



Badia Tedalda Eolico Srl

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Parco Eolico Poggio Tre Vescovi

Referente di progetto

Dott. Roberto Schirru

Coordinamento tecnico

ENVIarea stp snc Ing. Cristina Rabozzi, Dott. Agr. Andrea Vatteroni, Dott. Agr. Elena Lanzi

Progettazione opere civili e cantierizzazione

ENKI srl Ing. Andrea Mazzetti

Progettazione opere di utenza e di rete per la connessione CP "Badia Tedalda"

Ing. Michele Pigliaru

Geologia e geotecnica

Sinergia srls Dott. Geol. Luca Gardone

Aspetti trasportistici

Siemens Gamesa S.A. Ing. Alessandro Noro

Topografia

3D Metrica Ing. Paolo Corradeghini

Anemometria

Skywind GmbH Ing. Sasha Claes

Studio di impatto ambientale, studio di incidenza ambientale, aspetti socio-economici e antropici

ENVIarea stp snc Ing. Cristina Rabozzi, Dott. Agr. Andrea Vatteroni, Dott. Agr. Elena Lanzi

Paesaggio

INLAND Landscape Architecture Arch. Andrea Meli

Biodiversità, ecosistemi e reti ecologiche

Consorzio Futuro in Ricerca Dott. Lisa Brancaleoni (aspetti floristico-vegetazionali)

Dott. For. Iliara Scatarzi aspetti forestali, ecosistemi e reti ecologiche

Dott. Biol. Marco Lucchesi avifauna

Dott. Dino Scaravelli chiroterofauna

Archeologia

Cooperativa archeologia s.c. Dott. Andrea Biondi

Acustica

Tecnocreo srl Ing. Matteo Bertoneri

CEM e vibrazioni

Ing. Michele Pigliaru

Aprile 2023

PD.GEO.S.03.a Relazione Geologica Certificati analisi di laboratorio geotecnico

Progettazione specialistica
Soc. Sinergia s.r.l.s
Geol. Luca Gardone
- Ord.Geol.RT n.649

Rev.	Data	Oggetto
a	11/04/2023	Prima emissione



Committente:

GeoItalia srl - Roma

CONSULENZA GEOTECNICA SU PROVE DI LABORATORIO

**Cantiere: Parco Eolico Poggio Tre Vescovi - Comuni di Badia Tedalda (AR)
Casteldelci (RN) e Verghereto (FC)**

Verbale di Accettazione: **165**

Il Responsabile del Laboratorio
Dr.ssa Assunta Sfalanga

Handwritten signature of Assunta Sfalanga in black ink.

Il Direttore del Laboratorio
Prof. Luigi Carmignani

Handwritten signature of Luigi Carmignani in black ink.

San Giovanni Valdarno (AR), 25 Ottobre 2010



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TABELLA RIASSUNTIVA

SONDAGGIO	CAMPIONE	PROFONDITA'	GHIAIA	SABBIA	LIMO	ARGILLA	Contenuto d'acqua	LL	LP	IP	Peso di volume	Gs	ϕ	c	ELL	TXUU	Ed	SOSTANZA ORGANICA	
N.	N.	(m)	%	%	%	%	%	%	%	%	kN/m ³		17° RES	kPa	kPa	kPa		%	
1	1	3.60-4.00	26.5	31.0	23.3	19.2	10.9	39	21	18	20.7	2.73	17° RES	0 ^{RES}		145			
3	1	3.60-4.10	0.8	8.4	25.4	65.4	37.9	75	40	35	16.1	2.64	17° CD	14 ^{CD}	43	IMP.	X	8.9	
9	1	5.60-6.00	4.7	10.0	53.4	31.9	15.4	41	21	20	20.5	2.70							
10	1	4.70-5.00	38.0	9.2	33.1	19.7	18.8	31	17	14	20.5	2.71							
13	1	4.00-4.40	18.2	17.8	29.3	34.7	14.1	39	21	18	18.6	2.72							

Località: **Parco Eolico Poggio Tre Vescovi - Comuni di Badia Tedalda (AR) Castel delci (RN) e Verghereto (FC)**

Data: 19 Ottobre 2010

Verbale accettazione: **165**

CD = Taglio diretto consolidato lento drenato
 RES = taglio residuo
 ELL = espansione laterale libera
 TXUU = prova triassiale non consolidata e non drenata
 IMP. = prova non possibile data la natura del materiale



GeoItalia srl - Roma
TABELLA RIASSUNTIVA

SONDAGGIO	CAMPIONE	PROFONDITA'	GHIAIA	SABBIA	LIMO	ARGILLA	Contenuto d'acqua	LL	LP	IP	Peso di Volume	Gs	ϕ	c	ELL	TXUU	Ed
N.	N.	(m)	%	%	%	%	%	%	%	%	kN/m ³			kPa	kPa	kPa	
13	2	8.45-8.73	4.8	6.6	35.3	53.3	16.3	55	26	29	19.0	2.73					
15	2	6.00-6.30	2.1	19.6	44.4	33.9	14.5	44	22	22	19.7	2.75	17°RES	0 ^{RES}	93	IMP.	
17	2	9.50-9.90	0.0	0.6	23.9	75.5	13.5	73	27	46	20.6	2.78	21°CD 11°RES	3 ^{CD} 0 ^{RES}		335	
26	1	3.00-3.40	6.8	10.6	45.7	36.9	18.9	42	24	17	20.7	2.74	30°CD 15°RES	14 ^{CD} 0 ^{RES}		109	
27	1	4.00-4.30	8.4	50.7	27.3	13.6	26.4	38	28	10	17.6	2.68					

Località: **Parco Eolico Poggio Tre Vescovi - Comuni di Badia Tedalda (AR) Casteldelci (RN) e Verghereto (FC)**

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TABELLA RIASSUNTIVA

SONDAGGIO	CAMPIONE	PROFONDITA'	GHIAIA	SABBIA	LIMO	ARGILLA	Contenuto d'acqua	LL	LP	IP	Peso di Volume	Gs	ϕ	c	ELL	TXUU	Ed
N.	N.	(m)	%	%	%	%	%	%	%	%	kN/m ³			kPa	kPa	kPa	
27	2	8.45-8.75	5.3	28.3	41.2	25.2	20.2	47	27	20	15.7	2.68					
34	1	2.60-3.20	24.4	30.7	29.4	15.5	21.6	41	28	13	17.7	2.71	25 ^o CD	22 ^{CD}	IMP.	IMP.	
34	3	7.10-7.50	5.3	14.4	29.6	50.7	28.1	54	23	31	19.2	2.70	21 ^o CD	18 ^{CD}		64	X

Località: **Parco Eolico Poggio Tre Vescovi - Comuni di Badia Tedalda (AR) Casteldelci (RN) e Verghereto (FC)**

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DESCRIZIONE E RIPRESA FOTOGRAFICA DELLA CAROTA ESTRUSA

Committente: GeoItalia srl - Roma

Cantiere/Località: Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

Sondaggio: 1

Campione: 1

Profondità prelievo: 3.60-4.00

Data prelievo: 04/08/2010

Data apertura: 21/09/2010

Verbale accettazione n° 165

Descrizione: argillite omogenea e compatta, presenti concrezioni carbonatiche (Raccomandazioni AGI 1977). Argillite omogenea e compatta (UNI EN ISO 14688-2).

Colore: HUE 2.5Y VALUE 4 CHROMA 0 (Munsell Soil Color Chart)

Pocket (kg/cm²): fuori scala

Lunghezza carota: 39 cm
Diametro carota: 88,9 mm



Modalità di prelievo: sondaggio a rotazione

Tipo di fustella: Shelby

Classe di qualità del campione: **Q5** (Raccomandazioni AGI 1977)
C1 (Eurocodice 7)

Prove eseguite:

Cont. Acqua W	X	Granulom. Gr	X	T. Residuo TR	X
Peso Volume γ	X	Compress. ELL	-	Triass. TX UU	X
Peso Specifico Gs	X	Edometria Ed	-	Triass. TX CU	-
Limiti Cons. LL	X	T. Diretto TD	-	Triass. TX CD	-



Committente Geotalia srl – Roma **pagina 1 di 2**
Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Norma di riferimento ASTM D5550-00

Data prova	29/09/2010
Data certificato	19/10/2010
Verb. Accettazione	165
N. certificato	2515/2010

AccuPyc II 1340 V1.00 Unit 1 Serial #: 488 Page

Sample: VA165_S1_1_m 3,60-4,00
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S1_1.SMP

Analysis Gas: Helium
 Reported: 29/09/2010 17.06.46
 Sample Mass: 9.4900 g
 Temperature: 25.05 °C
 Number of Purges: 5

Analysis Start: 29/09/2010 16.49.00
 Analysis End: 29/09/2010 17.06.45
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2265 cm³
 Cell Volume: 11.8010 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 1, Campione 1, Prof. (m) 3,60-4,00

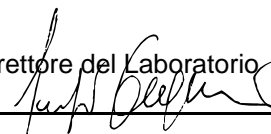
Combined Report

Tabular 1

Cycle#	Volume (cm ³)	Volume Deviation (cm ³)	Density (g/cm ³)	Density Deviation (g/cm ³)
1	3.4684	-0.0052	2.7361	0.0041
2	3.4727	-0.0009	2.7328	0.0007
3	3.4739	0.0003	2.7318	-0.0003
4	3.4745	0.0010	2.7313	-0.0008
5	3.4755	0.0020	2.7305	-0.0015
6	3.4763	0.0027	2.7299	-0.0022

Summary Data	Average	Standard Deviation
Volume:	3.4735 cm ³	0.0026 cm ³
Density:	2.7321 g/cm ³	0.0020 g/cm ³

Note: _____

Il direttore del Laboratorio


Lo sperimentatore




Committente Geotalia srl – Roma **pagina 2 di 2**
Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Data prova 29/09/2010
 Data certificato 19/10/2010
 Verb. Accettazione 165
 N. certificato 2515/2010

Norma di riferimento ASTM D5550-00

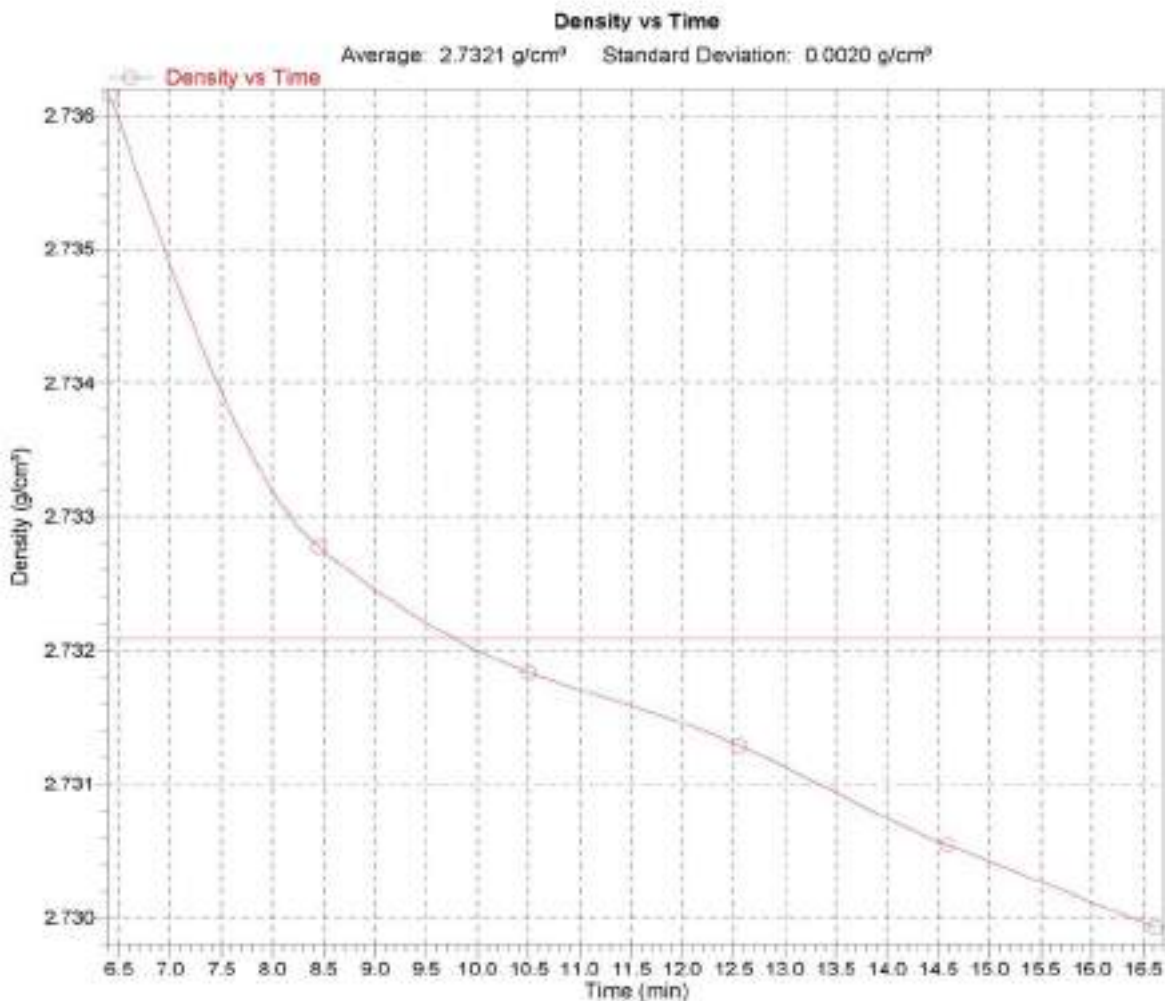
AccuPyc II 1340 V1.00 Unit 1 Serial # 488 Page 2

Sample: VA165_S1_1_m 3,60-4,00
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S1_1.SMP

Analysis Gas: Helium
 Reported: 29/09/2010 17.06.46
 Sample Mass: 9.4900 g
 Temperature: 25.05 °C
 Number of Purges: 5

Analysis Start: 29/09/2010 16.49.00
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Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 1, Campione 1, Prof. (m) 3,60-4,00



