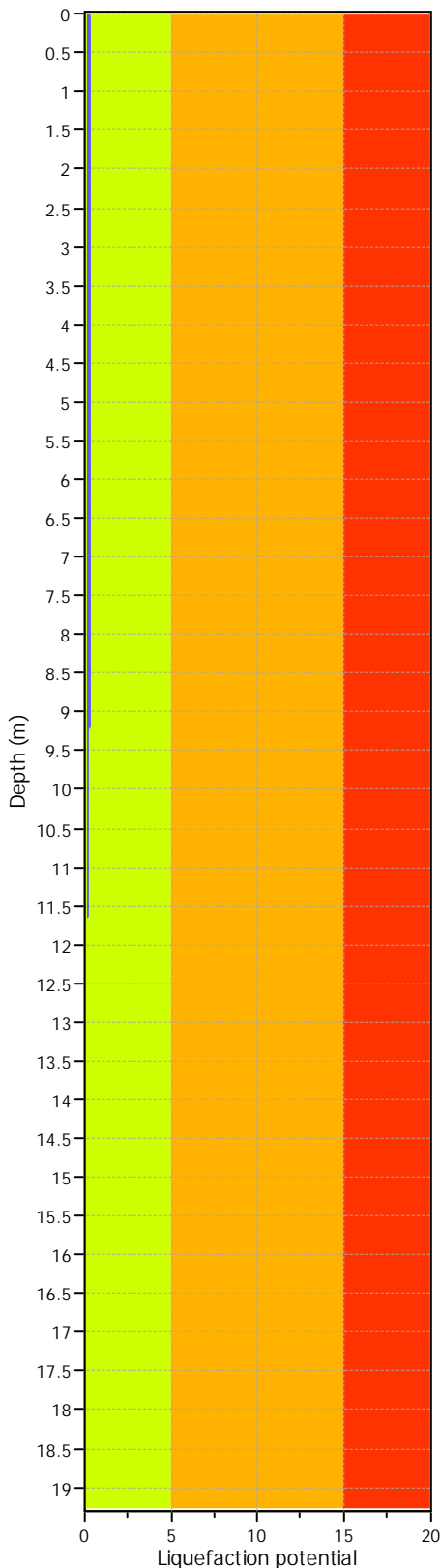
CRR plot



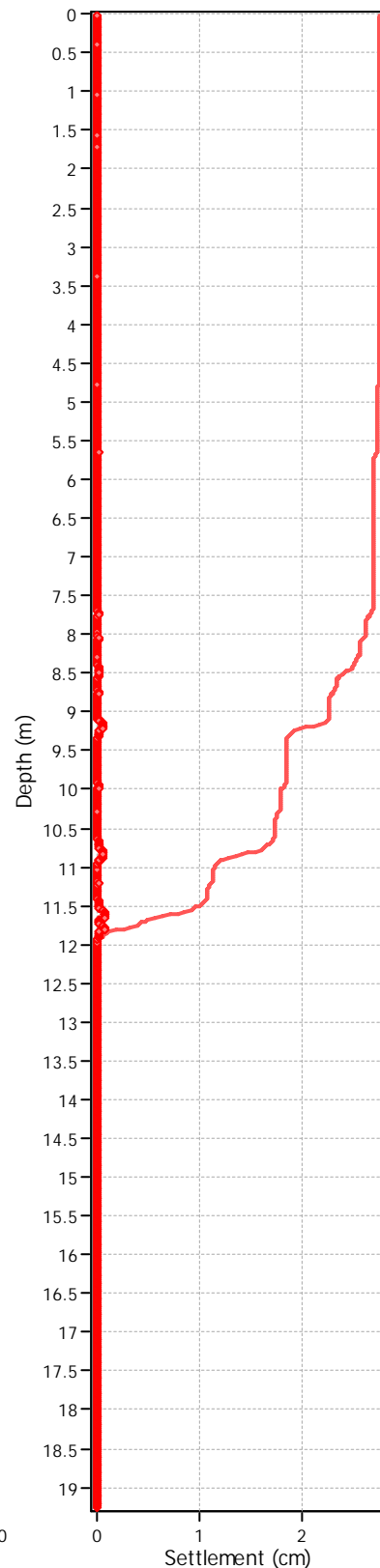
FS Plot



LPI



Vertical settlements



Analysis method: Robertson (2009)  
Fines correction method: Robertson (2009)  
Points to test: Based on Ic value  
Earthquake magnitude  $M_w$ : 6.14  
Peak ground acceleration: 0.14

G.W.T. (in-situ): 5.30 m  
G.W.T. (earthq.): 1.00 m  
Average results interval: 3  
Ic cut-off value: 2.60  
Unit weight calculation: Based on SBT

Use fill: No  
Fill height: N/A  
Fill weight: N/A  
Trans. detect. applied: Yes  
 $K_\sigma$  applied: No

Clay like behavior applied: All soils  
Limit depth applied: No  
Limit depth: N/A  
MSF method: Method based

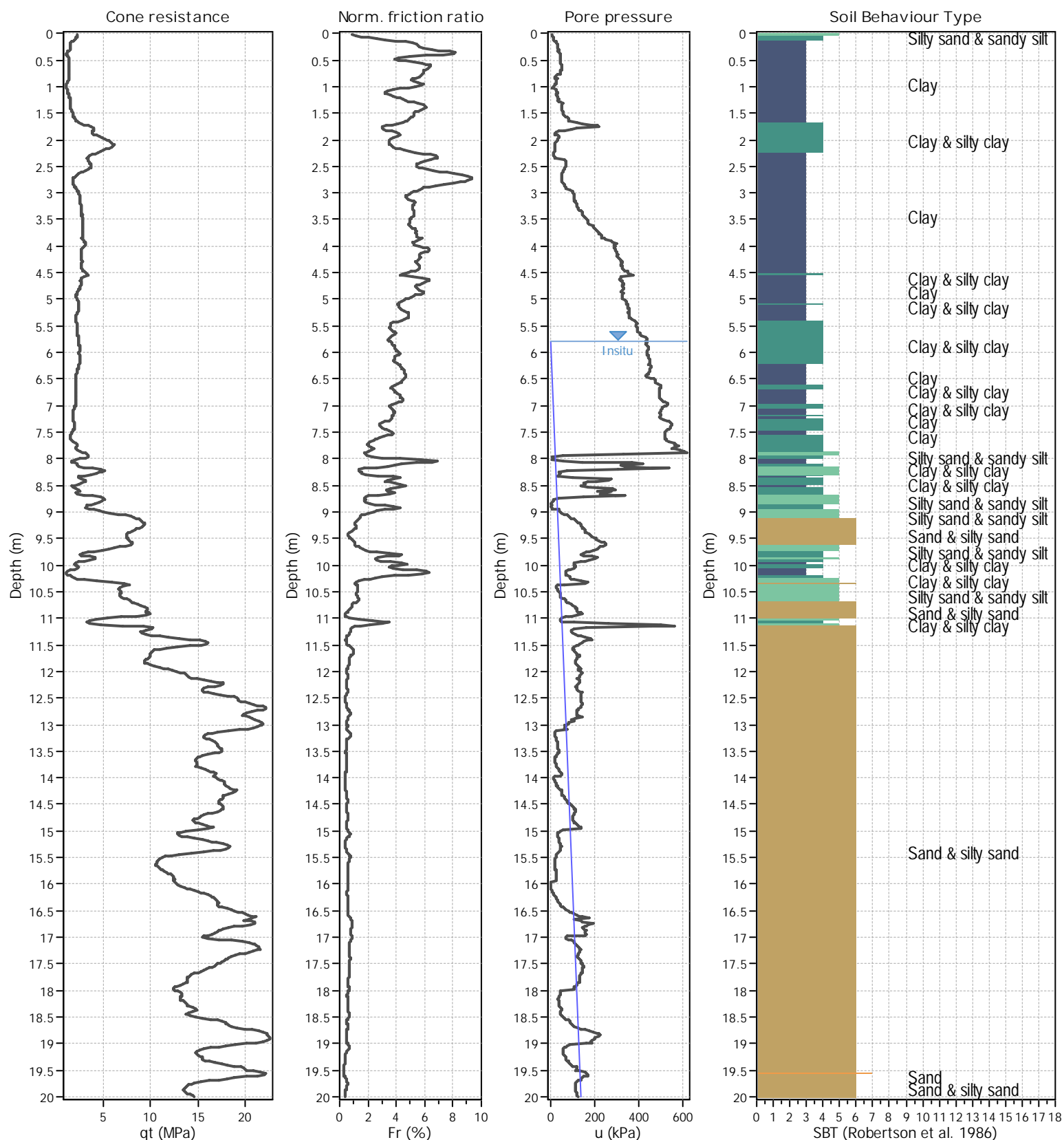


Project: Microzonazione Sismica III livello

Location: Busseto

CPT: cptu8\_Roncole\_Verdi

Total depth: 20.00 m



Analysis method:	Robertson (2009)	G.W.T. (in-situ):	5.80 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.14	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based



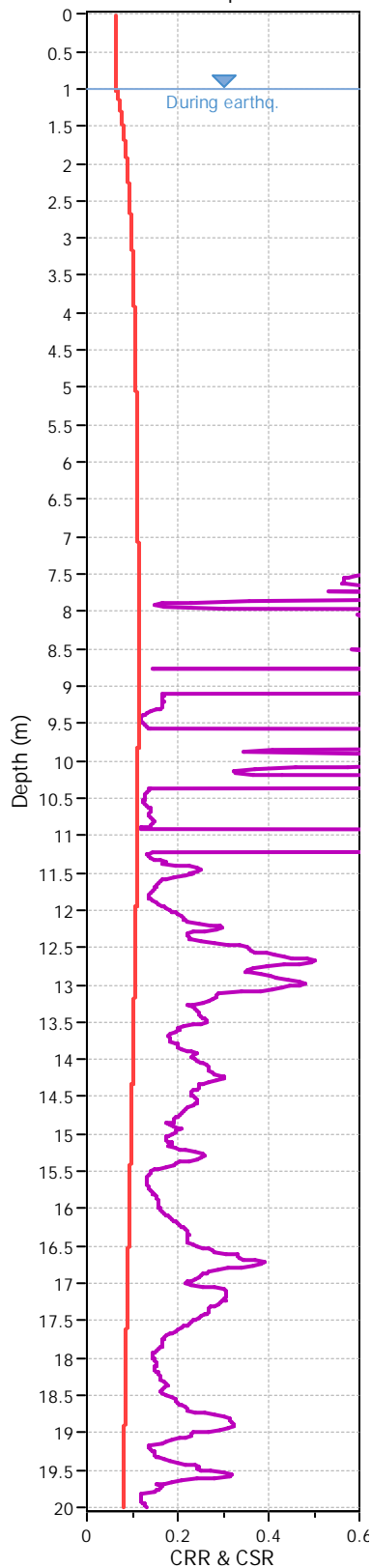
Project: Microzonazione Sismica III livello

Location: Busseto

CPT: cptu8\_Roncole\_Verdi

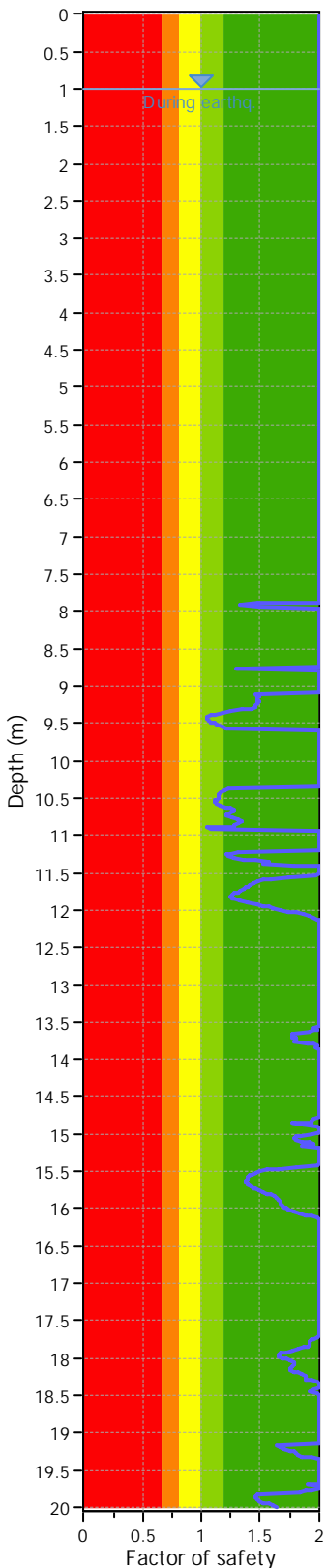
Total depth: 20.00 m

CRR plot



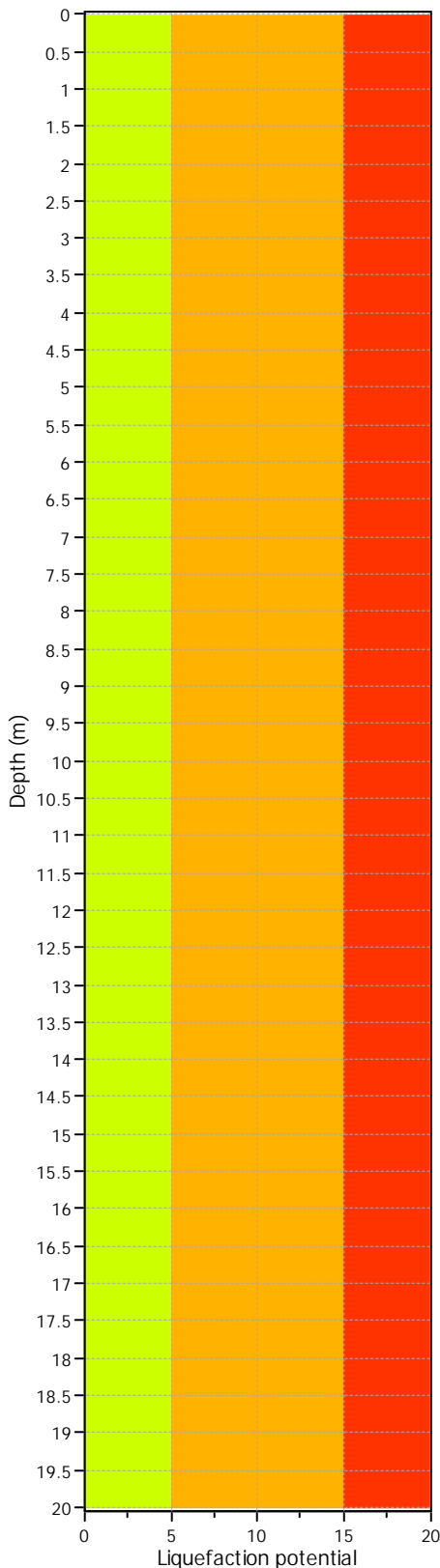
CRR & CSR

FS Plot



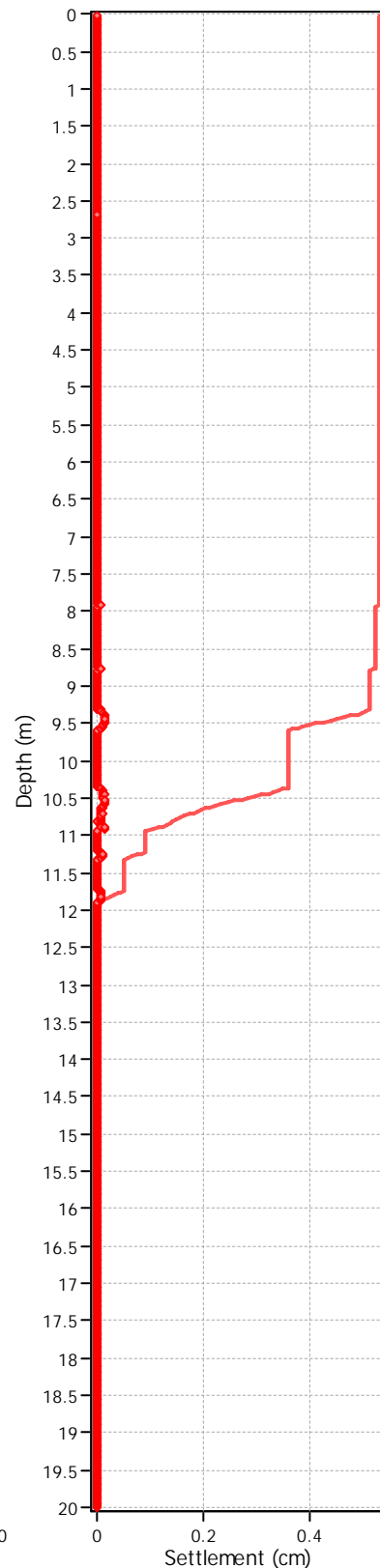
Factor of safety

LPI



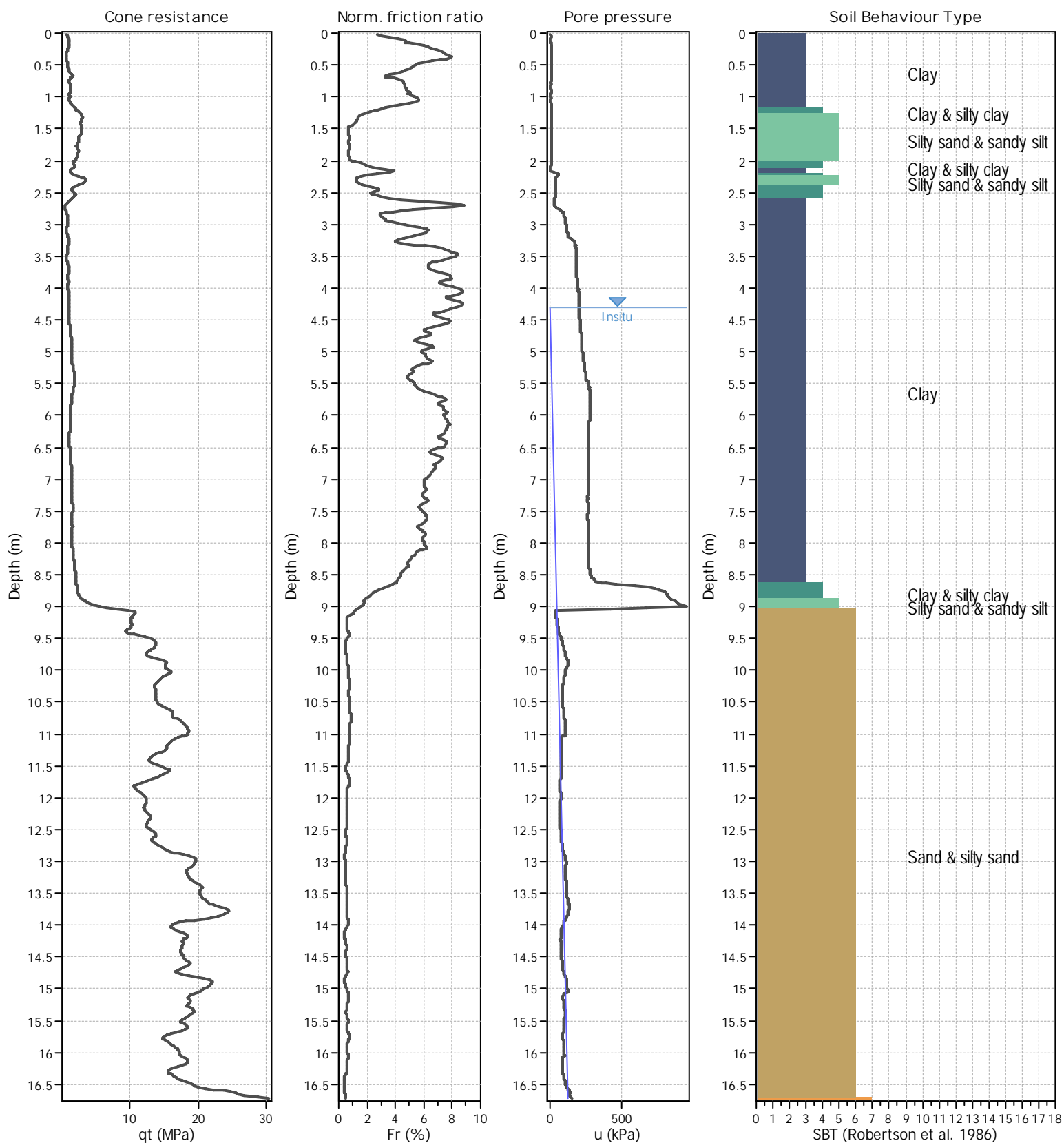
Liquefaction potential

Vertical settlements



Settlement (cm)

