

AUTOSTRADA (A14): BOLOGNA-BARI-TARANTO

TRATTO: BOLOGNA BORGO PANIGALE - BOLOGNA SAN LAZZARO

POTENZIAMENTO IN SEDE DEL SISTEMA AUTOSTRADALE E TANGENZIALE DI BOLOGNA

"PASSANTE DI BOLOGNA"

PROGETTO DEFINITIVO

DOCUMENTAZIONE GENERALE

GEOLOGIA

INDAGINI GEOGNOSTICHE IN SITO

INDAGINI GEOGNOSTICHE IN SITO PREGRESSE POZZETTI (1996-2010)

IL GEOLOGO

Dott. Vittorio Boerio Ord. Geol. Lombardia n.794 RESPONSABILE GEOLOGIA IL RESPONSABILE INTEGRAZIONE PRESTAZIONI SPECIALISTICHE

Ing. Raffaele Rinaldesi Ord. Ingg. Macerata N. A1068 IL DIRETTORE TECNICO

Ing. Andrea Tanzi Ord. Ingg. Parma N. 1154

PROGETTAZIONE NUOVE OPERE AUTOSTRADALI

CODICE IDENTIFICATIVO						ORDINATORE					
RIFERIMENTO PROGETTO					RIFERIMENTO DIRETTO	RIO		RIFERIN	MENTO ELABORATO		
Codice Commessa	Lotto, Sub-Prog, Cod. Appalto	Fase	Capitolo	Paragrafo	WBS	Parte d'opera	Tip.	Disciplina	Progressivo	Rev.	
111465	0000	PD	DG	GEO	SI000	00000	R	GEO	0014	- 2	SCALA -

	PROJECT MANAGER:		SUPPORTO SPECIALISTICO:		REVISIONE		
Spea					n.	data	
apou						DICEMBRE 2017	
ENGINEERING	Or	d. Ingg. Macerata N. A1068			1	SETTEMBRE 2019	
ENGINEERING					2	SETTEMBRE 2020	
A (1)	REDATTO:		VERIFICATO:		3	-	
gruppo Atlantia	KLDATTO.		VEIXII IOATO.		4	-	

VISTO DEL COMMITTENTE



IL RESPONSABILE UNICO DEL PROCEDIMENTO Ing. Fabio Visintin

VISTO DEL CONCEDENTE



Ministero delle Infrastrutture e dei Trasporti
DIPARTIMENTO PER LE INFRASTRUTTURE, GLI AFFARI GENERALI ED II. PERSONALE
STRUTTURA DI VIGILIANZA SULLE CONCESSIONABIE AUTOSTRADALI

POZ	POZZETTI ESPLORATIVI						
SIGLA	IMPRESA	ANNO					
Pxx	GEOTRIVELL	1996					



OPERA: Prolungamento Complanare di Bologna	N. SONDAGGIO: pozzetto n° 1 ml 3.00			
COMMITTENTE: SPEA ingegneria europea	SCALA SONDAGGIO: 1:20			
PERFORATORE: Bruno Mandrioli	GEOLOGO: Dott: Paolo Spallacci QUOTA (p.c.): PERIODO DI ESECUZIONE: 14/11/96			
COORD.:				
METODO DI PERF.: escavatore Benfra Terna				

	Profondita'	Potenza	Schema Stratigrafico	Descrizione geognostica	Prova di carico	Volumetria	P.P. Kg./cmq.	V.T. Kg./cmq	Scala 1.20
		1.00		Terreno vegetale: limo sabbioso plastico, marrone scuro.	. 1	1	- 1.4	0.6	
			older Jahr				2.4	0.6	
1	1.00		with with the	Limo sabbioso compatto, nocciola chiaro.			- F.S.	F.S.	ľ
		0.50	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$				F.S.		
	1.50		\$ 35.55	Limo sabbioso, da compatto a plastico, con inclusi organici e carbonatici mil- limetrici, colore nocciola scuro.			- 5	0.6	AND DESIGNATION OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN
			\$ \$ \$				3.8	0.8	-
2	2		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$		5.5		3.7	0.7	- Parent
		1.50	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$				2.6	F.S	
	l X		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$				2	0.5	5
			\$ \$ \$ \$ \$				2.4	0.7	7
No. of Concession, Name of Street, or other Persons, or other Pers	3 3.00		2 5 5		411		2.4	0.7	7



COMMITTENTE : SPEA. INGEGNARIA EUROPEA CANTIERE : BOLOGNA (14.11.96)

PROVA N.1 A MT. 0.50 DAL P.C.

DENSITA' IN SITO

ASTM D 1556

CARATTERISTICHE DELLA SABBIA CALIBRATA

Peso della sabbia per riempire il cono 1360.0 (gr) Peso di volume della sabbia calibrata 1.294 (gr\cm3)

Peso iniziale dell'apparecchiatura	7896.0	(gr)
Peso finale dell'apparecchiatura	4193.0	(gr)
Peso della sabbia	3703.0	(gr)
Volume	1810.7	(cm3)
Peso del materiale di scavo	3388.2	(gr)
Peso di volume naturale	1.871	(gr/cm3)
Umidità naturale	13.5	(%)
Densità secca del materiale di scavo	1.649	(gr/cm3)
Densità massima		(gr/cm3)
Grado di compattazione		(%)



COMMITTENTE : SPEA. INGEGNARIA EUROPEA DIAM. PIASTRA : 30 (CM)

CANTIERE : BOLOGNA (14.11.96) SEZ. PIASTR

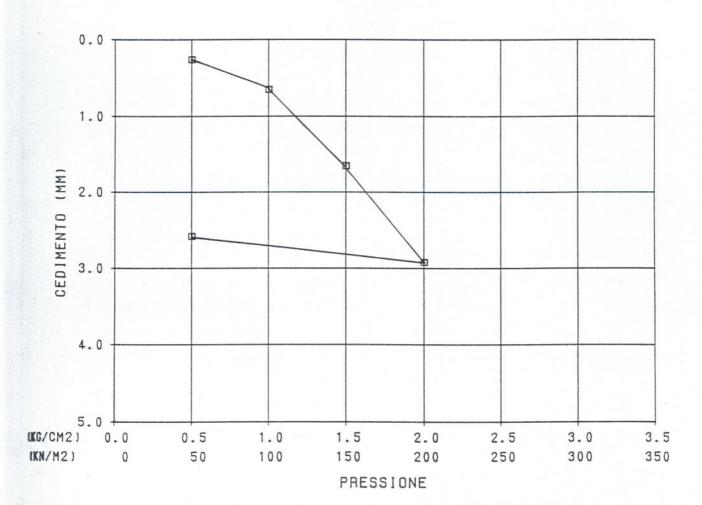
SEZ. PIASTRA : 700 (CM2)

PROVA N.1 A MT. 0.5 DAL P.C.

PROVA DI CARICO SU PIASTRA SNV 670 317 A (1981)

PRESSION (KG/CM2)		CEDIMENTO (MM)	MOD. DEFOR	RMAZIONE (KN/M2)
0.50	50	0.260		
1.00	100	0.650	215.8	21583
1.50	150	1.650	110 1	11011
2.00	200	2.920	118.1	11811
0.50	50	2.580		







OPERA: Prolungamento Complanare di Bologna	N. SONDAGGIO: pozzetto n° 2 ml 3.0		
COMMITTENTE: SPEA ingegneria europea	SCALA SONDAGGIO: 1:20		
PERFORATORE: Bruno Mandrioli	GEOLOGO: Dott: Paolo Spallacci		
COORD.:	QUOTA (p.c.):		
METODO DI PERF.: escavatore Benfra Terna	PERIODO DI ESECUZIONE: 14/11/96		

Scala 1:20	Profondita'	Potenza	Schema Stratigrafico	Descrizione geognostica	Prova di carico	Volumetria	P.P. Kg./cmq.	V.T. Kg./cmq	Scala 1:20
		0.80		Terreno vegetale, presenza di inclusi organici, marrone.	- 1 -	- 1	- 3.8 -	- 0.6 -	
1	0.80	0.70	* \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Limo debolmente sabbioso, da compatto a mediamente compatto, nocciola.			3.5	0.6	1
2	1.50		\$\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\ 2\\	Limo argilloso, plastico, variegato nocciola e grigio.			1.7	0.5	2
		1.50	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\				1.8	0.7	
3	3.00		3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5				1.5	0.6	



COMMITTENTE : SPEA. INGEGNERIA EUROPEA CANTIERE : BOLOGNA (14.11.1996)

PROVA N.2 A MT. 0.50 DAL P.C.

DENSITA' IN SITO

ASTM D 1556

CARATTERISTICHE DELLA SABBIA CALIBRATA

Peso della sabbia per riempire il cono 1360.0 (gr)
Peso di volume della sabbia calibrata 1.294 (gr\cm3)

Peso iniziale dell'apparecchiatura	6197.0	(gr)
Peso finale dell'apparecchiatura	2522.0	(gr)
Peso della sabbia	3675.0	(gr)
Volume	1789.0	(cm3)
Peso del materiale di scavo	3439.0	(gr)
Peso di volume naturale	1.922	(gr/cm3)
Umidità naturale	14.3	(%)
Densità secca del materiale di scavo	1.682	(gr/cm3)
Densità massima		(gr/cm3)
Grado di compattazione		(%)



COMMITTENTE : SPEA. INGEGNERIA EUROPEA DIAM. PIASTRA : 30 (CM)

CANTIERE : BOLOGNA (14.11.96) SEZ. PIASTRA : 700 (CM2)

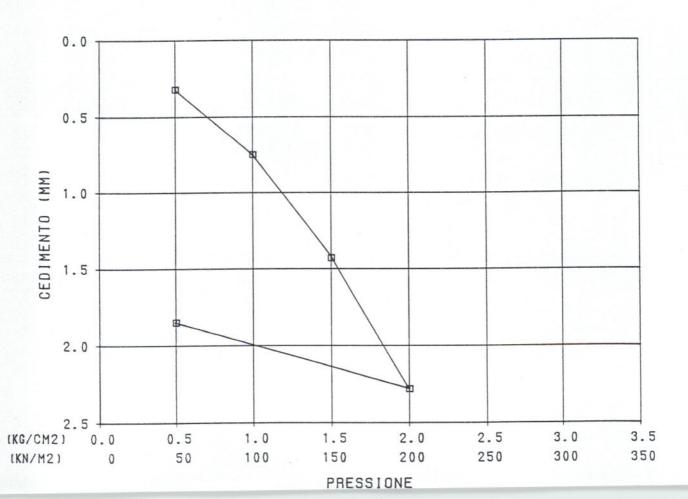
PROVA N.2 A MT. 0.5 DAL P.C.

PROVA DI CARICO SU PIASTRA

SNV 670 317 A [1981]

PRESSI		CEDIMENTO (MM)	MOD. DEFOR	
0.50 1.00 1.50 2.00 0.50	50 100 150 200 50	0.320 0.750 1.430 2.280 1.850	270.3 176.5	27027 17647

PRIMO CICLO : M SECONDO CICLO : TERZO CICLO :





GEOTRIVELL	
OPERA: Prolungamento Complanare di Bologna	N. SONDAGGIO: pozzetto n° 3 ml 3.0
COMMITTENTE: SPEA ingegneria europea	SCALA SONDAGGIO: 1:20
PERFORATORE: Bruno Mandrioli	GEOLOGO: Dott: Paolo Spallacci
COORD.:	QUOTA (p.c.):
METODO DI PERF.: escavatore Benfra Terna	PERIODO DI ESECUZIONE: 14/11/96

					8				
lotile and and	Protondita	Potenza	Schema Stratigrafico	Descrizione geognostica	Prova di carico	Volumetria	P.P. Kg./cmq.	V.T. Kg./cmq	C-1 clas
			ale ale	Terreno vegetale, marrone scuro.					STATISTICS.
		0.80	aller		- 1	1	1.8	0.4	
0	0.80		ulde ulde ulde ulde ulde ulde ulde ulde	Li competto possioni erropicho mediamente competto possioni			1.9	0.5	-
			\$ \$ \$ \$ \$	Limo sabbioso, con locali inclusioni organiche mediamente compatto, noccio- la.			2.4	0.5	
		0	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$				3.0	0.7	STATISTICS CONTRACTOR
		1.20	\$ \$ \$ \$ \$				2.5	0.7	CONTRACTOR DESCRIPTION OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLUMN TWO IS NAMED IN COLUMN TRANSPORT NAMED
			\$ \$ \$ \$ \$ \$ \$ \$ \$ \$				3.0	0.7	Secretary and participated
2	2.00		5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Limo argilloso sabbioso, plastico, marrone debolmente variegato grigio con localizzate spalmature ocracee.			1.8	0.5	and
			\$1515 \$1515 \$1515				2.0	0.7	
		1.00	\$151515 \$151515		-		1.8	0.6	-
			151515				1.2	0.5	
3 :	3.00		- T				1.4	0.5	



COMMITTENTE : SPEA. INGEGNERIA EUROPEA CANTIERE : BOLOGNA (14.11.1996)

PROVA N.3 A MT. 0.40 DAL P.C.

DENSITA' IN SITO

ASTM D 1556

CARATTERISTICHE DELLA SABBIA CALIBRATA

Peso della sabbia per riempire il cono 1360.0 (gr)
Peso di volume della sabbia calibrata 1.294 (gr\cm3)

Peso iniziale dell'apparecchiatura	8039.0	(gr)
Peso finale dell'apparecchiatura	3346.0	(gr)
Peso della sabbia	4693.0	(gr)
Volume	2575.7	(cm3)
Peso del materiale di scavo	4531.0	(gr)
Peso di volume naturale	1.759	(gr/cm3)
Umidità naturale	19.2	(%)
Densità secca del materiale di scavo	1.476	(gr/cm3)
Densità massima		(gr/cm3)
Grado di compattazione		(%)



COMMITTENTE : SPEA. INGEGNERIA EUROPEA

DIAM. PIASTRA: 30 (CM)

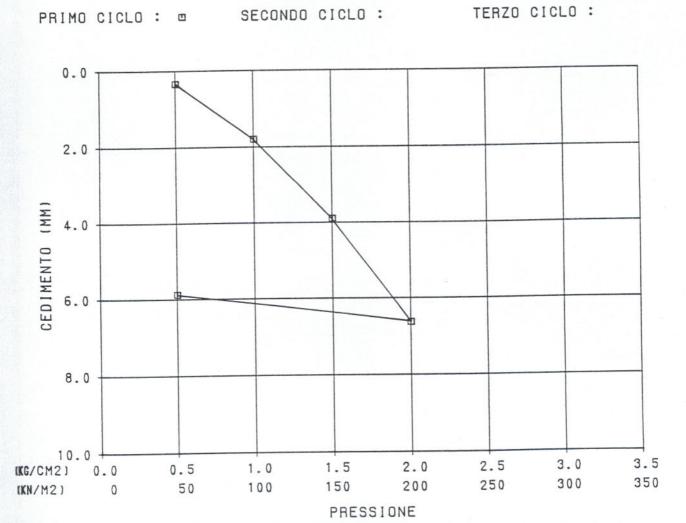
CANTIERE : BOLOGNA (14.11.96)

SEZ. PIASTRA : 700 (CM2)

PROVA N.3 A MT. 0.40 DAL P.C.

PROVA DI CARICO SU PIASTRA SNV 670 317 A [1981]

PRESSIO		CEDIMENTO (MM)	MOD. DEFOR	(KN/M2)
0.50 1.00 1.50 2.00 0.50	50 100 150 200 50	0.340 1.800 3.900 6.630 5.880	84.3 54.9	8427 5495





OPERA: Prolungamento Complanare di Bologna	N. SONDAGGIO: pozzetto n° 4 ml 2.70
COMMITTENTE: SPEA ingegneria europea	SCALA SONDAGGIO: 1:20
PERFORATORE: Bruno Mandrioli	GEOLOGO: Dott: Paolo Spallacci
COORD.:	QUOTA (p.c.):
METODO DI PERF.: escavatore Benfra Terna	PERIODO DI ESECUZIONE: 20/11/96

, · ·

Potenza	Schema Stratigrafico	Descrizione geognostica	Prova di carico	Volumetria	P.P. Kg./cmq.	V.T. Kg./cmq	C-1 class
0.70	which	Terreno vegetale, marrone scuro.	- 1	1			
	\$ \$ \$ \$ \$	Limo sabbioso, mediamente addensato, nocciola chiaro.			2.5	0.9	-
0.80	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$				2.2	0.3	NAME AND ADDRESS OF THE OWNER, WHEN SHEET
	\$ 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Limo sabbioso argilloso, mediamente compatto, variegato nocciola grigio con spalmature ocracee di ossidazione.			2.5	0.4	STREET, SQUARE, STREET, SQUARE, SQUARE
	25.25 25.25 25.25 25.25				3.5	0.7	SCHOOL SECTION
1.20	\$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1				4.0	0.8	
					3.5	0.7	
	0.80	0.80 	Terreno vegetale, marrone scuro. Terreno vegetale, marrone scuro. Limo sabbioso, mediamente addensato, nocciola chiaro. Limo sabbioso argilloso, mediamente compatto, variegato nocciola grigio con spalmature ocracee di ossidazione.	Terreno vegetale, marrone scuro. Limo sabbioso, mediamente addensato, nocciola chiaro. Limo sabbioso argilloso, mediamente compatto, variegato nocciola grigio con spalmature ocracee di ossidazione.	Terreno vegetale, marrone scuro. Limo sabbioso, mediamente addensato, nocciola chiaro. Limo sabbioso argilloso, mediamente compatto, variegato nocciola grigio con spalmature ocracee di ossidazione.	Terreno vegetale, marrone scuro. 1 1 1 Limo sabbioso, mediamente addensato, nocciola chiaro. 2.5 Limo sabbioso argilloso, mediamente compatto, variegato nocciola grigio con spalmature ocracee di ossidazione. 3.5 4.0	Terreno vegetale, marrone scuro. 1 1 1 Limo sabbioso, mediamente addensato, nocciola chiaro. 2.5 - 0.9 2.3 - 0.2 Limo sabbioso argilloso, mediamente compatto, variegato nocciola grigio con spalmature ocracee di ossidazione. 3.5 - 0.7



COMMITTENTE : SPEA. INGEGNERIA EUROPEA CANTIERE : BOLOGNA (20.11.1996)

PROVA N.4 A MT. 0.40 DAL P.C.

DENSITA' IN SITO

ASTM D 1556

CARATTERISTICHE DELLA SABBIA CALIBRATA

Peso della sabbia per riempire il cono 1360.0 (gr)
Peso di volume della sabbia calibrata 1.294 (gr\cm3)

Peso iniziale dell'apparecchiatura	8767.0	(gr)
Peso finale dell'apparecchiatura	4489.0	(gr)
Peso della sabbia	4278.0	(gr)
Volume	2255.0	(cm3)
Peso del materiale di scavo	3899.0	(gr)
Peso di volume naturale	1.729	(gr/cm3)
Umidità naturale	18.2	(%)
Densità secca del materiale di scavo	1.463	(gr/cm3)
Densità massima		(gr/cm3)
Grado di compattazione		(%)



COMMITTENTE : SPEA. INGEGNERIA EUROPEA

DIAM. PIASTRA: 30 (CM)

CANTIERE : BOLOGNA

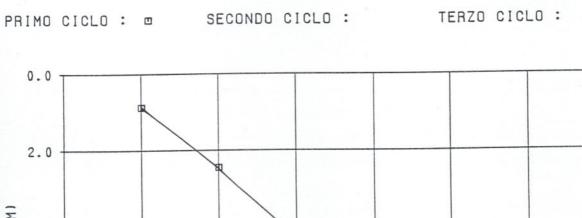
SEZ. PIASTRA : 700 (CM2)

PROVA N. 4 A

0.40 MT. DAL P.C.

PROVA DI CARICO SU PIASTRA SNV 670 317 A [1981]

1	(KG/CM2)	ONE (KN/M2)	CEDIMENTO (MM)	MOD. DEFOR	(KN/M2)
0	0.50	50 100	0.870 2.450	87.5	8746
0	1.50	150 200	4.300 6.940	56.8	5682
	0.50	50	5.740		



CEDIMENTO (MM) 6.0 8.0 10.0 3.5 1.5 2.0 2.5 3.0 0.5 1.0 KG/CM2) 0.0 350 150 300 250 100 200 50 KN/M2) 0 PRESSIONE

POZ	ZZETTI ESPLORA	ATIVI
SIGLA	IMPRESA	ANNO
Pxx	SERVIZI GEOTECNICI	1999



COMMITTENTE:

SPEA Ingegneria Europea S.p.A.