Il direttore del Laboratorio

[Signature]

Lo sperimentatore

[Signature]



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

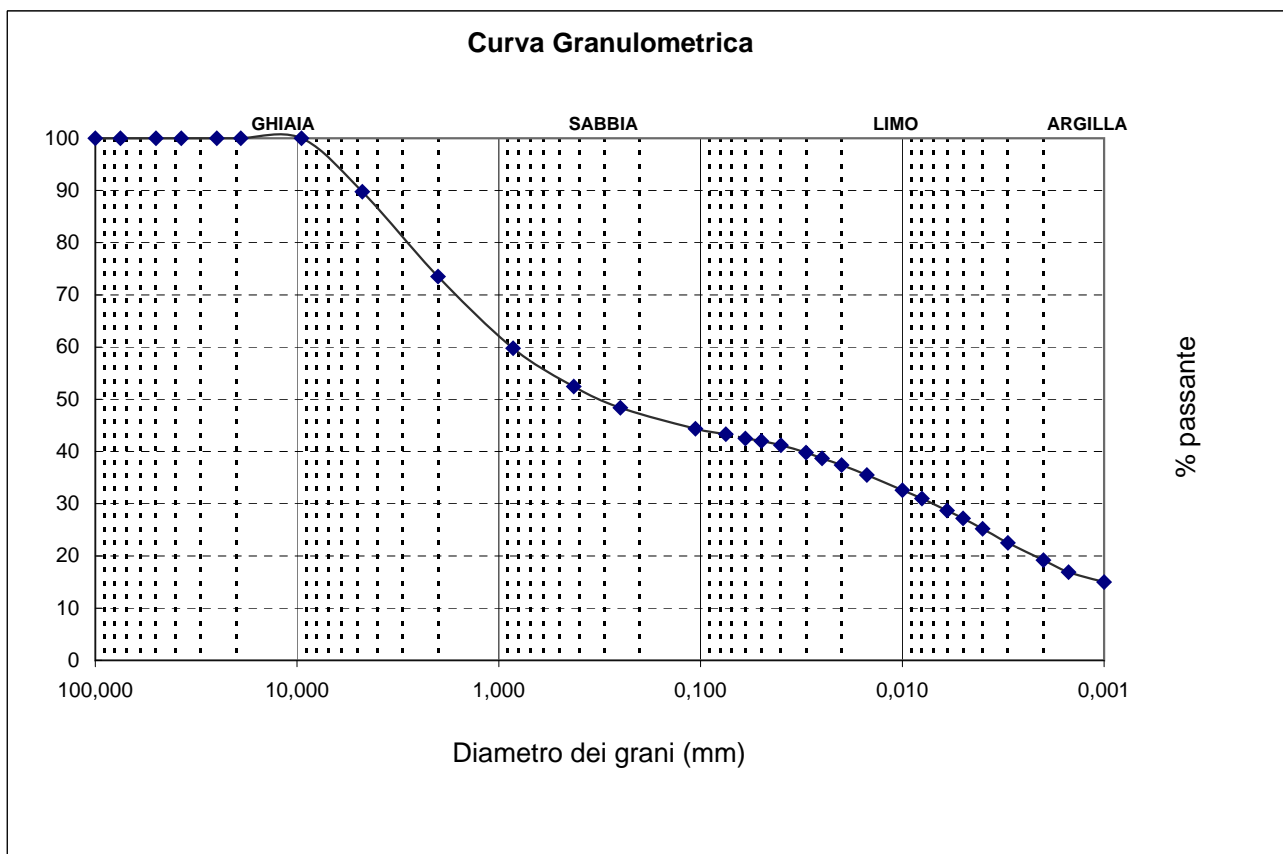
Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2462/2010

Pag. 1 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 1 Campione 1 Profondità 3.60-4.00

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)



Riepilogo dei risultati

Ciottoli	(> 60 mm)	0,0
Ghiaia	(60 - 2 mm)	26,5
Sabbia	(2 - 0,060 mm)	31,0
Limo	(0,060 - 0,002 mm)	23,3
Argilla	(< 0,002 mm)	19,2

D10	<0,002
D30	0,0071
D60	0,8695

Classificazione AGI 1994

Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2462/2010

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rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 1 Campione 1 Profondità 3.60-4.00

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)

Setacciatura:


Massa materiale (g): 202.27

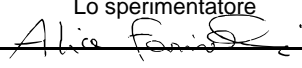
Vagli ASTM	Apertura vagli (mm)	Massa Trattenuta (g)	Trattenuto %	Passante %
3"	75,000	0,00	0,0	100,0
2"	50,000	0,00	0,0	100,0
1,5"	37,500	0,00	0,0	100,0
1"	25,000	0,00	0,0	100,0
3/4"	19,000	0,00	0,0	100,0
3/8"	9,500	0,00	0,0	100,0
No.4	4,750	20,69	10,2	89,8
No.10	2,000	32,86	26,5	73,5
No.20	0,850	27,83	40,2	59,8
No.40	0,425	14,79	47,5	52,5
No.60	0,250	8,28	51,6	48,4
No.140	0,106	8,12	55,7	44,3
No.200	0,075	2,10	56,7	43,3

Sedigrafia:

Material Mass (g): 4.360
 Material/Liquid: soil / 0.20% Sodium Metaphosphate (w/w)
 Measurement Principle: X-Ray monitored gravity sedimentation
 Calculation Method: Stokes sedimentation and Beer's law of extinction
 Test Number: 2
 Analyzed: 05/10/2010 12.39.24
 Reported: 06/10/2010 10.01.17
 Liquid Visc: 0.7683 mPa.s
 Analysis Temp: 32.0 °C
 Full Scale Mass: 43.3 %
 Analysis Type: High Speed(Adj)
 Run Time: 0:04 hrs:min
 Sample Density: 2.732 g/cm³
 Liquid Density: 0.9951 g/cm³
 Base/Full Scale: 134 / 96 kCnts/s
 Reynolds Number: 0.82

Diametro (mm)	Trattenuto %	Passante %
0,060	57,5	42,5
0,050	58,0	42,0
0,040	58,8	41,2
0,030	60,2	39,8
0,025	61,3	38,7
0,020	62,6	37,4
0,015	64,5	35,5
0,010	67,4	32,6
0,008	69,0	31,0
0,006	71,3	28,7
0,005	72,8	27,2
0,004	74,8	25,2
0,003	77,5	22,5
0,002	80,8	19,2
0,002	83,1	16,9
0,001	85,0	15,0

Il direttore del Laboratorio


Lo sperimentatore




Committente Geotalia srl - Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

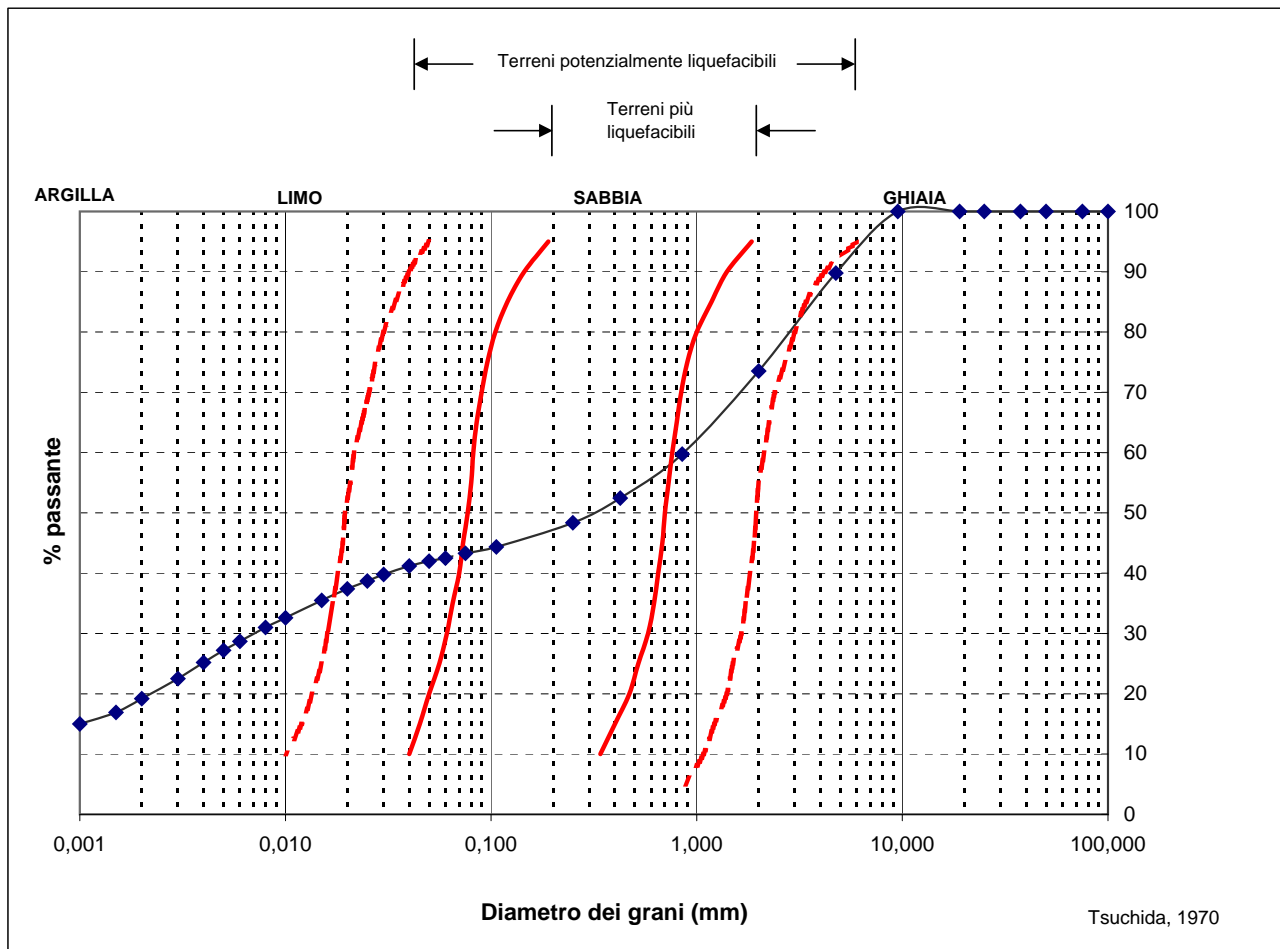
Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2462/2010

Pag. 3 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 1 Campione 1 Profondità 3.60-4.00

POTENZIALE DI LIQUEFACIBILITA'



Il direttore del Laboratorio
[Signature]

Lo sperimentatore
[Signature]



Committente Geotalia srl – Roma Pag. 1 di 1
 Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda

LIMITI DI CONSISTENZA

Norma di riferimento ASTM D4318

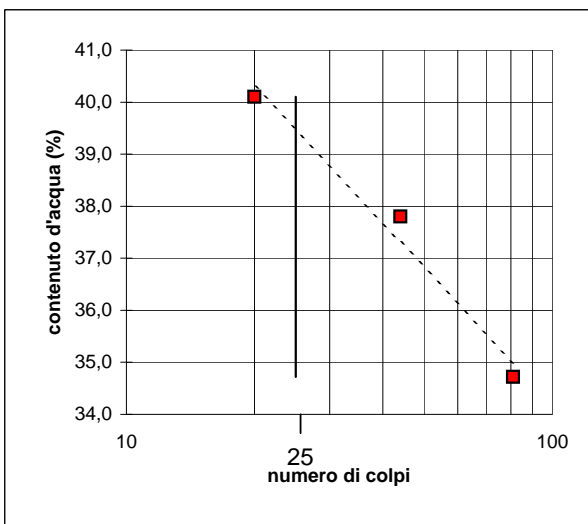
Data prova 04/10/10
 Data certificato 06/10/10
 Verb. Accettazione 165
 N. Certificato 2458/2010

Sondaggio 1 Campione 1 Profondità 3.60-4.00

Limite Liquido				39,5
Numero tara		B22	B21	A8
Numero dei colpi		81	44	20
P. umido + tara	g	86,13	86,05	99,90
P. secco + tara	g	68,46	67,27	76,41
Peso tara	g	17,57	17,59	17,83
Peso umido	g	68,56	68,46	82,07
Peso secco	g	50,89	49,68	58,58
Contenuto d'acqua	%	34,72	37,80	40,10

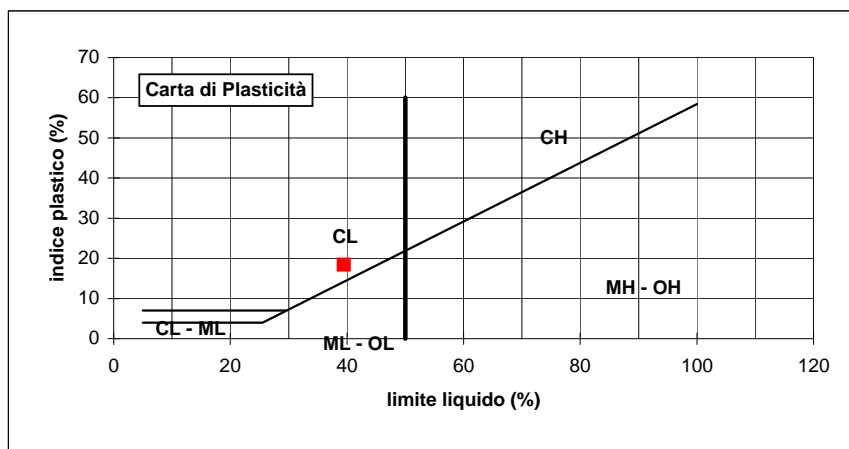
Limite Plastico				21,0
Numero tara		A7	B26	
P. umido + tara	g	32,09	33,82	
P. secco + tara	g	29,60	30,99	
Peso tara	g	17,77	17,53	
Peso umido	g	14,32	16,29	
Peso secco	g	11,83	13,46	
Contenuto d'acqua	%	21,05	21,03	

Umidità Naturale			
Numero tara		B44	
P. umido + tara	g	73,54	
P. secco + tara	g	69,45	
Peso tara	g	31,98	
Peso umido	g	41,56	
Peso secco	g	37,47	
Contenuto d'acqua	%	10,9	