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	5.80 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.14	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based



Analysis method:	Robertson (2009)	G.W.T. (in-situ):	4.30 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.14	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based



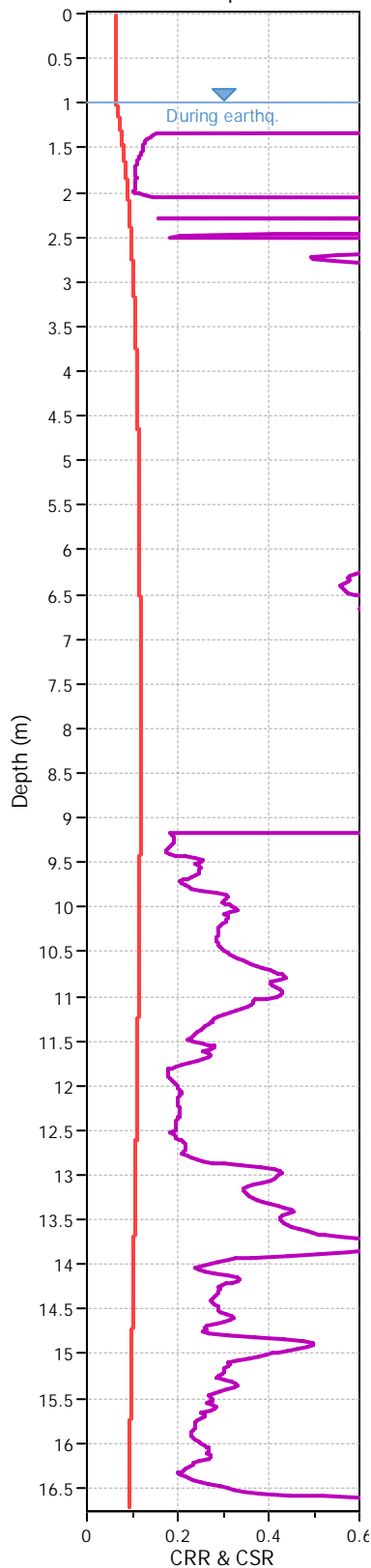
Project: Microzonazione Sismica III livello

Location: Busseto

CPT: cptu9\_Samboseto

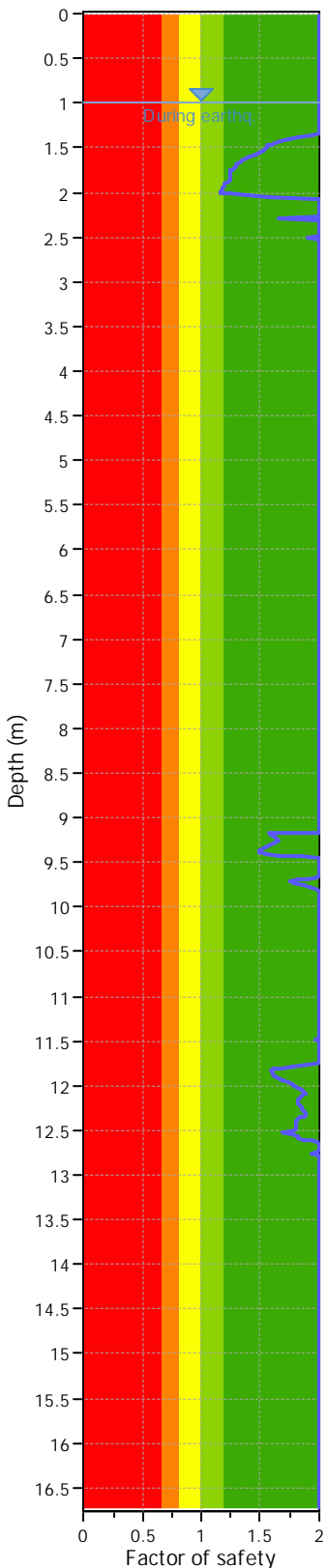
Total depth: 16.72 m

CRR plot



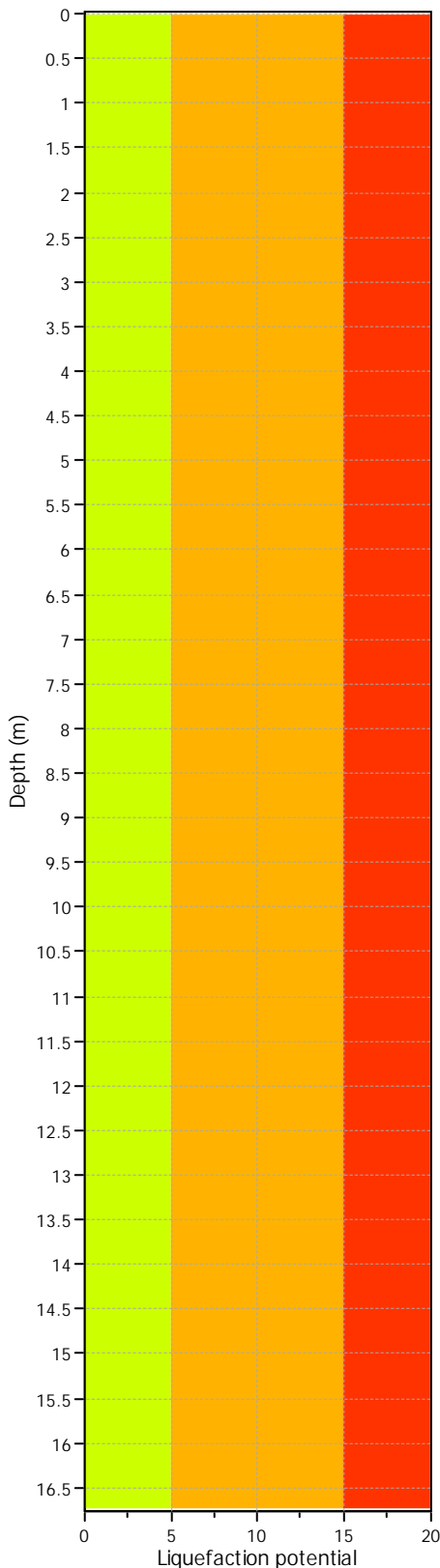
CRR & CSR

FS Plot



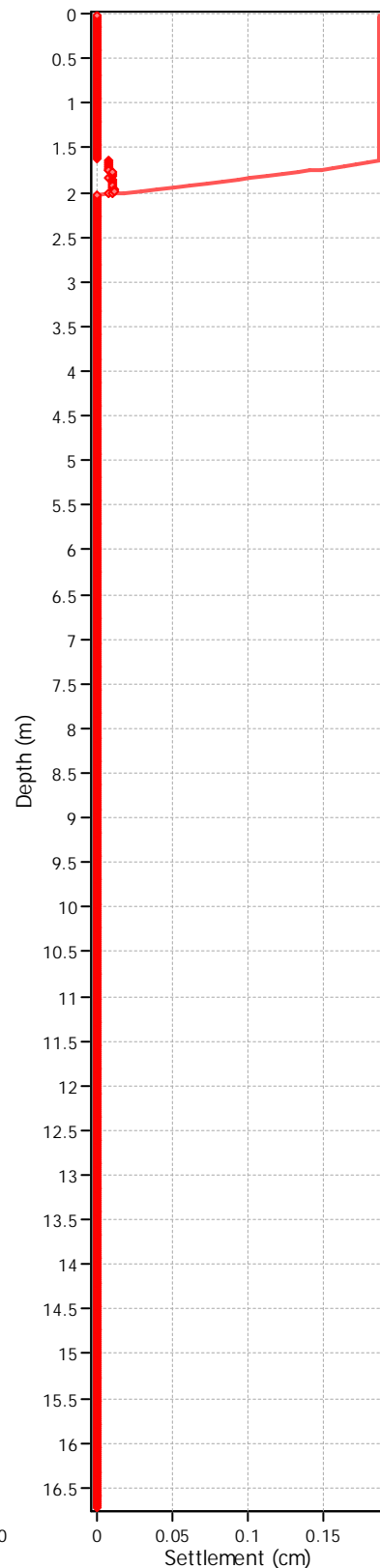
Factor of safety

LPI



Liquefaction potential

Vertical settlements



Settlement (cm)

Analysis method: Robertson (2009)  
Fines correction method: Robertson (2009)  
Points to test: Based on Ic value  
Earthquake magnitude  $M_w$ : 6.14  
Peak ground acceleration: 0.14

G.W.T. (in-situ): 4.30 m  
G.W.T. (earthq.): 1.00 m  
Average results interval: 3  
Ic cut-off value: 2.60  
Unit weight calculation: Based on SBT

Use fill: No  
Fill height: N/A  
Fill weight: N/A  
Trans. detect. applied: Yes  
 $K_\sigma$  applied: No

Clay like behavior applied: All soils  
Limit depth applied: No  
Limit depth: N/A  
MSF method: Method based

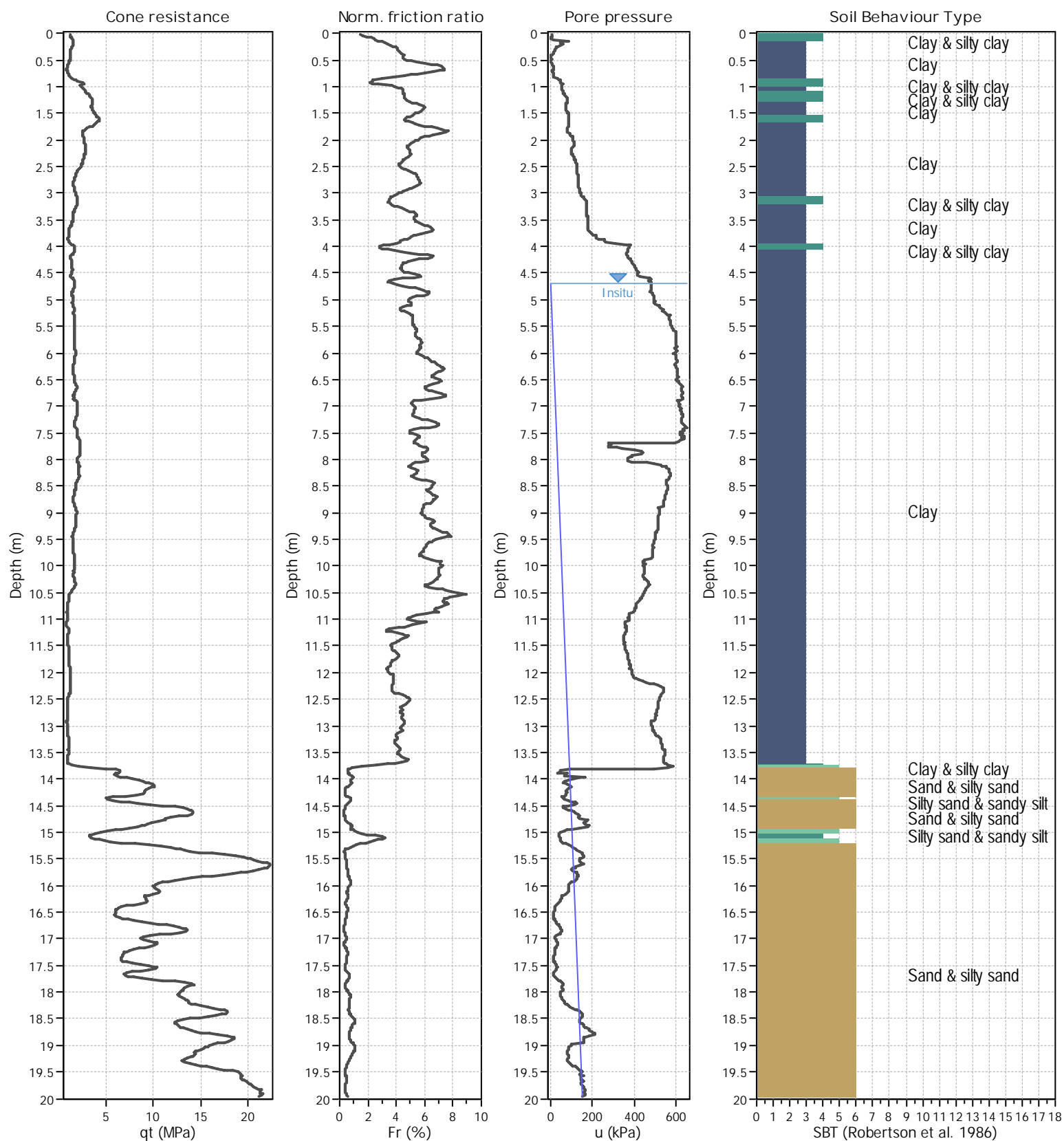


Project: Microzonazione Sismica III livello

Location: Busseto

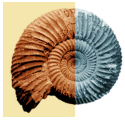
CPT: cptu10\_Contrada della Chiesa

Total depth: 19.96 m



Analysis method:	Robertson (2009)	G.W.T. (in-situ):	4.70 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.16	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based

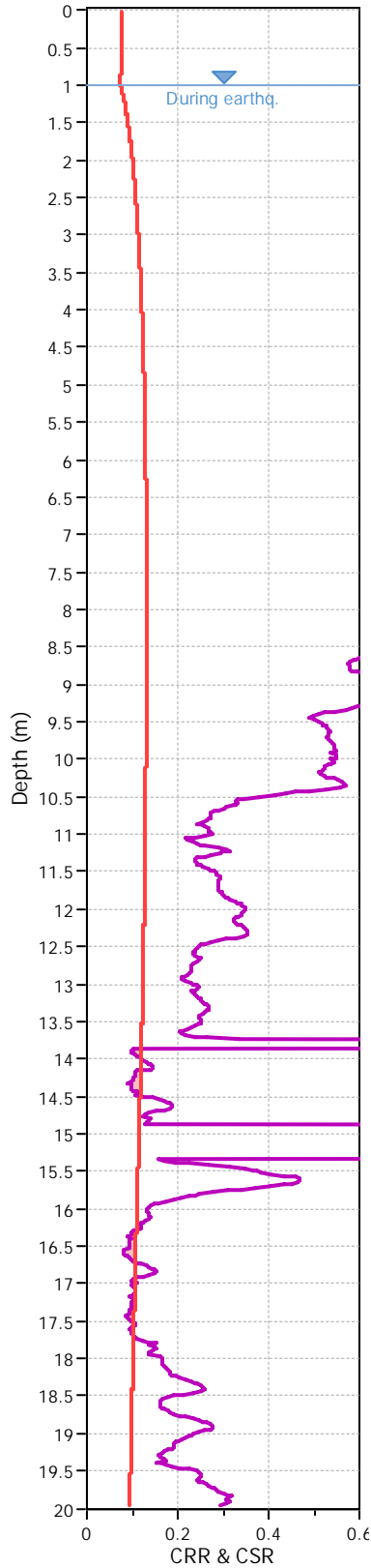




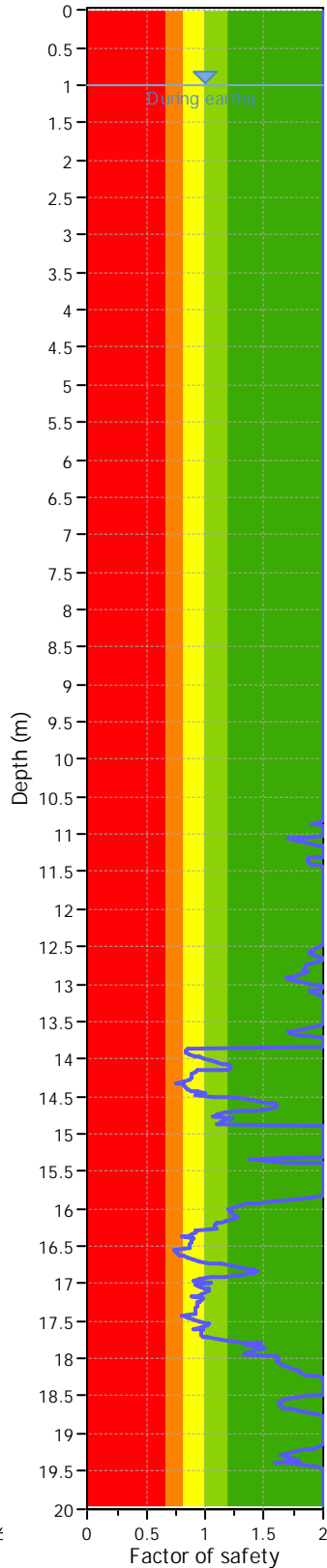
Project: Microzonazione Sismica III livello  
Location: Busseto