DATA DI ESECUZIONE:

4 dicembre 1998

CANTIERE: Potenziamento del sistema autostradale e Tangenziale di Bologna

Opera: Autostrada Bologna-Bari-Taranto; sistema Tangenziale di Bologna. Campagna indagini geognostiche.

POZZETTO ESPLORATIVO P8 Coord. UTM: X = 686,295; Y = 4933,492 Quota fondo foro: ~4,00 m dal p.c. Quota p.c.: 29 m s.l.m.: Dimensioni del pozzetto (in m): 1,0 x 2,0 Geologo: Dott. Lorenzo Fusilli Escavatore: TERNA - JVC Prof. H₂O Campioni Prove di carico su piastra (PLT) Litologia strato Stratigrafia Ka/ Ka/ (mi) m tipo cm2 cm2 ·m Terreno vegetale a granulometria limo-sabbiosa, di colore marrone scuro. 0,50 Sabbia, a granulometria uniforme, a luoghi debolmente limosa, di colore variabile dall'avana scuro al marroncino e subordinatamente al grigio; debolmente umida. Debolmente addensata. 3,5 3,7 Cub 4,00 Fine pozzetto: -4,00 m dal p.c.



COMMITTENTE:

SPEA Ingegneria Europea S.p.A.

DATA DI ESECUZIONE:

7 dicembre 1998

CANTIERE: Potenziamento del sistema autostradale e Tangenziale di Bologna

Opera: Autostrada Bologna-Bari-Taranto; sistema Tangenziale di Bologna. Campagna indagini geognostiche.

	-	*	POZZETTO ESPLOR	ATIV	o F	9			
			uota fondo foro : -4,00 m dal p.c. Coord. U	TM: X	= 686				
Esca		TERNA - JVC	Dimensioni del pozzetto (in m): 1,5 X 2,5			G		_	ott. Lorenzo Fusilli
scala	Prof. strato m	Litologia	Stratigrafia	H₂O (m)		pioni tipo	P.P Kg/ cm2	T.V Kg/ cm2	Prove di carico su piastra (PLT)
	0.90		Terreno vegetale di colore marrone scuro.						
1	0,80		Limo sabbioso, a luoghi limo con sabbia, di colore avana, con evidenti tracce di alterazione color ocra. Molto consistente.				>6		PLT1 - prof.: -1,5 m M _{E1} = 38961 KN/m ² M _{E1} = 204545,5 KN/m ²
2							>6		
3	3,50						5,5		
4	4,00		Sabbia a granulometria uniforme, a luoghi debolmente limosa,di colore avana-marrone. Debolmente addensata.						
5	Totalistic Transported Transpo		Fine pozzetto: -4,00 m dal p.c.						



COMMITTENTE:

SPEA Ingegneria Europea S.p.A.

DATA DI ESECUZIONE:

7 dicembre 1998

CANTIERE: Potenziamento del sistema autostradale e Tangenziale di Bologna

Opera: Autostrada Bologna-Bari-Taranto; sistema Tangenziale di Bologna. Campagna indagini geognostiche.

POZZETTO ESPLORATIVO P10 Coord. UTM: X = 686,899; Y = 4933,549 Quota fondo foro: -4,00 m dal p.c. Quota p.c.: 32 m s.l.m.: Geologo: Dott. Lorenzo Fusilli Escavatore: TERNA - JVC Dimensioni del pozzetto (in m): 1,5 X 2,5 Prof. P.P Campioni H₂O Prove di carico su piastra (PLT) strato Litologia Stratigrafia Kg/ Kg/ (m) m tipo cm2 cm2 Terreno vegetale di copertura. 0.2 Terreno di riporto costituito da materiale di discarica di varia origine (mattoni, calcinacci, 0,5 plastica ecc.). PLT1 - prof.: -1,5 m Sabbia a granulometria uniforme, di colore $M_{E1} = 58064 \text{ KN/m}^2$; marroncino chiaro; debolmente umida. Sciolta. $M_{E1} = 450000 \text{ KN/m}^2$; 4,00 Fine pozzetto: -4,00 m dal p.c.



COMMITTENTE:

SPEA Ingegneria Europea S.p.A.

DATA DI ESECUZIONE:

7 dicembre 1998

CANTIERE: Potenziamento del sistema autostradale e Tangenziale di Bologna

Opera: Autostrada Bologna-Bari-Taranto; sistema Tangenziale di Bologna. Campagna indagini geognostiche.

POZZETTO ESPLORATIVO P11

			POZZETTO ESPLORA						
		39 m s.l.m.: Q TERNA - JVC	uota fondo foro : -4,00 m dal p.c. Coord. L	TM: >	TM: X = 686,857; Y = 4933,385 Geologo : Dott. Lorenzo Fusilli				
scala	Prof. strato	Litologia	Stratigrafia	H ₂ O (m)	Camp m	oioni	P.P Kg/ cm2	T.V Kg/ cm2	Prove di carico su piastra (PLT)
1	1,50		Теггепо di riporto costituito da ghiaia, ciottoli e materiale di discarica (mattoni, calcinacci, есс.).						
2			Sabbia a granulometria uniforme, a luoghi debolmente limosa, di colore dal marroncino all'avana; debolmente umida. Sciolta.						PLT1 - prof.: -1,8 m dal p.c. M _{E1} = 48128 KN/m ² ; M _{E2} = 187500 KN/m ² ;
3_	4,00								
5			Fine pozzetto: -4,00 m dal p.c.						



COMMITTENTE:

SPEA Ingegneria Europea S.p.A.

DATA DI ESECUZIONE:

4 dicembre 1998

CANTIERE: Potenziamento del sistema autostradale e Tangenziale di Bologna

Opera: Autostrada Bologna-Bari-Taranto; sistema Tangenziale di Bologna. Campagna indagini geognostiche.

POZZETTO ESPLORATIVO P13

- 23		9	POZZETTO ESPLORA						
			uota fondo foro : -4,00 m dal p.c. Coord U	TM: X	= 68				
Esca		TERNA - JVC	Dimensioni del pozzetto (in m) 1,0 X 2,0			G			ott. Lorenzo Fusilli
scala	Prof. strato m	Litologia	Stratigrafia	H ₂ O (m)		npioni tipo	P.P Kg/ cm2	T.V Kg/ cm2	Prove di carico su piastra (PLT)
THE PERSON NAMED IN	0,30		Terreno vegetale di colore marrone scuro.						
T I I I I I I I I I I I I I I I I I I I	1,50		Terreno di riporto costituito da ghiaia e sabbia rimaneggiati, con ciottoli e materiale di discarica (mattoni, calcinacci, ecc.).		i i				
2			Limo argilloso debolmente ghiaioso, di colore avana-grigio; i clasti sono ben arrotondati (φ _{max} = 3-4 cm). Da consistente a molto consistente.				2,0		
3	2,80		Argilla limosa, di colore grigio con sfumature				1,9		
			avana. Molto consistente		3,5 3,7	Cub	2,0		
4	4,00	En and enthanties							
5			Fine pozzetto: -4,00 m dal p.c.						



COMMITTENTE:

SPEA Ingegneria Europea S.p.A.

DATA DI ESECUZIONE:

4 dicembre 1998

CANTIERE: Potenziamento del sistema autostradale e Tangenziale di Bologna

Opera: Autostrada Bologna-Bari-Taranto; sistema Tangenziale di Bologna. Campagna indagini geognostiche.

POZZETTO ESPLORATIVO P14 Coord. UTM: X = 687,632; Y = 4932,952 Quota fondo foro: -4,50 m dal p.c. Quota p.c.: 37 m s.l.m.: Geologo: Dott. Lorenzo Fusilli Escavatore: TERNA - JVC Dimensioni del pozzetto (in m) 1,5 X 2,5 Próf. P.P Campioni H₂O Prove di carico su piastra (PLT) Stratigrafia Kg/ strato Litologia Kg/ (m) m tipo cm2 cm2 m Terreno vegetale, di colore marrone. 0,40 Terreno di riporto, costituito da ghiaia, ciottoli e materiale di discarica (mattoni, calcinacci, ecc.) Limo sabbioso-argilloso, di colore marronegrigio, intensamente alterato e pedogenizzato, PLT1 - prof.: -2,00 dal p.c. passante gradualmente verso il basso a limo $M_{E1} = 21739 \text{ KN/m}^2$; argilloso. Molto consistente M_{E2}= 115384 KN/m²; 2,5 2,8 3,0 Argilla limosa debolmente sabbiosa; molto consistente. 3,5 4.0 3,50 Sabbia debolmente argilloso-limosa, di colore grigio con frequenti spalmature marroncine. Da molto umida a satura. Sciolta. 4,50 Fine pozzetto: 4,50 m dal p.c



COMMITTENTE:

SPEA Ingegneria Europea S.p.A.

DATA DI ESECUZIONE:

4 dicembre 1998

CANTIERE: Potenziamento del sistema autostradale e Tangenziale di Bologna

Opera: Autostrada Bologna-Bari-Taranto; sistema Tangenziale di Bologna. Campagna indagini geognostiche.

POZZETTO ESPLORATIVO P15 Coord. UTM: X = 687,772; Y = 4933,011 Quota fondo foro: -4,00 m dal p.c. Quota p.c.: 36 m s.l.m.: Escavatore: TERNA - JVC Geologo: Dott. Lorenzo Fusilli Dimensioni del pozzetto (in m) 1,0 X 2,0 Prof. PP TV H₂O Campioni Prove di carico su piastra (PLT) Stratigrafia Litologia Kg/ Kg/ strato m tipo (m) m cm2 cm2 Terreno vegetale, di colore marrone chiaro. 0,40 Terreno di riporto costituito da ghiaia, ciottoli e materiale di discarica (mattoni, calcinacci, ecc.), frammisto a sabbia e limo. >6 Limo con argilla, di colore grigio-avana. >6 Molto consistente. >6 3,0 Çub 3,2 5,5 3,5 3,2 4,00 Fine pozzetto: -4,00 m dal p.c.



COMMITTENTE:

SPEA Ingegneria Europea S.p.A.

DATA DI ESECUZIONE:

9 dicembre 1998

CANTIERE: Potenziamento del sistema autostradale e Tangenziale di Bologna

Opera: Autostrada Bologna-Bari-Taranto; sistema Tangenziale di Bologna. Campagna indagini geognostiche.

POZZETTO ESPLORATIVO P16 Coord. UTM: X = 687,646; Y = 4932,811 Quota fondo foro: -4,00 m dal p.c. Quota p.c.: 37 m s.l.m,: Geologo: Dott. Lorenzo Fusilli Escavatore: TERNA - JVC Dimensioni del pozzetto (in m): 1,0 X 2,0 P.P T.V Prof. H₂O Campioni Prove di carico su piastra (PLT) Stratigrafia Kg/ Kg/ Litologia strato m tipo cm2 m Terreno vegetale, di colore marrone scuro. 0,50 Limo sabbioso, di colore marrone chiaro, intensamente alterato e pedogenizzato, passante gradualmente verso il basso a sabbia con limo, di colore marrone chiaro. Mediamente addensato. 2,70 Limo con argilla debolmente sabbioso, di colore variabile dal marroncino al grigio; da consistente 2,0 a molto consistente. 3 3,4 3,50 0,5 Argilla limosa debolmente sabbiosa, di colore grigio con spalmature marroncino-ocra; da poco 1.2 a moderatamente 4,00 consistente. Molto umida. 4,0 1,0 Cub Fine pozzetto: -4,00 m dal p.c.



COMMITTENTE:

SPEA Ingegneria Europea S.p.A.

DATA DI ESECUZIONE:

9 dicembre 1998

CANTIERE: Potenziamento del sistema autostradale e Tangenziale di Bologna

Opera: Autostrada Bologna-Bari-Taranto; sistema Tangenziale di Bologna. Campagna indagini geognostiche.

POZZETTO ESPLORATIVO P29

Quot	ta p.c.: 4	9 m s.l.m.: C	uota fondo foro : -5,00 m dal p.c. Coord.U	TM: X = 690,965; Y = 4930,073					73
		TERNA - JVC	Dimensioni del pozzetto (in m) 1,5 X 2,5						ott. Lorenzo Fusilli
scala	Prof. strato m	Litologia	Stratigrafia	H ₂ O (m)		npioni tipo	P.P Kg/ cm2	T.V Kg/ cm2	Prove di carico su piastra (PLT)
Note the Contract	0,30		Теггеno vegetale, di colore marrone.						
- Composition			Terreno di riporto, costituito da sabbia e ghiaia frammisto a materiale di discarica di varia origine.						
1	1,40		Limo sabbioso, di colore marroncino, intensamente alterato e pedogenizzato.						
2	2,00		Sabbia ghiaioso-limosa, di colore avana chiaro, mediamente alterata nella parte alta; clasti ben arrotondati (φ _{max} = 1 cm). Sciolta.						
			Sabbia debolmente limosa con inclusi clasti da poco a ben arrotondati (ф _{max} = 3-4 cm), di colore grigio con frequenti spalmature ocracee. Sciolta. Da -3,50 e -3,80 m dal p.c. livello di limo con						PLT1 - prof.: -2,00 dal p.c. ME1 = 34351 KN/m2; ME2= 140625KN/m2;
3 4	7,100		argilla debolmente sabbioso, di colore grigio- marroncino.				1,5 2,0		
	4,50								
5	5,00		Argilla con limo debolmente sabbiosa, di colore grigio scuro; mediamente consistente.				1,3		
			Fine pozzetto: -5,00 m dal p.c.						Ε.

POZ	POZZETTI ESPLORATIVI							
SIGLA	IMPRESA	ANNO						
Pxxx	SERVIZI GEOTECNICI	2000						

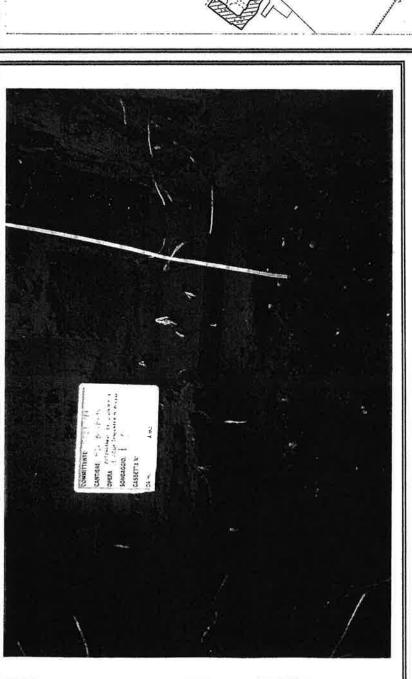
COMUNE: BOLOGNA

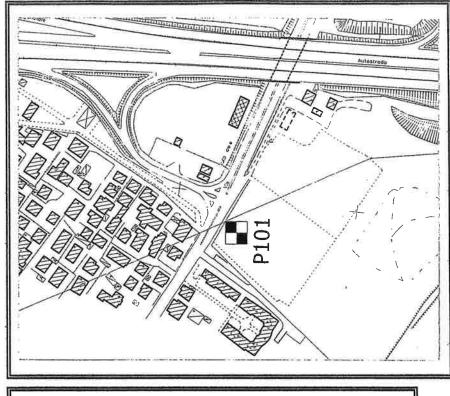
LOCALITA': TANGENZIALE DI BOLOGNA -

SCHEDA UBICATIVA

UBICAZIONE POZZETTO Pz101







LEGENDA:

POZZETTO ESPLORATIVO

ERVIZED POZZETI POZZET	TERRENO V	CANTIERE: OPERA: GEOLOGO: COMPERATORE: ATTREZZATU DESCRIZION	RA: Terna universale-	di Bologna sistema enziale di Bologr t. S. Marino DATA: 07	QUO PRO	FONDI	TA' PO REV. I CAMP Odi	OZZETN. PIONI	s.l.m.= TO (in r DATA R PROV	m) 3.00 RIFERIMENTO INT SOS-SPE-TGBOX E IN SITO MODULO DI COMPRESSIBILITA Me (MPd)	2-BO
POZZETI Z 1	TERRENO V	GEOLOGO: DOPERATORE: ATTREZZATU DESCRIZION /EGETALE a g	Potenziamento del autostradale e Tangott. P.F. Grangié Dot RA: Terna universale- E LITOSTRATIGRAFICA ranulometria sabbioso	sistema lenzîale di Bologr t. S. Marino DATA: 07,	PRO	FONDI	TA' PO REV. I CAMP Odi	DZZET N. I	PROV	RIFERIMENTO INI S05-SPE-TGBO: E IN SITO MODULO DI COMPRESSIBILITA Me (MPa)	ATSUBO OTEN
Z1	TERRENO V	OPERATORE: ATTREZZATU DESCRIZION /EGETALE a g	Pott, P.F. Grangié Dot RA: Terna universale- E LITOSTRATIGRAFICA ranulometria sabbioso	t. S. Marino DATA: 07,		0	CAMP Odil	N. TONO	PROV	RIFERIMENTO INI S05-SPE-TGBO: E IN SITO MODULO DI COMPRESSIBILITA Me (MPa)	ATIS NI
ING/CONTROL ING/CO	nocciola.	ATTREZZATU DESCRIZION /EGETALE a g	RA: Terna universale-	ave (N.P. 69 (Cmq / Cmq	S N S	NUMERO OF THE OF	OUOTA QUOTA	PROV	E IN SITO MODULO DI COMPRESSIBILITÀ Me (MPd)	DENSITA IN SITO
SCOLOGICHE RATIGRAFIAN RATIONAL STATES OF THE SCOLOGICHE RATIONAL STATES OF THE SCO	nocciola.	DESCRIZION /EGETALE a g	IE LITOSTRATIGRAFICA ranulometria sabbiosa		P.P. kg/enq	kg/cmq i/V,RES.	ORIMON	QUOTA	PO QUOTA	MODULO DI COMPRESSIBILITA Me (MPs)	
ABOLIS ALL STATE OF THE STATE O	nocciola.	/EGETALE a g	ranulometria sabbioso	di colore	d.q	(2) (2) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4		E.			
	nocciola.			di colore			C1 RI		½LT 0.80	49.1-36,7	.99
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6.50 5.00 5.00 5.00 5.00 5.00 5.00 5.00	Ghiaia in arrotondat	matrice sabb i.	iosa, ciottoli eterome	tricí ben	21		C2 R	2.00			the second secon
25.2	-	FINE	POZZETTO -3.00 m	dal piano campo	agna		+				Ť
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	1	Lo conto l	LECENDA CAMPIONI	LEGENDA PRO	VE IN	SITO				NOTE	_
		20 20111	RM: Rimaneggiato	LF: Lefranc							
	TA I		CB: Cubico	PLT: Carico s	u pîast	ra					
			ELL'ACQUA DURANTE LO SCAVO A' DATA ORA	A' DATA ORA RM: Rimaneggiato	A' DATA ORA RM: Rimaneggiato LF: Lefranc	A' DATA ORA RM: Rimaneggiato LF: Lefranc	A' DATA ORA RM: Rimaneggiato LF: Lefranc	A' DATA ORA RM: Rimaneggiato LF: Lefranc	A' DATA ORA RM: Rimaneggiato LF: Lefranc	LL'ACQUA DURANTE LO SCAVO LEGENDA CAMPIONI LEGENDA PROVENI AL LEGENDA	A' DATA ORA RM: Rimaneggiato LF: Lefranc



PROVA	DI CARIC	O SU PIASTRA N°	1	RIF.	P101			
СОММІТТ	ENTE:	SPEA - INGEGNERIA EUI	ROPEA - S.	o.A.				
CANTIER	E:	Autostrada Bologna-Bari-Taranto e Tang. di Bologna						
OPERA:	Potenziame	nto del sistema autostradale	e Tangenzi	iale di Bologn	а			
DATA:	07/06/'00	OPERATORE:						

			CARATTERISTICHE DI	ELLA PIASTR	A		
T	diametro (mm):	300	area (cm²):	700	spessore (cm):	3	

RIFERIMENTO DELL'ATTREZZATURA: Norma Svizzera SNV 670317a

Ciclo di carico, scarico e ricarico (gradini di carico e scarico: 50-150-250-350-50-150-250 KN/m²

MODALITA' ESECUTIVE: Carico preliminare di 20 KN/m². Cedimento misurato ogni 2 minuti.

