

	PROGETTISTA: 	UNITÀ 000	COMMESSA 023081
	LOCALITÀ Regione Marche	SPC. LA-E-80030	
	PROGETTO Rif. met. Ravenna – Chieti Tratto Recanati – San Benedetto del Tronto	Fg. 1 di 30	Rev. 0

Rifacimento Metanodotto Ravenna - Chieti
Tratto Recanati – San Benedetto del Tronto
DN 650 (26"), DP 75 bar
ed opere connesse

Verifica tecnica di compatibilità interferenze dell'opera
con aree a pericolosità idrogeologica elevata e molto elevata
Art. 12 delle Norme di Attuazione PAI Regione Marche
Art. 7 Norme Tecniche di Attuazione PAI Interregionale Fiume Tronto

ALLEGATO 1:

BEDUSCHI GEOTECNICA di Beduschi Giovanni Srl – San Daniele Po (CR)
Indagine geognostica

Luglio 2017

Committente: SAIPEM	Sondaggio: BH 81
Riferimento: MET. RAVENNA - CHIETI	Data: 17/07/2017
Coordinate: N 43.06766° E 13.83077°	Quota:
Perforazione: CAROTAGGIO CONTINUO	

SCALA 1:100	STRATIGRAFIA - BH 81	Pagina 1/1
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Prof. m	R v	A r	Pr a	metri m	LITOLOGIA	Campioni	RP	VT	Profil. % 0 - 100	SPT S.P.T.	N	ROD % 0 - 100	prof. m	DESCRIZIONE
1													1.0	SUOLO LIMO ARGILLOSO MARRONE CON RARI ELEMENTI GHIAIOSI.
2						1) Rm = 1.80 2.00	2.5			8-10-10	20			ARGILLA MARRONE MOLTO CONSISTENTE, INTERCALATA DA LIVELLI CENTIMETRICI DI GHIAIA MEDIO PICCOLA.
3						2) Shm = 3.10 3.20	4							
4							4.5							
5						3) Shm = 5.00 5.40	4.5						5.8	SABBIA MARRONE CHIARO-NOCCIOLA DEBOLMENTE LIMOSA, MODERATAMENTE ADDENSATA.
6							3						5.8	
7						4) Rm = 7.00 7.50	2.7						6.1	GHIAIA MODERATAMENTE CEMENTATA BIANCASTRA (CONGLOMERATO).
8							3.2							SABBIA MARRONE CHIARO-NOCCIOLA LIMOSA, MODERATAMENTE ADDENSATA, PRESENTE LIVELLO DI GHIAIA DA m 7.00 A m 7.50.
9							4						9.8	
10						5) Rm = 9.50 10.00	3.7							ARGILLA LIMOSA MARRONE-GRIGIO, DA CONSISTENTE A MOLTO CONSISTENTE.
11							4.0							
12							4.0							
13							4						13.0	
14							>4.5							ARGILLA GRIGIA MOLTO CONSISTENTE, DEBOLMENTE MARNOSA, PRESENTI LIVELLI CENTIMETRICI SABBIO-LIMOSI
15							4.0						15.0	

PRESENZA DI ACQUA A FONDO FORO, MISURATA DOPO ESTRAZIONE DEL RIVESTIMENTO TERMINATO IL CAROTAGGIO.

Committente: SAIPEM	Sondaggio: BH 82
Riferimento: MET. RAVENNA - CHIETI	Data: 17-18/07/2017
Coordinate: N 43.08655° E 13.83080°	Quota:
Perforazione: CAROTAGGIO CONTINUO	

SCALA 1:100					STRATIGRAFIA - BH 82					Pagina 1/1					
Ø mm	R v	A s	Pr	metri tot.	LITOLOGIA	Campioni	RP	VT	Profil. % 0 — 100	S.P.T. S.P.T.	N	RQD % 0 — 100	prof. m	DESCRIZIONE	
															ARGILLA LIMOSA CON ELEMENTI GHIAIOSI.
						1) Rlm = 1.50 2.00							1.0		SABBIA NOCCIOLA, ADDENSATA, PRESENTI LIVELLI DI GHIAIA MODERATAMENTE CEMENTATI, Ø > 15 cm.
						2) Rlm = 3.00 3.50				4-8-12	18				
						3) Rlm = 5.00 5.50				15-25-50/5cm	RH				
						4) Rlm = 7.00 7.50				8-9-12	21				
						5) Rlm = 9.00 9.50				12-15-17	32				
													10.0		SABBIA NOCCIOLA-GRIGIO, MOLTO ADDENSATA ALTERNATA A LIVELLI CONGLOMERATICI BEN CEMENTATI. AVANZAMENTO LENTO.
101													15.0		

BH 81



BH 81: da m. 0 a m. 5



BH 81: da m. 5 a m. 10



BH 81: da m. 10 a m. 15



BH 81: SONDA

BH 82



BH 82: da m. 0 a m. 5



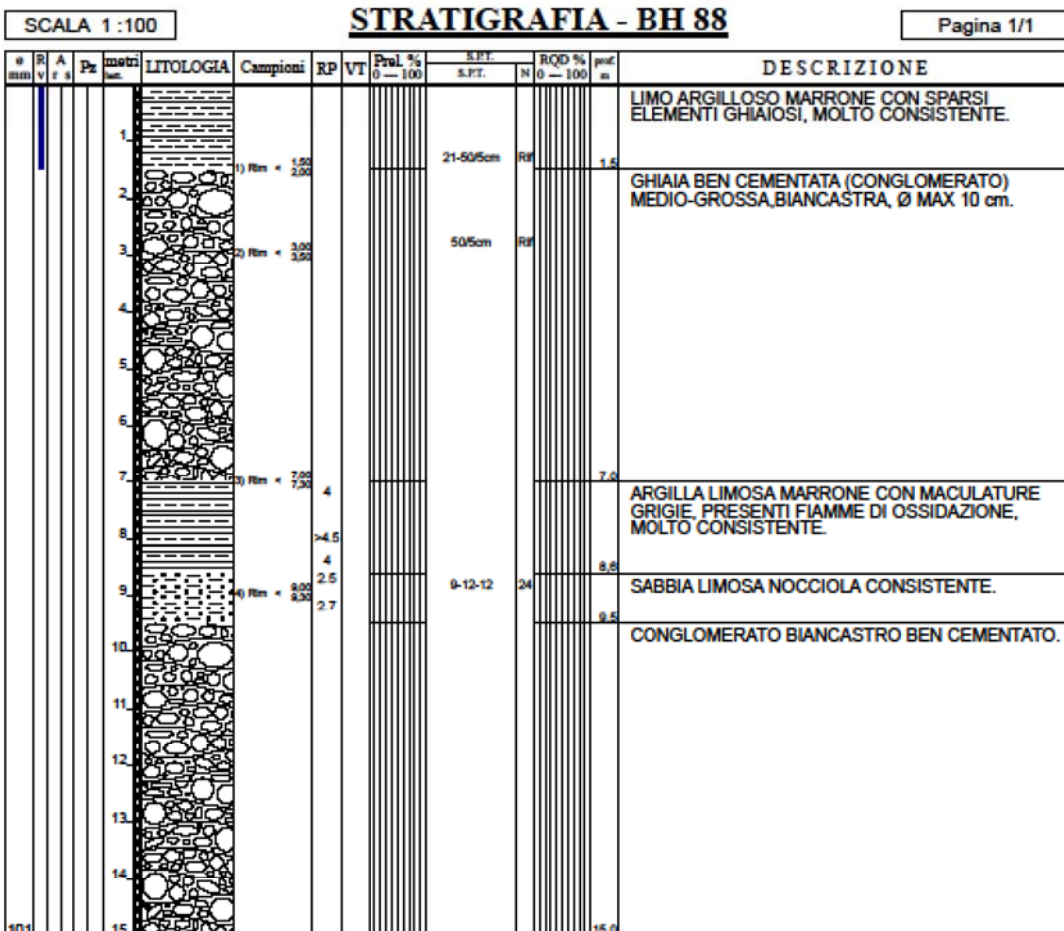
BH 82: da m. 5 a m. 10



BH 82: da m. 10 a m. 15



BH 82: SONDA



BH 88



BH 88: da m. 0 a m. 5



BH 88: da m. 5 a m. 10



BH 88: da m. 10 a m. 15



BH 88: SONDA

[illegible]