CPT: cptu10\_Contrada della Chiesa  
Total depth: 19.96 m

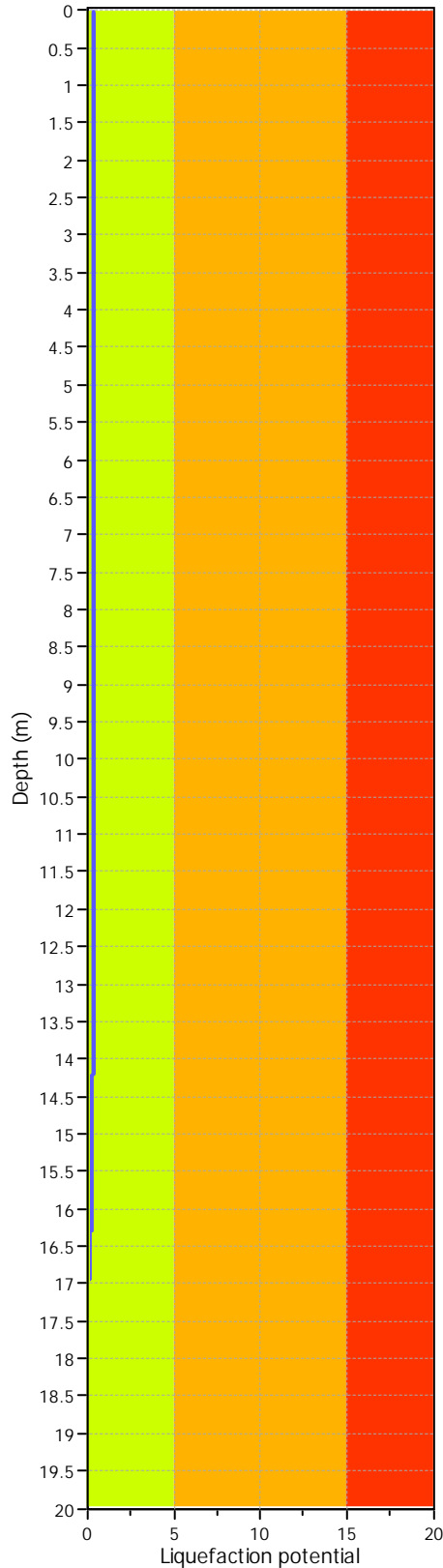
CRR plot



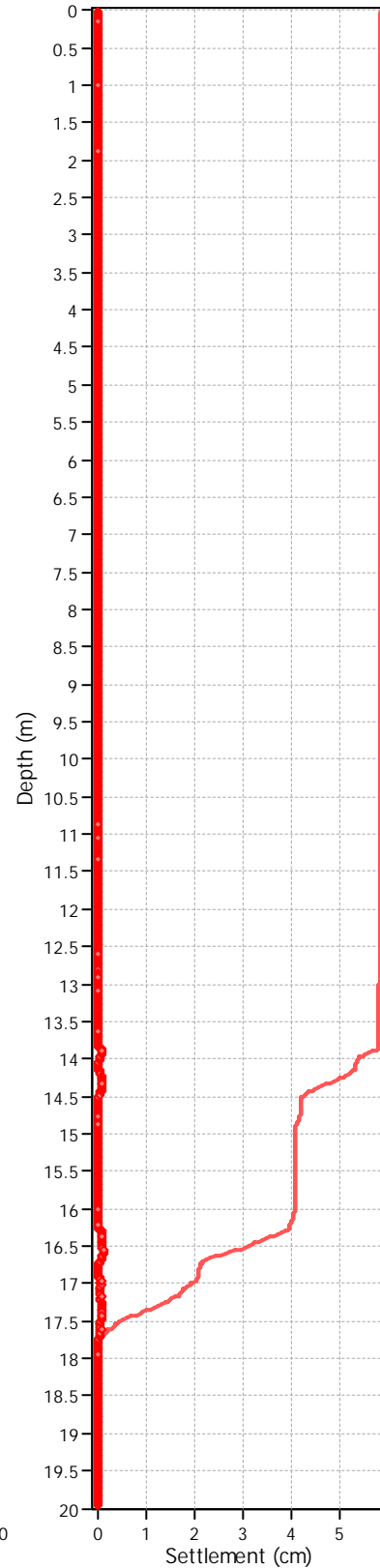
FS Plot



LPI



Vertical settlements



Analysis method:	Robertson (2009)	G.W.T. (in-situ):	4.70 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.16	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based



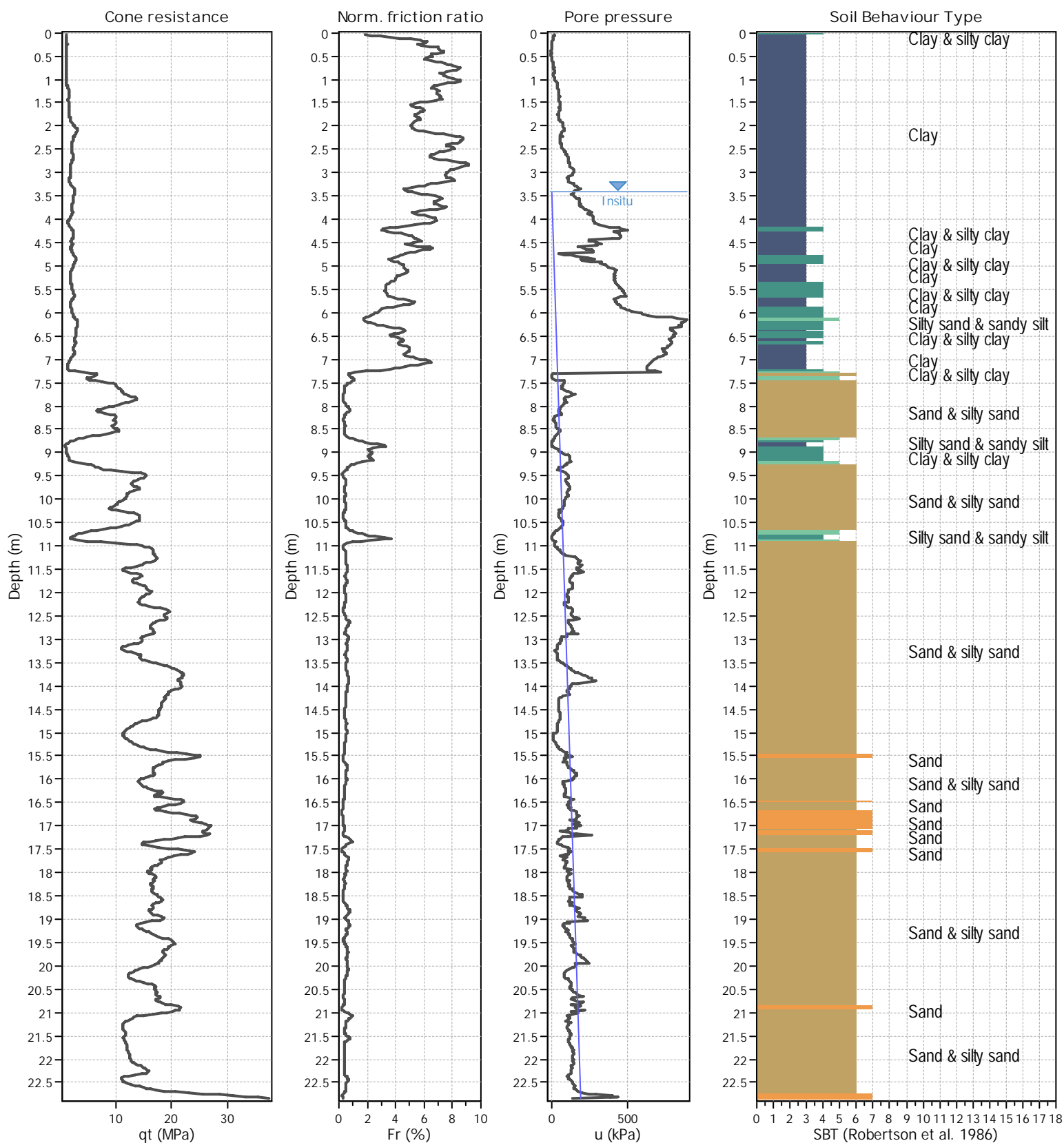


Project: Microzonazione Sismica III livello

Location: Busseto

CPT: scptu1\_Busseto

Total depth: 22.84 m



Analysis method:	Robertson (2009)	G.W.T. (in-situ):	3.40 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.16	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based



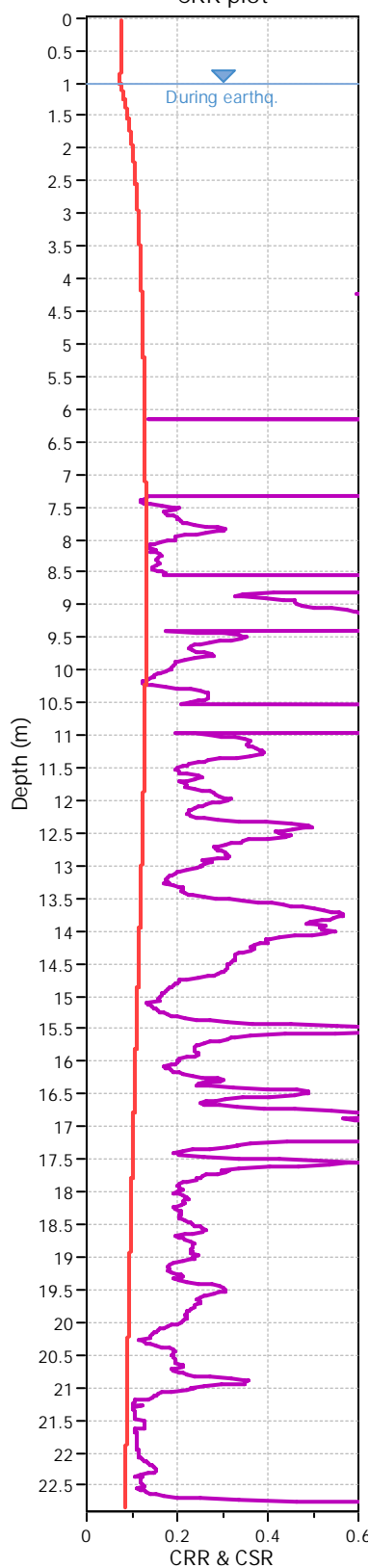
Project: Microzonazione Sismica III livello

Location: Busseto

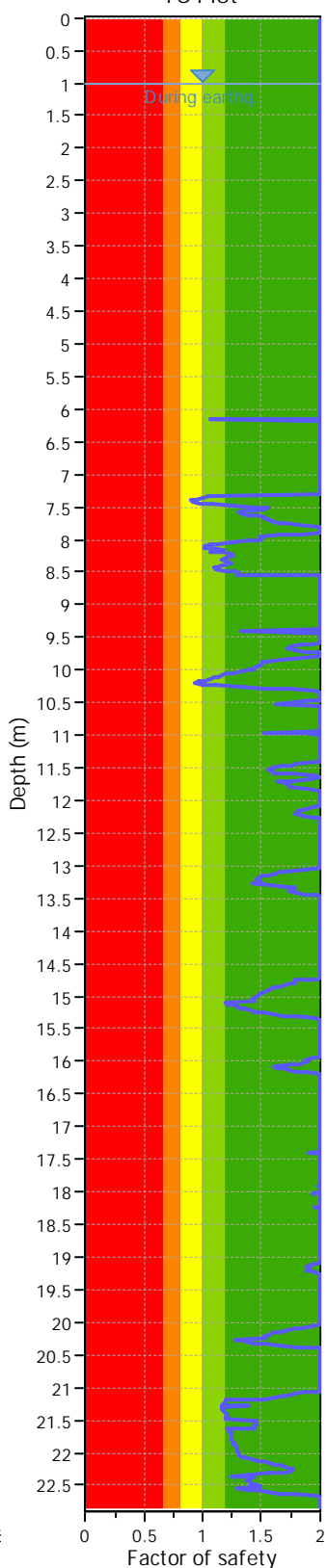
CPT: scptu1\_Busseto

Total depth: 22.84 m

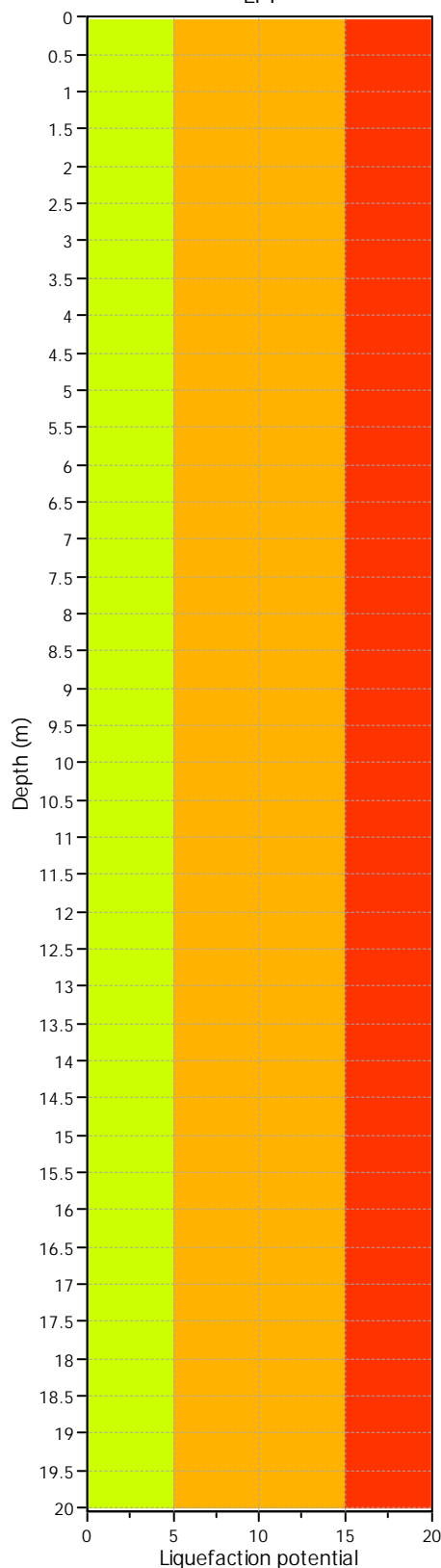
CRR plot



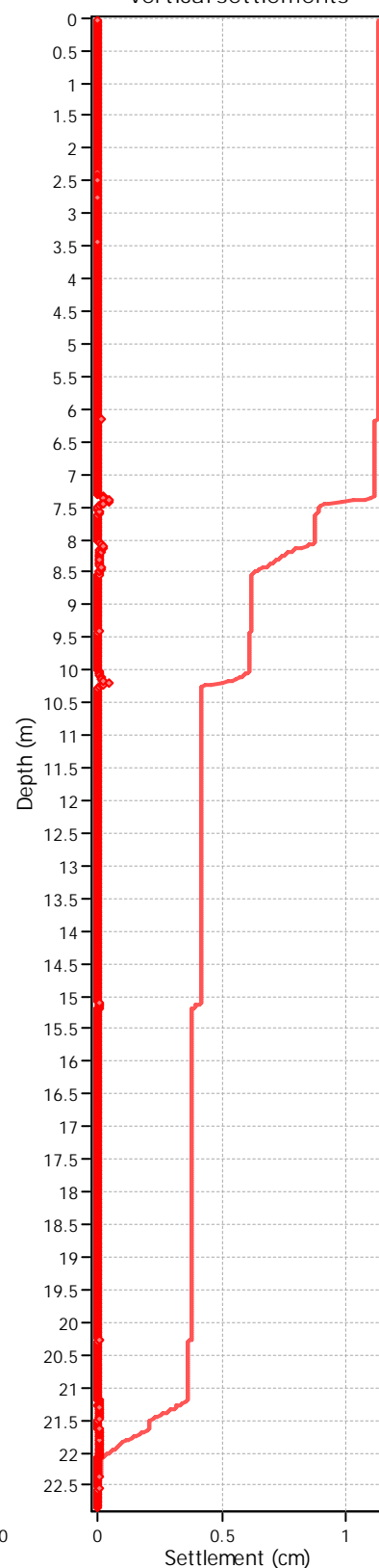
FS Plot



LPI



Vertical settlements

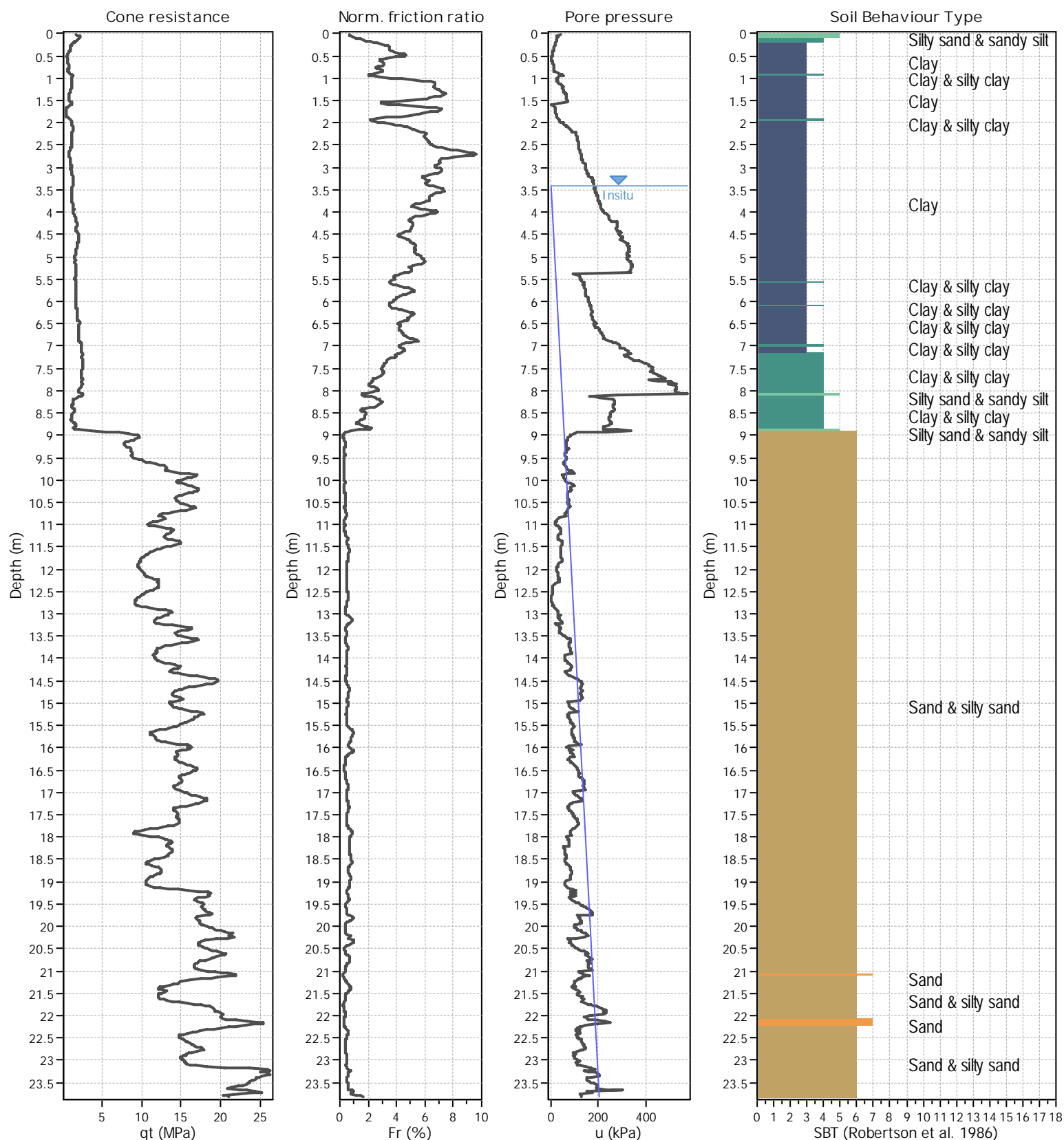


Analysis method: Robertson (2009)  
Fines correction method: Robertson (2009)  
Points to test: Based on Ic value  
Earthquake magnitude  $M_w$ : 6.14  
Peak ground acceleration: 0.16