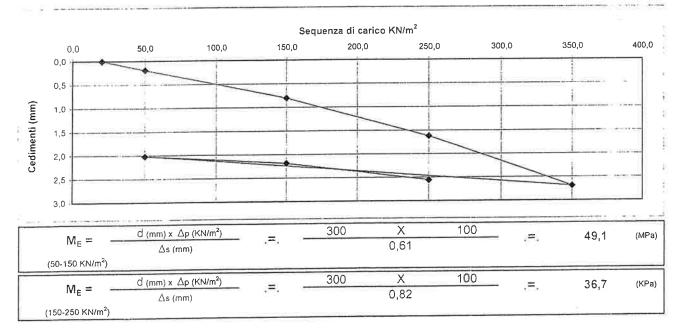
CARATTERISTICHE AL CONTORNO

PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 0,80 DIMENSIONI DELLO SCAVO I x I (m):

TERRENO DI PROVA:

LE TITURE

Carico	Tempi	Let	tura compara	atori	Somma	Media	Cedimen	ito ∆s (mm)
(KN/m ²)	(min)	A (mm)	B (mm)	C (mm)	A+B+C	(A+B+C)/3	Parziale	Totale
20,00	5,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
50,00	2,00	0,16	0,24	0,18	0,58	0,19	0,19	0,19
150,00	2,00	0,62	0,87	0,92	2,41	0,80	0,61	0,80
250,00	2,00	1,52	1,61	1,73	4,86	1,62	0,82	1,62
350,00	2,00	2,45	2,75	2,87	8,07	2,69	1,07	2,69
50,00	2,00	2,05	1,99	2,01	6,05	2,02	-0,67	2,02
150,00	2,00	2,12	2,32	2,12	6,56	2,19	0,17	2,19
250,00	2,00	2,34	2,75	2,57	7,66	2,55	0,37	2,55



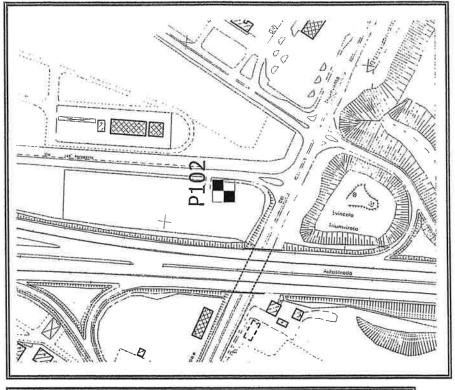
LOCALITA': TANGENZIALE DI BOLOGNA

COMUNE: BOLOGNA

SCHEDA UBICATIVA

UBICAZIONE POZZETTO Pz102

STRALCIO PLANIMETRICO





LEGENDA:

POZZETTO ESPLORATIVO

			2018	****			- V	-		
		COMMITTENTI	E: SPEA INGEGNERIA EL	JROPEA S.p.A.	COORD GAUS-BO	ACA	= X			
SER SER	VIZI	CANTIERE:	Autostrada Bologna- Sistema Tangenziale	-Bari-Idranto		19	= Y			
GEOTEC		OPERA:	Deterrigmento del s	istema	QUOTA P		Automorphism (Control of Control			
***************************************	ov Vertienva sace e ura - o		autostradale e Tang	enziale di Bologno	PROFOND	ITA' PO	ZZETTO	(in r	n) 1.50	
SIGLA PO	ZZETTO	GEOLOGO: I	Dott. P.F. Grangié Dot	t. S. Marino	ne /'00	REV. N	I. DA	TA F	IFERIMENTO INT	ERNO
P/1	()2	ATTREZZATL	JRA: Terna universale-	JVC DATA: 06/0	1-1-1-	1_1_	<u> </u>		E IN SITO	2-80
	E H				. F. E.	CAMP				¥0
SCALA (m) PROFONDITA' OLITICALES ORE SPESSORE	GAZZ	DESCRIZION	NE LITOSTRATIGRAFICA		る。	kg/cmc NUMERO TIPO	ATOUDTA		MODULO DI COMPRESSIBILITÀ Me (MPa)	INSTANTANTANTANTANTANTANTANTANTANTANTANTANT
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0.15	the same of the sa		metria ghiaiosa misto		4			1 1		1
0.25	TERRENO	vegetale e i	Ol RIPORTO a granulor	netria sabbiosa di		1				
0.40	colore ava	ina.			+ $+$ $+$ $+$					1
							PL	D.60	102.3-44.6	1.90
1.10	SABBIA LII	MOSA di coloi	re marrone scuro con	inglobati litoclast	i					
	eterogene	i ed eteromei	trici, rari laterizi.				1			Ť
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1.50	4-43	FINE POZZ	ZETTO -1.50 m dal p	iano campagna						
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5.00	'ACQUA DURANTE	In scavo T	LEGENDA CAMPIONI	LEGENDA PROVI	E IN SITO		- 1		NOTE	
PROFONDITA'	DATA DURANTE	ORA	RM: Rimaneggiato	LF: Lefranc						
TROFORDIA	D. 1111		CB: Cubico	PLT: Carico su	piastra					
9.00										_



PROVA	DI CARIC	O SU PIASTRA N°	1	RIF.	P102				
СОММІТТ	ENTE:	SPEA - INGEGNERIA EUROPEA - S.p.A.							
CANTIER	E:	Autostrada Bologna-Bari-Taranto e Tang, di Bologna							
OPERA:	Potenziame	nto del sistema autostradale	e Tangenzia	le di Bologna	a				
DATA:	06/06/'00	OPERATORE:	Dott. Geo	L Salvatore M	arino				

		CARATTERISTICHE D	ELLA PIASTR	A	
diametro (mm):	300	area (cm²):	700	spessore (cm):	3

RIFERIMENTO DELL'ATTREZZATURA: Norma Svizzera SNV 670317a

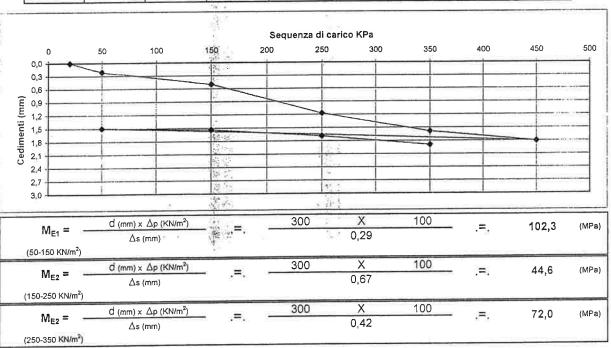
Ciclo di carico, scarico e ricarico (gradini di carico e scarico: 50-150-250-350-450-50-150-250-350 KN/m²). Carico preliminare di 20 KN/m². Cedimento misurato ogni 2 minuti.

CARATTERISTICHE AL CONTORNO

PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 0,60 DIMENSIONI DELLO SCAVO I x I (m):

TERRENO DI PROVA: Sabbia limosa con inglobati litoclasti eterogenei ed eterometrici arrotondati. Rari laterizi.

Carico	Tempi	Le	ttura compara	atori	Somma	Media	Cedimen	to ∆s (mm)
(KN/m²)	(min)	A (mm)	B (mm)	C (mm)	A+B+C	(A+B+C)/3	Parziale	Totale
20,00	5,00	0,00	€ 30,00	0,00	0,00	0,00	0,00	0,00
50,00	2,00	0,43	0,12	0,06	0,61	0,20	0,20	0,20
150,00	2,00	0,86	३ 50,41	0,22	- 1,49	0,50	0,29	0,50
250,00	2,00	1,71	減 (1,15	0,65	. 3,51	1,17	0,67	1,17
350,00	2,00	2,28	1,58	0,90	4,76	1,59	0,42	1,59
450,00	2,00	2,53	1,85	1,03	5,40	1,80	0,21	1,80
50,00	2,00	2,17	1,57	0,75	4,49	1,50	-0,30	1,50
150,00	2,00	2,21	1,60	0,80	4,61	1,54	0,04	1,54
250,00	2,00	2,42	1,72	0,93	5,07	1,69	-0,11	1,69
350,00	2,00	2,69	1,89	1,10	5,67	1,89	0,20	1,89
			15 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				8	



COMUNE: BOLOGNA

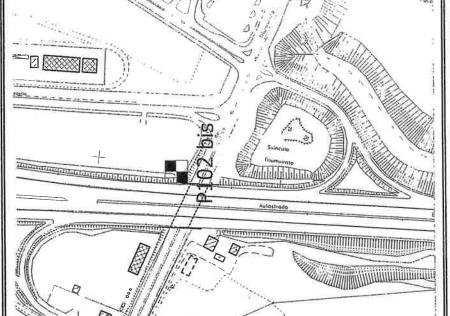
LOCALITA': TANGENZIALE DI BOLOGNA -

UBICAZIONE POZZETTO Pz102 bis

STRALCIO PLANIMETRICO







LEGENDA:



	1		COMMITTENTE	SPEA INGEGNERIA EL	JROPEA S.p.A.	COORD GAUS-BOA	AGA ,	= X			
•	SERV		CANTIERE:	Autostrada Bologna- Sistema Tangenziale	al Bologna	QUOTA PO				,=	
GEC)TECN	ICI_	OPERA:	Potenziamento del s autostradale e Tang	enziale al Balogn					n m) 3.00	
SI	IGLA POZZI	110	OPERATORE	Oott. P.F. Grangié Dot	t. S. Marino		REV.	-	DATA	RIFERIMENTO IN	TERNO 02-BO
7/	<u> </u>	ZD18	ATTREZZATU	RA: Terna universale-	JAC		CAMP	IONI	PR	OVE IN SITO	
SCALA (m) PROFONDITA'	SIMBOLOGIA LITO STRATIGRAF	2.83		NE LITOSTRATIGRAFICA		kg/cmq kg/cmq kg/cmq TV,RES		-	nPo que	MODULO DI COMPRESSIBILITA Me (MPa)	DENSITA'
-	.15			metria ghiaiosa misto		4					
D.	.30	laniara au	ana	DI RIPORTO a granulor terizi, e ciottoli (ømax		di					
.00	2.55	SABBIA f Presenzo	di elementi (te limosa di colore d' ghiaiosi eterometrici e	a evoluti.				PLT 1		1.90
4.00-			FINE FOZ	ZETTO —3.00 m dal p			emplem and season of the seaso				and the second of the second o
5.0d	O DELL'AC	QUA DURANT	E LO SCAVO	LEGENDA CAMPIONI	LEGENDA PROV	VE IN SITO				NOTE	
		DATA	ORA	RM: Rimaneggiato	LF: Lefranc PLT: Carico su	The service of					
PROFO				CB: Cubico							



PROVA	DI CARIC	O SU PIASTRA N°	1	RIF.	P102bis		
СОММІТТ	ENTE:	SPEA - INGEGNERIA EU	ROPEA - S.	o.A.			
CANTIER	E:	Autostrada Bologna-Bari-Taranto e Tang. di Bologna					
OPERA:	Potenziame	nto del sistema autostradale	e Tangenzia	ale di Bologna	a		
DATA:	06/06/'00	OPERATORE:	Dott. Salva	tore Marino			

		CARATTERISTICHE D	ELLA PIAST	RA	
diametro (mm):	300	area (cm²):	700	spessore (cm):	3

RIFERIMENTO DELL'ATTREZZATURA: Norma Svizzera SNV 67.0317a

Ciclo di carico, scarico e ricarico (gradini di carico e scarico: 50-100-150-250-350-50-100-150-250

MODALITA' ESECUTIVE: KN/m²). Carico preliminare di 20 KN/m². Cedimento misurato ogni 2 minuti.

PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 0,70 DIMENSIONI DELLO SCAVO I x I (m):

TERRENO DI PROVA:

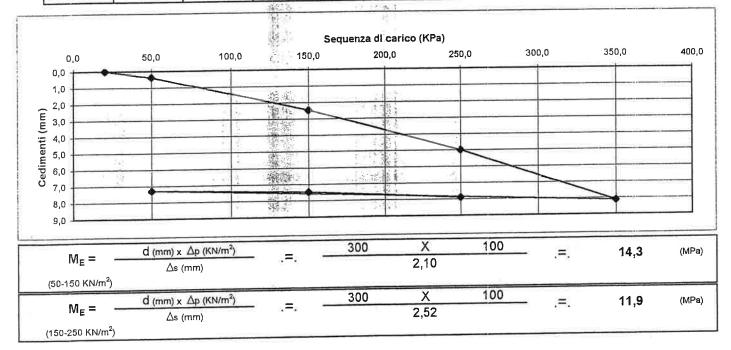
CARATTERISTICHE AL CONTORNO

DIMENSIONI DELLO SCAVO I x I (m):

Sabbia limosa di colore marrone chiaro. Presenti litoclasti evoluti.

LETTURE

Carico	Tempi	Lettura comparatori			Somma	Media	Cedimento ∆s (mm	
(KN/m²)	(min)	A (mm)	B (mm)	C (mm)	A+B+C	(A+B+C)/3	Parziale	Totale
20,00	5,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
50,00	2,00	0,33 :	0,46	0,35	1,14	0,38	0,38	0,38
150,00	2,00	2,34	2,60	2,49	7,43	2,48	2,10	2,48
250,00	2,00	5,00	5,00	5,00	15,00	5,00	2,52	5,00
350,00	2,00	8,14	7,92	8,32	24,38	8,13	3,13	8,13
50,00	2,00	7,42	7,05	7,40	21,87	7,29	-0,84	7,29
150,00	2,00	7,53	7,27	7,60	22,40	7,47	0,18	7,47
250,00	2,00	7,96	7,70	8,03	23,69	7,90	0,43	7,90
				5 - 3	ś			
				į.	1			





PROVA DI CARICO SU PIASTRA Nº			2	RIF.	P102bis	
соммітт	TENTE:	SPEA - INGEGNERIA EUR	OPEA - S.	p.A.	it i	
CANTIER	E:	Autostrada Bologna-Barí-Tar	anto e Tan	g. di Bologna		
OPERA:	Potenziame	nto del sistema autostradale e	Tangenzial	e di Bologna		
DATA:	06/06/'00	OPERATORE:	Dott. Salvatore Marino			

5.6	. E (5) A	CARATTERISTICHE DEL	RISTICHE DELLA PIASTRA				
diametro (mm):	300	area (cm²):	700	spessore (cm):	3		

RIFERIMENTO DELL'ATTREZZATURA: ¡Norma Svizzera SNV 670317a

Ciclo di carico, scarico e ricarico (gradini di carico e scarico: 50-150-250-350-50-150-250 KN/m²). Carico MODALITA' ESECUTIVE: preliminare di 20 KN/m². Cedimento misurato ogni 2 minuti.

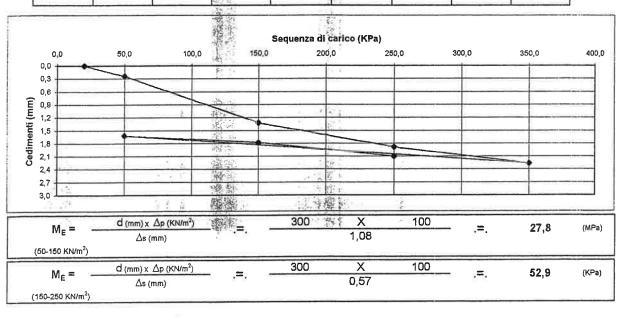
CARATTERISTICHE AL CONTORNO

PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 1,80 | DIMENSIONI DELLO SCAVO I x I (m): |

TERRENO DI PROVA: | Sabbia fine di colore marrone e tracce ocra, rare radici. Rari litoclasti eterometrici arrotondati.

LETTURE

Carico (KN/m²)	Tempi	Lettura comparatori		Somma	Media	Cedimento ∆s (mm)		
	(min)	A (mm)	∄·B (mm)	С (тт)	A+B+C	(A+B+C)/3	Parziale	Totale
20,00	5,00	0,00	0,00	0;00	0,00	0,00	0,00	0,00
50,00	2,00	, 0,20	0,25	0,26	0,71	0,24	0,24	0,24
150,00	2,00	1,27	1,33	1;35-35	3,95	1,32	1,08	1,32
250,00	2,00	1,23	2,40	2,02	5,65	1,88	0,57	1,88
350,00	2,00	1,48	2,87	2,45	6,80	2,27	0,38	2,27
50,00	2,00	0,95	2,02	1,87	4,84	1,61	-0,65	1,61
150,00	2,00	1,15	2,29	1,89	5,33	1,78	0,16	1,78
250,00	2,00	1,53	2,58	2,18	6,29	2,10	0,32	2,10
			E.		10			
			gi o					
			-7 -21 (2)	. 3				



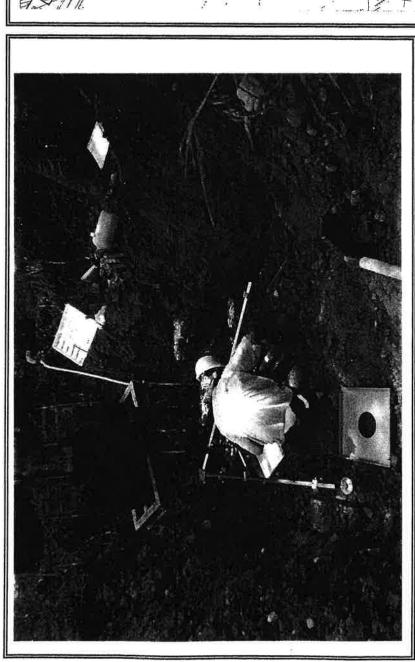
COMUNE: BOLOGNA

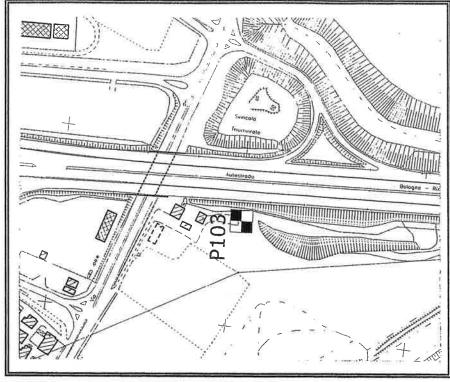
LOCALITA': TANGENZIALE DI BOLOGNA -

UBICAZIONE POZZETTO Pz103

SCHEDA UBICATIVA

STRALCIO PLANIMETRICO





LEGENDA:

POZZETTO ESPLORATIVO

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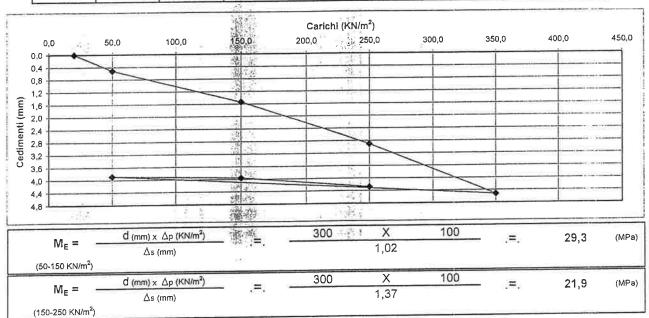
PROVA	DI CARÎC	O SU PIASTRA Nº	1	RIF.	P103
соммітт	ENTE: /3	ŠPEA - INGEGNERIA E	UROPEA - S.	p.A.	
CANTIER	E: ***	Autostrada Bologna-Bar	i-Taranto e Ta	ng. di Bologn	a
OPERA:	Potenziamer	ito del sistema autostrada	ale e Tangenz	iale di Bologn	а
DATA	06/06/100	OPERATORE	Dott. Salvato	re Marino	

1,1		CARATTERISTICHE DELLA	PIASTRA	4	
diametro (mm):	300	area (cm²):	700	spessore (cm):	3

RIFERIMENTO DELL'ATTREZZATURA: Norma Svizzera SNV 670317a Ciclo di carico scarico e ricarico (gradini di carico e scarico: 50-100-150-200-250-350-50-1**50-250** KN/m²). Carico preliminare di 20 KN/m². Cedimento misurato ogni 2 minuti. MODALITA' ESECUTIVE:

CARATTERISTICHE AL CONTORNO PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 0,90 DIMENSIONI DELLO SCAVO I x I (m): Sabbia limosa di colore marrone TERRENO DI PROVA:

Carico	Tempi	Le	ttura compara	itori	Somma	Media	Cedimen	to ∆s (mm)
(KN/m²)	(min)	A (mm)	∴B (mm)	C (mm)	A+B+C	(A+B+C)/3	Parziale	Totale
20,00	5,00	0,00	5, 0,00	ي 0,00	0,00	0,00	0,00	0,00
50;00	2,00	0,34	0,62	0.58	1,54	0,51	0,51	0,51
150,00	2,00	1,14	1,42	2,05	4,61	1,54	1,02	1,54
250,00	2,00	2,49	2,18	4,05	8,71	2,90	1,37	2,90
350,00	2,00	4,07	2,64	6,85	13,56	4,52	1,62	4,52
50,00	2,00	3,37	2,24	6,05	11,65	3,88	-0,64	3,88
150,00	2,00	3,45	2,30	6,12	11,87	3,96	1,05	3,96
250,00	2,00	3,89	2,34	6,61	12,84	4,28	0,32	4,28
			150 mm 140 22					





PROVA	DI CARIC	O SU PIASTRA Nº	2	RIF.	P103						
COMMITT	ENTE:	SPEA - INGEGNERIA EUROPEA - S.p.A.									
CANTIER	E: []	Autostrada Bologna-Bari-Taranto e Tang. di Bologna									
OPERA:	Potenziame	nto del sistema autostradal	e e Tangenzi	ale di Bologna							
ΠΑΤΑ	06/06/'00	OPERATORE:	Dott. Salvato	re Marino							

		CARATTERISTICHE DEL	LA PIASTR	A	e (cm): 3	
diametro (mm):	300	area (cm²):	700	spessore (cm):	3	

RIFERIMENTO DELL'ATTREZZATURA: Norma Svizzera SNV 670317a

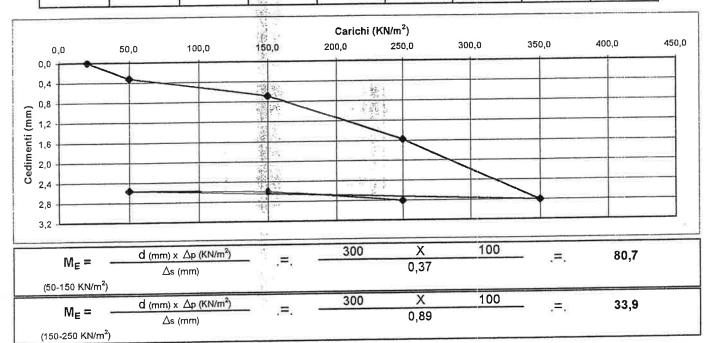
Sequenza di carico: 50-150-250-350-50-150-250 KN/m². Carico preliminare di 20 KN/m². Cedimento misurato ogni 2 minuti.

PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 2,50 DIMENSIONI DELLO SCAVO I x I (m):

TERRENO DI PROVA:

LETTURE

Carico	Tempi	Let	tura compara	atori	Somma	Media	Cedimen	to ∆s (mm)
(KN/m ²)	(min)	A (mm)	B (mm)	C (mm)	A+B+C	(A+B+C)/3	Parziale	Totale
20,00	5,00	0,00	0,00	0,00 11	0,00	0,00	0,00	0,00
50,00	2,00	0,23	0,15	0,58	0,96	0,32	0,32	0,32
150,00	2,00	0,68	0,20	1,20	2,08	0,69	0,37	0,69
250,00	2,00	0,46	2,22	2,05	4,73	1,58	0,89	1,58
350,00	2,00	1,55	3,85	3,03	8,43	2,81	1,23	2,81
50,00	2,00	0,41	3,23	4,05	7,69	2,56	-0,25	2,56
150,00	2,00	0;47	₹ 3,24	4,07	7,78	2,59	0,03	2,59
250,00	2,00	0,58	3,42	4,42	8,42	2,81	0,21	2,81
			I.	A 42				
			16	100				
			\$17					

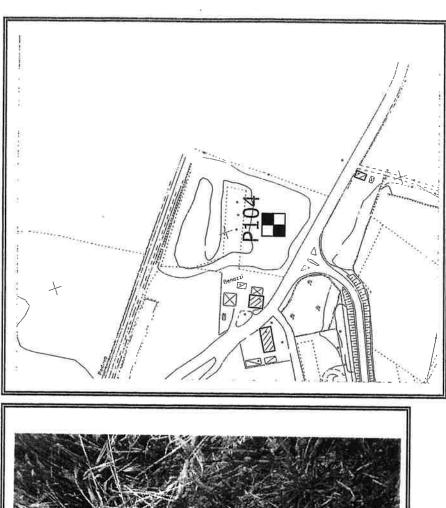


LOCALITA': TANGENZIALE DI BOLOGNA -

STRALCIO PLANIMETRICO

SCHEDA UBICATIVA

UBICAZIONE POZZETTO Pz104





LEGENDA:



			~~						SPEA INGEGNERIA Autostrada Bologi	EUROP	EA S.p.A.	COO	RD S-B0	DAG		= >		-1105-03-03-03-03-03-03-03-03-03-03-03-03-03-		
	_	_	SEF				CANTIERE	.	Sistema Tangenzi	gle di t	Bologna	-					s.l.r	n.=		
_	3E	07	ΓΕС	NIC			OPERA:		Potenziamento de autostradale e To	ngenzio	ile di Bologno	3		C C a local disease of		-			3.50	H-100 P - 1111
		SIG	LA PO	ZZET	го		GEOLOGO	: Do	tt. P.F. Grangié [ott. S.	Marino	1		-	EV.	-	DATA	RIF	ERIMENTO IN	TERNO
-	\supset	/	1	() 4	4		OPERATO ATTREZZ	ATUR	A: Terna universa	e-JVC	DATA: 07/0	76/1	10	T	1	J	г		5-SPE-TGBO	2-BO
<u>-</u>	ž.	W W		Z 1								- BH	. E.S.	된	-	IONI	- 1			≥ 0.
SCALA (m)	PROFONDITA"	SPESSORE	SIMBOLO LITO STRATIG	FORMAZ			DESCRIZ	IONE	LITOSTRATIGRAFIC	A 		kg/c	, kg/	/64	TIPO	QUOTA	про о	UOTA	MODULO DI OMPRESSIBILITA Me (MPa)	DENSI IN ST
	0.5	0.50			TERREN sabbios	NO VI sa di	EGETALE E colore a	E DI vana	RIPORTO a granu	ometric	limo									distribution and the second se
1.00		1.00			ARGILL ciottoli	A LIN	MOSA di c	olore	a marrone, preser	za di l	aterizi e				the second section is the second section of the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section is the second section in the second section is the second section in the second section is the second section in the second section is the second section in the section is the second section in the section is the second section in the section is the second section in the section is the section in the section in the section is the section in the section is the section in th	A STATE OF THE REAL PROPERTY OF THE PROPERTY O	to proper to the second second second second second second second second second second second second second se			and the second s
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Geologia Applicata all'Ingegneria Civile

via del Pianeta Terra, 39 - Roma

PROVA	DI CARIC	O SU PIASTRA N°	1	RIF.	P104							
COMMITT	ENTE:	SPEA - INGEGNERIA EUROPEA - S.p.A.										
CANTIER	E;	E: SPEA - INGEGNERIA EUROPEA - S.p.A. Autostrada Bologna-Bari-Taranto e Tang. di Bologr										
OPERA:	Potenziame	nto del sistema autostrada	le e Tangenzi	ale di Bologn	а							
DATA	07/06/'00	OPERATORE	Dott. Salvator	e Marino								

		CARATTERISTICHE D	FLI A PIASTR	Δ	
diametro (mm):	300	area (cm²):	700	spessore (cm):	3

RIFERIMENTO DELL'ATTREZZATURA: Norma Svizzera SNV 670317a

MODALITA' ESECUTIVE:

Sequenza di carico: 50-100-150-250-350-50-150-250 KN/m², Carico preliminare di 20 KN/m² Cedimento misurato ogni 2 minuti.

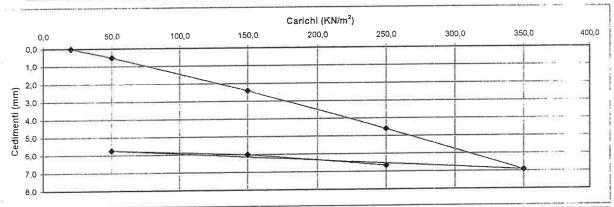
CARATTERISTICHE AL CONTORNO

PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 1,80 DIMENSIONI DELLO SCAVO I x I (m):

TERRENO DI PROVA: Limo argilloso di colore marrone. Presenza di fillosilicati. Umido

TERRENO DI PROVA:

Carico	Tempi	Let	tura compara	atori	Somma	Media	Cedimen	to ∆s (mm)
(KN/m²)	(min)	A (mm)	B (mm)	C (mm)	A+B+C	(A+B+C)/3	Parziale	Totale
20,00	5,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
50,00	2,00	0,51	0,45	0,55	1,51	0,50	0,50	0,50
150,00	2,00	2,48	2,48	2,24	7,20	2,40	1,90	2,40
250,00	2,00	5,72	4,55	3,52	13,79	4,60	2,20	4,60
350,00	2,00	8,85	6,28	5,64	20,77	6,92	2,33	6,92
50,00	2,00	7,45	5,79	3,98	17,22	5,74	-1,18	5,74
150,00	2,00	7,92	5,87	4,19	17,98	5,99	0,25	5,99
250,00	2,00	8,09	6,57	5,31	19,97	6,66	0,66	6,66



	d (mm) x Δp (KN/m²)		300	X	100	=	15,8	(MPa)
M _E = -	Δs (mm)		1,90		*STM	10,0	•	
(50-150 KN/m²)								
	$d (mm) \times \Delta p (KN/m^2)$		300	X	100	=	13,6	(MP
M _E =	∆s (mm)	1.77		2,20		50° (d)	.0,0	•
150-250 KN/m²)								



PROVA	DI CARIC	O SU PIASTRA Nº	2	RIF.	P104		
COMMITTENTE: SPEA - INGEGNERIA EUROPEA - S.p.A.							
CANTIERE: Autostrada Bologna-Bari-Taranto e Tang. di E							
OPERA: Potenziamento del sistema autostradale e Tangenziale di Bologna							
DATA:	07/06/00	OPERATORE:	Dott. Salvatore Marino				

		CA	RATTERISTICHE DELL	A PIASTR	A		
diametro (mm):	300	11/4	area (cm²):	700	spessore (cm):	3	

Norma Svizzera SNV 670317a RIFERIMENTO DELL'ATTREZZATURA:

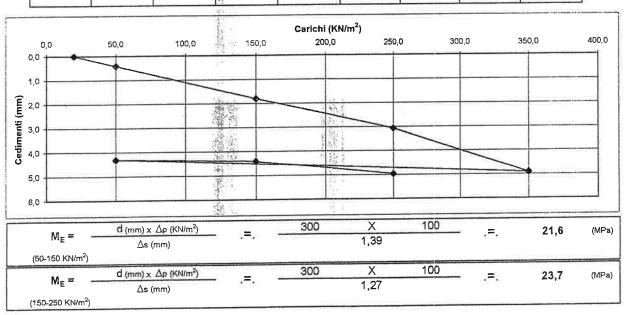
MODALITA' ESECUTIVE: Cedimento misurato ogni 2 minuti.

Sequenza di carico: 50-100-150-250-350-50-150-250 KN/m². Carico preliminare di 20 KN/m²

CARATTERISTICHE AL CONTORNO PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 1,80 DIMENSIONI DELLO SCAVO I x I (m):

Sabbia limosa di colore marrone TERRENO DI PROVA:

Carico	Tempi	Le	ttura compara	atori	Somma	Media	Cedimen	to ∆s (mm)
(KN/m ²)	(min)	A (mm)	B (mm)	C (mm)	A+B+C	(A+B+C)/3	Parziale	Totale
20,00	5,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
50,00	2,00	0,43	0,38	0,43	1,24	0,41	0,41	0,41
150,00	2,00	1,57	1,86	1,98	5,41	1,80	1,39	1,80
250,00	2,00	3,35	3,08	2,78	9,21	3,07	1,27	3,07
350,00	2,00	4,82	4,98	4,90	14,70	4,90	1,83	4,90
50,00	2,00	4,17	4,37	4,38	12,92	4,31	-0,59	4,31
150,00	2,00	4,47	4,62	4,09	13,18	4,39	0,09	4,39
250,00	2,00	5,09	5,07	4,71	14,87	4,96	0,56	4,96
33			\$ C	*6		P		
			ă.	* <u>N</u> -				

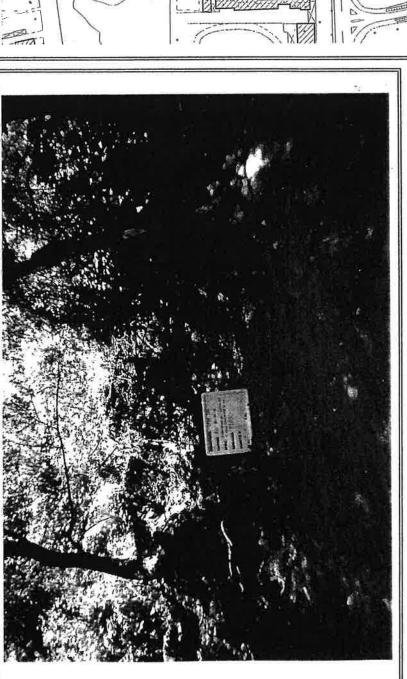


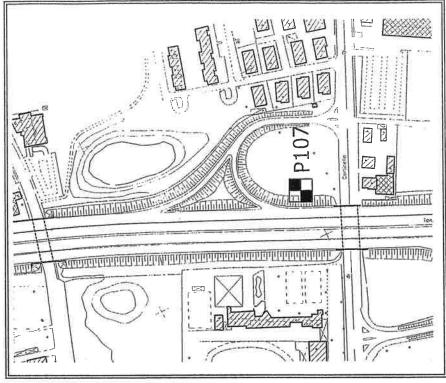
LOCALITA': TANGENZIALE DI BOLOGNA-

SCHEDA UBICATIVA

UBICAZIONE SONDAGGIO Pz 107

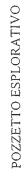
STRALCIO PLANIMETRICO





LEGENDA:





		COMMITTENTE	SPEA INGEGNERIA E	UROPEA S.p.A.	COORD GAUS-E	DAGE		=				
SE	RVIZI	CANTIERE:	Autostrada Bologna- Sistema Tangenziale	-Bari-Taranto : di Bologna	1		I	=	-			
GEOTE	CNICI	OPERA:	Potenziamento del autostradale e Tang	sistema	QUOTA					-	-) 3.00	
SIGLA P	OZZETTO	GEOLOGO: D	ott. P.F. Grangié		PROFO		EV.	****	DAT		m) 3.00	
P7	1107	OPERATORE:	RA: Terna universale-	-JVC DATA: 26	/05/'00			1	2/06	/00 E	05-SPE-TGB	02-BO
	三世	MINESEN			. 2 . 2	S EL		ION	_		E IN SITO	¥0
SCALA (m) PROFONDITA' SPESSORE SPESSORE	FORMAZIO GEOLOGIC GEOLOGIC	DESCRIZION	E LITOSTRATIGRAFICA		kg/cmg f.V.	T.V.RES. kg/cmg	NUMERO	QUOTA	про	QUOTA	MODULO DI COMPRESSIBILI Me (MPa)	DENSAT
0.40	SABBIA de all'avana,	bolmente limo: presenza di g	sa di colore variabile hiaia di riporto, mat	e dal marrone toni e cemento.								
1.70	SABBIA di	colore avana.		w ::	2 87			and the second s	PLT	1.30	44.1-48.5	EX
p.90	SABBIA lir	nosa di colore					the second secon	And the same of the street with the same street to the same on the same street to the same of the same street to the same stree		And the second s		
00		FINE	POZZETTO -3.00 m	dai piano campo	agno							
.00.		*					and the state of t	tandam mandesa signam sampi memanda aya sigi pasawa wa wa sa sampi da da da da da da da da da da da da da		And the second s		estimated a consideration of the constant of t
.00	'ACQUA DURANTE		EGENDA CAMPIONI	LEGENDA PRO	VE IN SITO)					NOTE	1000



PROV	A DI CARIC	O SU PIASTRA N°	1	RIF.	P107			
COMMIT	TENTE:	SPEA - INGEGNERIA EU	ROPEA - S.p.	Α				
CANTIE	RE:	: Autostrada Bologna-Bari-Taranto e Tang. di Bologr						
OPERA:	Potenziamer	to del sistema autostradale	utostradale e Tangenziale di Bologna					
DATA:	26/05/'00:	05/'00 : OPERATORE: Dott. Pier Francesco Grang						

		CARATTERISTICHE D	ELLA PIASTR	4	
diametro (mm):	300	area (cm²):	700	spessore (cm):	3

Norma Svizzera SNV 670317a RIFERIMENTO DELL'ATTREZZATURA:

MODALITA' ESECUTIVE:

Sequenza di carico: 50-100-150-250-350-50-150-250 KN/m². Carico preliminare di 20 KN/m²

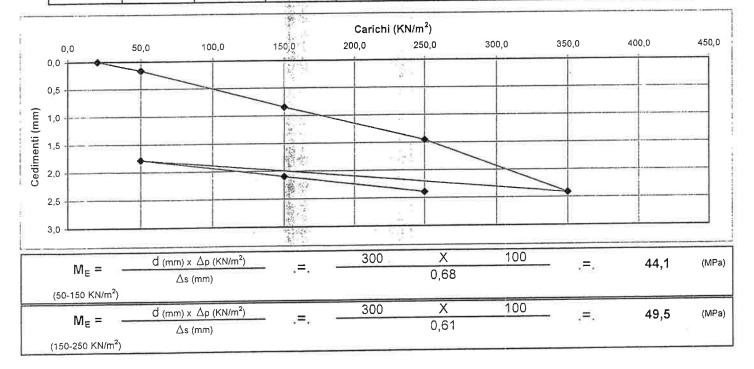
Cedimento misurato ogni 2 minuti.