BH 100



BH 100: da m. 0 a m. 5



BH 100: da m. 5 a m. 10



BH 100: da m. 10 a m. 15

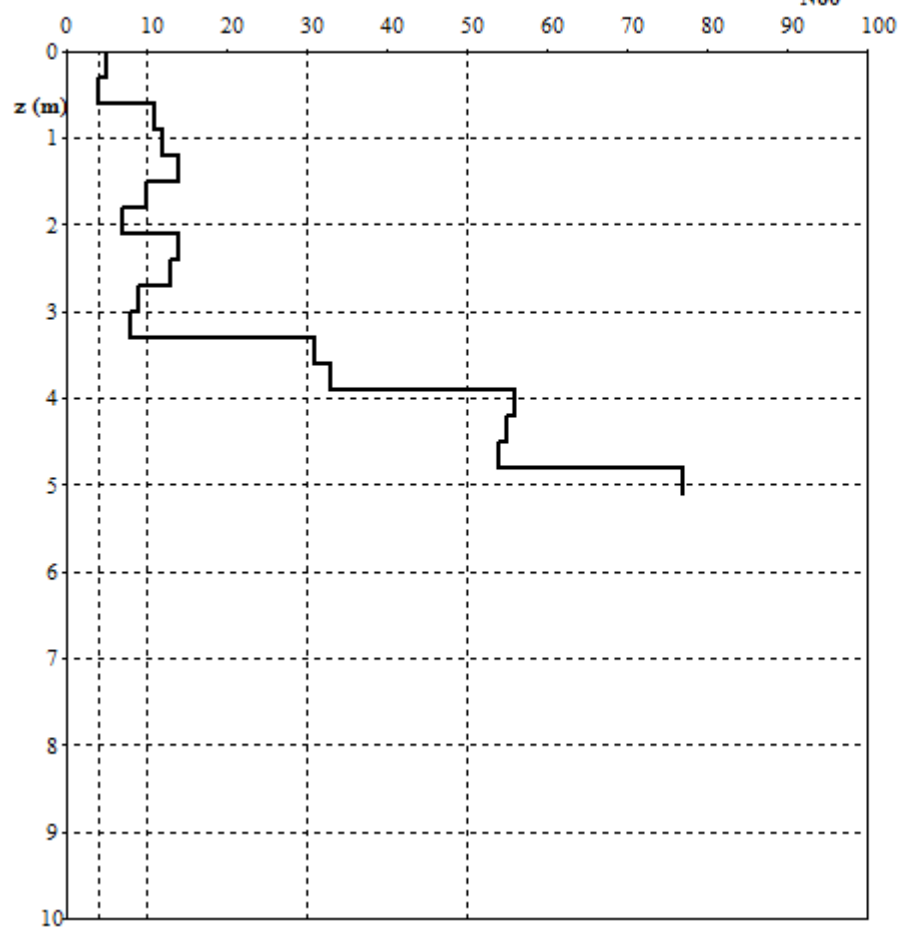


BH 100: SONDA

Prova penetrometrica dinamica continua 101

- RIF MET RAVENNA - CHIAVARI

N60



ANALISI PROVE PENETROMETRICHE DINAMICHE CONTINUE

Programma P.G.S.

c) Geosoft di Bruschi Alberto - Milano

Committente: SAIPEM SPA

Coordinate: lat 42.92655 lon 13.86495

Lavoro: RIF. MET. RAVENNA-CHIETI

Data: 29/07/2017

Dati del Penetrometro:

DPSH Pesante (AGI Meardi)

W	H	A	D	Wa	Wc
73.0	75.0	60.0	51.0	7.0	55.0

W = peso del maglio (Kg)

H = altezza di caduta (cm)

A = Angolo d'apertura del cono (°)

D = Diametro di base del cono (mm)

Wa = peso delle aste (Kg/m)

Wc = peso della cuffia (Kg)

Passo delle misure = 30.00 cm.

Profondità iniziale della prova = 0.3 m.

Profondità della falda = 4.8 m.

PROVA PENETROMETRICA n. 102

VALORI DI N

z (m)	N	N60	Nc
0.3	9	8	16
0.6	15	13	26
0.9	9	8	16
1.2	12	10	20
1.5	23	19	36
1.8	14	12	21
2.1	10	8	13
2.4	7	6	9
2.7	11	9	13
3.0	13	11	15
3.3	14	12	15
3.6	18	15	18
3.9	11	9	11
4.2	13	12	14
4.5	4	4	4
4.8	6	6	6
5.1	5	5	5
5.4	4	4	4
5.7	7	7	7
6.0	10	10	10
6.3	8	9	9
6.6	9	10	10
6.9	10	11	11
7.2	11	12	12
7.5	10	11	11
7.8	11	12	11

Committente: SAIPEM	Sondaggio: BH 105
Riferimento: MET. RAVENNA - CHIETI	Data: 20/07/2017
Coordinate: N 42.92179° E 13.86602°	Quota:
Perforazione: CAROTAGGIO CONTINUO	

SCALA 1:100				STRATIGRAFIA - BH 105										Pagina 1/1	
Prof. m	R. v	A. s	Pr	metri tot.	LITOLOGIA	Campioni	RP	VT	Profil. % 0 - 100	S.P.T. S.P.T.	N	ROD % 0 - 100	prof. m	DESCRIZIONE	
1													1.5	LIMO ARGILLOSO MARRONE CONSISTENTE.	
2						1) She = 1.50 2.00									
3						2) She = 3.00 3.50									
4													4.4	ARGILLA LIMOSA MARRONE SCURO, MODERATAMENTE CONSISTENTE, UMIDA (ACQUA COMUNQUE ASSENTE A FINE CAROTAGGIO)	
5						3) She = 5.00 5.50							4.8	LIMO ARGILLOSO GRIGIO-MARRONE CHIARO CON CALCINELLI.	
6															
7						4) Rlm = 7.00 7.50									
8															
9						5) Rlm = 9.00 9.50									
10															
11															
12															
13													13.2	ARGILLA GRIGIA, PLASTICA, MOLTO CONSISTENTE.	
14															
15													15.0		

BH 105



BH 105: da m. 0 a m. 5



BH 105: da m. 5 a m. 10



BH 105: da m. 10 a m. 15



BH 105: SONDA

ANALISI PROVE STATICHE CON PENETROMETRO MECCANICO [CPT]

Programma P.G.S.

c) Geosoft di Bruschi Alberto - Milano

Committente: SAIPEM SPA

Coordinate: lat 42.92282 lon 13.86630

Lavoro: RIF MET RAVENNA-CHIETI

Data: 29/07/2017

Passo delle misure = 20.00 cm.