G.W.T. (in-situ): 3.40 m  
G.W.T. (earthq.): 1.00 m  
Average results interval: 3  
Ic cut-off value: 2.60  
Unit weight calculation: Based on SBT

Use fill: No  
Fill height: N/A  
Fill weight: N/A  
Trans. detect. applied: Yes  
 $K_g$  applied: No

Clay like behavior applied: All soils  
Limit depth applied: No  
Limit depth: N/A  
MSF method: Method based



Analysis method:	Robertson (2009)	G.W.T. (in-situ):	3.40 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.18	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based



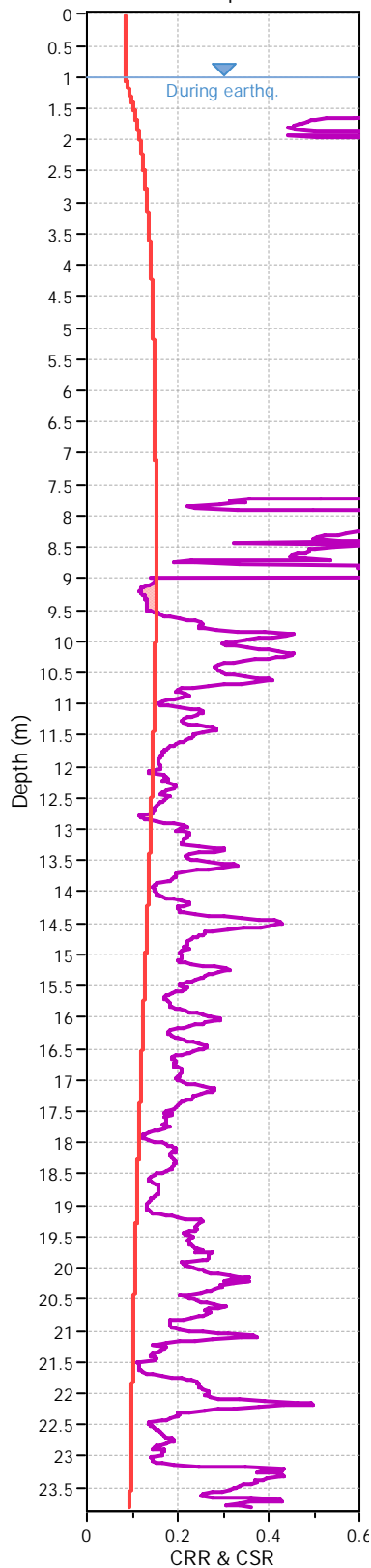
Project: Microzonazione Sismica III livello

Location: Busseto

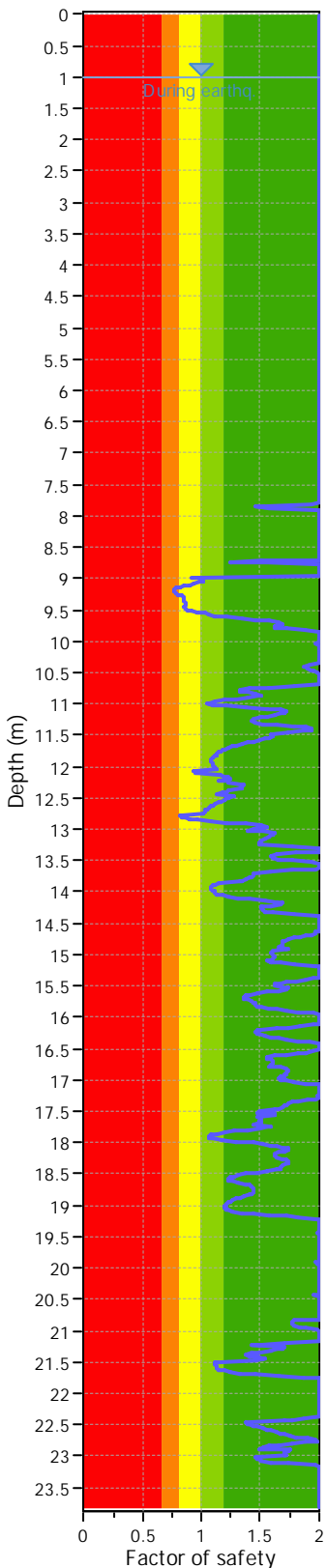
CPT: scptu2\_Busseto

Total depth: 23.82 m

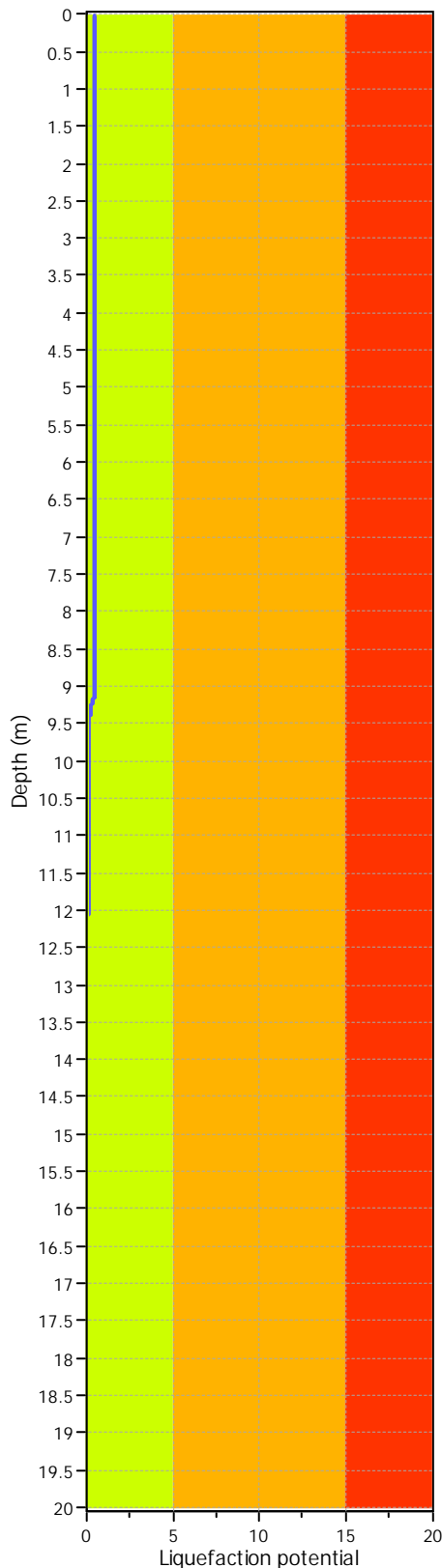
CRR plot



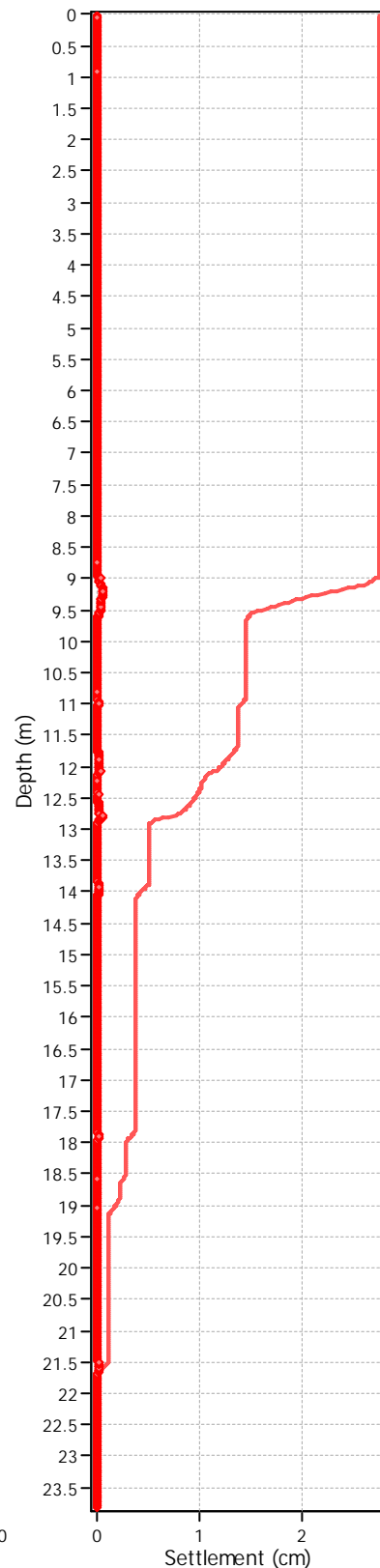
FS Plot



LPI



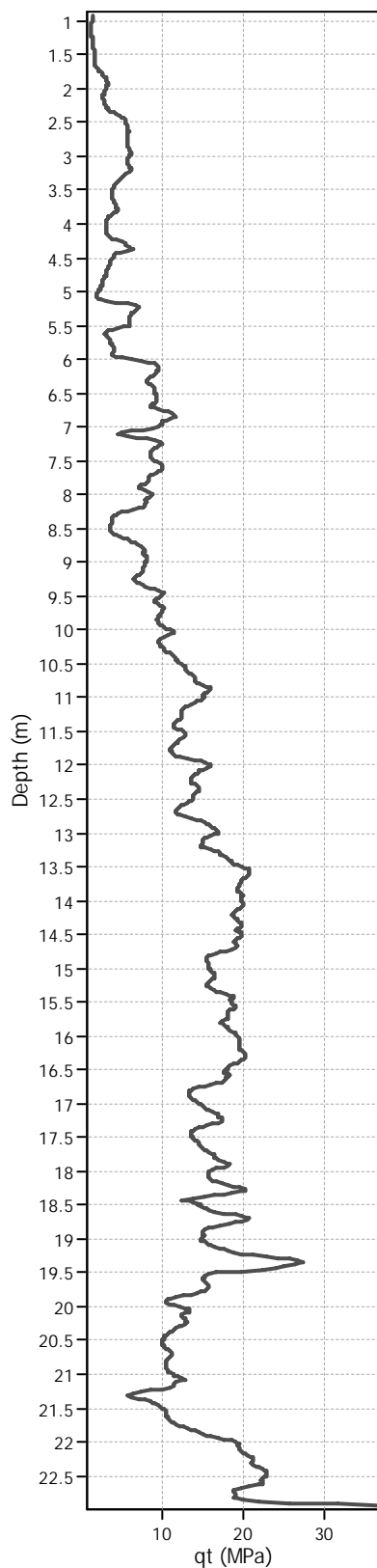
Vertical settlements



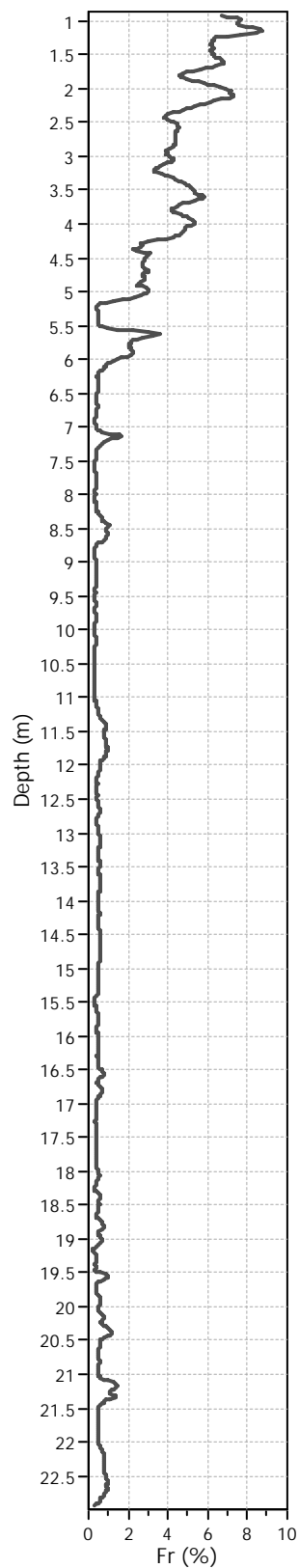
Analysis method:	Robertson (2009)	G.W.T. (in-situ):	3.40 m	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.18	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No		



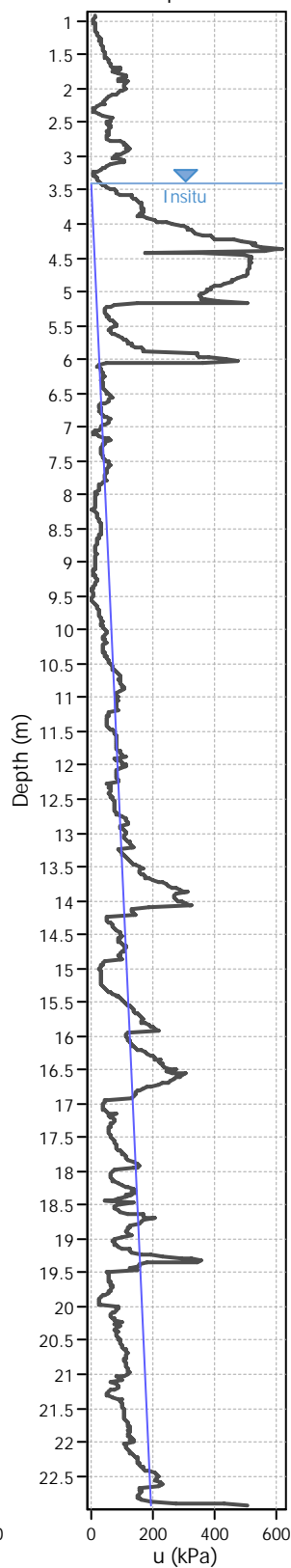
Cone resistance



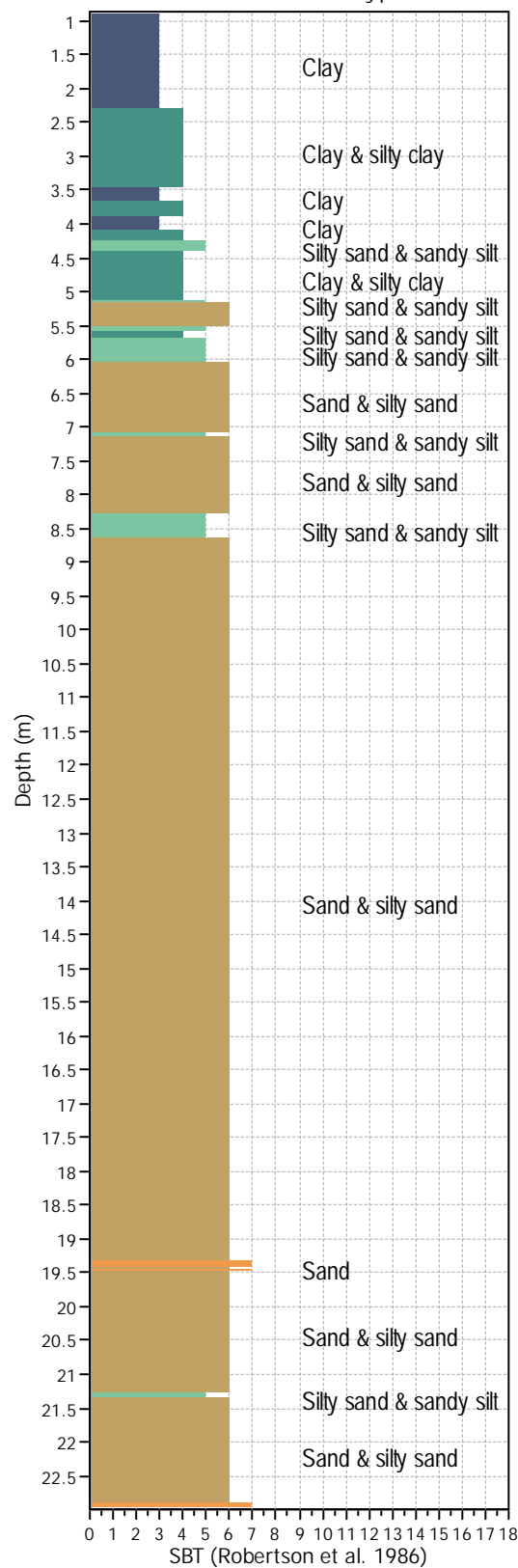
Norm. friction ratio



Pore pressure



Soil Behaviour Type

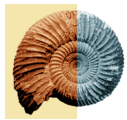


Analysis method: Robertson (2009)  
Fines correction method: Robertson (2009)  
Points to test: Based on Ic value  
Earthquake magnitude  $M_w$ : 6.14  
Peak ground acceleration: 0.17

G.W.T. (in-situ): 3.40 m  
G.W.T. (earthq.): 1.00 m  
Average results interval: 3  
Ic cut-off value: 2.60  
Unit weight calculation: Based on SBT