CARATTERISTICHE AL CONTORNO

1,30 DIMENSIONI DELLO SCAVO I x I (m): PROFONDITA' DI ESECUZIONE DELLA PROVA (m):

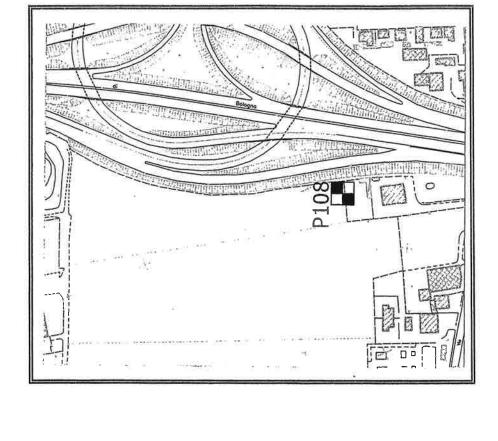
Sabbia di colore avana TERRENO DI PROVA:

Carico	Tempi	Let	tura compara	itori	Somma	Media	Cedimen	to ∆s (mm)
(KN/m²)	(min)	A (mm)	B:(mm)	C (mm)	A+B+C	(A+B+C)/3	Parziale	Totale
20,00	5,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
50,00	2,00	0,16	0,11	0,22	0,49	0,16	0,16	0,16
150,00	2,00	0,72	0,86	0,95	2,53	0,84	0,68	0,84
250,00	2,00	1,41	1,62	1,32	4,35	1,45	0,61	1,45
350,00	2,00	2,54	2,19	2,51	7,24	2,41	0,96	2,41
50,00	2,00	1,68	1,85	1,81	5,34	1,78	-0,63	1,78
150,00	2,00	1,98	2,19	2,11	6,28	2,09	0,31	2,09
250.00	2,00	2,80	2,37	2,01	7,18	2,39	0,30	2,39

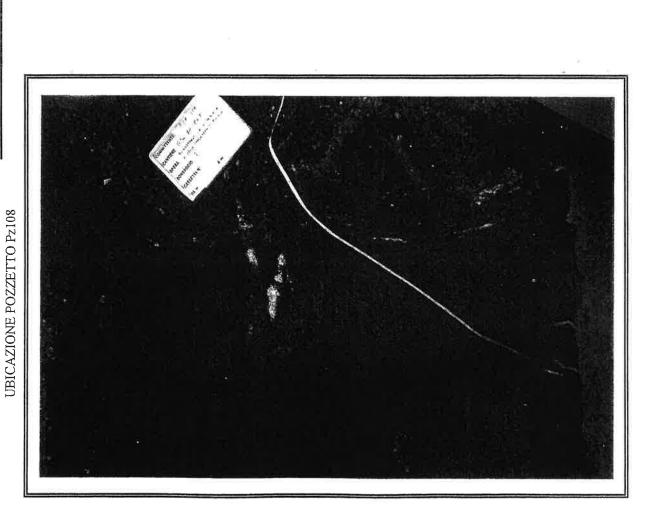


SCHEDA UBICATIVA

STRALCIO PLANIMETRICO



LEGENDA:



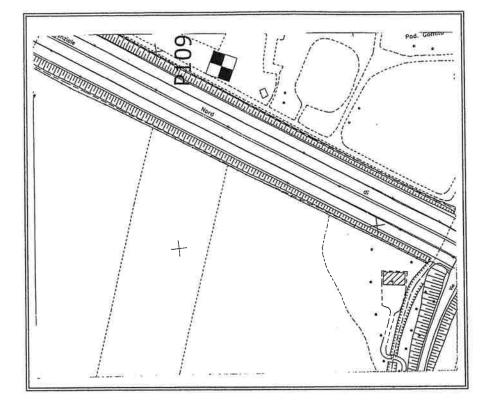
SIGLA POZZETTO SIGLA POZZETTO	SE	RVIZI	COMMITTENTE CANTIERE:	SPEA INGEGNERIA E Autostrada Bologna Sistema Tangenziale	UROPEA S.p.A. —Bari—Taranto e di Bologna	COORE GAUS-	-BOA	GA	X= '	Y		
SIGLA POZZETTO GEOLOGO: Dett. P.F. Grenglé Doit. S. Marine OPERATORE: ATREZZATURA: Terna universale—IV. DESCRIZIONE LITOSTRATIGRAFICA DESCRIZIONE LITOSTRATIGRAFICA STABILIZZANTE STRADALE mieto a bitume di colore grigio. STABILIZZANTE STRADALE mieto a bitume di colore grigio. ARGILLA LIMOSA di colore marrone. ARGILLA LIMOSA di colore marrone. FINE POZZETTO —3.30 m dal piano campagna FINE POZZETTO —3.30 m dal piano campagna LUELLO DELL'ACCUIA DURANTE LO SCAVO LEGENDA CAMPIONI LEGENDA PROVE IN STO NOTE NOTE NOTE NOTE NOTE NOTE NOTE NOTE	GEOTE	CNICI		Potenziamento del autostradale e Tang	sistema genziale di Bologna	1					n) 3.30	
DESCRIZIONE LITOSTRATIGRAFICA Descrizione PZ1	OZZETTO 08	OPERATORE:	Ž	DATA: 08/0	<u></u>		REV.	N. 1	DATA F	IFERIMENTO IN 05-SPE-TGBI	NTERNO	
STABILIZZANTE STRADALE misto a bitume di colore grigio. D.60 ARGILLA di colore grigio etonolità azzurre. Tracce nerastre. Plastica. ARGILLA LIMOSA di colore marrone. C1 C8 1.40 C2 C8 2.20 FINE POZZETTO -3.30 m dal piano compagna FINE POZZETTO -3.30 m dal piano compagna LUCLLO DELL'ACQUA DURANTE LO SCAVO LEGENDA CAMPIONI LEGENDA PROVE IN SITO NOTE PROFONDITA' DATA ORA RM: Rimaneggioto Lif: LEFENANC	PROFONDITA' SPESSORE	PORIVAZIONI GEOLOGICHE	DESCRIZION	IE LITOSTRATIGRAFICA		kg/cmg T.V.	Kg/cmg					DENSITA IN SITO
Piostico. ARGILLA LIMOSA di colore marrone. C2 CB 2.20 FINE POZZETTO -3.30 m dal piano campagna FINE POZZETTO -3.30 m dal piano campagna LIVELLLO DELL'ACQUA DURANTE LO SCAVO LEGENDA CAMPIONI LEGENDA PROVE IN SITO NOTE PROFONDITA' DATA ORA RM: Rimaneggiato Lf: LEFRANC	D.60	STABILIZZA	ANTE STRADALE	misto a bitume di								
ARGILLA LIMOSA di colore marrone. C2 CB 2.20 FINE POZZETTO -3.30 m dal piane campagna FINE POZZETTO -3.30 m dal piane campagna LIVELLO DELL'ACQUA DURANTE LO SCAVO LEGENDA CAMPIONI LEGENDA PROVE IN SITO NOTE PROFONDITA' DATA ORA RM: Rimaneggiato Lf: LEFRANC	0.60	ARGILLA o Plastica.	li colore grigio	etonalità azzurre. Ti	racce nerastre.							A STATE OF THE PERSON OF THE P
2.10 FINE POZZETTO -3.30 m dal piano campagna FINE POZZETTO -3.30 m dal piano campagna Dividuo Dell'Acqua Durante Lo Scavo Legenda Campioni Legenda Prove in Sito Note PROFONDITA' DATA ORA RM: Rimaneggiato Lf: LEFRANC		And Andread Control of			s.			C1	CB 1.40		The state of the s	And the same of th
FINE POZZETTO -3.30 m dal piano campagna FINE POZZETTO -3.30 m dal piano campagna DOLIVELLO DELL'ACQUA DURANTE LO SCAVO LEGENDA CAMPIONI LEGENDA PROVE IN SITO NOTE PROFONDITA' DATA ORA RM: Rimaneggiato Lf: LEFRANC	and the second s	ARGILLA 1	LIMOSA di colo	re marrone.				C2	CB 2.2	0	A manufacture of the contract	
DOUBLITACQUA DURANTE LO SCAVO LEGENDA CAMPIONI LEGENDA PROVE IN SITO NOTE PROFONDITA' DATA ORA RM: Rimaneggiato Lf: LEFRANC	3.30	And produced the control of the cont										and the second s
OCULTO DELL'ACQUA DURANTE LO SCAVO LEGENDA CAMPIONI LEGENDA PROVE IN SITO PROFONDITA' DATA ORA RM: Rimaneggiato Lf: LEFRANC			FINE POZZ	ΈΠΟ -3.30 m dal p	oiano campagna							the second second is a second second second
PROFONDITA' DATA ORA RM: Rimaneggiato Lf: LEFRANC)0									(A) (A) (A) (A) (A) (A) (A) (A) (A) (A)		
PROFONDITA' DATA ORA RM: Rimaneggiato Lf: LEFRANC	000	PACOLIA BURANTE	TO SCAVO	FGENDA CAMPIONI	LEGENDA PROVE	IN SIT	0				NOTE	a chiam is a subsequent data and
DIT. Cortes au picetro			ORA									

LOCALITA': TANGENZIALE DI BOLOGNA--

UBICAZIONE POZZETTO Pz109

SCHEDA UBICATIVA

STRALCIO PLANIMETRICO





POZZETTO ESPLORATIVO LEGENDA:

			*S**** (4.				⟨= ×	-	**	
CT.	DI <i>UZI</i>		SPEA INGEGNERIA E Autostrada Bologna	UROPEA S.p.A. -Bari-Taranto	COORD GAUS-BO	404	(= Y			
	RVIZI	CANTIERE:	Sistema Tangenziale	di Bologna	QUOTA P				=	************
GEOTEC	CNICI	OPERA:	Potenziamento del autostradale e Tang	sistema jenziale di Bologr	1				m) 3.30	
SIGLA P	OZZETTO		ott. S. Marino		1 1010112	REV.	-	DATA	RIFERIMENTO IN	TERNO
P71	09	OPERATORE: ATTREZZATU	RA: Terna universale-	-JVC DATA: 20,	/06/.00			DD.	605-SPE-TGBC	02-BO
	N H				. EL. EM	<u> </u>	PIONI	PRO	OVE IN SITO	K O
PROFONDITA' SPESSORE	LOGIAZYMACO O GRAFAGA	DESCRIZION	E LITOSTRATIGRAFICA		kg/cmg kg/cmg kg/cmg	NUMERO	QUOTA	про очо	MODULO DI COMPRESSIBILIT TA Ma (MPa)	YIS S
0.80	TERRENO	VEGETALE a gr	anulometria limosa d	di colore marrone		to an united any state of the s	en understande de la companya de la companya de la companya de la companya de la companya de la companya de la		A company of the second	And the state of the second se
0.80						C1 F	1.10) PLT 1.1	20.5-9.8	3.86
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3.30		FINE DOZZ	ETTO -3.30 m dal !	niana campaana			1			-
k.00a		FINE PUZZ	E110 -0.00 III adi (Surpagna			and the second state of th			
									NOTE	e o o o so comprehensia and come have surprise process in the other
i.og				I I COCKIDA DOON	E IN SILO				RUIL	
	'ACQUA DURANTE		EGENDA CAMPIONI	LEGENDA PROV						
LIVELLO DELL PROFONDITA'	DATA 20/06/'00	ORA	EGENDA CAMPIONI RM: Rimaneggiato CB: Cubico	LF: Lefranc PLT: Carico su						



PROVA	DI CARIC	O SU PIASTRA N°	1	RIF.	P109		
COMMITT	ROPEA - S.p.,	۹.					
CANTIERE: Autostrada Bologna-Bari-Taranto e Tang. di Bo							
OPERA:	ERA: Potenziamento del sistema autostradale e Tangenziale di Bologn						
DATA: 20/06/00 OPERATORE: Dott. Salvatore Marino							

		CARATTERISTICHE DE	ELLA PIASTR	A		
diametro (mm):	300	area (cm²):	700	spessore (cm):	3	

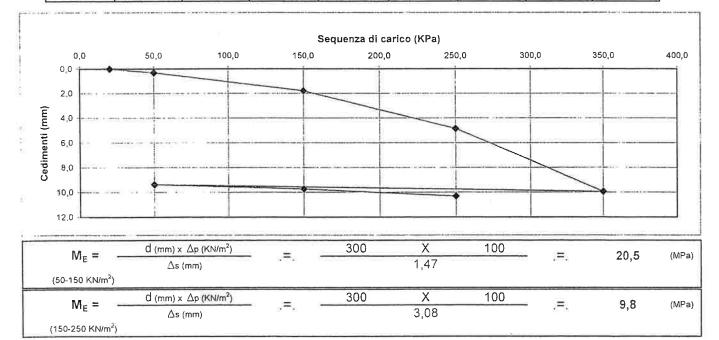
DATA:

20/06/'00 OPERATORE:

Norma Svizzera SNV 670317a RIFERIMENTO DELL'ATTREZZATURA: Sequenza di: 50-150-250-350-50-150-250 KN/m². Carico preliminare di 20 KN/m². Cedimento MODALITA' ESECUTIVE: misurato ogni 2 minuti.

CARATTERISTICHE AL CONTORNO PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 1,10 DIMENSIONI DELLO SCAVO I x I (m): Sabbia limosa di colore marrone. TERRENO DI PROVA: LETTURE

Carico	Tempi	Let	tura compara	tori	Somma	Media	Cedimer	nto ∆s (mm)
(KN/m²)	(min)	A (mm)	B (mm)	C (mm)	A+B+C	(A+B+C)/3	Parziale	Totale
20,00	5,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
50,00	2,00	0,33	0,39	0,22	0,93	0,31	0,31	0,31
150,00	2,00	2,28	1,92	1,14	5,33	1,78	1,47	1,78
250,00	2,00	5,75	5,07	3,74	14,56	4,85	3,08	4,85
350,00	2,00	10,50	10,30	9,00	29,80	9,93	5,08	9,93
50,00	2,00	10,23	10,12	7,78	28,12	9,37	-0,56.	9,37
150,00	2,00	10,56	10,48	8,14	29,18	9,73	0,35	9,73
250,00	2,00	11,20	11,07	8,69	30,95	10,32	0,59	10,32





Geologia Applicata all'Ingegneria Civile

via del Pianeta Terra, 39 - Roma

PROVA	DI CARIC	O SU PIASTRA N°	2	RIF.	P109
соммітт	ENTE;	SPEA - INGEGNERIA EL	JROPEA - S.	p.A.	
CANTIER	E:	Autostrada Bologna-Bari-	Taranto e Tar	g, di Bologna	
OPERA:	Potenziamen	to del sistema autostradale	e Tangenzial	e di Bologna	
DATA:	20/06/00	OPERATORE:	Dott. Salvat	ore Marino	

		CARATTERISTICHE DE	LLA PIASTR	A	
diametro (mm):	300	area (cm²):	700	spessore (cm):	3

RIFERIMENTO DELL'ATTREZZATURA: Norma Svizzera SNV 670317a

MODALITA' ESECUTIVE:

Sequenza di carico: 50-100-150-200-50-100-150 KN/m². Carico preliminare di 20 KN/m². Cedimento misurato ogni 2 minuti.

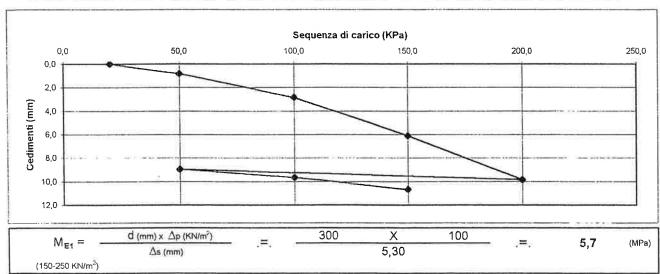
CARATTERISTICHE AL CONTORNO

PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 2,50 DIMENSIONI DELLO SCAVO I x I (m):

Sabbia limosa, molto umida.

TERRENO DI PROVA:

Tempi	Lett	ura compara	atori	Somma	Media	Cedimen	ito∆s (mm)
(min)	A (mm)	B (mm)	C (mm)	A+B+C	(A+B+C)/3	Parziale	Totale
5,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
2,00	0,81	0,73	0,90	2,44	0,81	0,81	0,81
2,00	2,83	2,83	2,83	8,49	2,83	2,02	2,83
2,00	5,12	8,03	5,18	18,33	6,11	3,28	6,11
2,00	8,51	12,00	9,00	29,51	9,84	3,73	9,84
2,00	7,83	11,00	8,00	26,83	8,94	-0,89	8,94
2,00	8,00	12,00	9,00	29,00	9,67	0,72	9,67
2,00	9,00	13,00	10,00	32,00	10,67	1,00	10,67
							~~~
		<del> </del>					
	(min) 5,00 2,00 2,00 2,00 2,00 2,00 2,00 2,00	(min)         A (mm)           5,00         0,00           2,00         0,81           2,00         2,83           2,00         5,12           2,00         8,51           2,00         7,83           2,00         8,00	(min)         A (mm)         B (mm)           5,00         0,00         0,00           2,00         0,81         0,73           2,00         2,83         2,83           2,00         5,12         8,03           2,00         8,51         12,00           2,00         7,83         11,00           2,00         8,00         12,00	(min)         A (mm)         B (mm)         C (mm)           5,00         0,00         0,00         0,00           2,00         0,81         0,73         0,90           2,00         2,83         2,83         2,83           2,00         5,12         8,03         5,18           2,00         8,51         12,00         9,00           2,00         7,83         11,00         8,00           2,00         8,00         12,00         9,00	(min)         A (mm)         B (mm)         C (mm)         A+B+C           5,00         0,00         0,00         0,00         0,00           2,00         0,81         0,73         0,90         2,44           2,00         2,83         2,83         2,83         8,49           2,00         5,12         8,03         5,18         18,33           2,00         8,51         12,00         9,00         29,51           2,00         7,83         11,00         8,00         26,83           2,00         8,00         12,00         9,00         29,00	(min)         A (mm)         B (mm)         C (mm)         A+B+C         (A+B+C)/3           5,00         0,00         0,00         0,00         0,00         0,00           2,00         0,81         0,73         0,90         2,44         0,81           2,00         2,83         2,83         2,83         8,49         2,83           2,00         5,12         8,03         5,18         18,33         6,11           2,00         8,51         12,00         9,00         29,51         9,84           2,00         7,83         11,00         8,00         26,83         8,94           2,00         8,00         12,00         9,00         29,00         9,67	(min)         A (mm)         B (mm)         C (mm)         A+B+C         (A+B+C)/3         Parziale           5,00         0,00         0,00         0,00         0,00         0,00         0,00           2,00         0,81         0,73         0,90         2,44         0,81         0,81           2,00         2,83         2,83         2,83         8,49         2,83         2,02           2,00         5,12         8,03         5,18         18,33         6,11         3,28           2,00         8,51         12,00         9,00         29,51         9,84         3,73           2,00         7,83         11,00         8,00         26,83         8,94         -0,89           2,00         8,00         12,00         9,00         29,00         9,67         0,72



LOCALITA': TANGENZIALE DI BOLOGNA-

STRALCIO PLANIMETRICO

SCHEDA UBICATIVA UBICAZIONE SONDAGGIO P2111

LEGENDA:

		AND DESCRIPTION OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUM	SPEA INGEGNERIA E Autostrada Bologna	-Bari-Iaranto	COORD GAUS-	BOAG	٠,٨	(= X '= Y			
SERVIZ		CANTIERE:	Sistema Tangenziale	di Bologna	OLIOTA	POT	-	makes part   partie	s.l.m.=		-
GEOTECNIC	<u>r</u>	OPERA:		sistema genziale di Bologna			-			n) 3.10	
SIGLA POZZETI	0		ott. P.F. Grangié				REV.		DATA R	IFERIMENTO IN	TERNO
P/1	11	OPERATORE:	RA: Terna universale-	-JVC DATA: 26/C	5/ 00					05-SPE-TGB0	2-BO
Z   Z					2 2	ei E	CAME	INOI		E IN SITO	No.
SCALA (m)  PROFONDITA  SPESSORE  SPESSORE  FORMAZIONI  PROFONDITA  SPECIOSICHE  PROFONDITA  SPECIOSICHE  PROFONDITA  SPECIOSICHE  SPECI		DESCRIZIONI	E LITOSTRATIGRAFICA		kg/cr kg/cr kg/cr	T.V.RE kg/cm	NUMERO	QUOTA	TIPO QUOTA	MODULO DI COMPRESSIBILIT Me (MPe)	DENSIT!
0.40	sabbiosa d	EGETALE E DI i colore marr i rari inclusi	RIPORTO a granulo one scuro a rossico di ghiaia.	metria limo io.							
2.40	SABBIA LIM	IOSA di colore	e marrone.				and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s		PLT 0.80	31.6-51.1	7
D.30	ARGILLA g	rigia debolme di tracce di c	nte limosa. ossidazione e vegeto	ili ossidati.	3.0 1.	.O D.4	-				
3.10		FINE PO	ZZETTO −3.10 m d	al piano campagno			1				
.oc		÷	27					The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon			
						0		-			THE MALL IN IN ALL ADVANCES.



PROVA	DI CARIC	O SU PIASTRA N°	1	RIF.	P111
соммітт	ENTE:	SPEA - INGEGNERIA EL	JROPEA - S.p.	.A.	
CANTIER	Εį	Autostrada Bologna-Bari-	Taranto e Tan	g. di Bologna	
OPERA:	Potenziame	nto del sistema autostradal	e e Tangenzia	le di Bologna	
DATA:	25/05/'00	OPERATORE:	Dott. Pier Fran	ncesco Grangie	è

		CARATTERISTICHE DE	LLA PIASTR	A		
diametro (mm):	300	area (cm²);	700	spessore (cm):	3	

RIFERIMENTO DELL'ATTREZZATURA: Norma Svizzera SNV 670317a

MODALITA' ESECUTIVE:

Sequenza di carico: 50-100-150-250-350-50-150-250 KN/m². Carico preliminare di 20 KN/m² Cedimento misurato ogni 2 minuti.