PROVA PENETROMETRICA STATICA n. 104

VALORI DI RESISTENZE MISURATI

z	Rp	Rl
0.4	60	84
0.6	72	81
0.8	43	63
1.0	32	47
1.2	26	38
1.4	19	44
1.6	19	42
1.8	19	41
2.0	30	58
2.2	33	57
2.4	34	69
2.6	35	69
2.8	37	94
3.0	38	75
3.2	37	68
3.4	38	71
3.6	38	72
3.8	36	64
4.0	38	76
4.2	61	95
4.4	64	103
4.6	49	76
4.8	48	75
5.0	31	70
5.2	73	100
5.4	73	121
5.6	79	121
5.8	60	79
6.0	49	90
6.2	33	67
6.4	37	54
6.6	45	62
6.8	40	64
7.0	44	76
7.2	58	92
7.4	64	122
7.6	62	114
7.8	60	102
8.0	52	100
8.2	46	87
8.4	55	96
8.6	49	94
8.8	49	87
9.0	50	94

9.2	45	88
9.4	52	101
9.6	56	94
9.8	51	91
10.0	56	93
10.2	57	98
10.4	60	110
10.6	54	105
10.8	52	92
11.0	48	91
11.2	60	102
11.4	64	108
11.6	68	118
11.8	64	110
12.0	61	109
12.2	65	113
12.4	71	124
12.6	65	115
12.8	58	100
13.0	63	107
13.2	69	120
13.4	67	117
13.6	49	97
13.8	58	100
14.0	62	107
14.2	67	115
14.4	66	117
14.6	60	110
14.8	60	113
15.0	64	119

z = profondità

Rp = resistenza di punta (bar)

Rl = resistenza d'attrito (bar)

VALORI CALCOLATI

z	Qc	Fs	Rf	L	g	sv	sv'	Uo
0.4	6.0	160.0	2.67	Sabbia limosa	19.5	7.7	7.7	0.0
0.6	7.2	60.0	0.83	Sabbia	20.0	11.7	11.7	0.0
0.8	4.3	133.3	3.10	Sabbia limosa	19.5	15.6	15.6	0.0
1.0	3.2	100.0	3.13	Sabbia limosa	19.5	19.5	19.5	0.0
1.2	2.6	80.0	3.08	Sabbia limosa	19.5	23.4	23.4	0.0
1.4	1.9	166.7	8.77	Torba	17.5	26.9	26.9	0.0
1.6	1.9	153.3	8.07	Torba	17.5	30.4	30.4	0.0
1.8	1.9	146.7	7.72	Torba	17.5	33.9	33.9	0.0
2.0	3.0	186.7	6.22	Argilla	18.0	37.5	37.5	0.0
2.2	3.3	160.0	4.85	Argilla limosa	18.5	41.2	41.2	0.0
2.4	3.4	233.3	6.86	Argilla	18.0	44.8	44.8	0.0
2.6	3.5	226.7	6.48	Argilla	18.0	48.4	48.4	0.0
2.8	3.7	380.0	10.27	Argilla	18.0	52.0	52.0	0.0
3.0	3.8	246.7	6.49	Argilla	18.0	55.6	55.6	0.0
3.2	3.7	206.7	5.59	Argilla	18.0	59.2	59.2	0.0
3.4	3.8	220.0	5.79	Argilla	18.0	62.8	62.8	0.0
3.6	3.8	226.7	5.96	Argilla	18.0	66.4	66.4	0.0
3.8	3.6	186.7	5.19	Argilla	18.0	70.0	70.0	0.0
4.0	3.8	253.3	6.67	Argilla	18.0	73.6	73.6	0.0
4.2	6.1	226.7	3.72	Argilla limosa	18.5	77.3	77.3	0.0
4.4	6.4	260.0	4.06	Argilla limosa	18.5	81.0	81.0	0.0
4.6	4.9	180.0	3.67	Argilla limosa	18.5	84.7	84.7	0.0
4.8	4.8	180.0	3.75	Argilla limosa	18.5	88.4	88.4	0.0
5.0	3.1	260.0	8.39	Argilla	18.0	92.0	92.0	0.0
5.2	7.3	180.0	2.47	Sabbia limosa	19.5	95.9	95.9	0.0

5.4	7.3	320.0	4.38	Argilla limosa	18.5	99.6	99.6	0.0
5.6	7.9	280.0	3.54	Sabbia limosa	19.5	103.5	103.5	0.0
5.8	6.0	126.7	2.11	Sabbia limosa	19.5	107.4	107.4	0.0
6.0	4.9	273.3	5.58	Argilla limosa	18.5	111.1	111.1	0.0
6.2	3.3	226.7	6.87	Argilla	18.0	114.7	114.7	0.0
6.4	3.7	113.3	3.06	Sabbia limosa	19.5	118.6	118.6	0.0
6.6	4.5	113.3	2.52	Sabbia limosa	19.5	122.5	122.5	0.0
6.8	4.0	160.0	4.00	Argilla limosa	18.5	126.2	126.2	0.0
7.0	4.4	213.3	4.85	Argilla limosa	18.5	129.9	129.9	0.0
7.2	5.8	226.7	3.91	Argilla limosa	18.5	133.6	133.6	0.0
7.4	6.4	386.7	6.04	Argilla limosa	18.5	137.3	137.3	0.0
7.6	6.2	346.7	5.59	Argilla limosa	18.5	141.0	141.0	0.0
7.8	6.0	280.0	4.67	Argilla limosa	18.5	144.7	144.7	0.0
8.0	5.2	320.0	6.15	Argilla	18.0	148.3	148.3	0.0
8.2	4.6	273.3	5.94	Argilla	18.0	151.9	151.9	0.0
8.4	5.5	273.3	4.97	Argilla limosa	18.5	155.6	155.6	0.0
8.6	4.9	300.0	6.12	Argilla	18.0	159.2	159.2	0.0
8.8	4.9	253.3	5.17	Argilla limosa	18.5	162.9	162.9	0.0
9.0	5.0	293.3	5.87	Argilla	18.0	166.5	166.5	0.0
9.2	4.5	286.7	6.37	Argilla	18.0	170.1	170.1	0.0
9.4	5.2	326.7	6.28	Argilla	18.0	173.7	173.7	0.0
9.6	5.6	253.3	4.52	Argilla limosa	18.5	177.4	177.4	0.0
9.8	5.1	266.7	5.23	Argilla limosa	18.5	181.1	181.1	0.0
10.0	5.6	246.7	4.40	Argilla limosa	18.5	184.8	184.8	0.0
10.2	5.7	273.3	4.80	Argilla limosa	18.5	188.5	188.5	0.0
10.4	6.0	333.3	5.56	Argilla limosa	18.5	192.2	192.2	0.0
10.6	5.4	340.0	6.30	Argilla	18.0	195.8	195.8	0.0
10.8	5.2	266.7	5.13	Argilla limosa	18.5	199.5	199.5	0.0
11.0	4.8	286.7	5.97	Argilla	18.0	203.1	203.1	0.0
11.2	6.0	280.0	4.67	Argilla limosa	18.5	206.8	206.8	0.0
11.4	6.4	293.3	4.58	Argilla limosa	18.5	210.5	210.5	0.0
11.6	6.8	333.3	4.90	Argilla limosa	18.5	214.2	214.2	0.0
11.8	6.4	306.7	4.79	Argilla limosa	18.5	217.9	217.9	0.0
12.0	6.1	320.0	5.25	Argilla limosa	18.5	221.6	221.6	0.0
12.2	6.5	320.0	4.92	Argilla limosa	18.5	225.3	225.3	0.0
12.4	7.1	353.3	4.98	Argilla limosa	18.5	229.0	229.0	0.0
12.6	6.5	333.3	5.13	Argilla limosa	18.5	232.7	232.7	0.0
12.8	5.8	280.0	4.83	Argilla limosa	18.5	236.4	236.4	0.0
13.0	6.3	293.3	4.66	Argilla limosa	18.5	240.1	240.1	0.0
13.2	6.9	340.0	4.93	Argilla limosa	18.5	243.8	243.8	0.0
13.4	6.7	333.3	4.98	Argilla limosa	18.5	247.5	247.5	0.0
13.6	4.9	320.0	6.53	Argilla	18.0	251.1	251.1	0.0
13.8	5.8	280.0	4.83	Argilla limosa	18.5	254.8	254.8	0.0
14.0	6.2	300.0	4.84	Argilla limosa	18.5	258.5	258.5	0.0
14.2	6.7	320.0	4.78	Argilla limosa	18.5	262.2	262.2	0.0
14.4	6.6	340.0	5.15	Argilla limosa	18.5	265.9	265.9	0.0
14.6	6.0	333.3	5.56	Argilla limosa	18.5	269.6	269.6	0.0
14.8	6.0	353.3	5.89	Argilla limosa	18.5	273.3	273.3	0.0
15.0	6.4	366.7	5.73	Argilla limosa	18.5	277.0	277.0	0.0