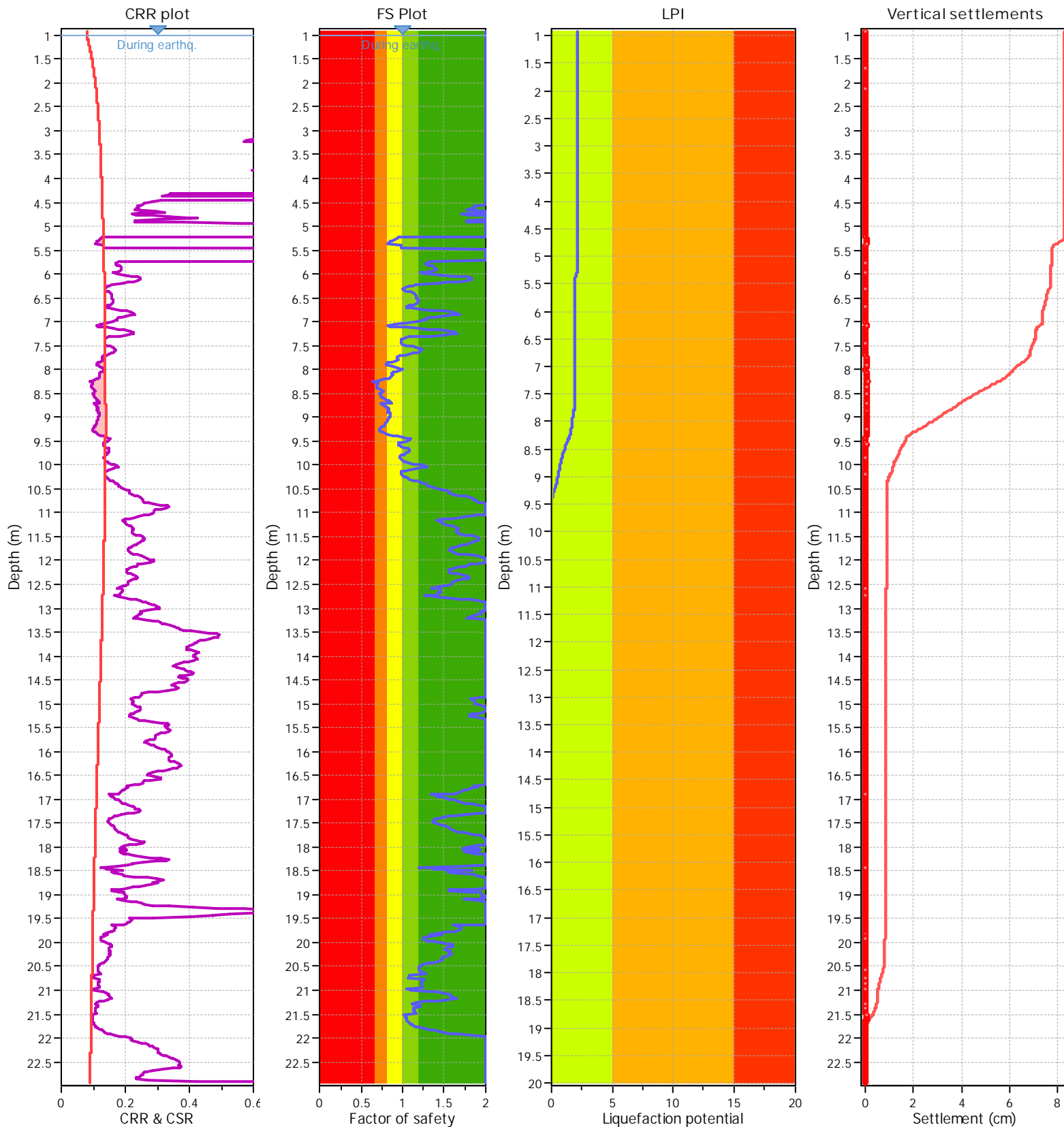
Use fill: No  
Fill height: N/A  
Fill weight: N/A  
Trans. detect. applied: Yes  
 $K_\sigma$  applied: No

Clay like behavior applied: All soils  
Limit depth applied: No  
Limit depth: N/A  
MSF method: Method based



Project: Microzonazione Sismica III livello  
Location: Busseto

CPT: scptu3\_Busseto  
Total depth: 22.94 m



Analysis method:	Robertson (2009)	G.W.T. (in-situ):	3.40 m	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.17	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No		





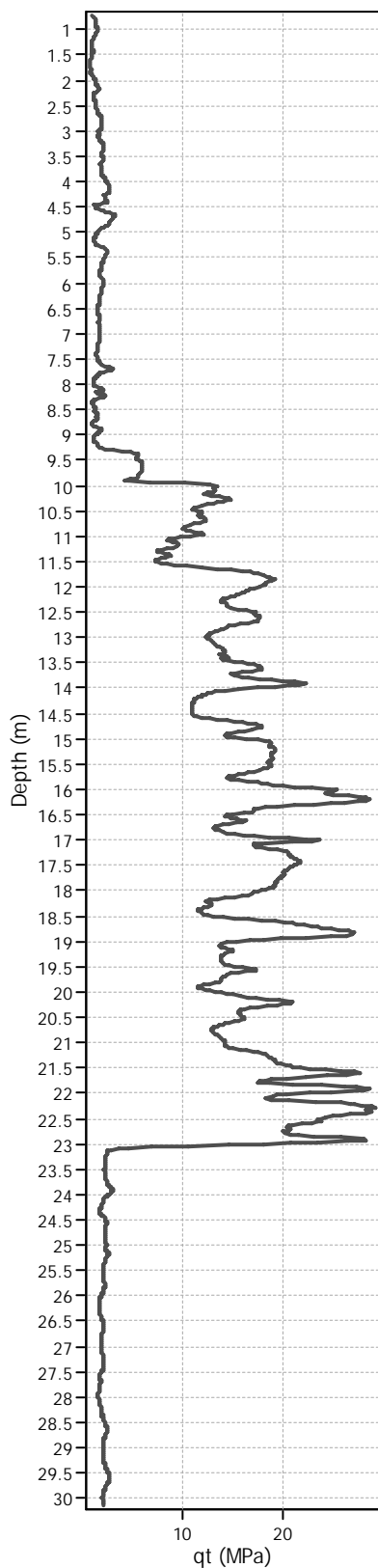
Project: Microzonazione Sismica III livello

Location: Busseto

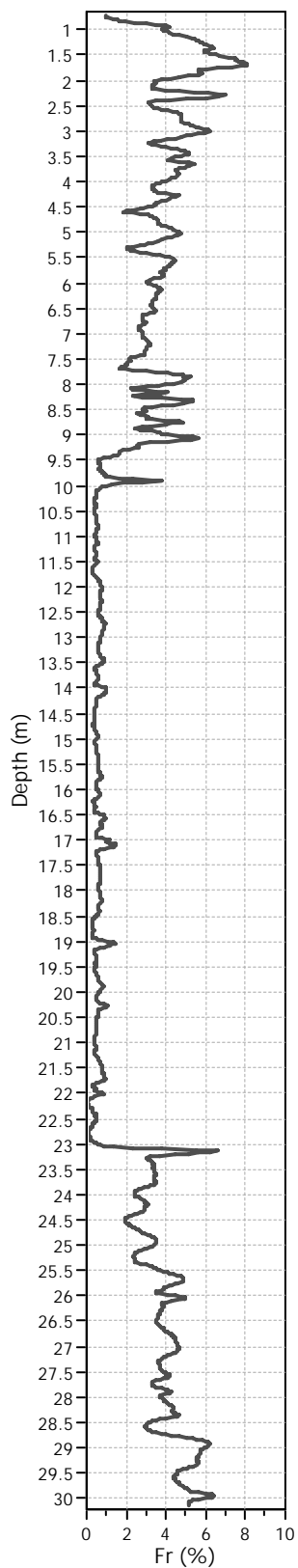
CPT: scptu4\_Roncole\_Verdi

Total depth: 30.14 m

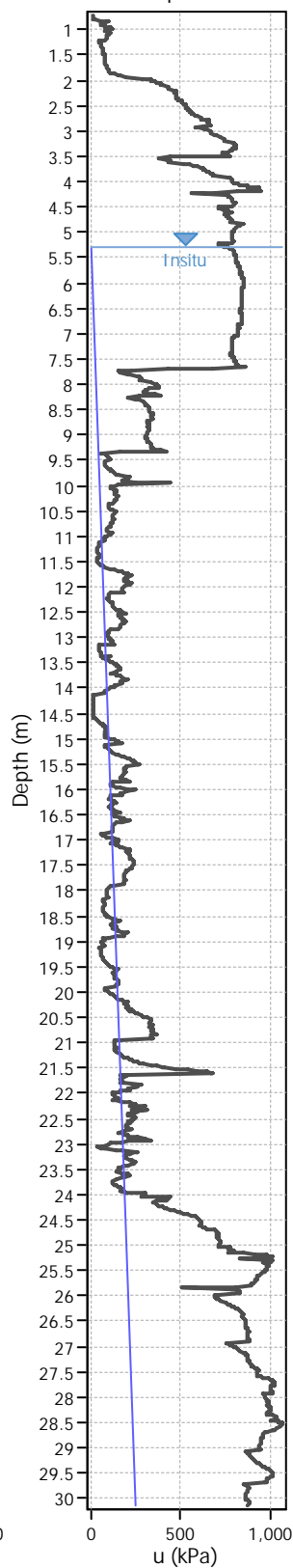
Cone resistance



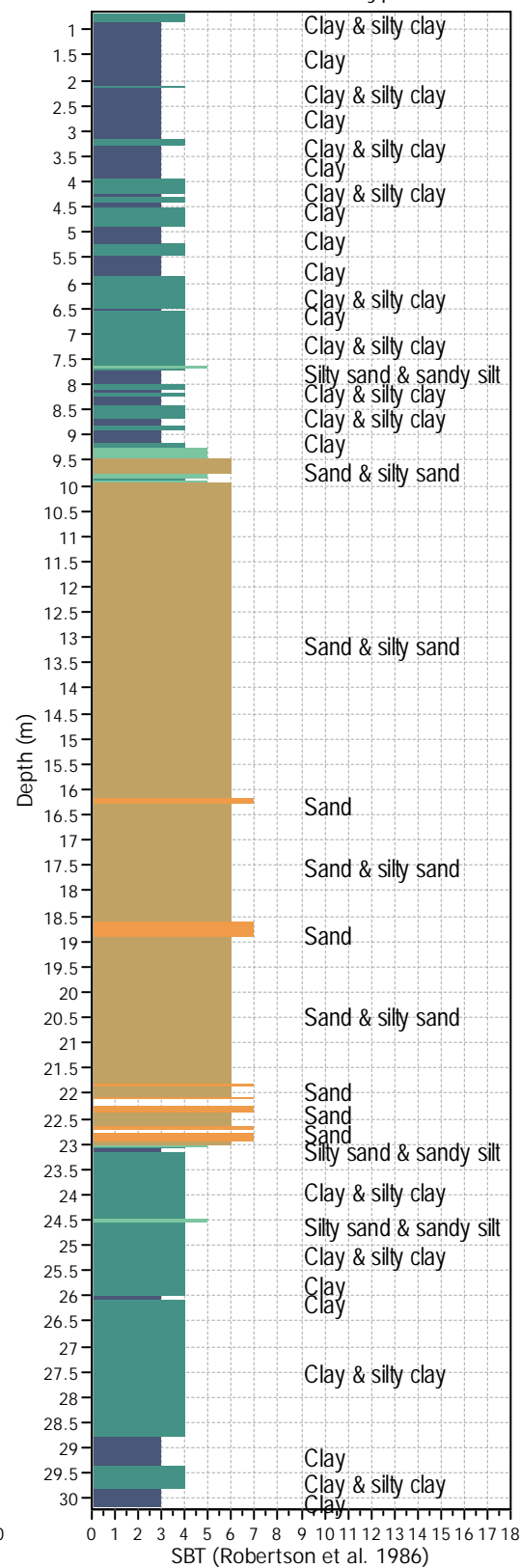
Norm. friction ratio



Pore pressure



Soil Behaviour Type



Analysis method:	Robertson (2009)	G.W.T. (in-situ):	5.30 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.14	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based





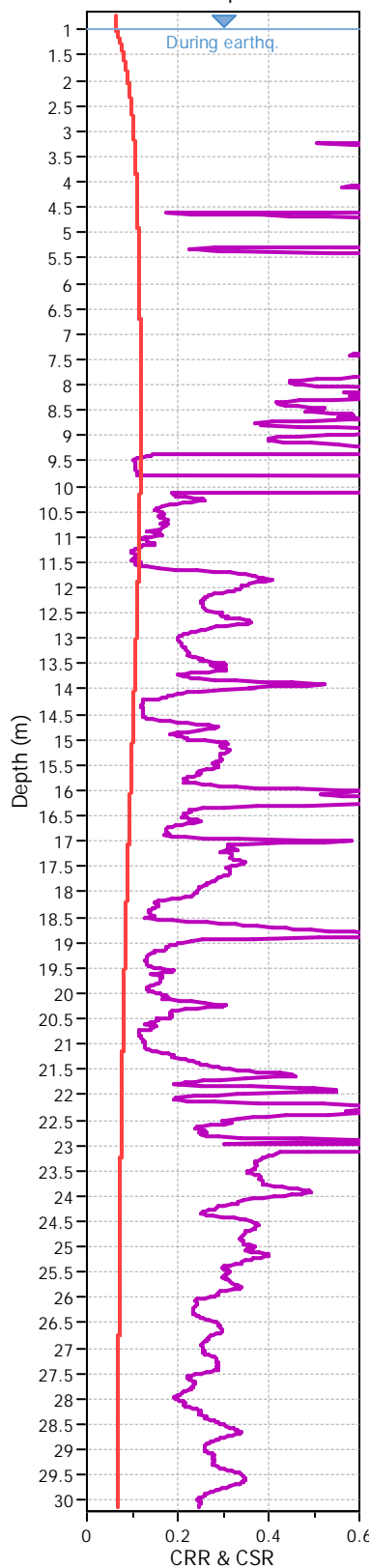
Project: Microzonazione Sismica III livello

Location: Busseto

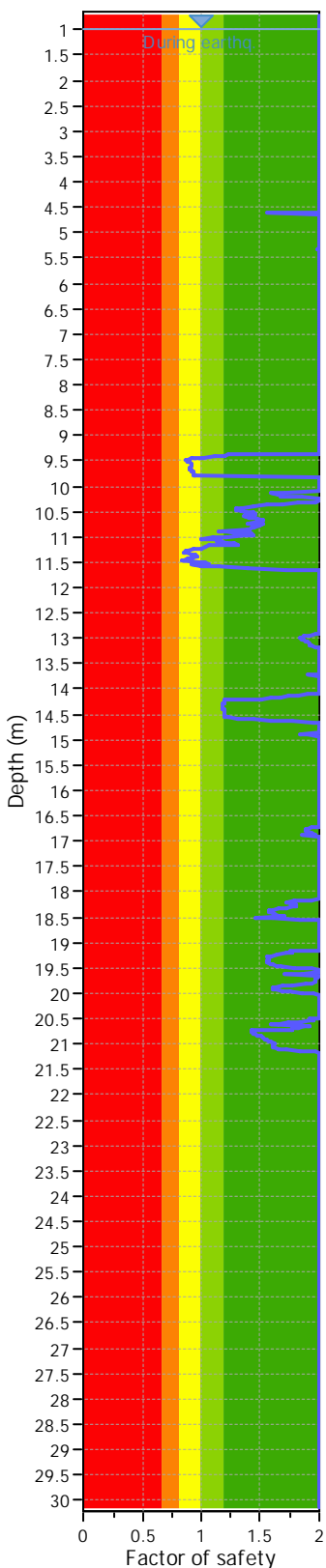
CPT: scptu4\_Roncole\_Verdi

Total depth: 30.14 m

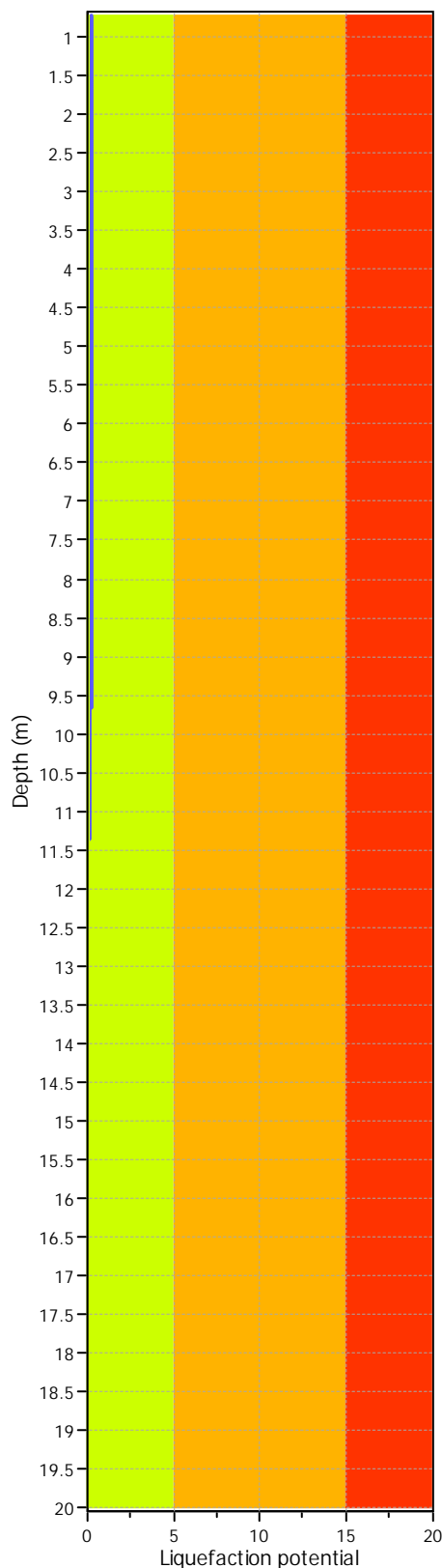
CRR plot



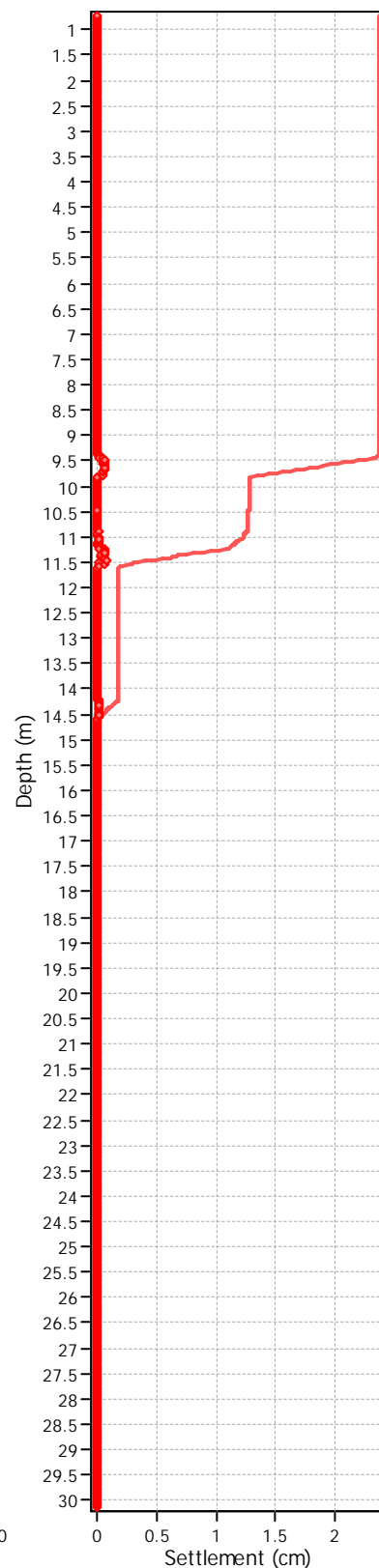
FS Plot



LPI



Vertical settlements



Analysis method: Robertson (2009)  
Fines correction method: Robertson (2009)  
Points to test: Based on Ic value  
Earthquake magnitude  $M_w$ : 6.14  
Peak ground acceleration: 0.14