CARATTERISTICHE AL CONTORNO

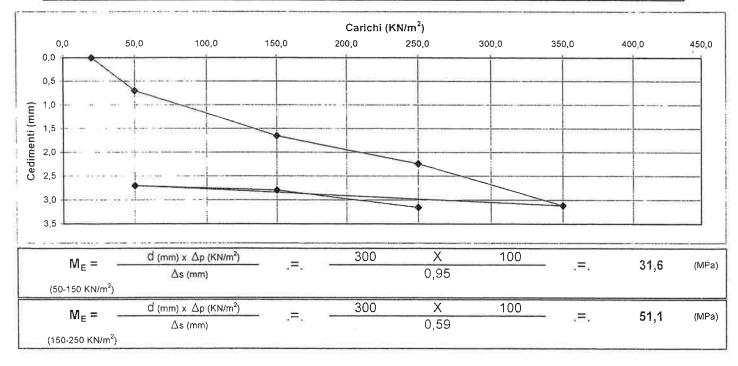
PROFONDITA' DI ESECUZIONE DELLA PROVA (m):

0,80 DIMENSIONI DELLO SCAVO I x I (m):

Sabbia limosa di colore marrone

TERRENO DI PROVA:

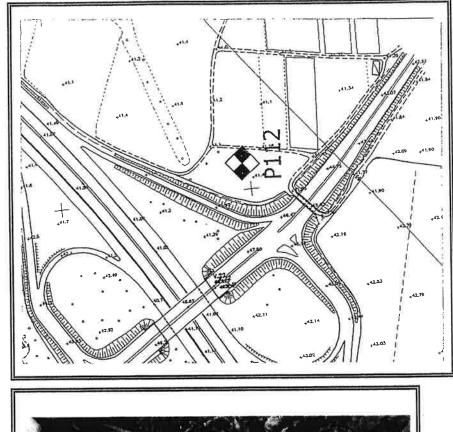
Carico	Tempi	Let	tura compara	itori	Somma	Media	Cedimer	nto ∆s (mm)	
(KN/m²)	(min)	A (mm)	B (mm)	C (mm)	A+B+C	(A+B+C)/3	Parziale	Totale	
20,00	5,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
50,00	2,00	0,60	0,90	0,60	2,10	0,70	0,70	0,70	
150,00	2,00	1,95	1,44	1,56	4,95	1,65	0,95	1,65	
250,00	2,00	2,14	2,31	2,26	6,71	2,24	0,59	2,24	
350,00	2,00	3,08	3,16	3,11	9,35	3,12	0,88	3,12	
50,00	2,00	2,41	2,86	2,83	8,10	2,70	-0,42	2,70	٦
150,00	2,00	2,50	2,98	2,90	8,38	2,79	0,09	2,79	٦
250,00	2,00	3,02	3,29	3,16	9,47	3,16	0,36	3,16	

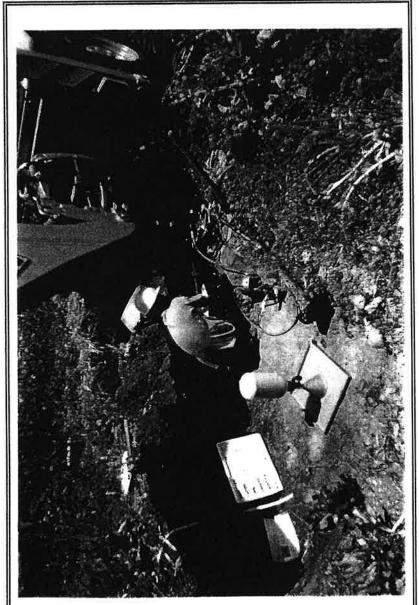


UBICAZIONE POZZETTO Pz112

#### SCHEDA UBICATIVA

#### STRALCIO PLANIMETRICO





LEGENDA:



OPERA: Potenziamento del sistema autostradale e Tangenziale di Bologno PROFONDITA' POZZETTO (in m) 3.50  SIGLA POZZETTO GEOLOGO: Dott. P.F. Granqié Dott. S. Marino  OPERATORE: ATTREZZATURA: Terna universale—JVC  DATA: 08/06/'00  DATA: 08/06/'00  REV. N. DATA RIFERMENTO INTERNO DATA: 08/06/'00  REV. N. DATA RIFERMENTO INTERNO DATA: 08/06/'00  REV. N. DATA RIFERMENTO INTERNO DATA: 08/06/'00  DESCRIZIONE LITOSTRATIGRAFICA  DESCRIZIONE LITOSTRATIGRAFICA  DESCRIZIONE LITOSTRATIGRAFICA  DESCRIZIONE LITOSTRATIGRAFICA  DESCRIZIONE DI RIPORTO a granulometria sabbioso— Ilimosa di colore nocciola.  DESCRIZIONE DI RIPORTO a granulometria sabbioso— Ilimosa di colore nocciola.  C1 RM 0.90 PLT 0.90 37.7—24.8 1.4  SABBIA LIMOSA di colore marrone chiaro.	SERVIZ	I	COMMITTENTE:	SPEA INGEGNERIA El Autostrada Bologna- Sistema Tangenziale	JROPEA S.p.A.  Bari—Taranto di Bologna	COORD GAUS-BO		Y=	= X = Y			
SIGLA POZZETTO GEOLOGO. Dott. P.F. Grandil Dott. S. World Object No. 200 OPERATORE. Temperature interest universale—INC. 2016 OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OBJECT OB	The second second second second second			Potenziamento del s autostradale e Tang	sistema enziale di Bologna				-		n) 3.50	
DESCRIZIONE LITOSTRATIGRAFICA  DESCRIZIONE LITOSTRATIGRAFICA  TERRENO VEGETALE E DI RIPORTO a granulometria sabbioso- limasa di colore nacciola.  SABBIA LIMOSA di colore marrone chiaro.  SABBIA LIMOSA di colore marrone chiaro.  FINE POZZETTO -3.50 m dal piano compagna  FINE POZZETTO -3.50 m dal piano compagna  LUZELLO DELL'ACQUA DURANTE LO SCAVO LEGENDA CAMPIONI LEGENDA PROVE IN STO  NOTE  PROFONDITA' DATA ORA RM: Rimaneggioto LEGENDA PROVE IN STO  NOTE	PZ112	<u>)</u>	OPERATORE:		DATA: DR/C		REV	. N.		DATA R	iferimento in 05—spe—tgbo	
TERRENO VEGETALE E DI RIPORTO a granulometria sabbioso— limosa di colore nocciola.  C1 RM 0.50 PLT 0.50 S77.7-24.8 S.  SABBIA LIMOSA di colore marrone chiaro.  C2 RM 2.00  FINE POZZETTO -3.50 m dal piano campagna  4.00  4.00  LEGENDA CAMPIONI LEGENDA PROVE IN SITO NOTE	SCALA (m) PROFONDITA' SPESSORE SPESSORE TO WANTONI GEOLOGICHE		DESCRIZION	E LITOSTRATIGRAFICA	×	kg/cmq L.V. kg/cmq T.V.RES.	5					DENSITA IN SITO
SABBIA LIMOSA di colore marrone chiaro.  SABBIA LIMOSA di colore marrone chiaro.  CZ.RM 2.00  FINE POZZETTO -3.50 m dal piano compagna  4.00  LEGENDA PROVE IN SITO NOTE  PROFONDITA' DATA ORA RM: Rimaneggiato LF: Lefranc		TERRENO VE	EGETALE E DI olore nocciolo	RIPORTO a granulor J.	netria sabbioso-							
SABBIA LIMOSA di colore marrone chiaro.  2.00  SABBIA LIMOSA di colore marrone chiaro.  FINE POZZETTO -3.50 m del piano compagna  FINE POZZETTO -3.50 m del piano compagna  LIVELLO DELL'ACQUA DURANTE LO SCAVO LEGENDA CAMPIONI LEGENDA PROVE IN SITO NOTE  PROFONDITA' DATA ORA RM: Rimaneggiato LF: Lefranc	.00.						c	1 RM	0.90 F	PLT 0.90	37.7-24.8	1.84
FINE POZZETTO -3.50 m dal piano campagna  4.00  4.00  LIVELLO DELL'ACQUA DURANTE LO SCAVO LEGENDA CAMPIONI LEGENDA PROVE IN SITO NOTE  PROFONDITA' DATA ORA RM: Rimaneggiato LF; Lefranc		SABBIA LIMO	OSA di colore	marrone chiaro.			c	2 RM		PLT 1.60	19.0 <b>–26.4</b>	
FINE POZZETTO -3.50 m dal piano campagna  4.00  4.00  LIVELLO DELL'ACQUA DURANTE LO SCAVO LEGENDA CAMPIONI LEGENDA PROVE IN SITO NOTE  PROFONDITA' DATA DRA RM: Rimaneggiato LF: Lefranc	.06-								A de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de la composição de l		American (American (Americ	<b>1.89</b>
LIVELLO DELL'ACQUA DURANTE LO SCAVO LEGENDA CAMPIONI LEGENDA PROVE IN SITO NOTE  PROFONDITA' DATA ORA RM: Rimaneggiato LF: Lefranc			FINE POZZ	FTTO -3.50 m dal s	iano campagna			the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon			And the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s	the contract of the contract of the contract of
PROFONDITA' DATA ORA RM: Rimaneggiato LF: Lefranc	.00.		2						And the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the 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	PROFONDITA" DAT.	A   C				pīastra						



PROVA	DI CARIC	O SU PIASTRA Nº	1	RIF.	P112
соммітті	ENTE:	SPEA - INGEGNERIA EL	JROPEA - S.p.	Α.	"
CANTIERE	:	Autostrada Bologna-Bari-	Taranto e Tan	g. di Bologna	
OPERA:	Potenziamer	nto del sistema autostradal	e e Tangenzia	le di Bologna	
DATA:	08/06/'00	OPERATORE:	Dott. Salvatore	e Marino	

		CARATTERISTICHE DE	LLA PIASTRA	4		
diametro (mm):	300	area (cm²):	700	spessore (cm):	3	

RIFERIMENTO DELL'ATTREZZATURA: Norma Svizzera SNV 670317a

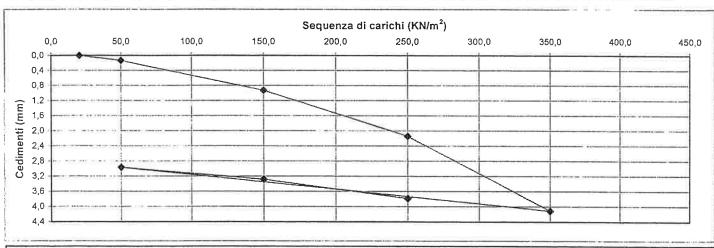
Sequenza di carico: 50-150-250-350-50-150-250 KN/m². Carico preliminare di 20 KN/m². Cedimento misurato ogni 2 minuti.

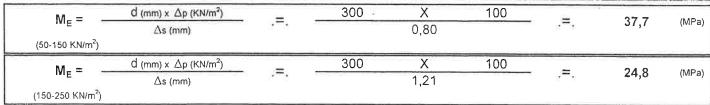
CARATTERISTICHE AL CONTORNO
PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 0,90 DIMENSIONI DELLO SCAVO I x I (m):

TERRENO DI PROVA:

Sabbia limosa di colore marrone oraceo

LETTURE Cedimento As (mm) Carico Tempi Lettura comparatori Somma Media (KN/m²)A (mm) C (mm) A+B+C (A+B+C)/3 (min) B (mm) **Parziale** Totale 0,00 20,00 0,00 0,00 0,00 5,00 0,00 0,00 0,00 50,00 2,00 0,12 0,14 0,14 0,40 0,13 0,13 0,13 150,00 2,00 0,83 0,85 1,10 2,78 0,93 0,80 0,93 250,00 2,00 1,86 1,82 2,74 6,42 2,14 1,21 2,14 350,00 2,00 3,84 3,35 5,15 12,34 1,97 4,11 4,11. 50,00 2,00 2,81 --2,36 3,73 8,90 2,97 -1,15 2.97 150,00 2,00 3,07 2,66 4,12 9,85 3,28 0,32 3,28 250,00 2.00 3,52 3.07 4.77 11,36 3,79 0,51 3.79







PROVA	DI CARIC	O SU PIASTRA N°	2	RIF.	P112
COMMITT	ENTE:	SPEA - INGEGNERIA EL	JROPEA - S.p	.A.	
CANTIER	Ēģ.	Autostrada Bologna-Bari-	Taranto e Tar	ng, di Bologna	3
OPERA:	Potenziamer	nto del sistema autostrada	le e Tangenzia	ale di Bologna	3
DATA:	08/06/'00	OPERATORE:	Dott. Salvator	e Marino	

		CARATTERISTICHE D	ELLA PIASTR	A	
diametro (mm):	300	area (cm²):	700	spessore (cm):	3

RIFERIMENTO DELL'ATTREZZATURA: Norma Svizzera SNV 670317a

MODALITA' ESECUTIVE:

Sequenza di carico: 50-150-250-350-50-150-250 KN/m². Carico preliminare di 20 KN/m². Cedimento misurato ogni 2 minuti.

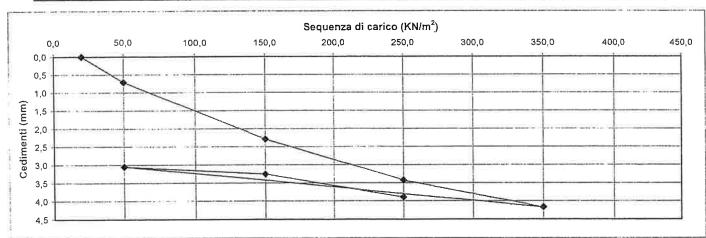
CARATTERISTICHE AL CONTORNO

PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 2,00 DIMENSIONI DELLO SCAVO I x I (m):

Sabbia limosa di colore marrone chiaro con venature e sacche verdastre.

TERRENO DI PROVA:

			Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Committee of the Commit		LIIOI			- 69 - 4 - 17 Pp	remain to the	
7	Carico	Tempi	Lett	tura comparat	tori	Somma	Media	Cedimer	nto ∆s (mm)	
	(KN/m ² )	(min)	A (mm)	B (mm)	C (mm)	A+B+C	(A+B+C)/3	Parziale	Totale	
5	20,00	5,00	0,00	0,00	0,00	達:0,00	o,00	0.00	% 0,00 L	1
1	50,00	2,00	0,67	0,71	0,75	2,13	0,71	0,71	0,71	0.70
Ì	150,00	2,00	2,57	1,77	2,52	6,86	2,29	1,58	2,29	
	250,00	2,00	3,95	2,34	3,98	10,27	3,42	1,14	3,42	
	350,00	2,00	4,99	3,17	4,34	12,50	4,17	0,74	4,17	
	50,00	2,00	3,60	:1;85	3,70	9,15	3,05	ii ≟1,12	3,05	
	150,00	2,00	3,81	2,04	3,92	9,77	3,26	0,21	3,26	1
	250,00	2,00	4,61	2,45	4,61	11,67	3,89	0,63	3,89	
				3			a resid	NE V		



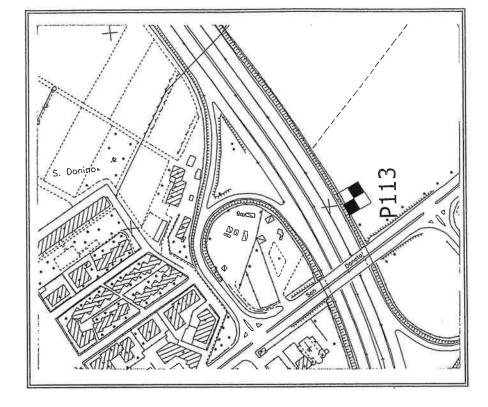
M =	d (mm) x $\Delta p$ (KN/m ² )	_	300	Χ	100	7-1	19,0	(MPa)
M _{E1} = -	∆s (mm)	×T×		1,58		171	19,0	(IVII-a)
(50-150 KN/m ² )								
N/I —	$d (mm) \times \Delta p (KN/m^2)$	_	300	X	100	S—8.	26,4	(MPa)
M _{E2} = -	Δs (mm)	(d = d)		1,14		÷.—•;	20,4	(1011 a)
(150-250 KN/m²)	,,,							

## LOCALITA': TANGENZIALE DI BOLOGNA--

## SCHEDA UBICATIVA

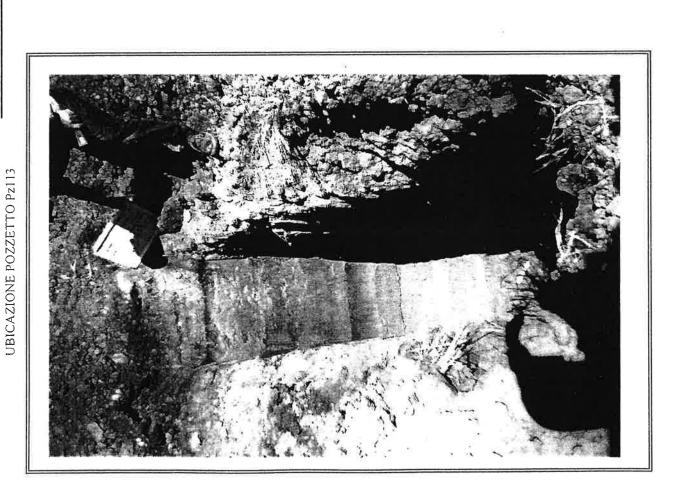
### STRALCIO PLANIMETRICO





LEGENDA:





		S	ERVĽ	ZI	COMMITTENTS CANTIERE:	SPEA INGEGNERIA E Autostrada Bologna Sistema Tangenziak	-Bari-Taranto	GAUS-	BOA	AGA	X= Y=	Y		
-	E	_	ECNIC		OPERA:	Potenziamento del autostradale e Tan	sistema	Victoria and				n s.l.m.=	. 790	
			POZZET		GEOLOGO: 1	Dott. S. Marino	genziale di bologno	PROFO				Like and the second second	m) 3.80 RIFERIMENTO I	Charles and pro-
F	5	7	11	3	OPERATORE	: IRA: Terna universale-	-JVC DATA: 21/0	06/,00	b where	REV.	N.		605-SPE-TGB	02-BO
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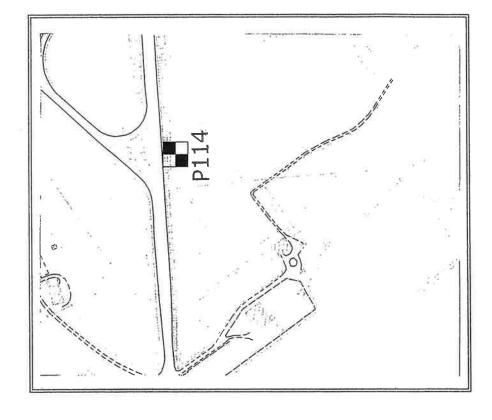
# LOCALITA': TANGENZIALE DI BOLOGNA--

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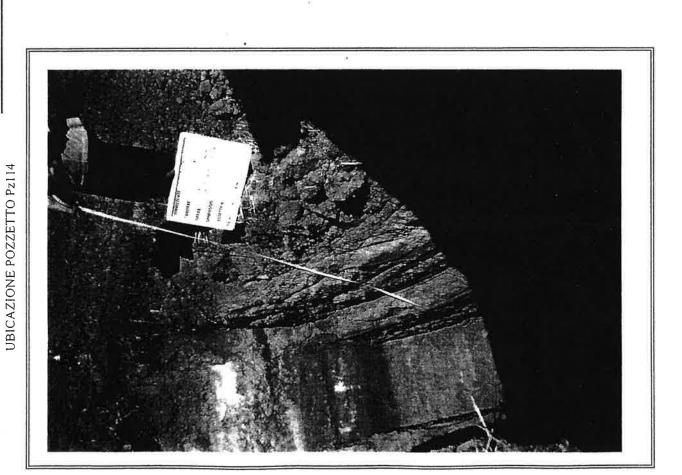
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### SCHEDA UBICATIVA

STRALCIO PLANIMETRICO



#### LEGENDA:



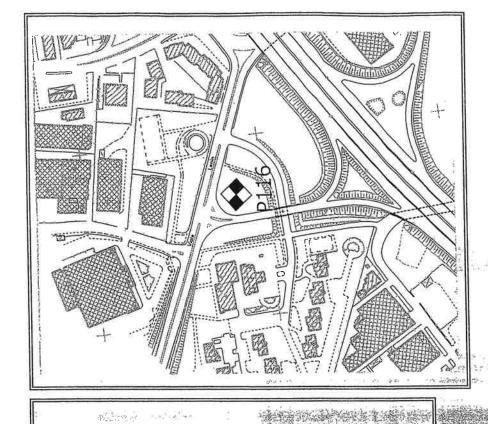
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LOCALITA': TANGENZIALE DI BOLOGNA-

SCHEDA UBICATIVA

UBICAZIONE SONDAGGIO Pz116

STRALCIO PLANIMETRICO



LEGENDA



PROVA	DICARIC	O SU PIASTRA N°	1	RIF.	P116
соммітт	ENTE:	SPEA - INGEGNERIA EL	JROPEA - S.	p.A.	
CANTIER	Ε:	Autostrada Bologna-Bari-	Taranto e Ta	ng. di Bologna	
OPERA:	Potenziame	nto del sistema autostradal	e e Tangenzi	ale di Bologna	
DATA:	25/05/'00	OPERATORE:	Dott. Pier Fr	ancesco Grangiè	

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		CARATTERISTICHE DE	LLA PIASTR	A	
diametro (mm):	300	area (cm²):	700	spessore (cm):	3

7.100

RIFERIMENTO DELL'ATTREZZATURA: Norma Svizzera SNV 670317a

MODALITA' ESECUTIVE:

Sequenza di carico: 50-150-250-350-50-100-150 KN/m2. Carico preliminare di 20 KN/m2. Cedimento misurato ogni 2 minuti.