z = profondità (m)

Qc = resistenza alla punta (MPa)

Fs = resistenza d'attrito (kPa)

Rf = rapporto delle resistenze (%)

L = litologia (criterio di Schmertmann, 1976)

g = peso di volume (kN/mc)

sv = tensione litostatica totale (kPa)

sv' = tensione litostatica effettiva (kPa)

Uo = pressione nei pori (kPa)

CARATTERISTICHE GEOTECNICHE

z	L	CF	Id	f	Su	OCR	M	Cc	Go	Vs
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0.4	Sabbia limosa	5	60	45.0		18.4	17.3		58.0	319
0.6	Sabbia	0	60	44.1		14.7	20.7		80.0	332
0.8	Sabbia limosa	10	45	42.0		8.6	16		86.0	295
1.0	Sabbia limosa	13	39	40.2		5.7	13.2		93.0	276
1.2	Sabbia limosa	15	34	38.7		4	11.7		100.0	263
1.4	Torba	31			74.9	21.2	15.4	0.183	231.0	245
1.6	Torba	31			74.8	18.7	15.4	0.174	231.0	245
1.8	Torba	31			74.59	16.7	15.3	0.169	230.0	245
2.0	Argilla	25			118.5	24	24.4	0.149	366.0	272
2.2	Argilla limosa	22			130.4	24.1	26.8	0.131	402.0	278
2.4	Argilla	27			134.19	22.8	27.6	0.158	414.0	280
2.6	Argilla	27			138.1	21.7	28.4	0.153	426.0	281
2.8	Argilla	33			145.9	21.3	30	0.203	450.0	285
3.0	Argilla	27			149.8	20.5	30.8	0.153	462.0	287
3.2	Argilla	26			145.6	18.7	30	0.141	450.0	285
3.4	Argilla	27			149.5	18.1	30.8	0.144	462.0	287
3.6	Argilla	28			149.3	17.1	30.8	0.146	462.0	287
3.8	Argilla	28			141.19	15.3	29.1	0.135	437.0	283
4.0	Argilla	31			149.1	15.4	30.7	0.155	461.0	287
4.2	Argilla limosa	20			240.9	23.7	49.6	0.116	744.0	320
4.4	Argilla limosa	21			252.8	23.7	52.1	0.121	782.0	323
4.6	Argilla limosa	23			192.6	17.3	39.7	0.115	596.0	304
4.8	Argilla limosa	23			188.5	16.2	38.8	0.116	582.0	303
5.0	Argilla	39			120.3	9.9	24.8	0.178	372.0	274
5.2	Sabbia limosa	16	42	36.7		1.9	28.7		336.0	333
5.4	Argilla limosa	22			288	22	59.4	0.125	891.0	333
5.6	Sabbia limosa	20	43	36.6		1.8	30.5		361.0	339
5.8	Sabbia limosa	18	38	35.4		1.3	25.3		346.0	319
6.0	Argilla limosa	30			191.6	13.1	39.5	0.141	593.0	304
6.2	Argilla	38			127.4	8.4	26.2	0.158	393.0	278
6.4	Sabbia limosa	28	31	32.7		1	17.6		328.0	285
6.6	Sabbia limosa	24	34	33.4		1	20.3		352.0	298
6.8	Argilla limosa	30			155	9.3	31.9	0.120	479.0	290
7.0	Argilla limosa	32			170.8	10	35.2	0.131	528.0	297
7.2	Argilla limosa	26			226.7	12.9	46.7	0.118	701.0	316
7.4	Argilla limosa	30			250.5	13.9	51.6	0.147	774.0	323
7.6	Argilla limosa	30			242.4	13.1	49.9	0.141	749.0	321
7.8	Argilla limosa	29			234.2	12.3	48.3	0.129	725.0	319
8.0	Argilla	34			202.1	10.3	41.6	0.148	624.0	308
8.2	Argilla	36			177.9	8.9	36.6	0.146	549.0	300
8.4	Argilla limosa	31			213.8	10.4	44	0.133	660.0	312
8.6	Argilla	36			189.6	9	39.1	0.148	587.0	304
8.8	Argilla limosa	34			189.5	8.8	39	0.135	585.0	304
9.0	Argilla	36			193.3	8.8	39.8	0.145	597.0	306
9.2	Argilla	39			173.2	7.7	35.7	0.151	536.0	298
9.4	Argilla	37			201.1	8.8	41.4	0.150	621.0	308
9.6	Argilla limosa	32			216.9	9.3	44.7	0.127	671.0	314
9.8	Argilla limosa	35			196.8	8.2	40.5	0.136	608.0	307
10.0	Argilla limosa	32			216.6	8.9	44.6	0.125	669.0	314
10.2	Argilla limosa	33			220.5	8.9	45.4	0.130	681.0	315
10.4	Argilla limosa	34			232.3	9.2	47.9	0.140	719.0	319
10.6	Argilla	38			208.2	8.1	42.9	0.150	644.0	311
10.8	Argilla limosa	36			200	7.6	41.2	0.135	618.0	308
11.0	Argilla	39			183.9	6.9	37.9	0.146	569.0	303
11.2	Argilla limosa	33			231.7	8.5	47.7	0.129	716.0	319
11.4	Argilla limosa	32			247.6	8.9	51	0.127	765.0	323
11.6	Argilla limosa	33			263.39	9.3	54.3	0.132	815.0	328
11.8	Argilla limosa	33			247.3	8.6	51	0.130	765.0	323
12.0	Argilla limosa	35			235.1	8	48.4	0.136	726.0	320
12.2	Argilla limosa	34			251	8.4	51.7	0.132	776.0	325
12.4	Argilla limosa	33			274.8	9.1	56.6	0.133	849.0	331
12.6	Argilla limosa	35			250.7	8.2	51.7	0.135	776.0	325
12.8	Argilla limosa	36			222.5	7.1	45.8	0.131	687.0	316