G.W.T. (in-situ): 5.30 m  
G.W.T. (earthq.): 1.00 m  
Average results interval: 3  
Ic cut-off value: 2.60  
Unit weight calculation: Based on SBT

Use fill: No  
Fill height: N/A  
Fill weight: N/A  
Trans. detect. applied: Yes  
 $K_\sigma$  applied: No

Clay like behavior applied: All soils  
Limit depth applied: No  
Limit depth: N/A  
MSF method: Method based

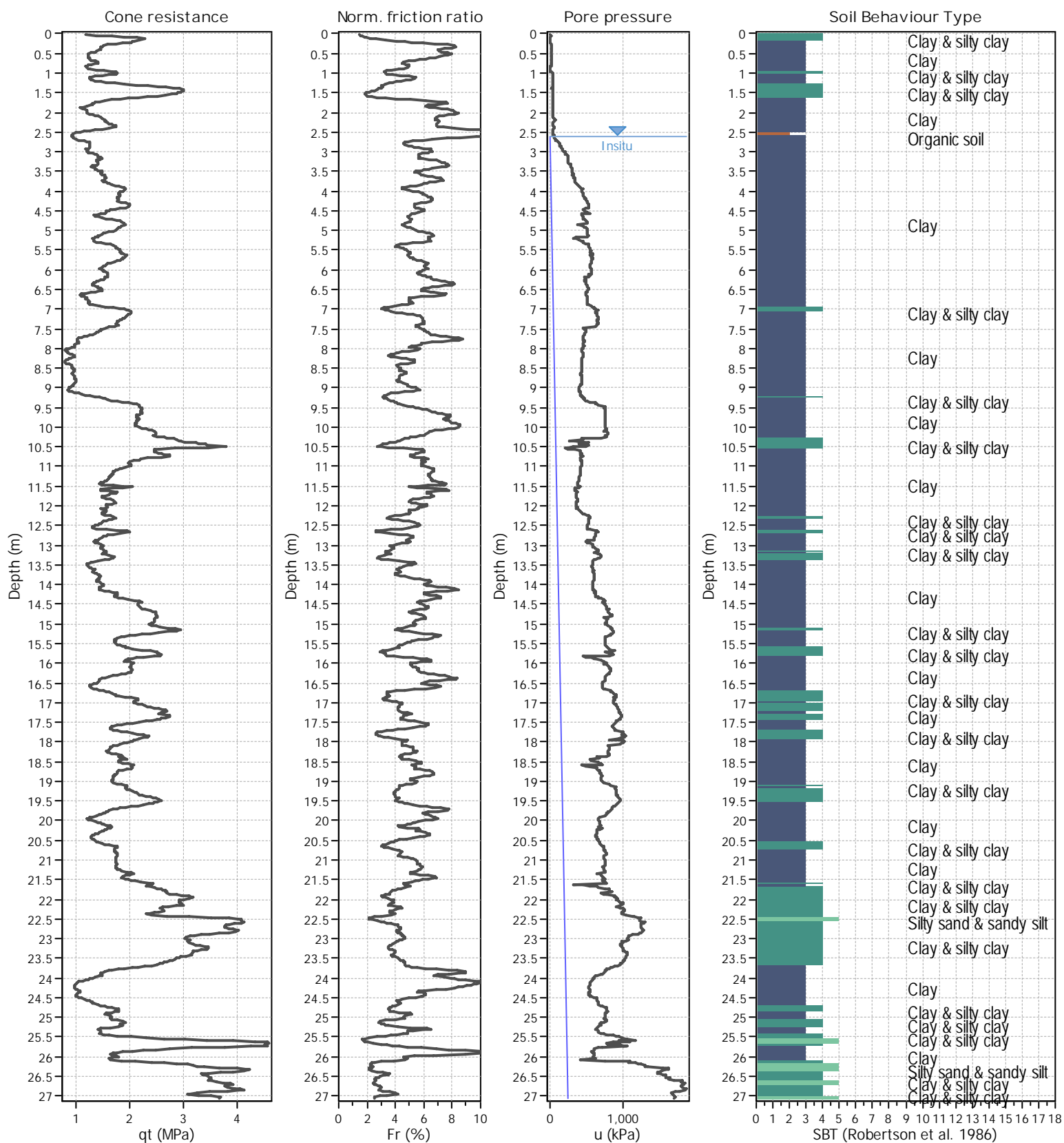


Project: Microzonazione Sismica III livello

Location: Busseto

CPT: scptu5\_San Rocco

Total depth: 27.06 m



Analysis method:	Robertson (2009)	G.W.T. (in-situ):	2.60 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.16	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based



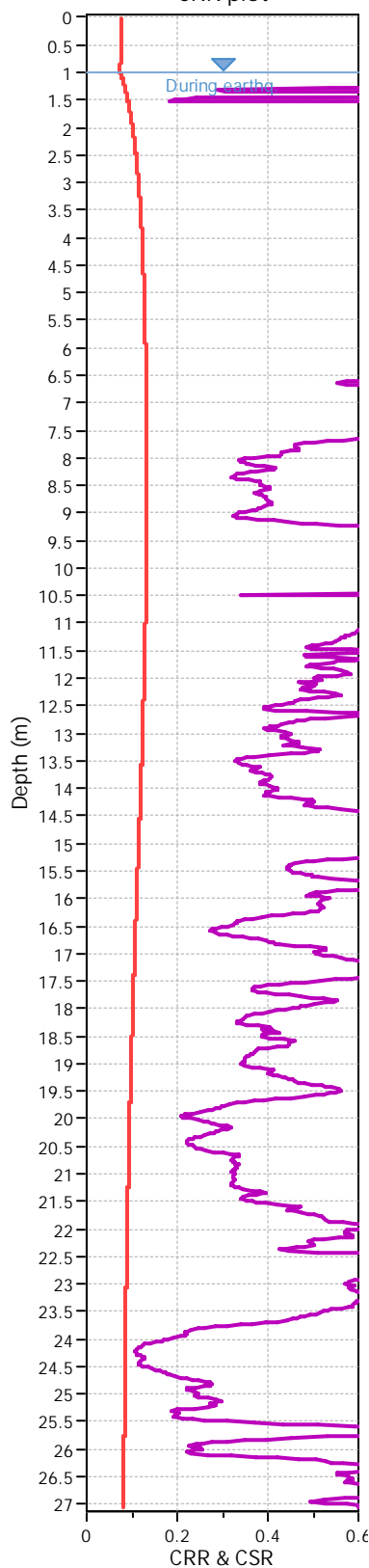
Project: Microzonazione Sismica III livello

Location: Busseto

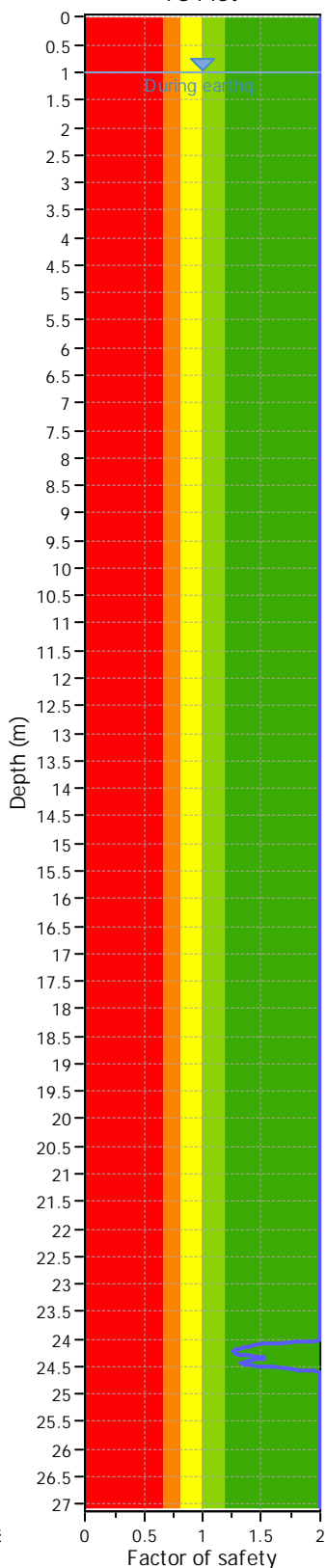
CPT: scptu5\_San Rocco

Total depth: 27.06 m

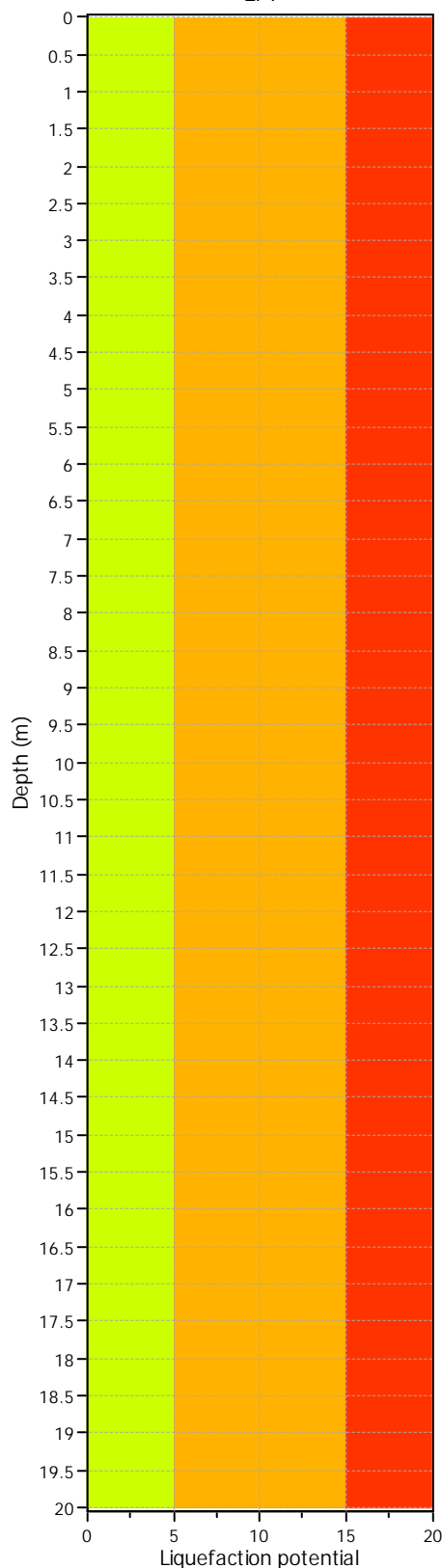
CRR plot



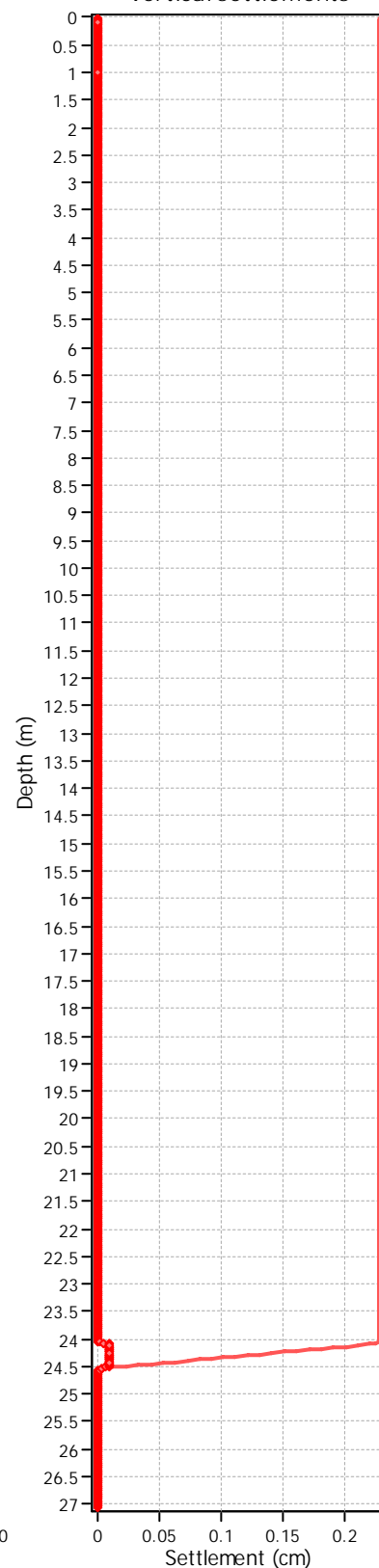
FS Plot



LPI



Vertical settlements



Analysis method: Robertson (2009)  
Fines correction method: Robertson (2009)  
Points to test: Based on Ic value  
Earthquake magnitude  $M_w$ : 6.14  
Peak ground acceleration: 0.16

G.W.T. (in-situ): 2.60 m  
G.W.T. (earthq.): 1.00 m  
Average results interval: 3  
Ic cut-off value: 2.60  
Unit weight calculation: Based on SBT

Use fill: No  
Fill height: N/A  
Fill weight: N/A  
Trans. detect. applied: Yes  
 $K_\sigma$  applied: No

Clay like behavior applied: All soils  
Limit depth applied: No  
Limit depth: N/A  
MSF method: Method based

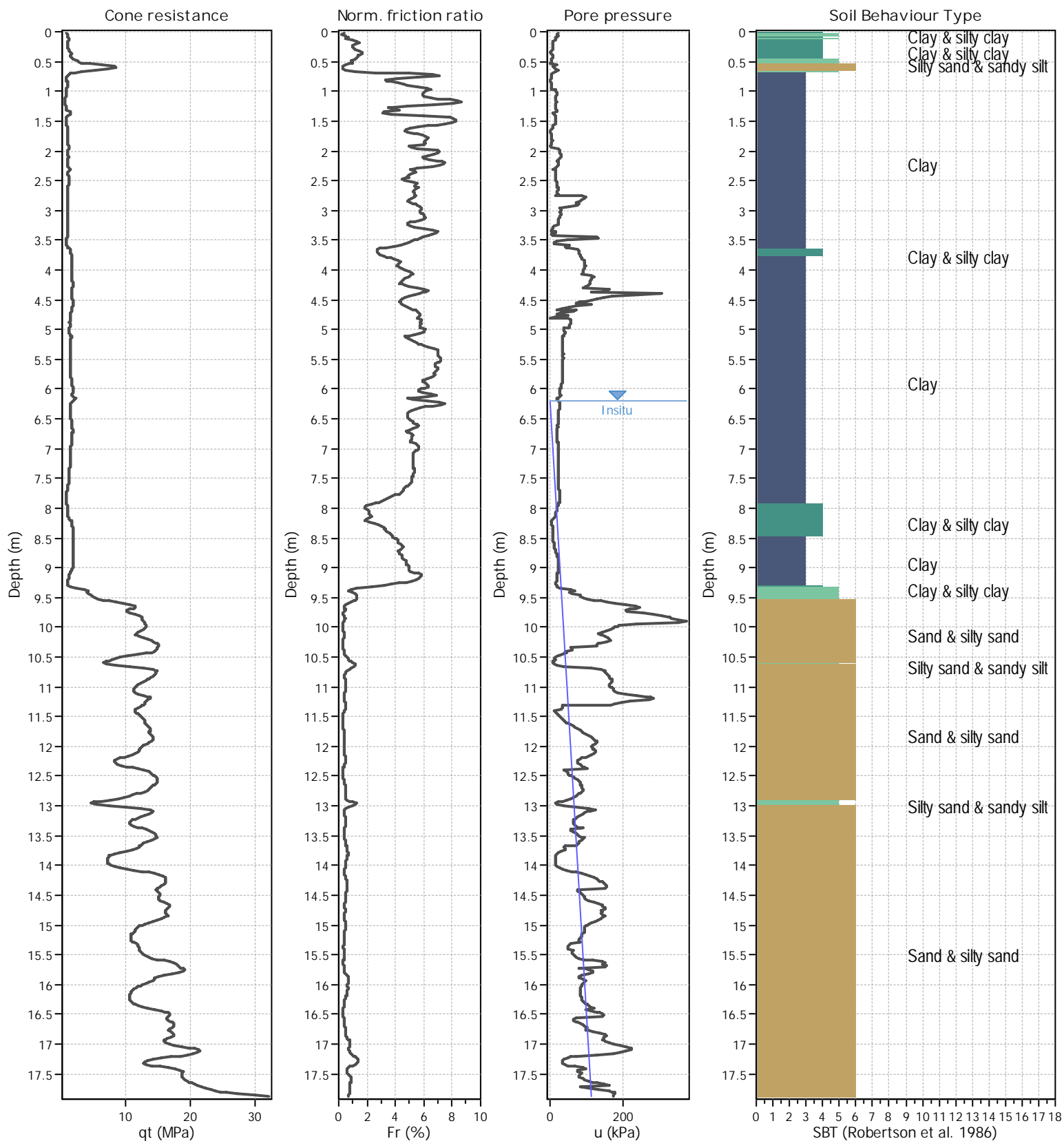


Project: Microzonazione Sismica III livello

Location: Busseto

CPT: scptu1\_Busseto\_Casa Salute

Total depth: 17.88 m



Analysis method:	Robertson (2009)	G.W.T. (in-situ):	6.20 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.17	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based