CARATTERISTICHE AL CONTORNO

servera transportant o

 $d \text{ (mm)} \times \Delta p \text{ (KN/m}^2)$ 

 $\Delta s$  (mm)

 $M_E =$ 

(150-250 KN/m²)

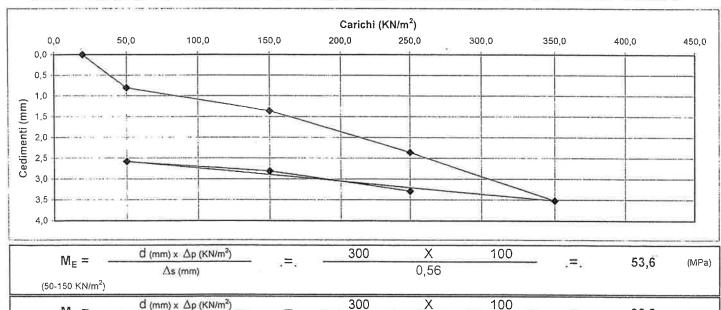
PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 0,90 DIMENSIONI DELLO SCAVO I x I (m):

TERRENO DI PROVA:

Limo sabbioso di colore nocciola

LETTURE

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150,00	2,00	1,37	1,28	1,44	4,09	1,36	0,56	1,36	1
250,00	2,00	2,12	2,35	2,60	7,07	2,36	0,99	2,36	- 1
350,00	2,00	3,25	書: 3,74	3,57	10,56	3,52	- Sc 1,16	3,52	PRODUCT CO
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150,00	2,00	2,89	2,87	2,67	8,43	2,81	0,23	2,81	1
250,00	2,00	3,52	3,12	3,22	9,86	3,29	0,48	3,29	1



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## LOCALITA': TANGENZIALE DI BOLOGNA -

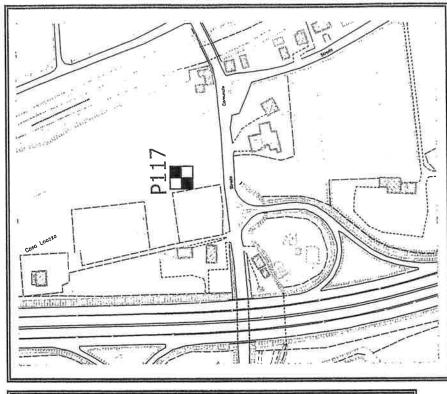
UBICAZIONE POZZETTO Pz117

### COMUNE: BOLOGNA

#### SCHEDA UBICATIVA

STRALCIO PLANIMETRICO





LEGENDA:

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	FON	рпа,	DAT	ra	ORA	RM: Rimaneggiato CB: Cubico	PLT: Carico su	piasi	tra		$\dashv$					
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			-													



PROVA	DICARIC	O SU PIASTRA N°	1	RIF.	P117						
соммітт	TENTE:	SPEA - INGEGNERIA EUROPEA - S.p.A.									
CANTIER	E:	Autostrada Bologna-Bari-Taranto e Tang. di Bologna									
OPERA:	Potenziame	nto del.sistema autostradal	e e Tangenzial	e di Bologna	214						
DATA:	25/05/'00	OPERATORE:	Dott. Pier Fran	cesco Grangiè							

- Takers &

		CARATTERISTICHE D	ELLA PIASTR	A	
diametro (mm):	300	area (cm²):	700	spessore (cm):	3

RIFERIMENTO DELL'ATTREZZATURA: Norma Svizzera SNV 670317a

MODALITA' ESECUTIVE:

Sequenza di carico: 50-150-250-350-50-150 KN/m². Carico preliminare di 20 KN/m². Cedimento misurato ogni 2 minuti.

CARATTERISTICHE AL CONTORNO

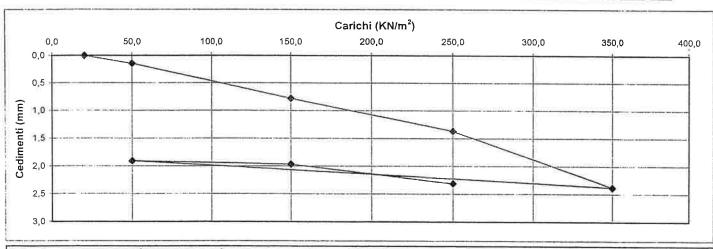
PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 0,80 DIMENSIONI DELLO SCAVO I x I (m):

TERRENO DI PROVA:

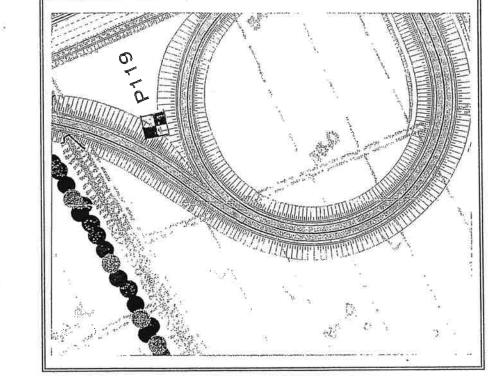
Limo sabbioso di colore marrone chiaro

LETTURE

Carico	Tempi	Lett	ura compara	tori	Somma	Media	Cedimer	to ∆s (mm)	
(KN/m²)	(min)		B (mm)	C (mm)	A+B+C	(A+B+C)/3	Parziale	Totale	Car 18/25
20,00	5,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	261
50,00	2,00	0,14	0,15	0,14	0,43	0,14	0,14	0,14	
150,00	2,00	0,64	0,72	0,97	2,33	0,78	0,63	0,78	1
250,00	2,00	1,41	1,27	1,42	4,10	1,37	0,59	1,37	
350,00	2,00	2,61	2,20	2,34	###7,15°	#. =2,38	1,02	£972;38	lavaştırı i
50,00	2,00	2,01	1,91	1,80	5,72	1,91	-0,48	1,91	
150,00	2,00	1,94	1,98	1,98	5,90	1,97	0,06	1,97	
250,00	2,00	2,42	2,47	2,04	6,93	2,31	0,34	s : 2,31	1

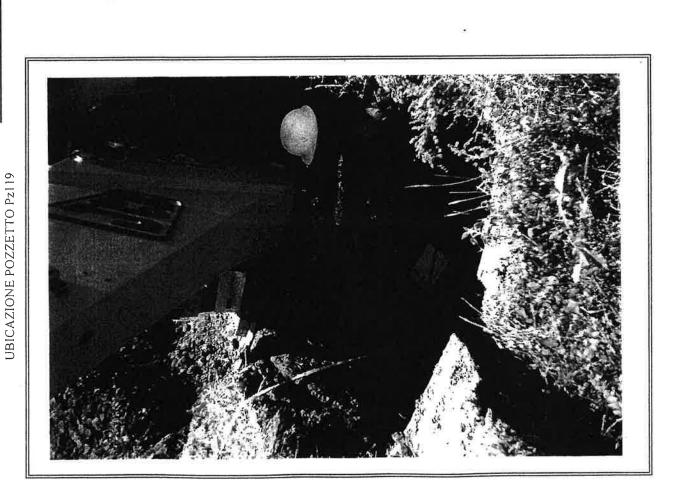


M _E = -	d (mm) x $\Delta p$ (KN/m ² )		300	X	100	_	47.4	
IAIE -	Δs (mm)	· · · · ·		0,63			47,4	(MPa
(50-150 KN/m ² )	0, 100							
M _E =	d (mm) x Δp (KN/m²)	_	300	X	100		50.0	
INE -	$\Delta$ s (mm)	·		0,59		,=,	50,8	(MPa
(150-250 KN/m²)				•				



LEGENDA:





			arr	T 77'				-	SPEA INGEGNERIA Autostrada Bologr	EUROP	EA S.p.A. -Taranto		COO GAU	RD S-B	OAG	X A	= \ X = \ Y				
,	_	١,	SER	VL		C	ANTIERE:	15	Sistema Tangenzi	ale di t	ologna			~				s.l.m	·		
_	ξE	07	TEC	NIC			PERA:	ŀ	Potenziamento de autostradale e To	l sister Ingenzio	na Ile di Bol								****	3.00	
		SIGI	A PC	ZZET	О				t. S. Marino					-		EV.		DATA	RIF	ERIMENTO IN	
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	ı. i	$\leftarrow$	- 1			/	MINLELA	(i Oit	a rollie più							CAMP	IONI	PF	ROVE	IN SITO	
SCALA (m)	PROFONDITA	SPESSORE	SIMBOLO LITO STRATIGI	FORWAZION GFOLOGICHE			DESCRIZI	ONE	LITOSTRATIGRAFIC	Α			kg/cmc	kg/cmg	kg/cmg	NUMERO	QUOTA	TIPO OU	OTA	MODULO DI OMPRESSIBILITA Me (MPa)	DENSITA IN SITO
	0.80	0.80			TERRE	NO VEC	GETALE.										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	_													_							

47 m



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Geologia Applicata all'Ingegneria Civile via del Pianeta Terra, 39 - Roma

 $M_E =$ 

(150-250 KN/m²)

 $\Delta$ s (mm)

PROVA	DICARIC	O SU PIASTRA N°	1	RIF.	P119			
соммітт	ENTE:	SPEA - INGEGNERIA EUROPEA - S.p.A.						
CANTIER	Εį	Autostrada Bologna-Bari-Taranto e Tang. di Bologna						
OPERA:	Potenziamer	nto del sistema autostradale	e e Tangenzia	ale di Bologna				
DATA:	21/06/'00	OPERATORE:	Dott. Geol.	Salvatore Marir	10			

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17,4

(MPa)

21 (4) 190%

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Contraction -

CARATTERISTICHE DELLA PIASTRA											
diametro (mm):	300	area (cm²);	700	spessore (cm):	3						

RIFERIMENTO DELL'ATTREZZATURA: Norma Svizzera SNV 670317a

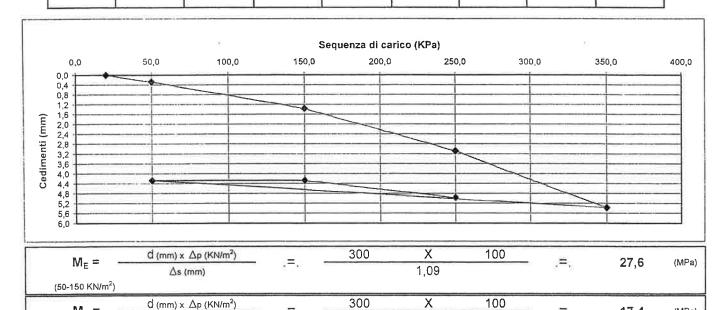
Sequenza di carico: 50-150-250-350-50-150-250 KN/m². Carico preliminare di 20 KN/m². Cedimento misurato ogni 2 minuti.

CARATTERISTICHE AL CONTORNO

PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 1,10 DIMENSIONI DELLO SCAVO I x I (m): 

TERRENO DI PROVA: Sabbia limosa di colore marrone chiaro. Tracce ocra e nerastre. Umida

LETTURE 6 Cedimento ∆s (mm) Carico Tempi Lettura comparatori Somma Media (KN/m²)(min) A (mm) B (mm) C (mm) A+B+C (A+B+C)/3 Parziale Totale 0,00 0,00 0,00 0,00 0.00 20,00 5,00 6 O,00 0,00 m 0,30 0.09 0,27 0,27 50,00 2,00 0,43 0,82 0,27 1,00 1,66 4,08 1,36 1,36 150,00 2,00 1,42 1,09 9.25 3,08 250,00 2,00 3,12 2.44 3,69 3,08 1,73 350,00 2,00 5,65 4,30 6,17 16,12 5,37 2,29 5,37 4,04 3,91 4,87 12,82 4,27 -1,10 4,27 50,00 2,00 150,00 2,00 4,42 3,26 5,13 12,81 4,27 0,00 4,27 5,16 3,90 5,86 14.91 0,70 250,00 2,00 4,97 4,97



1,73

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PROV	A DI CARIC	O SU PIASTRA N°	2	RIF.	P119				
COMMITT	ENTE:	SPEA - INGEGNERIA EUROPEA - S.p.A.							
CANTIER	E:	Autostrada Bologna-Bari-Taranto e Tang, di Bologna							
OPERA:	Potenziame	nto del sistema autostradale	e Tangenzial	e di Bologna					
DATA:	21/06/'00	OPERATORE:	Dott. Geol, S	alvatore Marino	)				

			CARATTERISTICHE D	ELLA PIASTR	A	
d	iametro (mm):	300	area (cm²):	700	spessore (cm):	3

18. de 2. de 18. de 18. de 18. de 18. de 18. de 18. de 18. de 18. de 18. de 18. de 18. de 18. de 18. de 18. de

RIFERIMENTO DELL'ATTREZZATURA: Norma Svizzera SNV 670317a

Sequenza di carico: 50-150-250-350-50-150-250 KN/m². Carico preliminare di 20 KN/m². Cedimento misurato ogni 2 minuti.

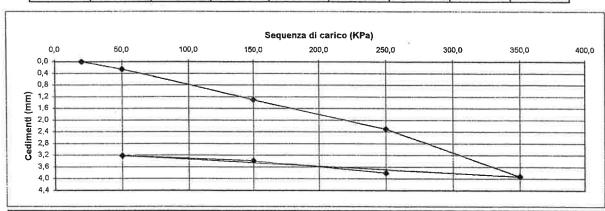
CARATTERISTICHE AL CONTORNO

PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 2,00 | DIMENSIONI DELLO SCAVO I x I (m): |

TERRENO DI PROVA: | Sabbia debolmente limosa marrone, umida, sciolta se rimaneggiata. Tracce nerastre:

LETTURE

Carico Lettura comparatori Somma Media Cedimento As (mm) (KN/m²) (min) A (mm) B (mm) A+B+C Parziale Totale C (mm) 5 (A+B+C)/3 生物的研究。 20,00 5,00 0,00 0,00 0,00 0,00 0,00 0,00 50,00 2,00 0,47 0,17 0,13 0,76 0,25 0,25 0,25 2,30 150,00 2,00 0,86 0,75 3,91 1,30 1,05 1,30 250,00 2,00 3,98 1,55 1,36 6,89 2,30 0,99 2,30 350,00 2,00 4,95 3,44 3,36 11,75 1,62 3,92 3,92 ten - details a 4,14 2,56 9,65 3,22 50,00 2,00 2,95 3,22 -0,70 150,00 2,00 4,36 3,02 2,77 10,15 3,38 0,17 3,38 250,00 2,00 4,97 3,28 3,15 11,40 3,80 0,42 3,80



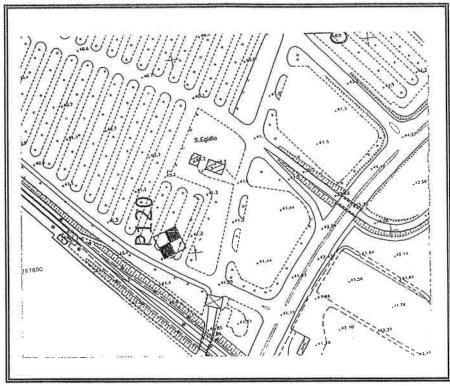
M _E =	$d (mm) \times \Delta p (KN/m^2)$	-	300	Х	100		20.0	(140-)
IAIE	Δs (mm)	e sa <del>-</del> .		1,05	// <del> </del>	- <del>-</del> _0	28,6	(MPa)
(50-150 KN/m ² )								
NA =	d (mm) x Δp (KN/m ² )	-	300	X	100	. <b>=</b> .	30,2	(MPa)
M _E =	Δs (mm)	.~.		0,99				
(150-250 KN/m ² )								

# COMUNE: BOLOGNA

# SCHEDA UBICATIVA UBICAZIONE POZZETTO Pz120

## STRALCIO PLANIMETRICO





LEGENDA:

POZZETTO ESPLORATIVO

	S	ERVL	ZI	COMMITTENTI	SPEA INGEGNERIA E Autostrada Bologna- Sistema Tangenziale	JROPEA S.p.A. -Bari—Taranto di Boloana	GAUS	-B0/	AGA	X=   Y=	Y					
GE	_	CNIC		OPERA:	Potenziamento del autostradale e Tang	sistema Jenziale di Bologni	QUOTA POZZETTO m s.l.m.=  PROFONDITA' POZZETTO (in m) 3.00									
	SIGLA	POZZET	го		Oott, P.F. Grangié Dot	t. S. Marino			REV.		DATA	RIFERIMENT				
P	7	21	)	OPERATORE	: IRA: Terna universale-	JVC DATA: 08/	06/'00		1			605-SPE-				
الم		_ \	<u> </u>	ATTICECTOR	Note 101110 Cities Cities		9	Bry 5	CAM	PION	l Pi	ROVE IN SI				
SCALA (m) PROFONDITA'	SPESSORE	BOLOGIA SO LITO ATIGRAF SO SO SO SO SO SO SO SO SO SO SO SO SO S		DESCRIZION	NE LITOSTRATIGRAFICA	2 × 35	kg/cm	KA/KE	CAM	QUOTA	про оц	MODULO COMPRESSI IOTA Me (MP	O SE			
0.4	p.4q		TERRENO ghiaiosa	VEGETALE E D con elementi e	al RIPORTO a granulor eterometrici di colore	netria sabbiosa— avana.					SO PLT O	.60 16.5—1	1.0 7.86			
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			SABBIA L	IMOSA di color	e marrone.	201			C2 1	RM 1.4	40 PLT 1	.40 55.9-5	57.7 1.8			
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PROF	ONDITA	( DA	TA	ORA	RM: Rimaneggiato	LF: Lefranc PLT: Carico su	nicetr	3								
		-			CB: Cubico	PLI; Carico su	piusti									
		+								1						



Geologia Applicata all'Ingegneria Civile via del Pianeta Terra, 39 - Roma

PROVA	DI CARIC	O SU PIASTRA N°	11	RIF.	P120			
COMMITT	ENTE:	SPEA - INGEGNERIA EUROPEA - S.p.A.						
CANTIER	<u> </u>	Autostrada Bologna-Bari-Taranto e Tang. di Bologna						
OPERA:	Potenziamer	to del sistema autostradal	e e Tangenzi	ale di Bologna	1			
DATA:	08/06/'00	OPERATORE:	Dott. Geol. S	alvatore Marino	Ò			

		CARATTERISTICHE D	ELLA PIASTRA	4		
diametro (mm):	300	area (cm²):	700	spessore (cm):	3	

RIFERIMENTO DELL'ATTREZZATURA: Norma Svizzera SNV 670317a

MODALITA' ESECUTIVE:

Sequenza di carico: 50-150-250-350-50-150-250 KN/m². Carico preliminare di 20 KN/m². Cedimento

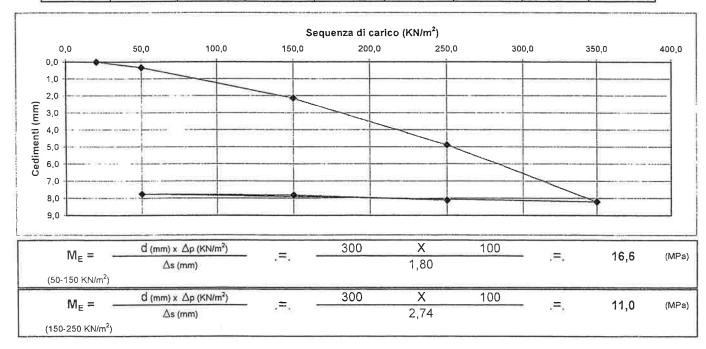
misurato ogni 2 minuti.