13.0	Argilla limosa	35			242.4	7.6	49.9	0.128	749.0	322
13.2	Argilla limosa	34			266.2	8.3	54.9	0.132	824.0	329
13.4	Argilla limosa	35			258.1	7.9	53.2	0.133	798.0	327
13.6	Argilla	44			186	5.6	38.3	0.153	575.0	304
13.8	Argilla limosa	37			221.8	6.6	45.7	0.131	686.0	316
14.0	Argilla limosa	36			237.7	7	49	0.131	735.0	321
14.2	Argilla limosa	35			257.5	7.4	53.1	0.130	797.0	327
14.4	Argilla limosa	37			253.4	7.2	52.2	0.135	783.0	326
14.6	Argilla limosa	39			229.2	6.4	47.2	0.140	708.0	319
14.8	Argilla limosa	40			229.1	6.3	47.2	0.145	708.0	319
15.0	Argilla limosa	39			244.9	6.7	50.5	0.143	758.0	323

z = profondità (m)

CF = contenuto di fine [passante al 200] (%)

Id = indice di densità (%)

f = angolo d'attrito (°)

Su = resistenza al taglio non drenata (kPa)

OCR = grado di sovraconsolidamento

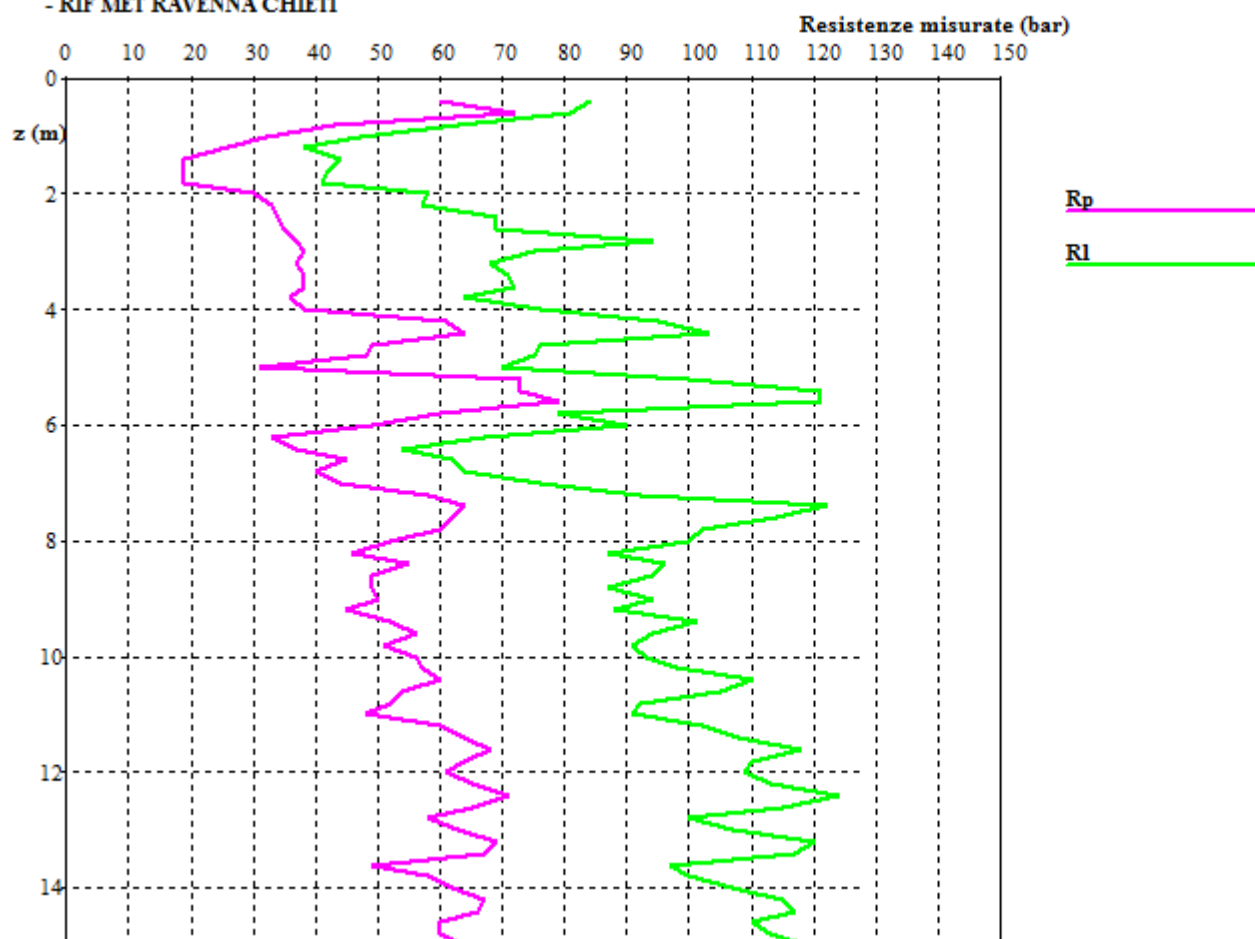
M = modulo confinato (MPa)

Cc = indice di compressibilità (-)

Go = modulo di taglio (MPa)

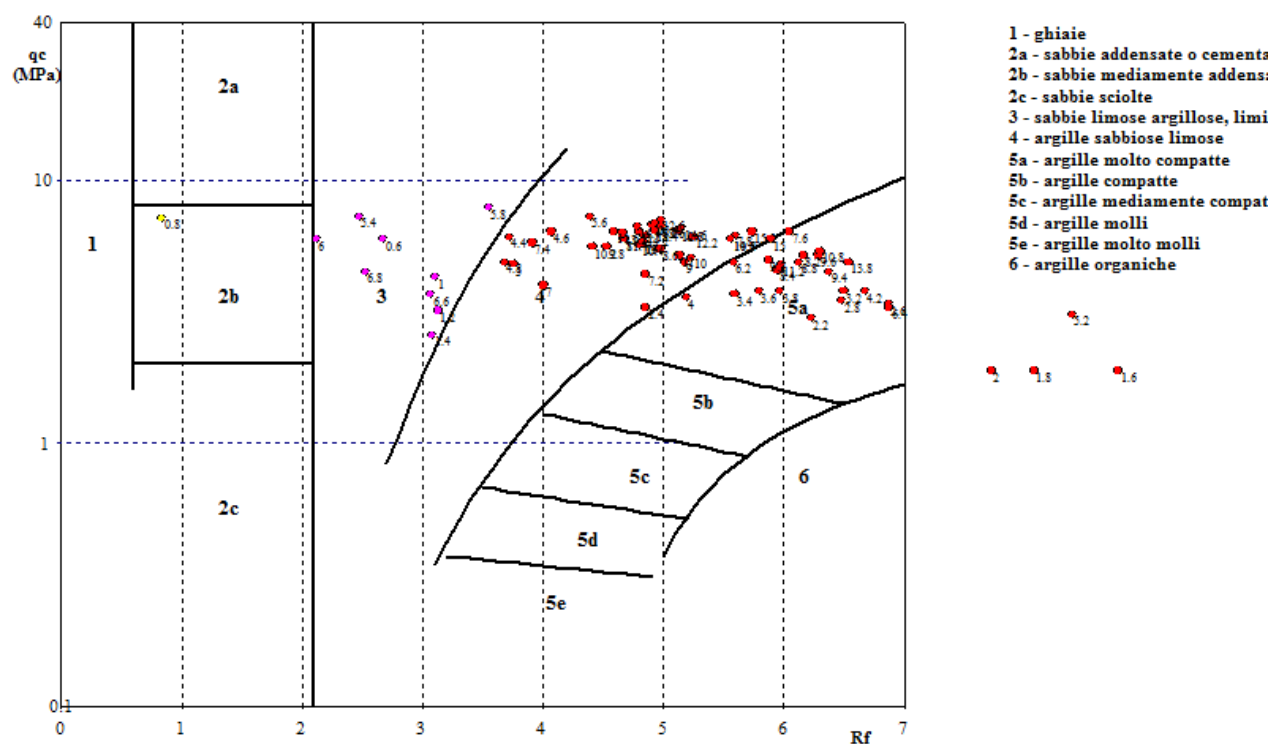
Vs = velocità onde di taglio (m/s)