Limite Liquido LL	39,5
Limite Plastico LP	21,0
Indice di Plasticità Ip	18,4
Umidità Naturale Wn	10,9
Indice di Consistenza Ic	1,5

$$I_p = LL - LP \quad I_c = \frac{LL - W_n}{I_p}$$



- ML** Limi inorganici di bassa plasticità
- MH** Limi inorganici di alta plasticità
- CL** Argille inorganiche di bassa plasticità
- CH** Argille inorganiche di alta plasticità
- OL** Argille organiche di bassa plasticità
- OH** Argille organiche di alta plasticità

Il direttore del Laboratorio

Lo sperimentatore



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

SETUP DATA

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1	Test type	<input type="radio"/> Single stage <input checked="" type="radio"/> Multistage
Sample description	Materiale passante a 0.425 mm a contenuto d'acqua compreso tra LL e LP.		
Preparation method	Remoulded at a specified moisture content		

STAGE 1

Machine number	4.00	Specimen depth (m)	3.60/4.00
----------------	------	--------------------	-----------

Initial measurements

Diameter of internal ring (mm)	70.0	Internal radius (mm)	35.0
Diameter of external ring (mm)	100.0	External radius (mm)	50.0
Specimen thickness (mm)	5.0	Distance between force points (mm)	77.0
Mass of cell (g)	605.1	Specimen volume (cc)	20.0
Mass of cell + wet soil (g)	647.9	Mass of specimen (g)	42.7

Trimmings moisture content

Mass of wet soil + tin (g)	86.13
Mass of dry soil + tin (g)	68.46
Mass of tin (g)	17.57

Final moisture content

Mass of wet soil + tin (g)	51.88
Mass of dry soil + tin (g)	42.51
Mass of tin (g)	17.62

Applied stress

Mass directly applied (kg)	0.27	Total mass on specimen (kg)	5.27
Mass indirectly applied (kg)	0.50	Normal stress (kPa)	13
Load arm ratio (**:1)	10.0		

Consolidation stage

Initial vertical displacement reading (mm)*		
t100 (root mins)	1.73	
t100 (mins)	3.00	
Estimated linear displacement at failure (mm)	3.00	
Minimum time to failure (t_f) (mins)	38.04	
Rate of linear displacement (mm/min)	Calculated 0.079	Actual 0.018
Rate of angular displacement (°/min)	Calculated 0.106	Actual 0.024

Shear stage - initial readings

Vertical displacement (mm)*	
Shear force device A (N)*	
Shear force device B (N)*	
Angular rotation (°)*	

* If initial readings are not entered, values will be taken from the test data



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS
 Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

SETUP DATA

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1	Test type	<input type="radio"/> Single stage <input checked="" type="radio"/> Multistage
Sample description	Materiale passante a 0.425 mm a contenuto d'acqua compreso tra LL e LP.		
Preparation method	Remoulded at a specified moisture content		

STAGE 2

Applied stress			
Mass directly applied (kg)	0.27	Total mass on specimen (kg)	10.27
Mass indirectly applied (kg)	1.00	Normal stress (kPa)	25
Load arm ratio (**:1)	10.0		

Consolidation stage			
Initial vertical displacement reading (mm)*			
t100 (root mins)	0.91		
t100 (mins)	0.83		
Estimated horizontal displacement at failure (mm)	3.00		
Minimum time to failure (t_f) (mins)	10.56		
Rate of linear displacement (mm/min)	Calculated	0.284	Actual 0.018
Rate of angular displacement (°/min)	Calculated	0.383	Actual 0.024

Shear stage - initial readings			
Vertical displacement (mm)*			
Shear force device A (N)*			
Shear force device B (N)*			
Angular rotation (°)*			

* If initial readings are not entered, values will be taken from the test data



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

SETUP DATA

Project location	GEOITALIA - Balzo		Sample depth (m)	3.60/4.00
Project reference	Palazzi Giomarelli srl		Sample type	Remoulded
Borehole number	1		Test type	<input type="radio"/> Single stage <input checked="" type="radio"/> Multistage
Sample number	1			
Sample description	Materiale passante a 0.425 mm a contenuto d'acqua compreso tra LL e LP.			
Preparation method	Remoulded at a specified moisture content			

STAGE 3

Applied stress

Mass directly applied (kg)	0.27	Total mass on specimen (kg)	20.27
Mass indirectly applied (kg)	2.00	Normal stress (kPa)	50
Load arm ratio (**:1)	10.0		

Consolidation stage

Initial vertical displacement reading (mm)*			
t100 (root mins)		2.67	
t100 (mins)		7.14	
Estimated horizontal displacement at failure (mm)		3.00	
Minimum time to failure (t_f) (mins)		90.64	
Rate of linear displacement (mm/min)	Calculated	0.033	Actual 0.018
Rate of angular displacement (°/min)	Calculated	0.045	Actual 0.024

Shear stage - initial readings

Vertical displacement (mm)*	
Shear force device A (N)*	
Shear force device B (N)*	
Angular rotation (°)*	

* If initial readings are not entered, values will be taken from the test data



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST REPORT - SUMMARY

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		
Sample description	Materiale passante a 0.425 mm a contenuto d'acqua compreso tra LL e LP.		
Preparation method	Remoulded at a specified moisture content		

INITIAL CONDITIONS	Stage 1	Stage 2	Stage 3
Specimen depth (m)	3.60/4.00	-	-
Specimen thickness (mm)	5.0	-	-
External ring radius (mm)	50.0	-	-
Internal ring radius (mm)	35.0	-	-
Moisture content (trimmings) (%)	35	-	-

SHEARING	Stage 1	Stage 2	Stage 3
Average linear displacement (mm/min)	0.018	0.018	0.018
Rate of angular displacement (°/min)	0.024	0.024	0.024
Conditions at end of shear			
Normal stress (kPa)	13	25	50
Residual shear stress (kPa)	3	7	15
Average linear displacement (mm)	6.08	7.26	8.98
Angular displacement (°)	8.2	9.8	12.1

FINAL MEASUREMENTS	Stage 1	Stage 2	Stage 3
Moisture content (%)	38	-	-

Assumed cohesion (kPa)	0.0
Angle of residual shear resistance (°)	16.6

Comments / variations from procedures:

Il presente rapporto di prova è formato da n. 24 pagine.

Tested Date	Farinelli 08/10/2010	Checked Date	Sfalanga 15/10/2010	Approved Date	Carmignani 25/39/2010
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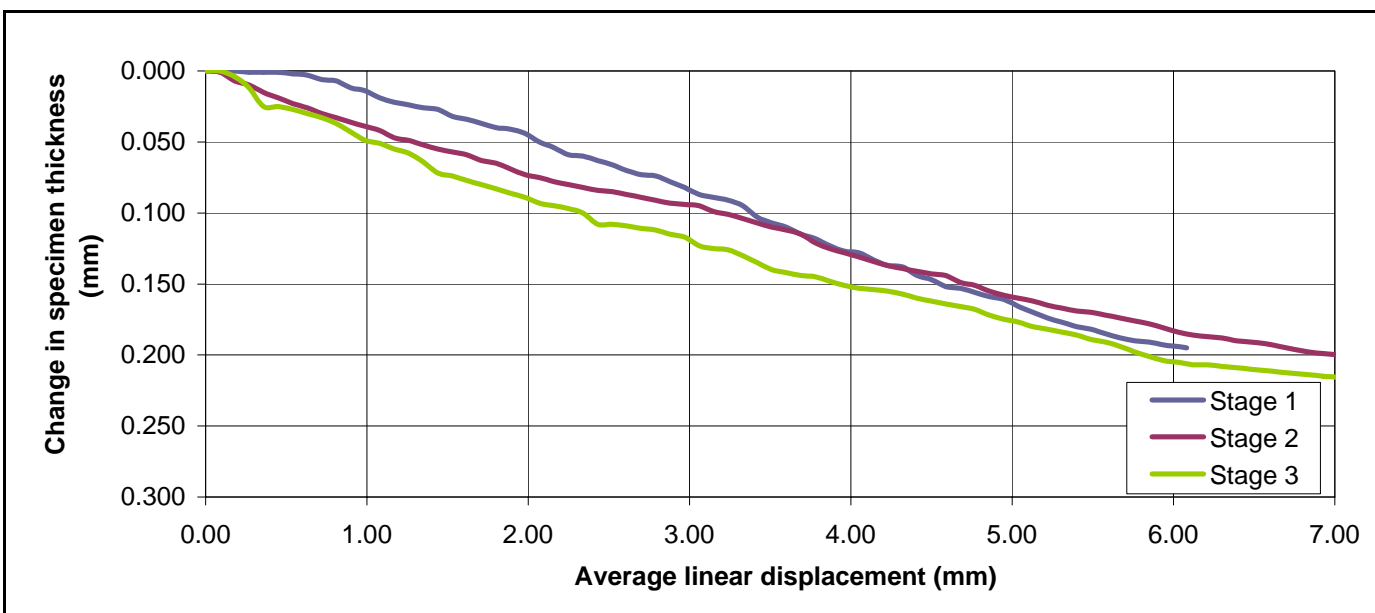
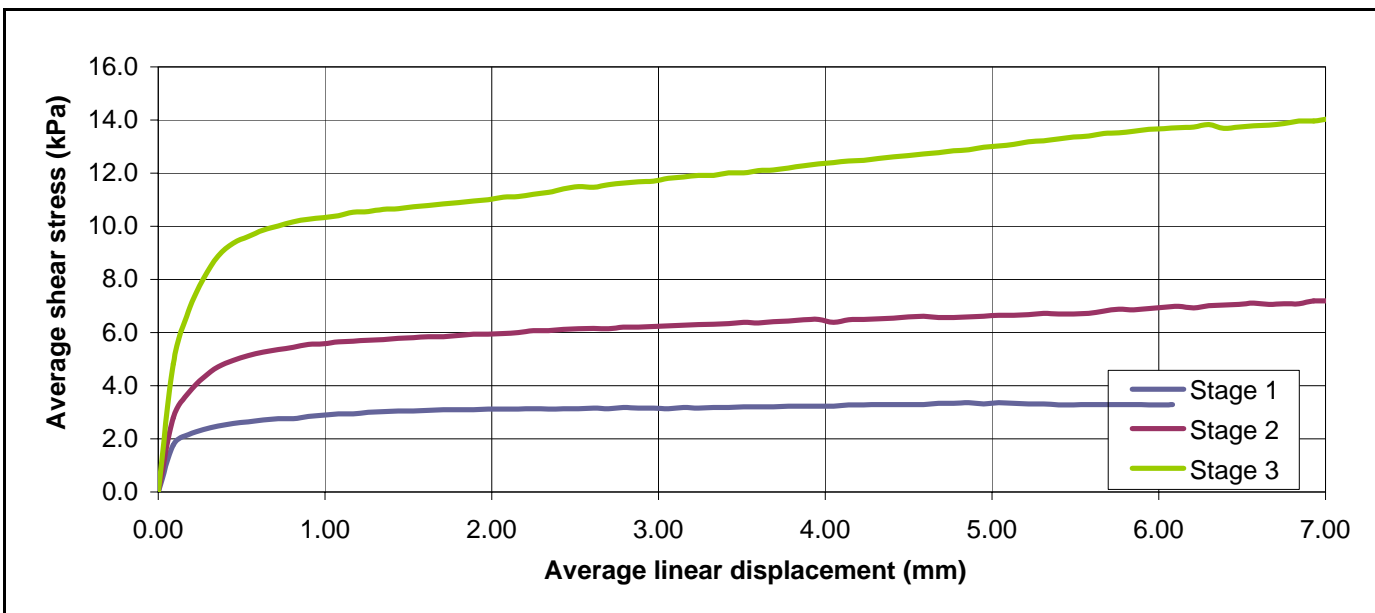


DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST REPORT - SHEARING

Project location	GEOITALIA - Balzo	Sample depth (m)	3.60/4.00
Project reference	Palazzi Giomarelli srl	Sample type	Remoulded
Borehole number	1		
Sample number	1		



Tested Date	Farinelli 08/10/2010	Checked Date	Sfalanga 15/10/2010	Approved Date	Carmignani 25/39/2010
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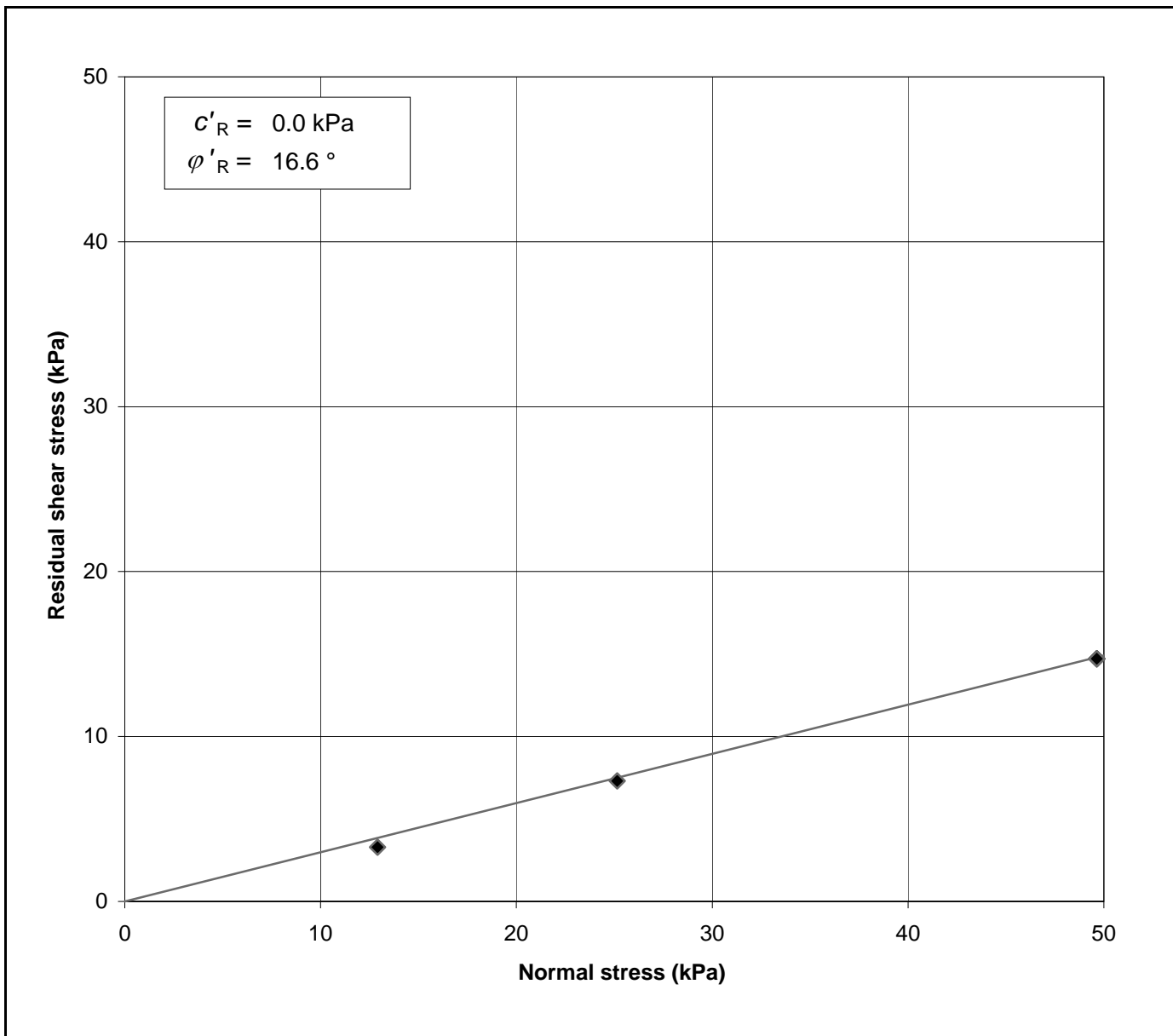


DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST REPORT - SHEARING

Project location	GEOITALIA - Balzo	Sample depth (m)	3.60/4.00
Project reference	Palazzi Giomarelli srl	Sample type	Remoulded
Borehole number	1		
Sample number	1		



Tested Date	Farinelli 08/10/2010	Checked Date	Sfalanga 15/10/2010	Approved Date	Carmignani 25/39/2010
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DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 1 **Normal stress (kPa)** **13**

Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	0.186	0.2	0.000
0.08	0.195	0.3	0.009
0.13	0.201	0.4	0.015
0.21	0.208	0.5	0.022
0.32	0.216	0.6	0.030
0.51	0.223	0.7	0.037
0.81	0.229	0.9	0.043
1.29	0.242	1.1	0.056
2.05	0.257	1.4	0.071
3.25	0.274	1.8	0.088
5.17	0.284	2.3	0.098
8.21	0.296	2.9	0.110
13.06	0.314	3.6	0.128
20.76	0.334	4.6	0.148
33.00	0.354	5.7	0.168
52.47	0.371	7.2	0.185
83.43	0.379	9.1	0.193
132.66	0.385	11.5	0.199
210.92	0.393	14.5	0.207
335.37	0.394	18.3	0.208
533.23	0.395	23.1	0.209
847.84	0.407	29.1	0.221
929.52	0.407	30.5	0.221



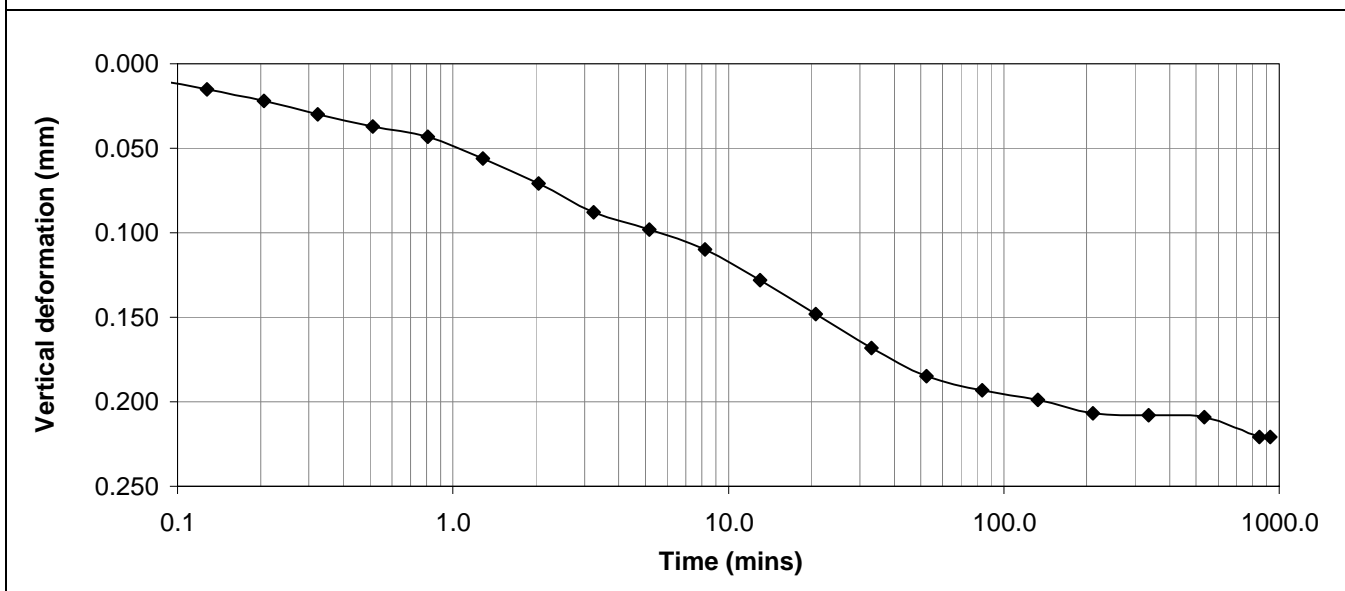
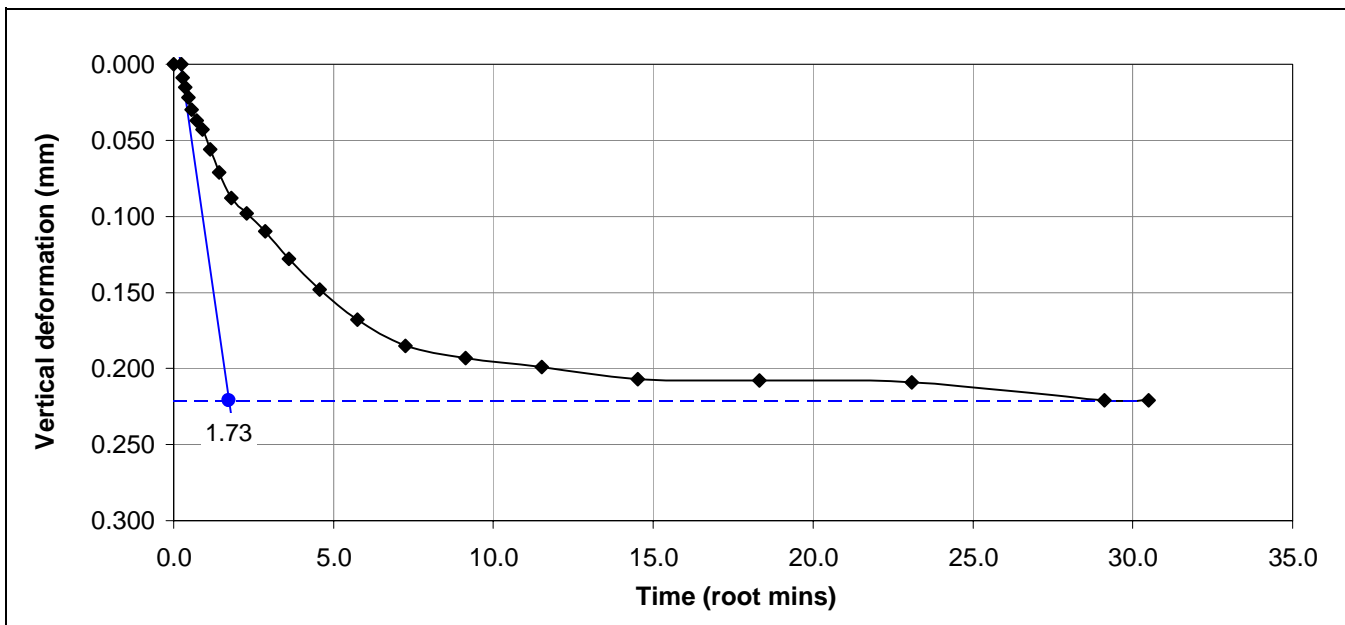
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 1 **Normal stress (kPa)** **13**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	04/10/2010	Date	15/10/2010	Date	25/39/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 1 **Normal stress (kPa)** **13**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
0.01	0.427	0.0	0.1	0.0	0.00	0.000	0.0	0.0
5.01	0.427	3.7	4.3	0.1	0.09	0.000	4.0	1.8
10.00	0.427	4.5	5.2	0.2	0.18	0.000	4.8	2.2
15.00	0.428	5.0	5.6	0.4	0.27	0.001	5.3	2.4
20.00	0.428	5.3	5.9	0.5	0.36	0.001	5.6	2.5
25.00	0.428	5.5	6.1	0.6	0.45	0.001	5.8	2.6
30.00	0.429	5.6	6.3	0.7	0.54	0.002	5.9	2.6
35.00	0.430	5.7	6.5	0.8	0.63	0.003	6.1	2.7
40.00	0.433	5.8	6.6	1.0	0.72	0.006	6.2	2.8
45.00	0.434	5.5	6.9	1.1	0.81	0.007	6.2	2.8
50.00	0.439	5.8	7.0	1.2	0.90	0.012	6.4	2.8
55.00	0.441	5.8	7.2	1.3	0.99	0.014	6.5	2.9
60.00	0.446	5.8	7.4	1.5	1.08	0.019	6.6	2.9
65.00	0.449	5.8	7.4	1.6	1.17	0.022	6.6	2.9
70.00	0.451	5.9	7.6	1.7	1.26	0.024	6.7	3.0
75.00	0.453	5.9	7.7	1.8	1.35	0.026	6.8	3.0
80.00	0.454	6.0	7.7	1.9	1.44	0.027	6.8	3.0
85.00	0.459	5.9	7.8	2.1	1.53	0.032	6.8	3.0
90.00	0.461	6.0	7.8	2.2	1.62	0.034	6.9	3.1
95.00	0.464	6.2	7.7	2.3	1.71	0.037	6.9	3.1
100.00	0.467	6.2	7.7	2.4	1.80	0.040	6.9	3.1
105.00	0.468	6.2	7.7	2.5	1.89	0.041	6.9	3.1
110.00	0.471	6.2	7.8	2.7	1.98	0.044	7.0	3.1
115.00	0.477	6.2	7.8	2.8	2.07	0.050	7.0	3.1
120.00	0.481	6.2	7.8	2.9	2.16	0.054	7.0	3.1
125.00	0.486	6.2	7.9	3.0	2.25	0.059	7.0	3.1
130.00	0.487	6.2	7.8	3.2	2.34	0.060	7.0	3.1
135.00	0.490	6.2	7.9	3.3	2.43	0.063	7.0	3.1
140.00	0.493	6.3	7.8	3.4	2.52	0.066	7.0	3.1
145.00	0.497	6.3	7.9	3.5	2.61	0.070	7.1	3.2
150.00	0.500	6.3	7.8	3.6	2.70	0.073	7.0	3.1
155.00	0.501	6.4	7.9	3.8	2.79	0.074	7.1	3.2
160.00	0.505	6.3	7.9	3.9	2.88	0.078	7.1	3.2
165.00	0.509	6.3	7.9	4.0	2.97	0.082	7.1	3.2



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 1 **Normal stress (kPa)** **13**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
170.00	0.514	6.3	7.8	4.1	3.06	0.087	7.0	3.1
175.00	0.516	6.4	7.9	4.2	3.15	0.089	7.1	3.2
180.00	0.518	6.3	7.9	4.4	3.24	0.091	7.1	3.2
185.00	0.522	6.4	7.9	4.5	3.33	0.095	7.1	3.2
190.00	0.530	6.3	8.0	4.6	3.42	0.103	7.1	3.2
195.00	0.534	6.4	8.0	4.7	3.51	0.107	7.2	3.2
200.00	0.537	6.4	8.0	4.9	3.60	0.110	7.2	3.2
205.00	0.542	6.4	8.0	5.0	3.69	0.115	7.2	3.2
210.00	0.545	6.4	8.1	5.1	3.78	0.118	7.2	3.2
215.00	0.550	6.6	7.9	5.2	3.87	0.123	7.2	3.2
220.00	0.554	6.5	8.0	5.3	3.96	0.127	7.2	3.2
225.00	0.555	6.6	7.9	5.5	4.05	0.128	7.2	3.2
230.00	0.560	6.6	8.1	5.6	4.14	0.133	7.3	3.3
235.00	0.564	6.6	8.1	5.7	4.23	0.137	7.3	3.3
240.00	0.565	6.7	8.1	5.8	4.32	0.138	7.4	3.3
245.00	0.571	6.7	8.1	5.9	4.41	0.144	7.4	3.3
250.00	0.574	7.0	7.8	6.1	4.50	0.147	7.4	3.3
255.00	0.579	6.9	7.9	6.2	4.59	0.152	7.4	3.3
260.00	0.580	6.9	8.1	6.3	4.68	0.153	7.5	3.3
265.00	0.583	6.9	8.1	6.4	4.77	0.156	7.5	3.3
270.00	0.586	6.9	8.2	6.6	4.86	0.159	7.5	3.4
275.00	0.588	7.0	7.9	6.7	4.95	0.161	7.4	3.3
280.00	0.593	7.0	8.1	6.8	5.04	0.166	7.5	3.4
285.00	0.597	6.9	8.1	6.9	5.13	0.170	7.5	3.3
290.00	0.601	6.9	8.0	7.0	5.22	0.174	7.4	3.3
295.00	0.604	6.9	8.0	7.2	5.31	0.177	7.4	3.3
300.00	0.607	6.8	7.9	7.3	5.40	0.180	7.3	3.3
305.00	0.609	6.7	8.0	7.4	5.49	0.182	7.3	3.3
310.00	0.612	6.7	8.1	7.5	5.58	0.185	7.4	3.3
315.00	0.615	6.7	8.1	7.6	5.67	0.188	7.4	3.3
320.00	0.617	6.7	8.1	7.8	5.76	0.190	7.4	3.3
325.00	0.618	6.6	8.2	7.9	5.85	0.191	7.4	3.3
330.00	0.620	6.5	8.2	8.0	5.94	0.193	7.3	3.3
335.00	0.621	6.6	8.1	8.1	6.03	0.194	7.3	3.3