CARATTERISTICHE AL CONTORNO
PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 0,60 DIMENSIONI DELLO SCAVO I x ! (m):

TERRENO DI PROVA:

Sabbia di colore marrone

LETTURE Cedimento ∆s (mm) Carico Tempi Lettura comparatori Somma Media B (mm) C (mm) (A+B+C)/3 (KN/m²) (min) A (mm) A+B+C Parziale... Totale. 20.00 5,00 ::, 0;00 ··· 0,00 0,00 0,00 0.00 0;00 0.00 50,00 2,00 0,32 0,19 0,50 1,01 0,34 0,34 0,34 150,00 2,00 2,06 1,69 2,67 6,42 2,14 1,80 2,14 2,73 6,14 5,76 14,62 4,87 2,74 250,00 2,00 4,87 24,62 350,00 2,00 6,73 9,14 8,76 8,21 3,33 8,21 2,89 50,00 2,00 6,42 8,69 8,18 23,29 7,76 7,76 8,75 8,24 7,82 150,00 2,00 6,47 23,46 -0,39 7,82 250,00 2,00 6,57 9,05 8,74 24,36 8,12 0,30 8,12 States of





Geologia Applicata all'Ingegneria Civile via del Pianeta Terra, 39 - Roma

		1111				
SPEA - INGEGNERIA EUROPEA - S.p.A.						
Autostrada Bologna-Bari-Taranto e Tang. di Bologna						
adale e Tange	enziale di Bolog	na				
Dott. Ged	ol. Salvatore Marii	าด				
	Bari-Taranto e					

	3// 23 3 4	CARATTERISTICHE D	ELLA PIASTR	A	
diametro (mm):	300	area (cm²):	700	spessore (cm):	3

RIFERIMENTO DELL'ATTREZZATURA: Norma Svizzera SNV 670317a

MODALITA' ESECUTIVE:

Sequenza di carico: 50-150-250-350-50-150-250 KN/m². Carico preliminare di 20 KN/m². Cedimento misurato ogni 2 minuti.

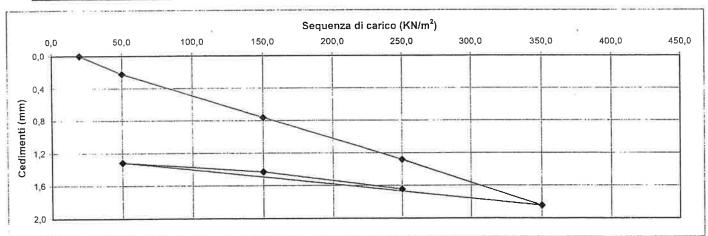
CARATTERISTICHE AL CONTORNO

PROFONDITA' DI ESECUZIONE DELLA PROVA (m): 1,40 DIMENSIONI DELLO SCAVO I x ! (m):

TERRENO DI PROVA:

Sabbia fine di colore marrone.

LETTURE Somma - Media Cedimento ∆s (mm) Tempi Lettura comparatori Carico (A+B+C)/3 Parziale Totale A (mm) C (mm) A+B+C (KN/m²)(min) B (mm) 0.00 5,00 0,00 ....0,00 0,00 0,00 0,00 0,00 **等邮票**公司。 20,00 A CHIEF ... 0,67 0,22 0,22 0.22 0,19 0,24 0,24 50,00 2,00 0,76 0,76 0,54 150,00 2,00 0,68 0,80 0,80 2,28 1,35 1,35 3,84 1,28 0,52 1,28 1,14 250,00 2,00 1,85 1,93 1,93 5,54 1.85 0,57 1,68 350,00 2,00 1,31 2,00 -1,18 1,38 1,38 3,94 1,31 -0,53 50,00 1,52 4,29 1,43 0,12 1,43 2,00 1,25 1,52 150,00 1,47 1.73 1.73 4.93 1,64 0,21 1,64 250,00 2.00



M = =	$d (mm) \times \Delta p (KN/m^2)$	_	300	X	100	) <del>-</del> 1	55,9	(MPa)
M _{E1} =	$\Delta$ s (mm)	38 T 81	0,54			50	55,5	(1011 2)
(50-150 KN/m ² )								
P.4 -	d (mm) x $\Delta p$ (KN/m ² )	_	300	Χ	100	7=7	57,7	(MPa)
M _E =	∆s (mm)	· -	0,52				51,1	(IVIPa)
(150-250 KN/m²)								

## DETERMINAZIONE DELLA DENSITA' IN SITO

Pozzetto di riferimento	Prova n.	Profondità (m)	Litologia in sintesi	Densità umida umida in sito (g/cm³)	Densita secca (g/cm³)	Vol. cavità di prova (cm³)	Contenuto d'acqua naturale (%)	Volume del cono (cm³)	Densità della sabbia calibrata (g/cm³)
P101	1	0,8	Sabbia Limosa	1,922	1,668	1420,13	15,2	1042,30	1,371
P102	1	0,6	Sabbia limosa	1,906	1,783	1551,42	6,9	1042,30	1,371
P102 bis	1	0,7	Sabbia limosa	1,906	1,783	1551,42	6,9	1042,30	1,371
P102 bis	2	1,8	Sabbia limosa	1,918	1,702	889,86	12,7	1042,30	1,371
P103	1	0,9	Sabbia limosa	2,021	1,652	1420,13	22,3	1042,30	1,371
P103	2	2,5	Sabbia limosa	2,105	1,837	1514,22	14,6	1042,30	1,371
P104	1	, 1,8	Sabbia limosa	1,927	1,592	1405,54	21	1042,30	1,371 =
P104	2	2,5	Sabbia limosa	1,941	1,574	1316,56	23,3	1042,30	1,371
P107	1	1,3	Sabbia limosa	1,884	1,683	1379,29	12	1042,30	1,371
P109	1	1,1	Sabbia limosa	1,864	1,549	1365,43	20,3	1042,30	1,371
P109	2	2,5	Sabbia limosa	1,944	1,550	1479,21	25,4	1042,30	1,371
P111	1	0,8	Sabbia limosa	1,808	1,574	1463,89	14,8	1042,30	1,371
P112	1	0,9	Sabbia limosa	1,844	1,550	1307,80	19	1042,30	1,371
P112	2	1,6	Sabbia limosa	1,893	1,578	1867,00	20	1042,30	1,371
P114	1	0,8	Limo argilloso	1,851	1,550	1567,47	19,4	1042,30	1,371
P114	2	1,5	Argilla limosa	2,009	1,648	1329,69	21,9	1042,30	1,371
P116	1	0,8	Limo sabbioso	2,086	1,772	1382,93	17,7	1042,30	1,371
P117	1	0,8	Sabbia limosa	1,826	1,595	1311,45	14,5	1042,30	1,371
P119	1	1,1	Sabbia limosa	1,900	1,593	1436,91	19,3	1042,30	1,371
P119	2	1,5	Sabbia limosa	1,941	1,623	2456,60	19,6	1042,30	1,371
P120	1	0,6	Sabbia limosa	1,886	1,697	1441,28	11,1	1042,30	1,371
P120	2	1,4	Sabbia limosa	1,891	1,684	1389,50	12,3	1042,30	1,371

POZZETTI ESPLORATIVI							
SIGLA	IMPRESA	ANNO					
OC3-PZx	SERVIZI GEOTECNICI	2010					





SERVIZI GEOTECNICI S.r.I.
Vla del Castelli Romani, 24 - 00040 POMEZIA - RM

### ANTICIPAZIONE PRELIMINARE DEI RISULTATI

COMMITTENTE SPEA Ingegneria Europea S.p.A.

Autostrada A14-MILANO NAPOLI

Ampliamento alla 4º corsia del tratto Bologna San Lazzaro—Diram. Ravenna LOTTO B — OPERE COMPENSATIVE OC3PZ4

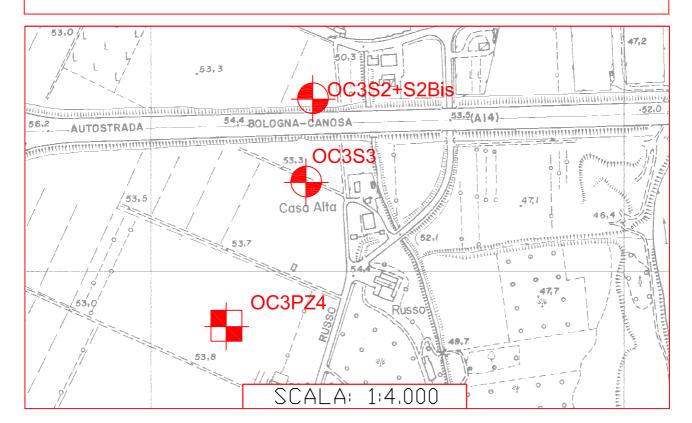
DENOMINAZIONE POZZETTO

## MONOGRAFIA UBICATIVA



CANTIERE





COORDINATE	WGS 84	LON.=11°26'01.45410'	LAT.=44°28'43.29572''	QUOTA
COORDINATE	LOCALI	E=9900724.504	N=3154793.243	52.629
COORDINATE	GAUSS-BOAGA	E=1693578.980	N=4927942.270	m. s.l.m.

NOTE: dal casello autostradale Bologna S. Lazzaro imboccare Via Caselle in direzione Bologna. Dopo circa 150 m girare in Via Zucchi. Percorrere circa 1.3 Km e girare a destra per Via Russo. Prendere la seconda strada sterrata incontrata sulla destra. Pozzetto eseguito nel campo alle spalle della casa esistente a circa 100 m in direzione SW dalla stessa.

Jing li

Uinistero delle Infrastrutture e dei Trasporti

	TIC	<u>GRAFIA</u>	POZZE	ТТО	ANTICIPA	ZIONE PRELIM	IJΝ	AR	ΕI	EI	RIS	UL.	ГАТ	I		
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	e	otec	nici		Autostrada A14-MII ANO	NAPOLI					E= '					
-				CANTIERE	Ampliamento alla 4° co Lazzaro-Diram. Ravenn	rsia del tratto Bologna Sa a	n QU	OTA	PC	ZZE	TTO I	n s.	l.m.=	52.629	9	
IZI GEOTECN		-Via dei Castelli Romani n°		GEOLOGO: I	LOTTO B - OPERE COM Dott. Geol. Simone Bio		PR	OFO	NDI	TA'	POZZ	ЕТТО	(in	m) 4.0	00	
$\bigcap$		7 D	7 /	OPERATORE	: Massimo Petrizzo	DATA: 20/	10/1	^			N	JMEF	RO C	OMMES	SA	
<u> </u>	igcup		<u> </u>	ATTREZZATU	JRA: Escavatore Kubato	1 55q. DATA: 207	10/ 1	· ·					108.			
	岁	SIMBOLOGIA LITO- STRATIGRAFICA					. ~	2	Š, ⊱		/PION	PR	OVE	IN PO	ZZETT	0
SCALA (m) PROFONDITA'	SPESSORE	MBOLUTO		DESC	CRIZIONE LITOSTRATIGRA	FICA	KN.	T.V. KN∕m²	T.V.RE KN/n	NUMERO	TIPO	TIPO	QUOTA	VAL	nei	SITO
ν <u>π</u>	N N	S HS								Ž	_ &	F	9	DI Me d	la PLT	ē s ē
0.40	0.40	* * * * * *		VEGETALE a marrone.	granulometria argillos	o limoso										
7.4			LIMO ARG	ILLOSO SABE	BIOSO di colore marror	ne_beige.	1200			D.SF	im 0.50	PLT1	0.50	Me₁=25.2 Me₃=133	MPa	(yn)1.78 (yd)1.59
. 7	0.40	EEEE	Glomeruli umido. D		carbonatici arrotondati	. Debolmente				Cr1F	im 0.50		0.50	Mei- 133	.J MIFU	(,5,,,5
0.70			÷				1000			Ca1F Cr2F	im 0.50 1.00 im 0.70					
.00	0.60		LIMO CON di deposi	N SABBIA di ti millimetric	colore beige avana. D i biancastri. Umido. D	iffusa presenza uro.				<b>5,2</b>	1.00					
1.30							600									
H							600									
			ARGILLA	CON LIMO di	colore grigio beige. [	a debolmente										
	1.00		compone	nte sabbioso	con screziature ocraci limosa. Locali deposit	ee a maggiore :i millimetrici	600									
			biancastri	i.	·											
00			1													
.00			con scre	ziature grigio	gillosa al tetto di color o acracee. Con argilla nolto umida.											
00 4.00		(A) 2-49/2019		FINE POZZI	ETTO —4.00m dal pian	o campagna	+									
od∎ LIVELL	.0 [	L DELL'ACQUA	DURANTE	LO SCAVO	LEGENDA CAMPIONI	LEGENDA PROVE I	N S	ш ITO		$\dashv$			N	OTE		
PROFC				ORA	Rim: Rimaneggiato	Lf: LEFRANC				1						
					Cb: Cubico	PLT: Carico su pi	astro	3								
					Ci: indisturbato	D.S.: Densità in s	situ									
					D.S.: Densità in situ											
						1										
		entatore			Ca.: Ambientale  II diretto										na 2	



Via dei Castelli Romani 24 - 00040 Pomezia (RM)

POZZETTO OC3PZ4 profondità investigata 4,00 m dal p.c.							
COMMITTENTE	SPEA Ingegneria Europea S.p.A.						
CANTIERE	Autoastrade A1: MILANO-NAPOLI - Ampliamento alla 4° corsia del tratto Bologna San Lazzaro-Diram. Ravenna Lotto B - OPERE COMPENSATIVE						



Panoramica pozzetto esplorativo.



Esecuzione della prova di Densità in Sito a 0,50 mda P.C.

COMMITTENTE

CANTIERE



SERVIZI GEOTECNICI S.r.I. Via dei Castelli Romani 24 - 00040 Pomezia (RM)

pr	POZZETTO OC3PZ4 ofondità investigata 4,00 m dal p.c.
	SPEA Ingegneria Europea S.p.A.
	Autoastrade A1: MILANO-NAPOLI - Ampliamento alla 4° corsia del tratto Bologna San Lazzaro-Diram. Ravenna
	Lotto B - OPERE COMPENSATIVE

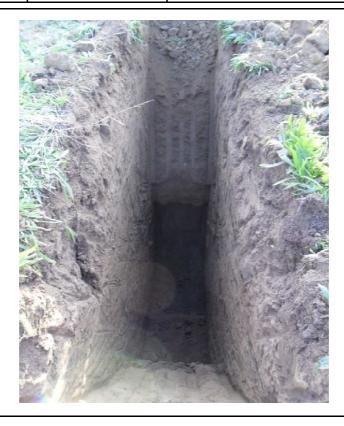


Esecuzione della prova PLT a 0,50 m da P.C.



Profondità massima raggiunta - 4,00 m da P.C.





Particolare dei terreni investigati



Area ripristinata a fine lavoro



SERVIZI GEOTECNICI S.r.l.

Via dei Castelli Romani n° 24 □ 00040 POMEZIA (RM)

tel./fax: 0683762504 - 0683762511

Codice Fiscale e P. Iva 04941201008

www.servizige otecnici.it-info@servizige otecnici.it

### Ministero delle Infrastrutture e dei Trasporti

Laboratorio in concessione con Aut. Min. n° 8610 del 08/10/2010 per l'esecuzione e certificazione di prove geotecniche di laboratorio e in sito (settore A e C) (D.P.R. n.380 □art.59 deD6.06.2001)

Società certificata UNI EN ISO 9001-2008 da SGS S.p.A.n. IT07/0939

CERTIFICATO n.	VERBALE DI ACCETTAZIONE	263-24	COMMESSA
DATA di emissione	DATA di emissione del verbale di accettazione	1-ott-10	108.10

	PROVA DI DENSITA□IN SITO								
Denominazione Profondità prova Data prova inizio prova NORMA									
Prova OC3PZ4-DS1		m dal p.c.	0,50	20-ott-10	ASTM D 1556-90				
COMMITTENTE		SPEA Ingegneria Europea S.p.A.							
CANTIERE		Autoastrade A1: MILANO-NAPOLI - Ampliamento alla 4° corsia del tratto Bologna San Lazzaro-Diram. Ravena Lotto B - OPERE COMPENSATIVE							
Descrizione	del terreno di prova	LIMO ARGILLOS	O SABBIOSO						

CARATTERISTICHE DELLE ATTREZZATURE						
Peso del cono	g	3513	Peso cono con sabbia	g	516	
Volume del cono	cm ³	1123,8	Densità della sabbia calibrata	g/cm ³	1,4	

RISULTATO DELLA PROVA								
Peso iniziale bottiglia con sabbia	g	10738	Peso del terreno scavato	g	2345			
Peso finale bottiglia con sabbia	g	7145	Contenuto in acqua	%	12,41			
Peso della sabbia versata	g	3593	Densità umida in sito	g/cm ³	1,78			
Volume sabbia versata	cm ³	2437,6	Densità secca in sito	g/cm ³	1,59			
Volume sabbia in foro	cm ³	1313,8						

NOTE:		

Lo sperimentatore

Il Direttore del Laboratorio Sa Disco



Prova

SERVIZI GEOTECNICI S.r.l.

Via dei Castelli Romani n° 24 □ 00040 POMEZIA (RM)

Codice Fiscale e P. Iva 04941201008

www.servizigeotecnici.it - info@servizigeotecnici.it

0,50

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Società certificata UNI EN ISO 9001-2008 da SGS S.p.A.n. IT07/0939

SNV 670 317a

	VERBALE DI ACCETTAZIONE	263-24	COMMESSA
DATA di emissione	DATA di emissione del verbale di accettazione	1-ott-10	108,10

DATA di emissione	•	DATA di emissione del verbale d	di accettazione 1-o	tt-10	108,10
DENOMINAZIONE	PROFONDITA' DI PROVA	DATA DI ESECUZIONE	DIAMETRO PIASTRA	NOR	MA

COMMITTENTE	SPEA Ingegneria Europea S.p.A.
CANTIERE	Autoastrade A1: MILANO-NAPOLI - Ampliamento alla 4° corsia del tratto Bologna San Lazzaro-Diram. Ravena Lotto B - OPERE COMPENSATIVE

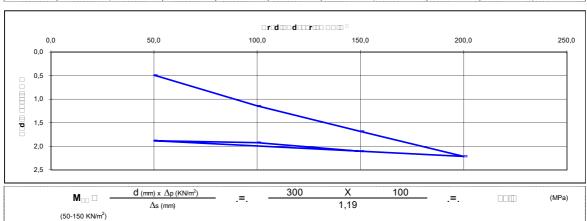
30,00

20-ott-10

LIMO ARGILLOSO SABBIOSO Descrizione del terreno di prova

OC3PZ4-PLT1 m dal p.c.

 LETTURE									
Carico	Tempi		ttura compara		Somma	Media	Cedimen	ito ∆s (mm)	
 (KN/m ² )	(min)	A (mm)	B (mm)	C (mm)	A+B+C	(A+B+C)/3	Parziale	Totale	
 20,0	2,0		0,000				0,000	0,000	
50,0	2,0		0,490				0,490	0,490	
100,0	2,0		1,140				0,650	1,140	
150,0	2,0		1,680				0,540	1,680	
200,0	2,0		2,210				0,530	2,210	
50,0	2,0		1,875				-0,335	1,875	
100,0	2,0		1,920				0,045	1,920	
150,0	2,0		2,100				0,180	2,100	
									1
 1									
 -									
									1
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d (mm) x  $\Delta p$  (KN/m²) 300 Χ 100  $M_{\square\square}$   $\square$ (MPa) .=. .=. 0,23  $\Delta \text{s (mm)}$ (50-150 KN/m²)

Lo sperimentatore

Il Direttore del Laboratorio

Simi Disale