Prova Penetrometrica Statica - RIF MET RAVENNA CHIETI



- RIF MET RAVENNA CHIETI

Criterio di identificazione di Schmertmann, 1978



ANALISI PROVE STATICHE CON PENETROMETRO MECCANICO [CPT]

Programma P.G.S.

c) Geosoft di Bruschi Alberto - Milano

Committente: SAIPEM SPA

Coordinate: lat 42.92089 lon 13.86663

Lavoro: RIF MET RAVENNA-CHIETI

Data: 29/07/2017

Passo delle misure = 20.00 cm.

PROVA PENETROMETRICA STATICA n. 106

VALORI DI RESISTENZE MISURATI

z	Rp	Rl
0.4	37	51
0.6	24	44
0.8	27	57
1.0	28	62
1.2	31	57
1.4	28	57
1.6	29	58
1.8	28	60
2.0	28	57
2.2	31	63
2.4	34	66
2.6	39	78
2.8	39	72
3.0	32	64
3.2	34	65
3.4	30	61
3.6	32	60
3.8	30	58
4.0	38	63
4.2	32	62
4.4	32	63
4.6	45	75
4.8	41	73
5.0	50	84
5.2	45	83
5.4	57	92
5.6	66	95
5.8	61	105
6.0	62	106
6.2	59	103
6.4	46	82
6.6	52	83
6.8	53	77
7.0	66	96
7.2	56	98
7.4	52	91
7.6	50	89
7.8	49	83
8.0	52	90
8.2	52	88
8.4	52	89
8.6	52	91
8.8	52	88
9.0	49	88

9.2	43	82
9.4	42	79
9.6	58	89
9.8	57	87
10.0	52	91
10.2	54	90
10.4	55	97
10.6	56	98
10.8	54	94
11.0	45	87
11.2	53	96
11.4	53	96
11.6	62	106
11.8	60	103
12.0	56	102
12.2	61	103
12.4	59	100
12.6	56	98
12.8	58	95
13.0	58	99
13.2	50	92
13.4	56	93
13.6	59	103
13.8	57	105
14.0	61	110
14.2	62	110
14.4	58	97
14.6	56	97
14.8	59	100
15.0	61	107

z = profondità

Rp = resistenza di punta (bar)

Rl = resistenza d'attrito (bar)

VALORI CALCOLATI

z	Qc	Fs	Rf	L	g	sv	sv'	Uo
0.4	3.7	93.3	2.52	Sabbia limosa	19.5	7.7	7.7	0.0
0.6	2.4	133.3	5.56	Argilla	18.0	11.3	11.3	0.0
0.8	2.7	200.0	7.41	Argilla	18.0	14.9	14.9	0.0
1.0	2.8	226.7	8.10	Argilla	18.0	18.5	18.5	0.0
1.2	3.1	173.3	5.59	Argilla	18.0	22.1	22.1	0.0
1.4	2.8	193.3	6.90	Argilla	18.0	25.7	25.7	0.0
1.6	2.9	193.3	6.67	Argilla	18.0	29.3	29.3	0.0
1.8	2.8	213.3	7.62	Argilla	18.0	32.9	32.9	0.0
2.0	2.8	193.3	6.90	Argilla	18.0	36.5	36.5	0.0
2.2	3.1	213.3	6.88	Argilla	18.0	40.1	40.1	0.0
2.4	3.4	213.3	6.27	Argilla	18.0	43.7	43.7	0.0
2.6	3.9	260.0	6.67	Argilla	18.0	47.3	47.3	0.0
2.8	3.9	220.0	5.64	Argilla	18.0	50.9	50.9	0.0
3.0	3.2	213.3	6.67	Argilla	18.0	54.5	54.5	0.0
3.2	3.4	206.7	6.08	Argilla	18.0	58.1	58.1	0.0
3.4	3.0	206.7	6.89	Argilla	18.0	61.7	61.7	0.0
3.6	3.2	186.7	5.83	Argilla	18.0	65.3	65.3	0.0
3.8	3.0	186.7	6.22	Argilla	18.0	68.9	68.9	0.0
4.0	3.8	166.7	4.39	Argilla limosa	18.5	72.6	72.6	0.0
4.2	3.2	200.0	6.25	Argilla	18.0	76.2	76.2	0.0
4.4	3.2	206.7	6.46	Argilla	18.0	79.8	79.8	0.0
4.6	4.5	200.0	4.44	Argilla limosa	18.5	83.5	83.5	0.0
4.8	4.1	213.3	5.20	Argilla limosa	18.5	87.2	87.2	0.0
5.0	5.0	226.7	4.53	Argilla limosa	18.5	90.9	90.9	0.0
5.2	4.5	253.3	5.63	Argilla	18.0	94.5	94.5	0.0