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 1 **Normal stress (kPa)** **13**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
337.91	0.622	6.6	8.2	8.2	6.08	0.195	7.4	3.3



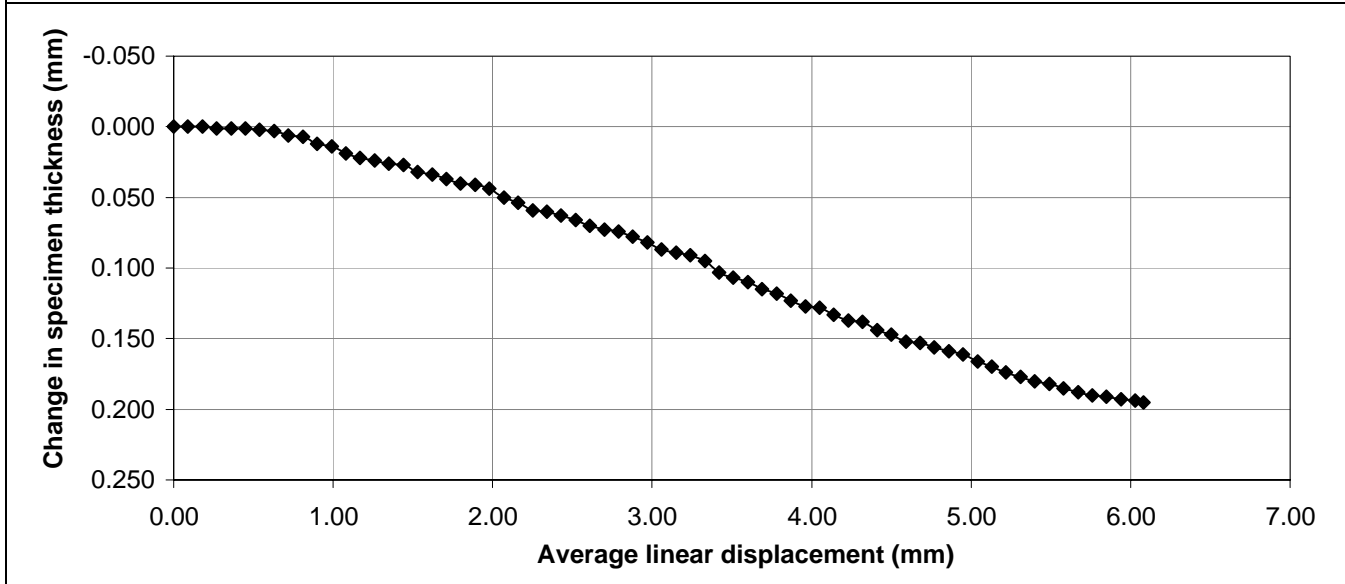
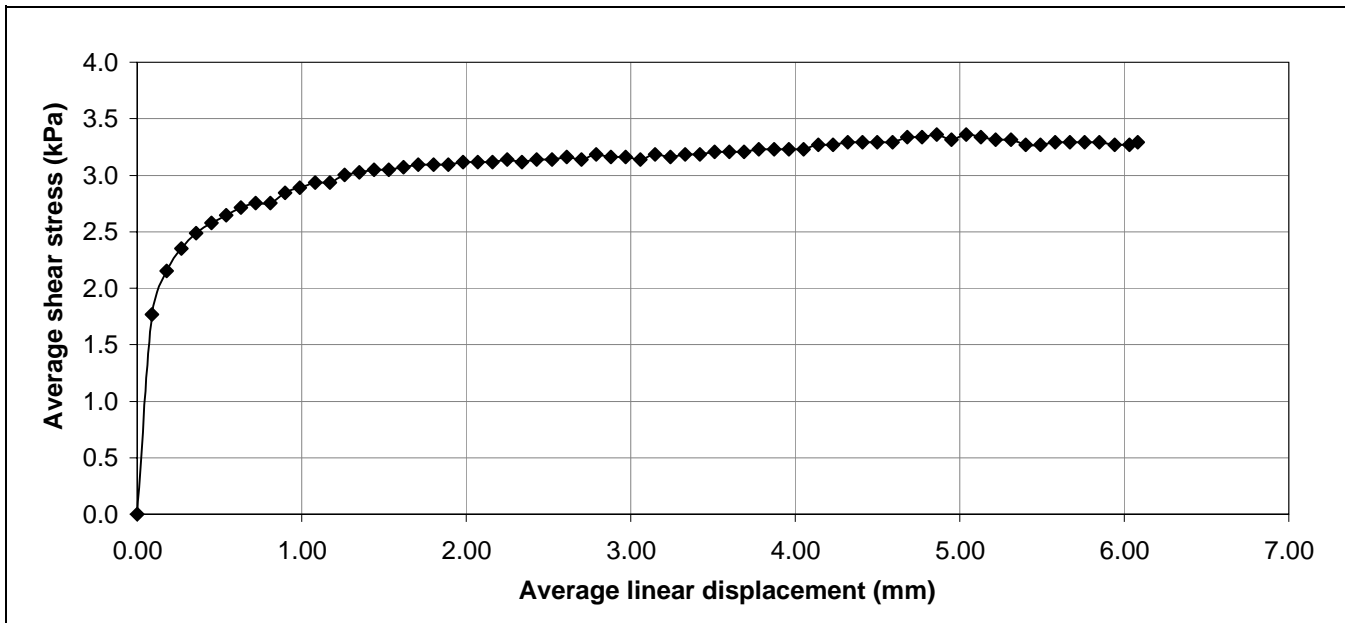
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 1	Normal stress (kPa)	13
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Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	05/10/2010	Date	15/10/2010	Date	25/39/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 2 **Normal stress (kPa)** **25**

Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	0.660	0.2	0.000
0.08	0.667	0.3	0.007
0.13	0.667	0.4	0.007
0.20	0.668	0.4	0.008
0.32	0.674	0.6	0.014
0.51	0.679	0.7	0.019
0.81	0.684	0.9	0.024
1.29	0.688	1.1	0.028
2.05	0.691	1.4	0.031
3.25	0.700	1.8	0.040
5.16	0.714	2.3	0.054
8.21	0.731	2.9	0.071
13.06	0.740	3.6	0.080
20.76	0.750	4.6	0.090
33.00	0.767	5.7	0.107
52.47	0.775	7.2	0.115
83.43	0.785	9.1	0.125
132.66	0.798	11.5	0.138
210.92	0.813	14.5	0.153
335.37	0.814	18.3	0.154
533.23	0.814	23.1	0.154
847.84	0.814	29.1	0.154
1093.78	0.814	33.1	0.154



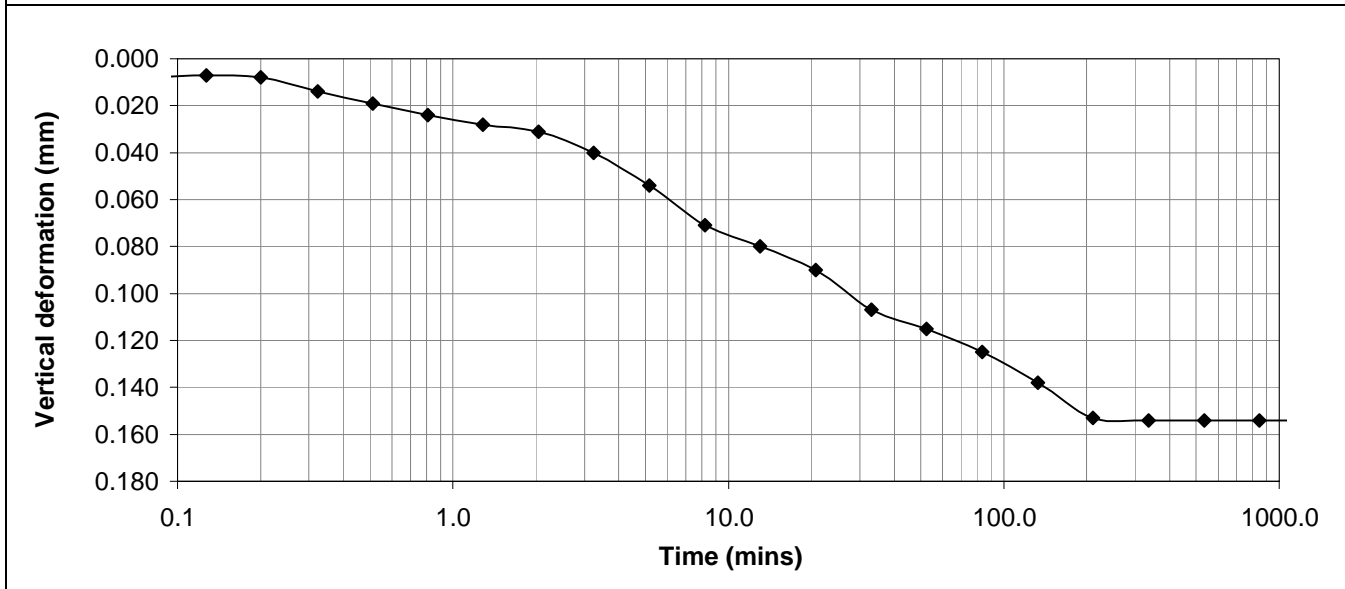
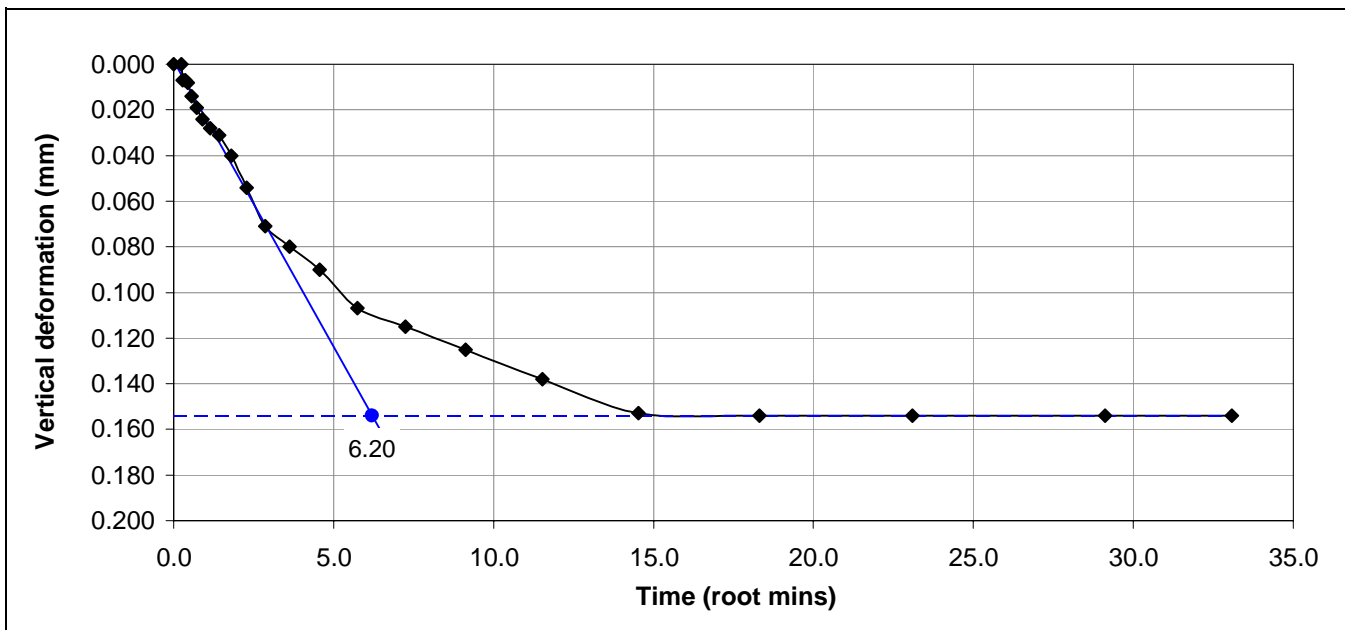
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 2	Normal stress (kPa)	25
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Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	05/10/2010	Date	15/10/2010	Date	25/39/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 2 **Normal stress (kPa)** **25**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
0.02	0.814	0.0	-0.2	0.0	0.00	0.000	0.0	0.0
5.00	0.815	5.8	6.5	0.1	0.09	0.001	6.3	2.8
10.00	0.821	7.7	8.7	0.2	0.18	0.007	8.3	3.7
15.00	0.824	8.9	10.1	0.4	0.27	0.010	9.6	4.3
20.00	0.829	9.8	11.0	0.5	0.36	0.015	10.5	4.7
25.00	0.833	10.3	11.6	0.6	0.45	0.019	11.1	5.0
30.00	0.837	10.7	12.0	0.7	0.54	0.023	11.5	5.1
35.00	0.840	10.9	12.4	0.8	0.63	0.026	11.8	5.3
40.00	0.844	11.1	12.6	1.0	0.72	0.030	12.0	5.4
45.00	0.847	10.9	13.2	1.1	0.81	0.033	12.2	5.4
50.00	0.850	11.2	13.4	1.2	0.90	0.036	12.4	5.6
55.00	0.853	11.2	13.5	1.3	0.99	0.039	12.5	5.6
60.00	0.856	11.2	13.8	1.5	1.08	0.042	12.6	5.6
65.00	0.861	11.3	13.8	1.6	1.17	0.047	12.7	5.7
70.00	0.863	11.3	14.0	1.7	1.26	0.049	12.8	5.7
75.00	0.866	11.2	14.2	1.8	1.35	0.052	12.8	5.7
80.00	0.869	11.4	14.2	1.9	1.44	0.055	12.9	5.8
85.00	0.871	11.3	14.4	2.1	1.53	0.057	13.0	5.8
90.00	0.873	11.5	14.4	2.2	1.62	0.059	13.1	5.8
95.00	0.877	11.4	14.5	2.3	1.71	0.063	13.1	5.8
100.00	0.879	11.3	14.8	2.4	1.80	0.065	13.2	5.9
105.00	0.883	11.5	14.8	2.5	1.89	0.069	13.3	5.9
110.00	0.887	11.4	14.9	2.7	1.98	0.073	13.3	5.9
115.00	0.889	11.5	14.9	2.8	2.07	0.075	13.3	6.0
120.00	0.892	11.7	14.9	2.9	2.16	0.078	13.4	6.0
125.00	0.894	11.7	15.2	3.0	2.25	0.080	13.6	6.1
130.00	0.896	11.7	15.2	3.2	2.34	0.082	13.6	6.1
135.00	0.898	11.7	15.4	3.3	2.43	0.084	13.7	6.1
140.00	0.899	11.8	15.4	3.4	2.52	0.085	13.7	6.1
145.00	0.901	11.9	15.4	3.5	2.61	0.087	13.8	6.2
150.00	0.903	12.0	15.2	3.6	2.70	0.089	13.7	6.1
155.00	0.905	11.9	15.6	3.8	2.79	0.091	13.9	6.2
160.00	0.907	12.0	15.5	3.9	2.88	0.093	13.9	6.2
165.00	0.908	12.0	15.6	4.0	2.97	0.094	13.9	6.2