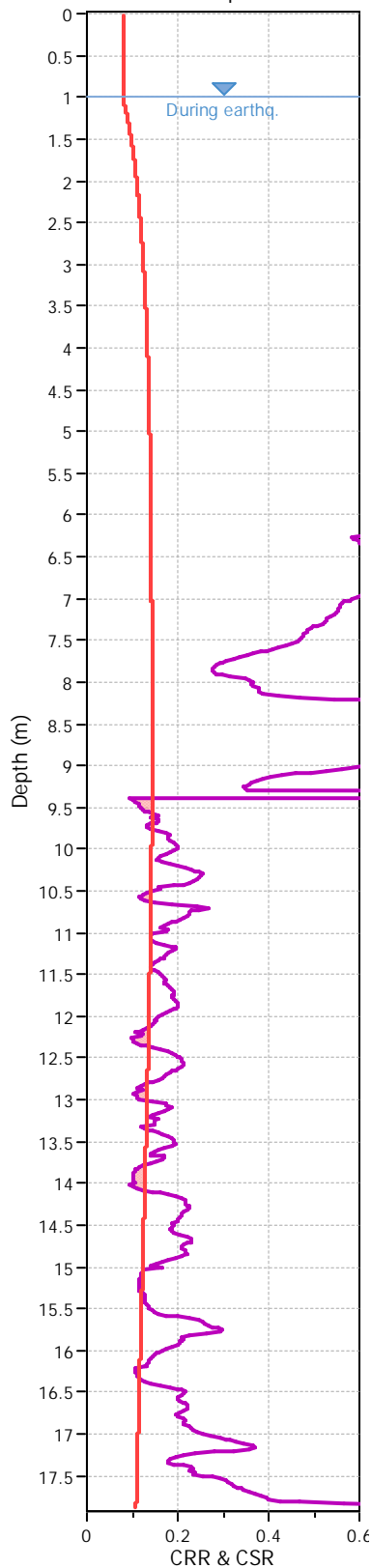
Project: Microzonazione Sismica III livello

Location: Busseto

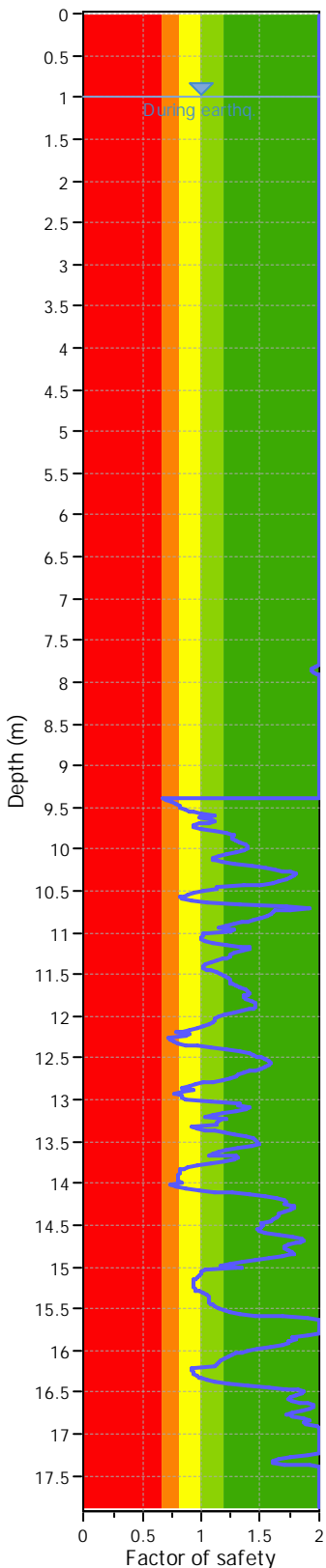
CPT: scptu1\_Busseto\_Casa Salute

Total depth: 17.88 m

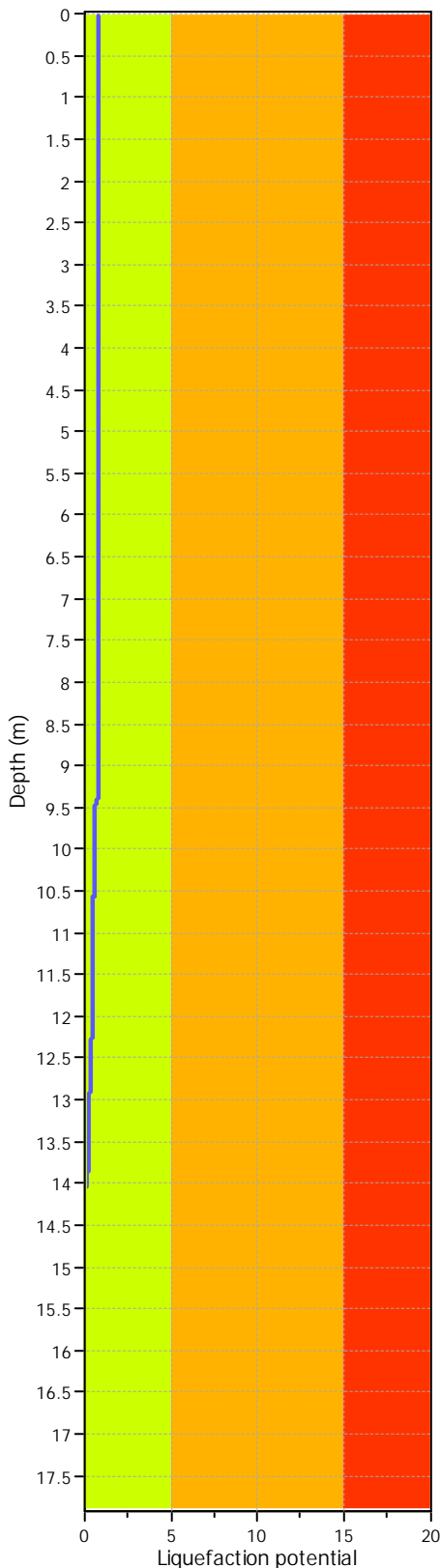
CRR plot



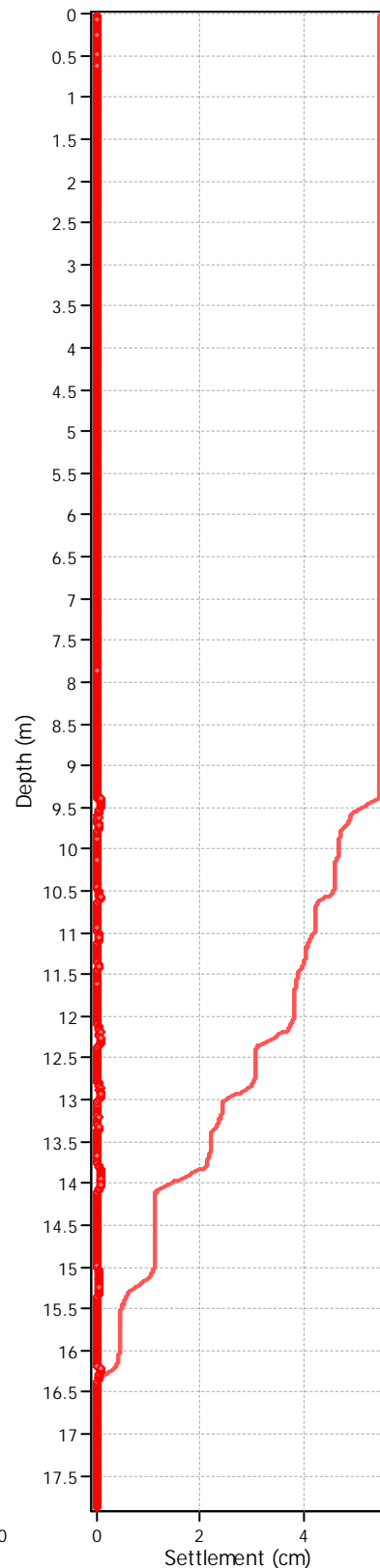
FS Plot



LPI



Vertical settlements

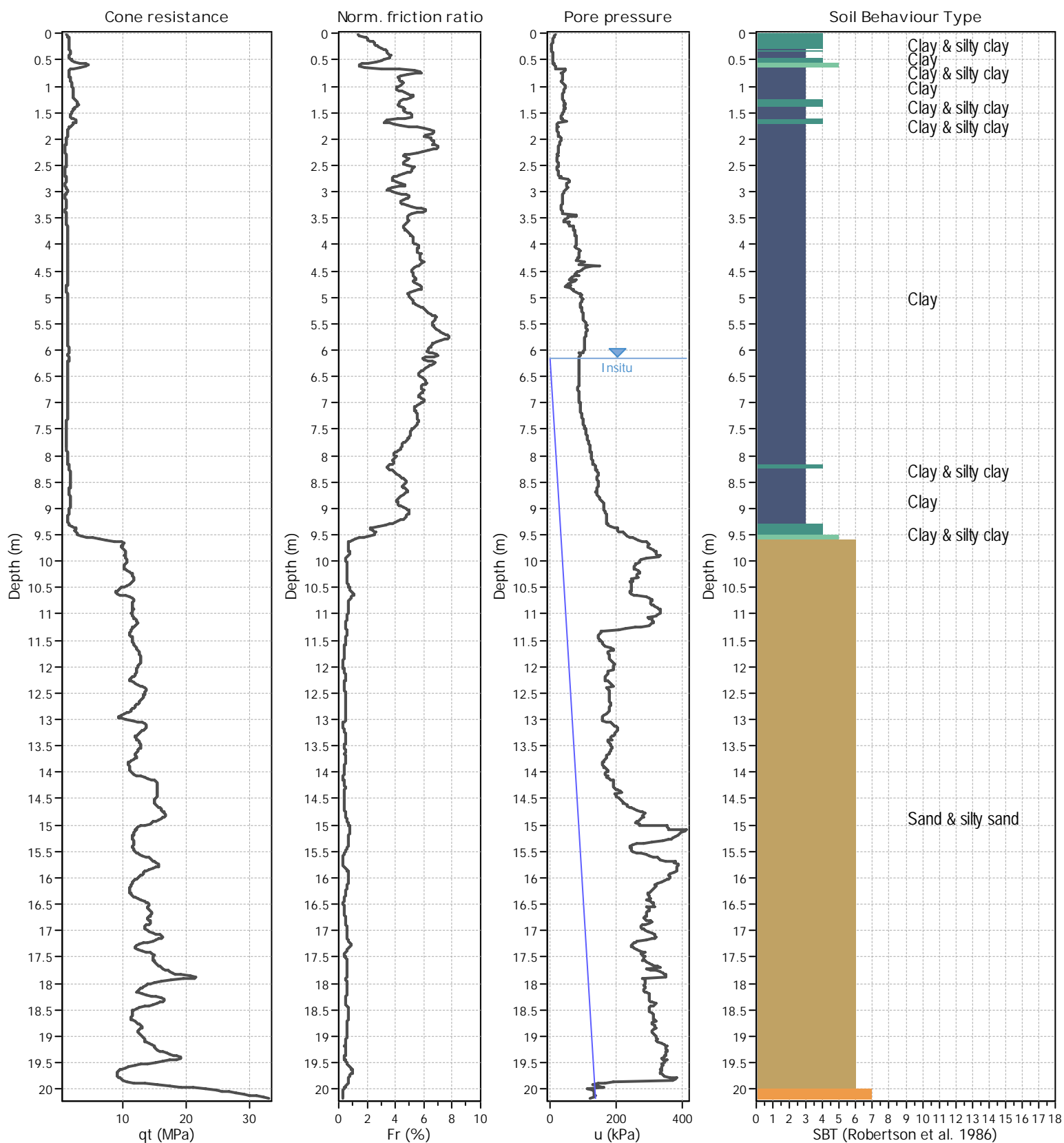


Analysis method: Robertson (2009)  
Fines correction method: Robertson (2009)  
Points to test: Based on Ic value  
Earthquake magnitude  $M_w$ : 6.14  
Peak ground acceleration: 0.17

G.W.T. (in-situ): 6.20 m  
G.W.T. (earthq.): 1.00 m  
Average results interval: 3  
Ic cut-off value: 2.60  
Unit weight calculation: Based on SBT

Use fill: No  
Fill height: N/A  
Fill weight: N/A  
Trans. detect. applied: Yes  
 $K_\sigma$  applied: No

Clay like behavior applied: All soils  
Limit depth applied: No  
Limit depth: N/A  
MSF method: Method based



Analysis method:	Robertson (2009)	G.W.T. (in-situ):	6.15 m	Use fill:	No	Clay like behavior	
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	1.00 m	Fill height:	N/A	applied:	All soils
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth applied:	No
Earthquake magnitude $M_w$ :	6.14	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	Limit depth:	N/A
Peak ground acceleration:	0.17	Unit weight calculation:	Based on SBT	$K_\sigma$ applied:	No	MSF method:	Method based





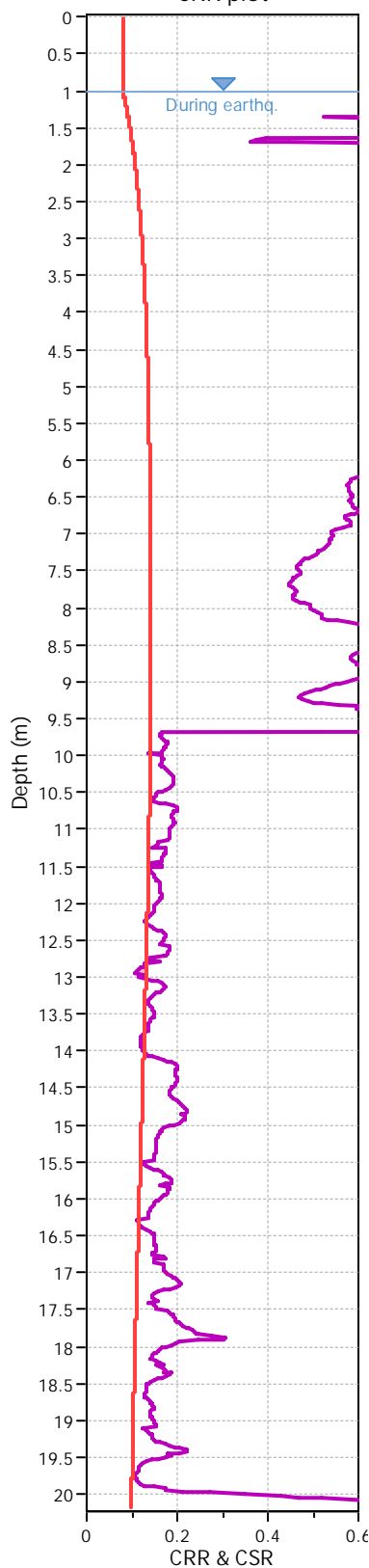
Project: Microzonazione Sismica III livello

Location: Busseto

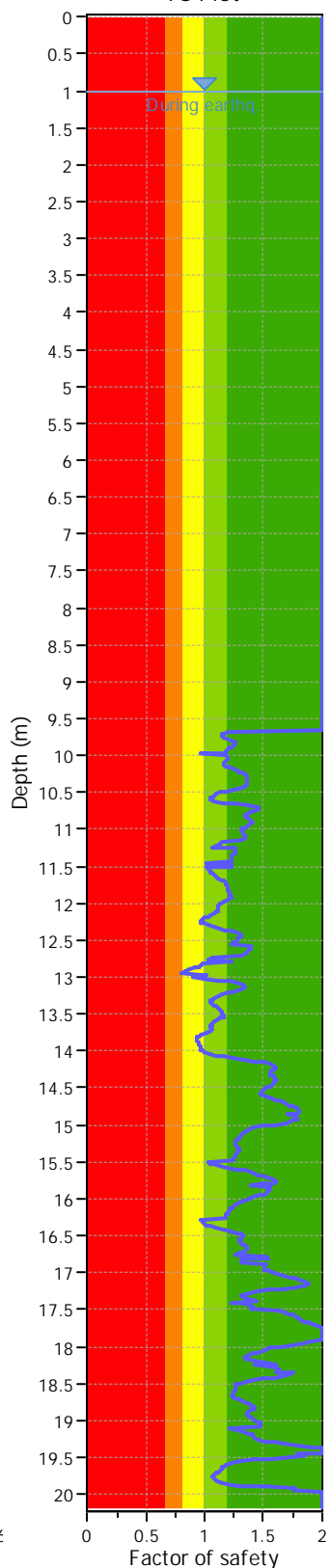
CPT: cptu2\_Busseto\_Casa Salute

Total depth: 20.18 m

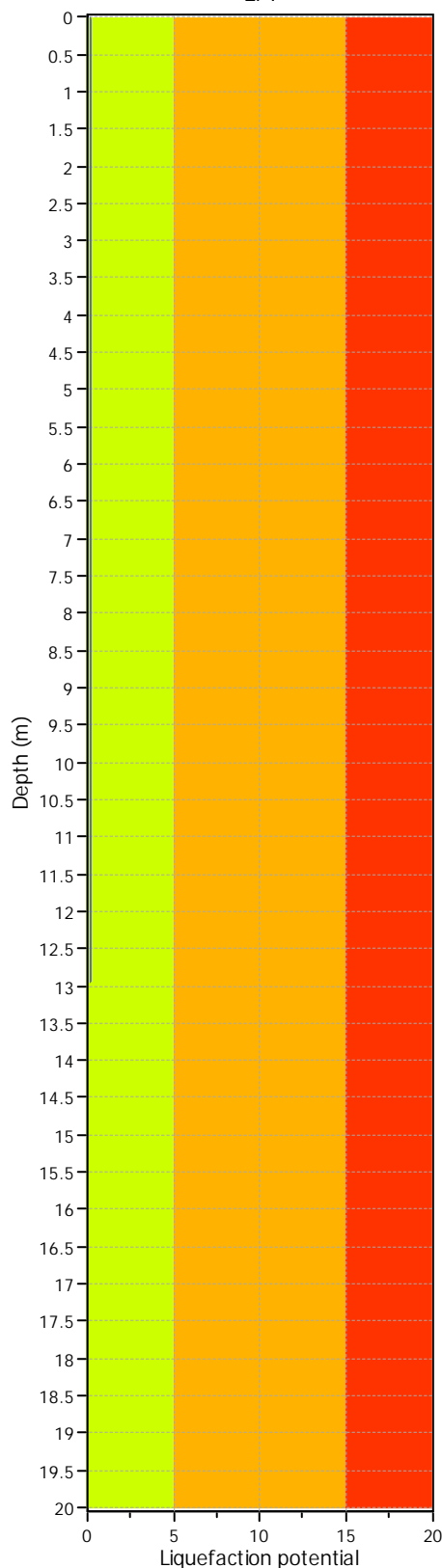
CRR plot



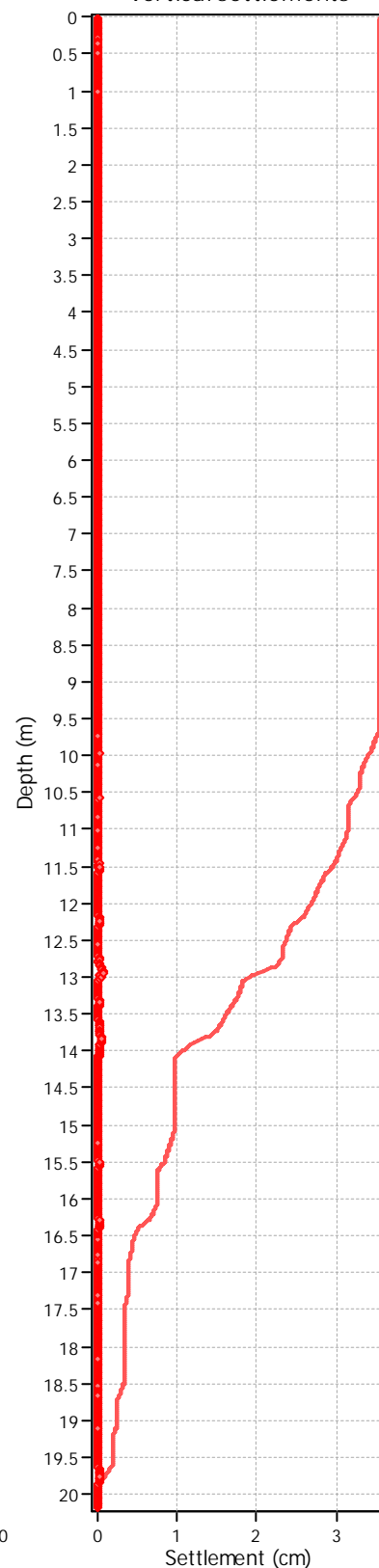
FS Plot



LPI



Vertical settlements



Analysis method: Robertson (2009)  
Fines correction method: Robertson (2009)  
Points to test: Based on Ic value  
Earthquake magnitude  $M_w$ : 6.14  
Peak ground acceleration: 0.17