5.4	5.7	233.3	4.09	Argilla limosa	18.5	98.2	98.2	0.0
5.6	6.6	193.3	2.93	Sabbia limosa	19.5	102.1	102.1	0.0
5.8	6.1	293.3	4.81	Argilla limosa	18.5	105.8	105.8	0.0
6.0	6.2	293.3	4.73	Argilla limosa	18.5	109.5	109.5	0.0
6.2	5.9	293.3	4.97	Argilla limosa	18.5	113.2	113.2	0.0
6.4	4.6	240.0	5.22	Argilla limosa	18.5	116.9	116.9	0.0
6.6	5.2	206.7	3.97	Argilla limosa	18.5	120.6	120.6	0.0
6.8	5.3	160.0	3.02	Sabbia limosa	19.5	124.5	124.5	0.0
7.0	6.6	200.0	3.03	Sabbia limosa	19.5	128.4	128.4	0.0
7.2	5.6	280.0	5.00	Argilla limosa	18.5	132.1	132.1	0.0
7.4	5.2	260.0	5.00	Argilla limosa	18.5	135.8	135.8	0.0
7.6	5.0	260.0	5.20	Argilla limosa	18.5	139.5	139.5	0.0
7.8	4.9	226.7	4.63	Argilla limosa	18.5	143.2	143.2	0.0
8.0	5.2	253.3	4.87	Argilla limosa	18.5	146.9	146.9	0.0
8.2	5.2	240.0	4.62	Argilla limosa	18.5	150.6	150.6	0.0
8.4	5.2	246.7	4.74	Argilla limosa	18.5	154.3	154.3	0.0
8.6	5.2	260.0	5.00	Argilla limosa	18.5	158.0	158.0	0.0
8.8	5.2	240.0	4.62	Argilla limosa	18.5	161.7	161.7	0.0
9.0	4.9	260.0	5.31	Argilla limosa	18.5	165.4	165.4	0.0
9.2	4.3	260.0	6.05	Argilla	18.0	169.0	169.0	0.0
9.4	4.2	246.7	5.87	Argilla	18.0	172.6	172.6	0.0
9.6	5.8	206.7	3.56	Sabbia limosa	19.5	176.5	176.5	0.0
9.8	5.7	200.0	3.51	Sabbia limosa	19.5	180.4	180.4	0.0
10.0	5.2	260.0	5.00	Argilla limosa	18.5	184.1	184.1	0.0
10.2	5.4	240.0	4.44	Argilla limosa	18.5	187.8	187.8	0.0
10.4	5.5	280.0	5.09	Argilla limosa	18.5	191.5	191.5	0.0
10.6	5.6	280.0	5.00	Argilla limosa	18.5	195.2	195.2	0.0
10.8	5.4	266.7	4.94	Argilla limosa	18.5	198.9	198.9	0.0
11.0	4.5	280.0	6.22	Argilla	18.0	202.5	202.5	0.0
11.2	5.3	286.7	5.41	Argilla limosa	18.5	206.2	206.2	0.0
11.4	5.3	286.7	5.41	Argilla limosa	18.5	209.9	209.9	0.0
11.6	6.2	293.3	4.73	Argilla limosa	18.5	213.6	213.6	0.0
11.8	6.0	286.7	4.78	Argilla limosa	18.5	217.3	217.3	0.0
12.0	5.6	306.7	5.48	Argilla limosa	18.5	221.0	221.0	0.0
12.2	6.1	280.0	4.59	Argilla limosa	18.5	224.7	224.7	0.0
12.4	5.9	273.3	4.63	Argilla limosa	18.5	228.4	228.4	0.0
12.6	5.6	280.0	5.00	Argilla limosa	18.5	232.1	232.1	0.0
12.8	5.8	246.7	4.25	Argilla limosa	18.5	235.8	235.8	0.0
13.0	5.8	273.3	4.71	Argilla limosa	18.5	239.5	239.5	0.0
13.2	5.0	280.0	5.60	Argilla limosa	18.5	243.2	243.2	0.0
13.4	5.6	246.7	4.40	Argilla limosa	18.5	246.9	246.9	0.0
13.6	5.9	293.3	4.97	Argilla limosa	18.5	250.6	250.6	0.0
13.8	5.7	320.0	5.61	Argilla limosa	18.5	254.3	254.3	0.0
14.0	6.1	326.7	5.36	Argilla limosa	18.5	258.0	258.0	0.0
14.2	6.2	320.0	5.16	Argilla limosa	18.5	261.7	261.7	0.0
14.4	5.8	260.0	4.48	Argilla limosa	18.5	265.4	265.4	0.0
14.6	5.6	273.3	4.88	Argilla limosa	18.5	269.1	269.1	0.0
14.8	5.9	273.3	4.63	Argilla limosa	18.5	272.8	272.8	0.0
15.0	6.1	306.7	5.03	Argilla limosa	18.5	276.5	276.5	0.0

z = profondità (m)

Qc = resistenza alla punta (MPa)

Fs = resistenza d'attrito (kPa)

Rf = rapporto delle resistenze (%)

L = litologia (criterio di Schmertmann, 1976)

g = peso di volume (kN/mc)

sv = tensione litostatica totale (kPa)

sv' = tensione litostatica effettiva (kPa)

Uo = pressione nei pori (kPa)

CARATTERISTICHE GEOTECNICHE

z	L	CF	Id	f	Su	OCR	M	Cc	Go	Vs
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0.4	Sabbia limosa	6	48	44.0		14.1	13.1		51.0	285
0.6	Argilla	16			95.5	30	19.7	0.140	296.0	258
0.8	Argilla	21			107.4	30	22.1	0.165	332.0	265
1.0	Argilla	23			111.3	30	22.9	0.174	344.0	267
1.2	Argilla	19			123.1	30	25.3	0.141	380.0	274
1.4	Argilla	24			111	30	22.8	0.158	342.0	267
1.6	Argilla	24			114.8	29.8	23.6	0.155	354.0	270
1.8	Argilla	27			110.7	25.6	22.8	0.168	342.0	267
2.0	Argilla	27			110.5	23	22.7	0.158	341.0	267
2.2	Argilla	27			122.4	23.2	25.2	0.158	378.0	274
2.4	Argilla	26			134.3	23.4	27.6	0.150	414.0	280
2.6	Argilla	26			154.1	24.8	31.7	0.155	476.0	289
2.8	Argilla	24			154	23	31.7	0.142	476.0	289
3.0	Argilla	29			125.8	17.6	25.9	0.155	389.0	276
3.2	Argilla	28			133.69	17.5	27.5	0.147	413.0	280
3.4	Argilla	32			117.5	14.5	24.2	0.158	363.0	272
3.6	Argilla	29			125.4	14.6	25.8	0.144	387.0	276
3.8	Argilla	32			117.2	12.9	24.1	0.149	362.0	272
4.0	Argilla limosa	25			149.1	15.6	30.7	0.125	461.0	287
4.2	Argilla	32			125	12.5	25.7	0.150	386.0	276
4.4	Argilla	33			124.8	11.9	25.7	0.152	386.0	276
4.6	Argilla limosa	25			176.7	16.1	36.4	0.126	546.0	298
4.8	Argilla limosa	29			160.5	14	33.1	0.136	497.0	292
5.0	Argilla limosa	25			196.4	16.4	40.5	0.127	608.0	306
5.2	Argilla	29			176.2	14.2	36.3	0.141	545.0	298
5.4	Argilla limosa	24			224.1	17.3	46.2	0.121	693.0	315
5.6	Sabbia limosa	19	40	36.0		1.6	26.8		342.0	326
5.8	Argilla limosa	25			239.8	17.2	49.4	0.130	741.0	320
6.0	Argilla limosa	25			243.6	16.9	50.2	0.129	753.0	321
6.2	Argilla limosa	27			231.5	15.5	47.7	0.133	716.0	317
6.4	Argilla limosa	31			179.3	11.6	36.9	0.136	554.0	300
6.6	Argilla limosa	27			203.2	12.8	41.9	0.119	629.0	308
6.8	Sabbia limosa	24	36	34.1		1	23.1		371.0	310
7.0	Sabbia limosa	22	39	34.9		1.1	27.3		400.0	326
7.2	Argilla limosa	29			218.7	12.6	45.1	0.133	677.0	314
7.4	Argilla limosa	31			202.6	11.3	41.7	0.133	626.0	308
7.6	Argilla limosa	32			194.4	10.6	40	0.136	600.0	306
7.8	Argilla limosa	31			190.3	10.1	39.2	0.128	588.0	304
8.0	Argilla limosa	31			202.1	10.4	41.6	0.131	624.0	308
8.2	Argilla limosa	31			202	10.2	41.6	0.128	624.0	308
8.4	Argilla limosa	32			201.8	9.9	41.6	0.130	624.0	308
8.6	Argilla limosa	32			201.7	9.7	41.5	0.133	623.0	308
8.8	Argilla limosa	32			201.5	9.5	41.5	0.128	623.0	308
9.0	Argilla limosa	35			189.4	8.7	39	0.137	585.0	304
9.2	Argilla	38			165.2	7.4	34	0.147	510.0	295
9.4	Argilla	39			161.1	7.1	33.2	0.145	498.0	294
9.6	Sabbia limosa	29	35	32.8		1	25.7		481.0	316
9.8	Sabbia limosa	29	35	32.6		1	25.3		486.0	315
10.0	Argilla limosa	35			200.6	8.3	41.3	0.133	620.0	308
10.2	Argilla limosa	33			208.5	8.4	43	0.126	645.0	311
10.4	Argilla limosa	35			212.3	8.4	43.7	0.134	656.0	312
10.6	Argilla limosa	34			216.2	8.4	44.5	0.133	668.0	314
10.8	Argilla limosa	35			208	7.9	42.9	0.132	644.0	311
11.0	Argilla	41			171.9	6.4	35.4	0.149	531.0	298
11.2	Argilla limosa	37			203.8	7.5	42	0.138	630.0	310
11.4	Argilla limosa	37			203.6	7.3	41.9	0.138	629.0	310
11.6	Argilla limosa	33			239.5	8.5	49.3	0.129	740.0	321
11.8	Argilla limosa	34			231.3	8.1	47.7	0.130	716.0	319
12.0	Argilla limosa	37			215.2	7.4	44.3	0.139	665.0	314
12.2	Argilla limosa	34			235	7.9	48.4	0.128	726.0	320
12.4	Argilla limosa	35			226.9	7.5	46.7	0.128	701.0	317
12.6	Argilla limosa	37			214.7	7	44.2	0.133	663.0	314
12.8	Argilla limosa	35			222.6	7.1	45.9	0.123	689.0	316