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 2 **Normal stress (kPa)** **25**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
170.00	0.909	12.2	15.5	4.1	3.06	0.095	14.0	6.3
175.00	0.913	12.1	15.7	4.2	3.15	0.099	14.0	6.3
180.00	0.915	12.2	15.7	4.4	3.24	0.101	14.1	6.3
185.00	0.918	12.2	15.8	4.5	3.33	0.104	14.1	6.3
190.00	0.921	12.2	15.9	4.6	3.42	0.107	14.2	6.3
195.00	0.924	12.5	15.8	4.7	3.51	0.110	14.3	6.4
200.00	0.926	12.4	15.8	4.9	3.60	0.112	14.2	6.4
205.00	0.929	12.2	16.2	5.0	3.69	0.115	14.3	6.4
210.00	0.935	12.3	16.2	5.1	3.78	0.121	14.4	6.4
215.00	0.939	12.4	16.3	5.2	3.87	0.125	14.5	6.5
220.00	0.942	12.5	16.3	5.3	3.96	0.128	14.5	6.5
225.00	0.945	13.0	15.3	5.5	4.05	0.131	14.3	6.4
230.00	0.948	13.0	15.7	5.6	4.14	0.134	14.5	6.5
235.00	0.951	13.0	15.8	5.7	4.23	0.137	14.5	6.5
240.00	0.953	13.0	15.9	5.8	4.32	0.139	14.6	6.5
245.00	0.955	13.0	16.0	5.9	4.41	0.141	14.6	6.5
250.00	0.957	13.1	16.1	6.1	4.50	0.143	14.7	6.6
255.00	0.958	13.1	16.2	6.2	4.59	0.144	14.8	6.6
260.00	0.963	13.6	15.5	6.3	4.68	0.149	14.7	6.6
265.00	0.965	13.5	15.6	6.4	4.77	0.151	14.7	6.6
270.00	0.969	13.5	15.7	6.6	4.86	0.155	14.7	6.6
275.00	0.972	13.3	16.0	6.7	4.95	0.158	14.8	6.6
280.00	0.974	13.4	16.1	6.8	5.04	0.160	14.9	6.7
285.00	0.976	13.4	16.1	6.9	5.13	0.162	14.9	6.7
290.00	0.979	13.3	16.3	7.0	5.22	0.165	14.9	6.7
295.00	0.981	13.4	16.4	7.2	5.31	0.167	15.0	6.7
300.00	0.983	13.9	15.8	7.3	5.40	0.169	15.0	6.7
305.00	0.984	13.8	15.9	7.4	5.49	0.170	15.0	6.7
310.00	0.986	13.8	16.0	7.5	5.58	0.172	15.0	6.7
315.00	0.988	13.7	16.5	7.6	5.67	0.174	15.2	6.8
320.00	0.990	13.9	16.6	7.8	5.76	0.176	15.4	6.9
325.00	0.992	13.9	16.5	7.9	5.85	0.178	15.3	6.9
330.00	0.995	14.1	16.5	8.0	5.94	0.181	15.4	6.9
335.00	0.998	14.2	16.6	8.1	6.03	0.184	15.5	6.9



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 2 **Normal stress (kPa)** **25**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
340.00	1.000	14.2	16.8	8.3	6.12	0.186	15.6	7.0
345.00	1.001	14.4	16.3	8.4	6.21	0.187	15.5	6.9
350.00	1.002	14.6	16.5	8.5	6.30	0.188	15.7	7.0
355.00	1.004	14.6	16.6	8.6	6.39	0.190	15.7	7.0
360.00	1.005	14.4	16.9	8.7	6.48	0.191	15.8	7.1
365.00	1.006	14.6	16.9	8.9	6.57	0.192	15.9	7.1
370.00	1.008	15.0	16.3	9.0	6.66	0.194	15.8	7.1
375.00	1.010	15.0	16.4	9.1	6.75	0.196	15.8	7.1
380.00	1.012	14.9	16.5	9.2	6.84	0.198	15.8	7.1
385.00	1.013	14.7	17.2	9.3	6.93	0.199	16.1	7.2
390.00	1.014	14.8	17.1	9.5	7.02	0.200	16.1	7.2
395.00	1.016	15.0	17.2	9.6	7.11	0.202	16.2	7.3
400.00	1.017	15.0	17.2	9.7	7.20	0.203	16.2	7.3
403.53	1.021	15.1	17.3	9.8	7.26	0.207	16.3	7.3



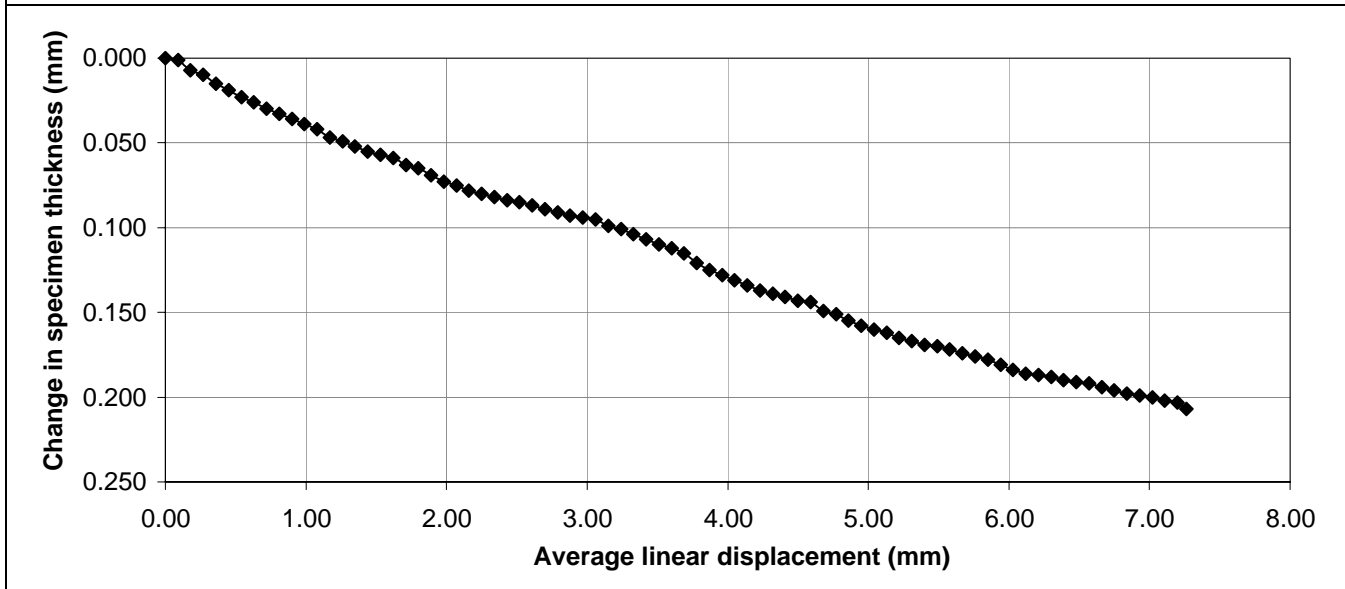
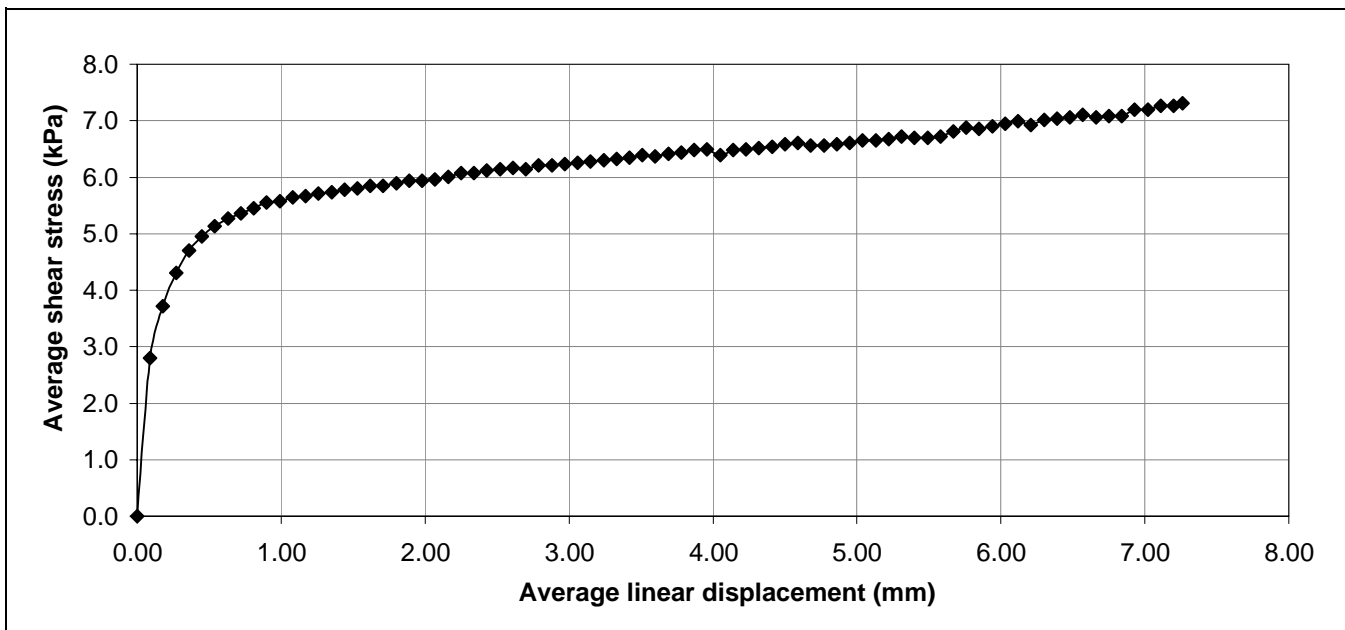
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 2 **Normal stress (kPa)** **25**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	06/10/2010	Date	15/10/2010	Date	25/39/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 3 **Normal stress (kPa)** **50**

Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	1.047	0.2	0.000
0.08	1.050	0.3	0.003
0.13	1.055	0.4	0.008
0.20	1.058	0.4	0.011
0.32	1.060	0.6	0.013
0.51	1.063	0.7	0.016
0.81	1.068	0.9	0.021
1.29	1.071	1.1	0.024
2.04	1.075	1.4	0.028
3.25	1.078	1.8	0.031
5.17	1.081	2.3	0.034
8.21	1.084	2.9	0.037
13.06	1.090	3.6	0.043
20.76	1.103	4.6	0.056
33.01	1.125	5.7	0.078
52.48	1.132	7.2	0.085
83.43	1.139	9.1	0.092
132.66	1.145	11.5	0.098
210.92	1.149	14.5	0.102
335.37	1.150	18.3	0.103
533.23	1.149	23.1	0.102
847.83	1.149	29.1	0.102
1029.88	1.149	32.1	0.102