G.W.T. (in-situ): 6.15 m  
G.W.T. (earthq.): 1.00 m  
Average results interval: 3  
Ic cut-off value: 2.60  
Unit weight calculation: Based on SBT

Use fill: No  
Fill height: N/A  
Fill weight: N/A  
Trans. detect. applied: Yes  
 $K_\sigma$  applied: No

Clay like behavior applied: All soils  
Limit depth applied: No  
Limit depth: N/A  
MSF method: Method based





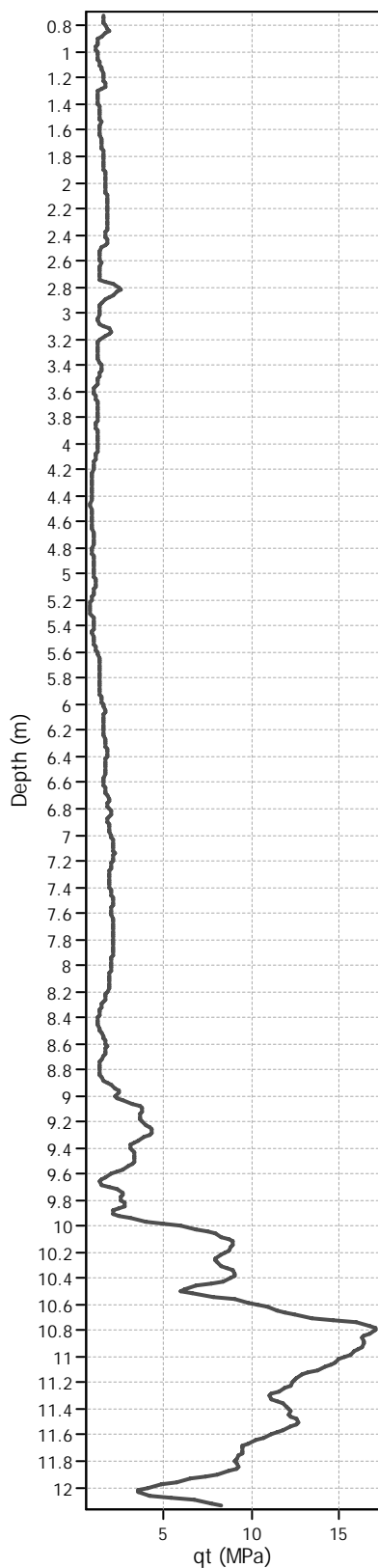
Project: Microzonazione Sismica III livello

Location: Busseto

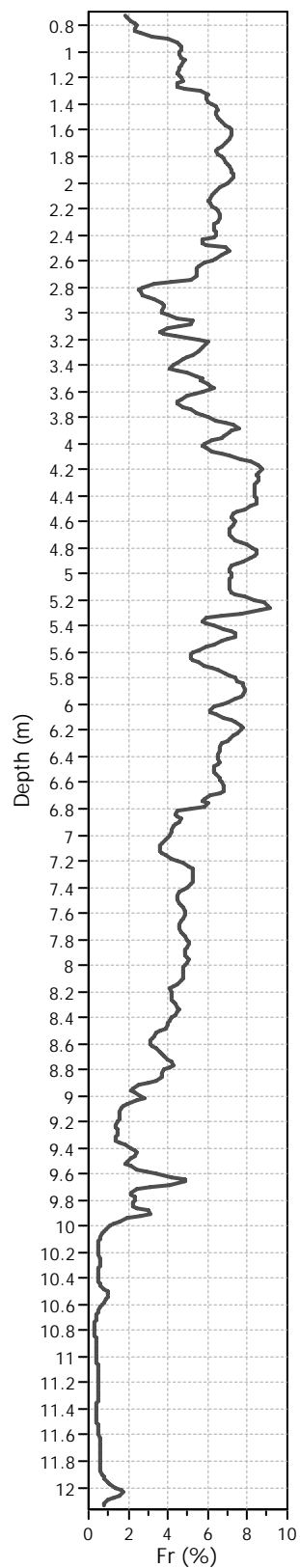
CPT: cptu3\_Busseto\_Casa Salute

Total depth: 12.14 m

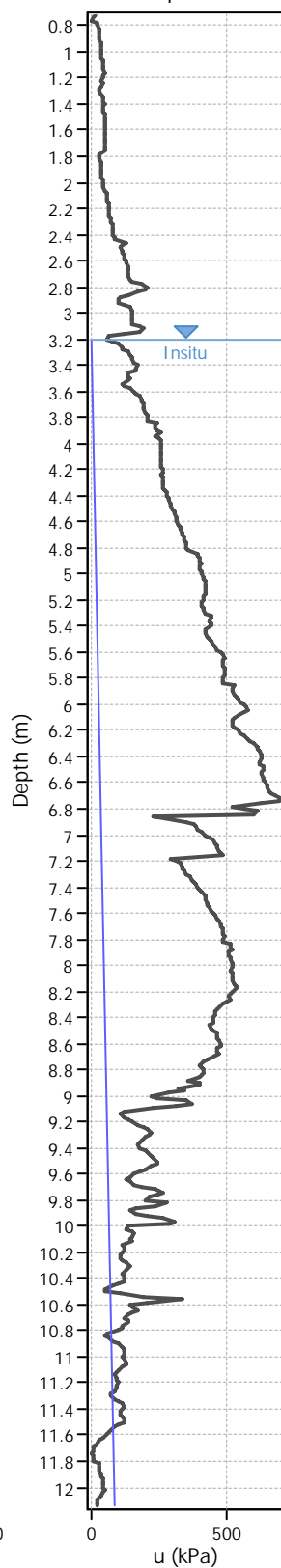
Cone resistance



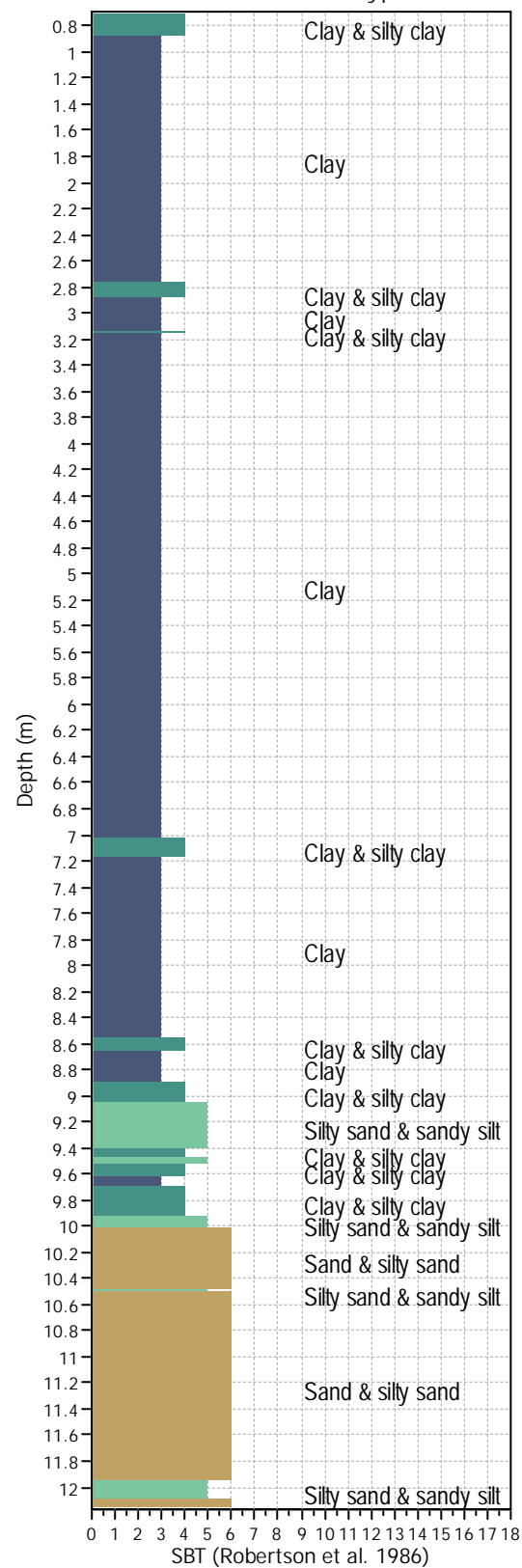
Norm. friction ratio



Pore pressure



Soil Behaviour Type



Analysis method: Robertson (2009)  
Fines correction method: Robertson (2009)  
Points to test: Based on Ic value  
Earthquake magnitude  $M_w$ : 6.14  
Peak ground acceleration: 0.17

G.W.T. (in-situ): 3.20 m  
G.W.T. (earthq.): 1.00 m  
Average results interval: 3  
Ic cut-off value: 2.60  
Unit weight calculation: Based on SBT

Use fill: No  
Fill height: N/A  
Fill weight: N/A  
Trans. detect. applied: Yes  
 $K_\sigma$  applied: No

Clay like behavior applied: All soils  
Limit depth applied: No  
Limit depth: N/A  
MSF method: Method based



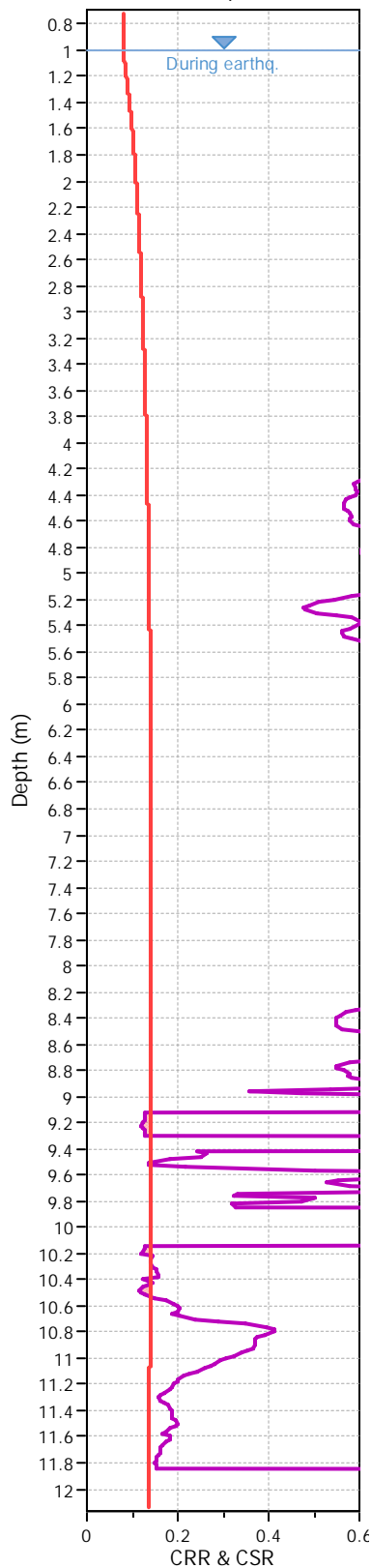
Project: Microzonazione Sismica III livello

Location: Busseto

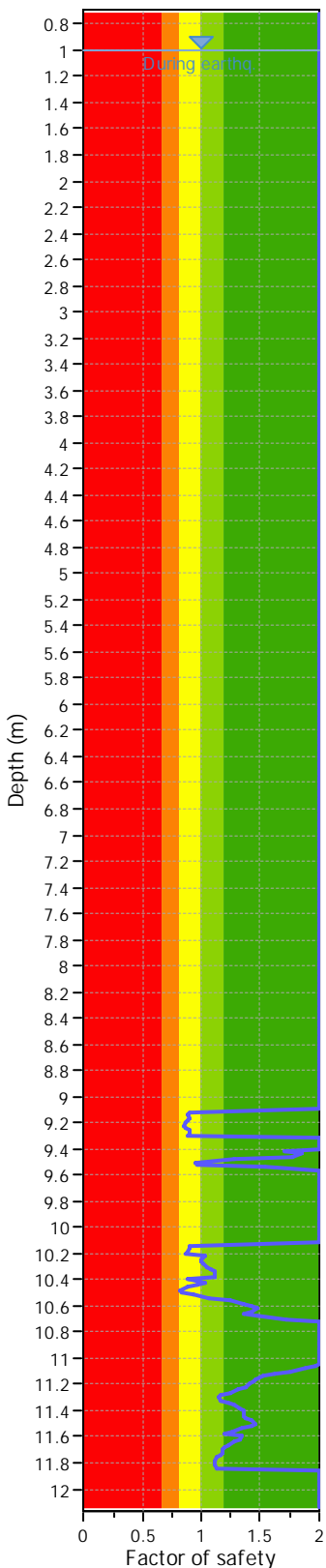
CPT: cptu3\_Busseto\_Casa Salute

Total depth: 12.14 m

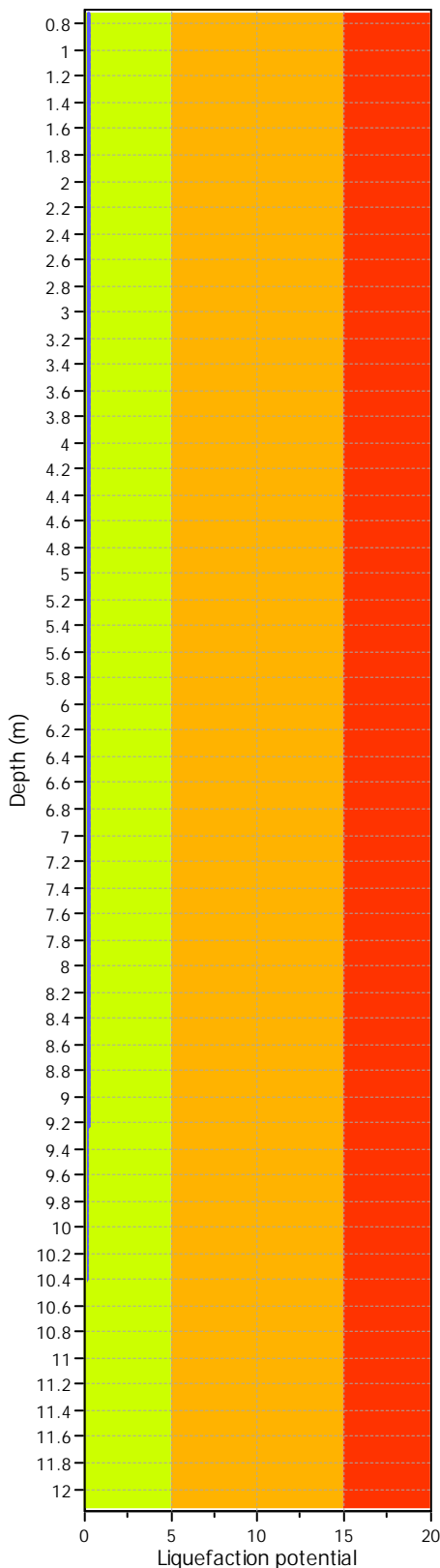
CRR plot



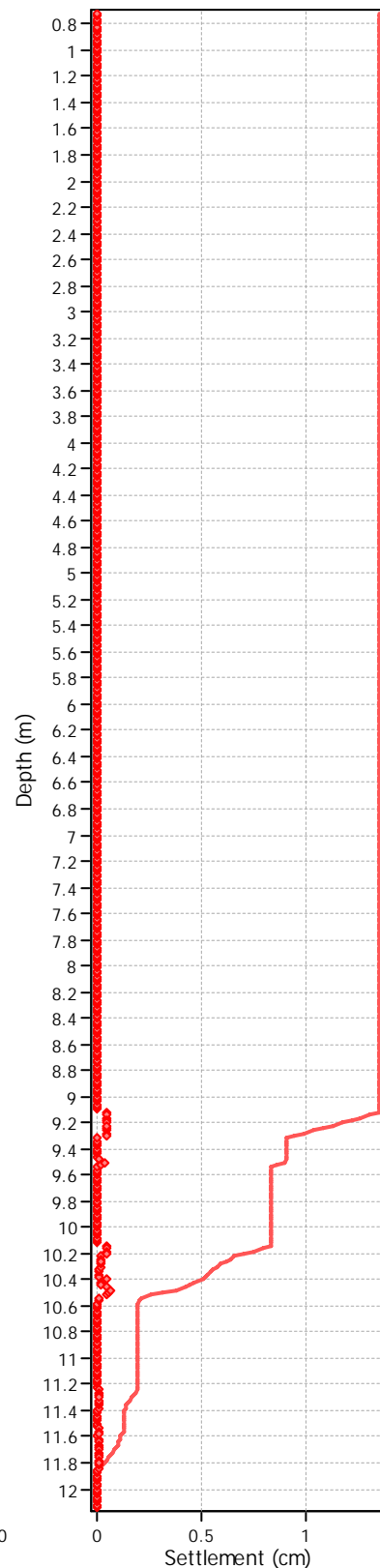
FS Plot



LPI



Vertical settlements



Analysis method: Robertson (2009)  
Fines correction method: Robertson (2009)  
Points to test: Based on Ic value  
Earthquake magnitude  $M_w$ : 6.14  
Peak ground acceleration: 0.17

G.W.T. (in-situ): 3.20 m  
G.W.T. (earthq.): 1.00 m  
Average results interval: 3  
Ic cut-off value: 2.60  
Unit weight calculation: Based on SBT

Use fill: No  
Fill height: N/A  
Fill weight: N/A  
Trans. detect. applied: Yes  
 $K_\sigma$  applied: No

Clay like behavior applied: All soils  
Limit depth applied: No  
Limit depth: N/A  
MSF method: Method based