13.0	Argilla limosa	36			222.4	7	45.8	0.129	687.0	316
13.2	Argilla limosa	41			190.3	5.9	39.2	0.141	588.0	306
13.4	Argilla limosa	36			214.1	6.6	44.1	0.125	662.0	314
13.6	Argilla limosa	37			226	6.8	46.6	0.133	699.0	317
13.8	Argilla limosa	39			217.8	6.5	44.9	0.141	674.0	315
14.0	Argilla limosa	38			233.7	6.9	48.1	0.138	722.0	320
14.2	Argilla limosa	37			237.5	6.9	48.9	0.135	734.0	321
14.4	Argilla limosa	37			221.4	6.3	45.6	0.126	684.0	316
14.6	Argilla limosa	39			213.2	6	43.9	0.131	659.0	314
14.8	Argilla limosa	38			225.1	6.2	46.4	0.128	696.0	317
15.0	Argilla limosa	38			232.9	6.4	48	0.133	720.0	320

z = profondità (m)

CF = contenuto di fine [passante al 200] (%)

Id = indice di densità (%)

f = angolo d'attrito (°)

Su = resistenza al taglio non drenata (kPa)

OCR = grado di sovraconsolidamento

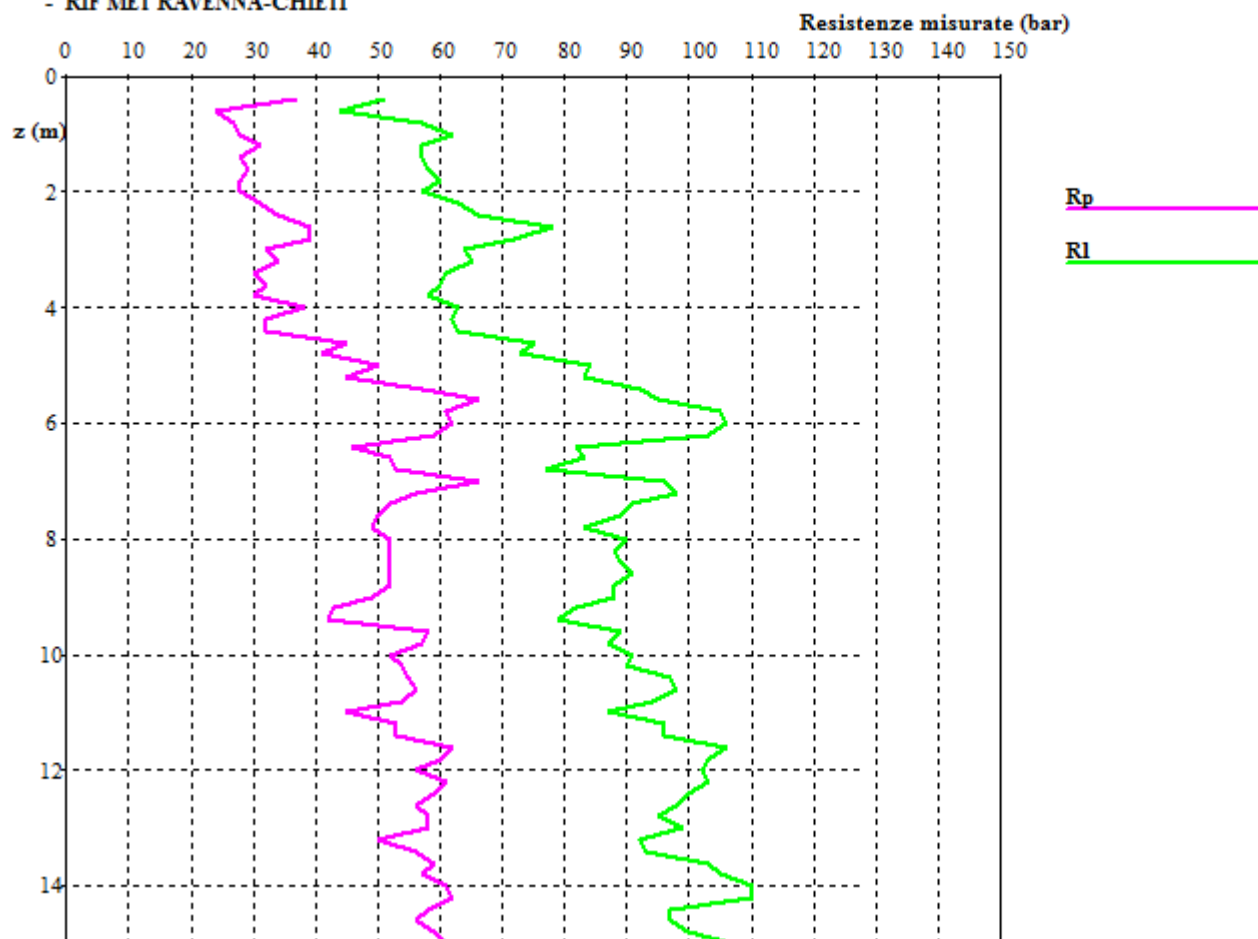
M = modulo confinato (MPa)

Cc = indice di compressibilità (-)

Go = modulo di taglio (MPa)

Vs = velocità onde di taglio (m/s)

Prova Penetrometrica Statica 106
- RIF MET RAVENNA-CHIETI



Prova Penetrometrica Statica 106

- RIF MET RAVENNA-CHIETI

Criterio di identificazione di Schmertmann, 1978