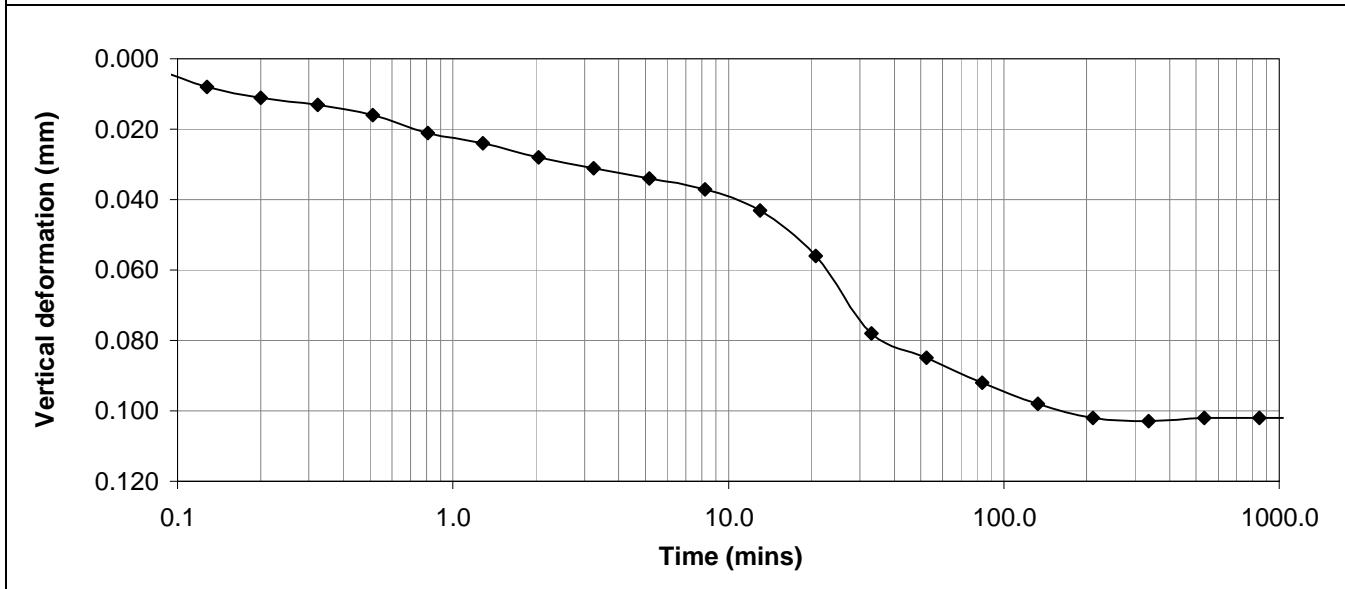
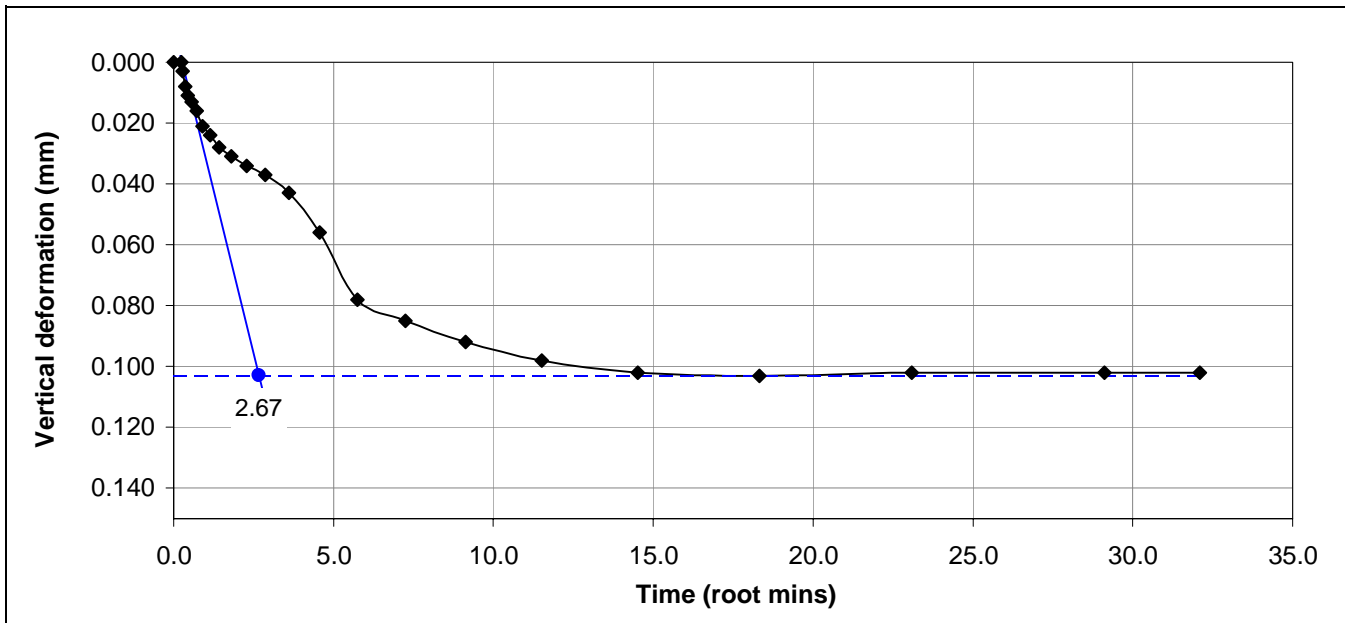
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 3 **Normal stress (kPa)** **50**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	06/10/2010	Date	15/10/2010	Date	25/39/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 3 **Normal stress (kPa)** **50**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
0.02	1.152	0.1	0.0	0.0	0.00	0.000	0.0	0.0
5.00	1.152	10.0	11.6	0.1	0.09	0.000	10.8	4.8
10.00	1.156	14.1	16.3	0.2	0.18	0.004	15.2	6.8
15.00	1.164	16.7	19.2	0.4	0.27	0.012	17.9	8.0
20.00	1.177	18.5	21.2	0.5	0.36	0.025	19.8	8.9
25.00	1.177	19.6	22.3	0.6	0.45	0.025	20.9	9.4
30.00	1.179	20.3	22.7	0.7	0.54	0.027	21.5	9.6
35.00	1.182	20.9	23.2	0.8	0.63	0.030	22.0	9.9
40.00	1.185	21.3	23.5	1.0	0.72	0.033	22.4	10.0
45.00	1.189	21.6	23.9	1.1	0.81	0.037	22.7	10.2
50.00	1.195	21.8	24.1	1.2	0.90	0.043	22.9	10.3
55.00	1.201	22.0	24.2	1.3	0.99	0.049	23.1	10.3
60.00	1.203	22.1	24.4	1.5	1.08	0.051	23.2	10.4
65.00	1.207	22.4	24.7	1.6	1.17	0.055	23.5	10.5
70.00	1.210	22.5	24.7	1.7	1.26	0.058	23.6	10.6
75.00	1.216	22.7	24.9	1.8	1.35	0.064	23.8	10.6
80.00	1.224	22.7	25.0	1.9	1.44	0.072	23.8	10.7
85.00	1.226	22.9	25.1	2.1	1.53	0.074	24.0	10.7
90.00	1.229	23.0	25.2	2.2	1.62	0.077	24.1	10.8
95.00	1.232	23.3	25.2	2.3	1.71	0.080	24.2	10.8
100.00	1.235	23.3	25.4	2.4	1.80	0.083	24.3	10.9
105.00	1.238	23.4	25.6	2.5	1.89	0.086	24.5	11.0
110.00	1.241	23.5	25.7	2.7	1.98	0.089	24.6	11.0
115.00	1.245	23.7	25.9	2.8	2.07	0.093	24.8	11.1
120.00	1.247	23.7	26.0	2.9	2.16	0.095	24.8	11.1
125.00	1.249	23.9	26.2	3.0	2.25	0.097	25.0	11.2
130.00	1.252	24.1	26.3	3.2	2.34	0.100	25.2	11.3
135.00	1.260	24.3	26.7	3.3	2.43	0.108	25.5	11.4
140.00	1.260	24.5	26.9	3.4	2.52	0.108	25.7	11.5
145.00	1.261	24.6	26.7	3.5	2.61	0.109	25.6	11.5
150.00	1.263	24.7	27.0	3.6	2.70	0.111	25.8	11.6
155.00	1.264	24.8	27.2	3.8	2.79	0.112	26.0	11.6
160.00	1.267	24.9	27.3	3.9	2.88	0.115	26.1	11.7
165.00	1.269	25.3	27.0	4.0	2.97	0.117	26.1	11.7



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 3 **Normal stress (kPa)** **50**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
170.00	1.275	25.4	27.4	4.1	3.06	0.123	26.4	11.8
175.00	1.277	25.4	27.6	4.2	3.15	0.125	26.5	11.9
180.00	1.278	25.5	27.8	4.4	3.24	0.126	26.6	11.9
185.00	1.282	25.5	27.8	4.5	3.33	0.130	26.6	11.9
190.00	1.287	25.7	28.0	4.6	3.42	0.135	26.8	12.0
195.00	1.292	25.9	27.8	4.7	3.51	0.140	26.8	12.0
200.00	1.294	26.0	28.1	4.9	3.60	0.142	27.0	12.1
205.00	1.296	26.0	28.2	5.0	3.69	0.144	27.1	12.1
210.00	1.297	26.1	28.4	5.1	3.78	0.145	27.2	12.2
215.00	1.300	26.3	28.6	5.2	3.87	0.148	27.4	12.3
220.00	1.303	26.4	28.8	5.3	3.96	0.151	27.6	12.3
225.00	1.305	26.4	29.0	5.5	4.05	0.153	27.7	12.4
230.00	1.306	26.6	29.1	5.6	4.14	0.154	27.8	12.5
235.00	1.307	26.8	29.0	5.7	4.23	0.155	27.9	12.5
240.00	1.309	27.0	29.1	5.8	4.32	0.157	28.0	12.5
245.00	1.312	27.1	29.3	5.9	4.41	0.160	28.2	12.6
250.00	1.314	27.2	29.4	6.1	4.50	0.162	28.3	12.7
255.00	1.316	27.3	29.6	6.2	4.59	0.164	28.4	12.7
260.00	1.318	27.4	29.7	6.3	4.68	0.166	28.5	12.8
265.00	1.320	27.6	29.8	6.4	4.77	0.168	28.7	12.8
270.00	1.324	27.7	29.9	6.6	4.86	0.172	28.8	12.9
275.00	1.327	27.9	30.1	6.7	4.95	0.175	29.0	13.0
280.00	1.329	28.0	30.2	6.8	5.04	0.177	29.1	13.0
285.00	1.332	28.2	30.3	6.9	5.13	0.180	29.2	13.1
290.00	1.334	28.4	30.5	7.0	5.22	0.182	29.4	13.2
295.00	1.336	28.8	30.3	7.2	5.31	0.184	29.5	13.2
300.00	1.338	28.9	30.5	7.3	5.40	0.186	29.7	13.3
305.00	1.341	29.0	30.7	7.4	5.49	0.189	29.8	13.4
310.00	1.343	29.1	30.8	7.5	5.58	0.191	29.9	13.4
315.00	1.346	29.2	31.1	7.6	5.67	0.194	30.1	13.5
320.00	1.350	29.3	31.1	7.8	5.76	0.198	30.2	13.5
325.00	1.353	29.4	31.3	7.9	5.85	0.201	30.3	13.6
330.00	1.356	29.6	31.4	8.0	5.94	0.204	30.5	13.6
335.00	1.357	29.6	31.5	8.1	6.03	0.205	30.5	13.7



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 3 **Normal stress (kPa)** **50**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
340.00	1.359	29.7	31.6	8.3	6.12	0.207	30.6	13.7
345.00	1.359	29.7	31.7	8.4	6.21	0.207	30.7	13.7
350.00	1.360	29.9	31.9	8.5	6.30	0.208	30.9	13.8
355.00	1.361	29.6	31.6	8.6	6.39	0.209	30.6	13.7
360.00	1.362	29.7	31.7	8.7	6.48	0.210	30.7	13.7
365.00	1.363	29.8	31.8	8.9	6.57	0.211	30.8	13.8
370.00	1.364	29.9	31.8	9.0	6.66	0.212	30.8	13.8
375.00	1.365	30.0	32.0	9.1	6.75	0.213	31.0	13.9
380.00	1.366	30.2	32.2	9.2	6.84	0.214	31.2	14.0
385.00	1.367	30.2	32.2	9.3	6.93	0.215	31.2	14.0
390.00	1.368	30.5	32.3	9.5	7.02	0.216	31.4	14.1
395.00	1.372	30.5	32.4	9.6	7.11	0.220	31.4	14.1
400.00	1.379	30.6	32.3	9.7	7.20	0.227	31.4	14.1
405.00	1.383	30.7	32.3	9.8	7.29	0.231	31.5	14.1
410.00	1.390	30.8	32.3	9.9	7.38	0.238	31.5	14.1
415.00	1.391	30.8	32.2	10.1	7.47	0.239	31.5	14.1
420.00	1.394	31.1	32.2	10.2	7.56	0.242	31.6	14.2
425.00	1.396	31.3	32.3	10.3	7.65	0.244	31.8	14.2
430.00	1.398	31.6	32.3	10.4	7.74	0.246	31.9	14.3
435.00	1.399	31.7	32.2	10.6	7.83	0.247	31.9	14.3
440.00	1.400	31.8	32.0	10.7	7.92	0.248	31.9	14.3
445.00	1.403	32.0	32.0	10.8	8.01	0.251	32.0	14.3
450.00	1.405	32.2	32.1	10.9	8.10	0.253	32.1	14.4
455.00	1.408	32.2	32.0	11.0	8.19	0.256	32.1	14.4
460.00	1.410	32.3	32.1	11.2	8.28	0.258	32.2	14.4
465.00	1.411	32.5	32.3	11.3	8.37	0.259	32.4	14.5
470.00	1.412	32.5	32.3	11.4	8.46	0.260	32.4	14.5
475.00	1.414	32.6	32.4	11.5	8.55	0.262	32.5	14.5
480.00	1.414	32.7	32.4	11.6	8.64	0.262	32.5	14.6
485.00	1.415	32.9	32.6	11.8	8.73	0.263	32.7	14.7
490.00	1.417	32.9	32.7	11.9	8.82	0.265	32.8	14.7
495.00	1.419	33.0	32.7	12.0	8.91	0.267	32.8	14.7
498.87	1.420	33.0	32.8	12.1	8.98	0.268	32.9	14.7



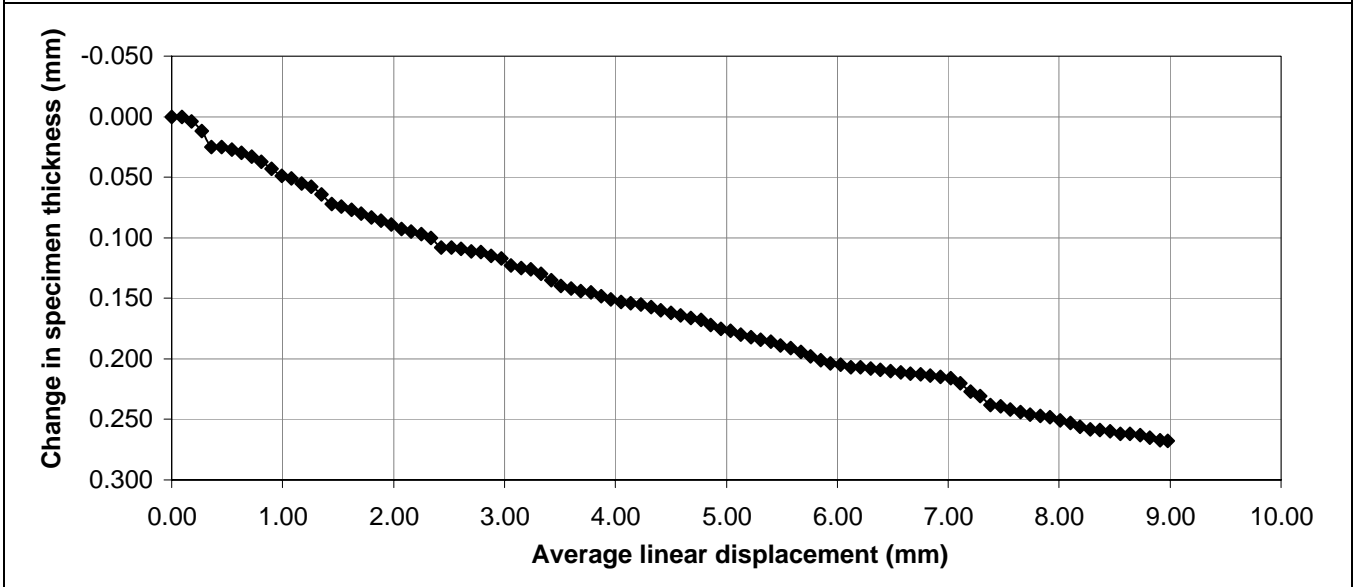
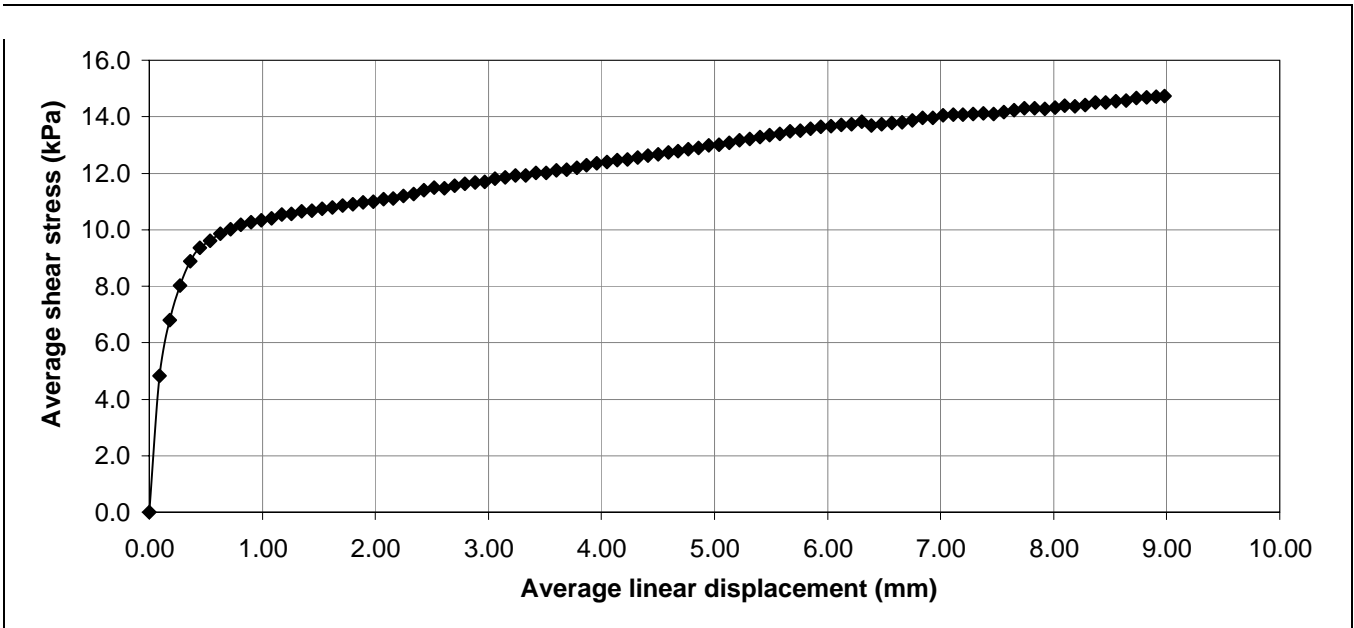
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.60/4.00
Borehole number	1	Sample type	Remoulded
Sample number	1		

STAGE 3	Normal stress (kPa)	50
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Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	07/10/2010	Date	15/10/2010	Date	No. 2539/2010



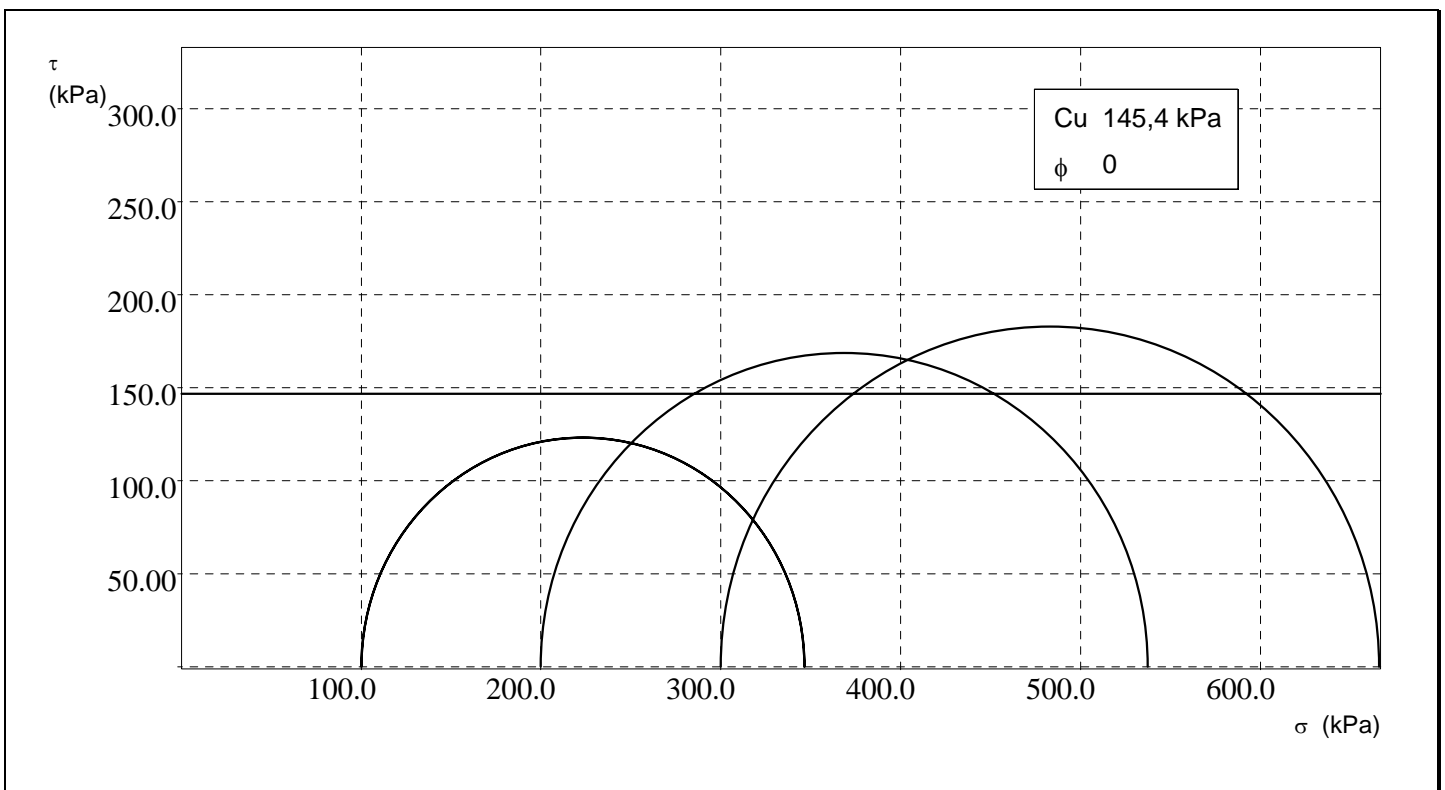
PROVA TRIASSIALE UU (ASTM D2850)

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Balzo
Sondaggio	1
Campione	1
Profondità	3.60-4.00

Risultati di prova

Provino	Ho mm	Ao cm ²	γ_n g/cm ³	γ_d g/cm ³	Wo %	So %	σ kPa	ϵ %	$\sigma_1 - \sigma_3$ kPa
10TUU897	76,00	11,39	2,246	2,007	11,90	90,20	100,00	3,24	246,50
10UU897B	76,00	11,39	2,178	1,970	10,56	74,78	200,00	2,97	337,32
10UU897C	76,00	11,39	2,196	1,982	10,78	78,03	300,00	2,65	365,96



Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

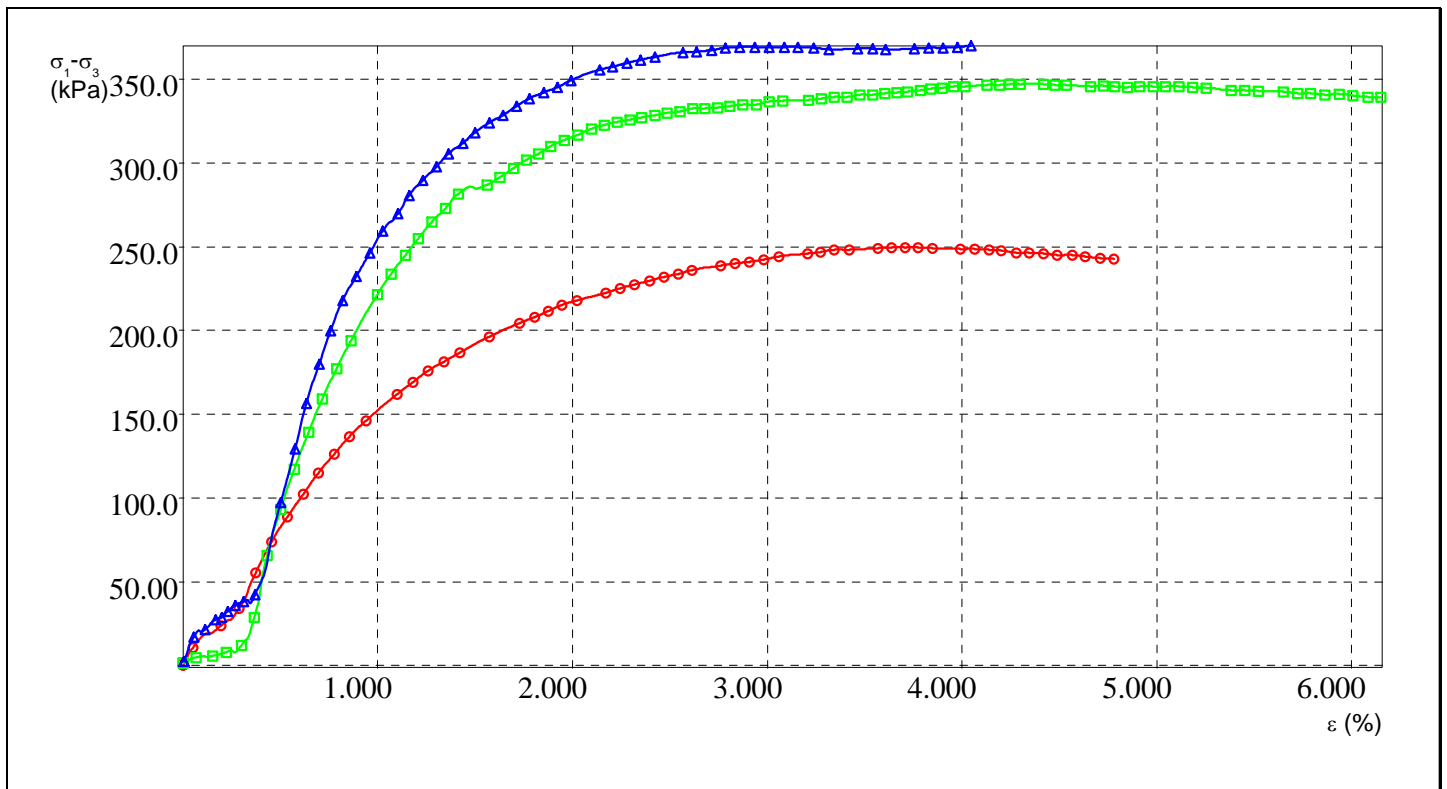
PROVA TRIASSIALE UU (ASTM D2850)

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Balzo
Sondaggio	1
Campione	1
Profondità	3.60-4.00

Risultati di prova

Provino	Ho mm	Ao cm ²	γ_n g/cm ³	γ_d g/cm ³	Wo %	So %	σ kPa	ε %	$\sigma_1 - \sigma_3$ kPa
10TUU897	76,00	11,39	2,246	2,007	11,90	90,20	100,00	3,24	246,50
10UU897B	76,00	11,39	2,178	1,970	10,56	74,78	200,00	2,97	337,32
10UU897C	76,00	11,39	2,196	1,982	10,78	78,03	300,00	2,65	365,96



Il Direttore del Laboratorio


Lo Sperimentatore


rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino A

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Balzo
Sondaggio	1
Campione	1
Profondità	3.60-4.00

Dati del provino

Data del sondaggio			
Sezione provino	11,394 cm ²	Densità umida iniziale	2,246 g/cm ³ γ_n
Altezza iniziale	76,000 mm	Densità umida finale	2,330 g/cm ³ γ_f
Altezza finale	72,318 mm	Densità secca	2,007 g/cm ³ γ_d
No. Tara 1	1	Umidità iniziale	11,898 % W_o
Peso tara 1	10,000 g	Umidità finale	10,483 % W_f
Tara + peso umido iniziale	204,49 g	Saturazione iniziale	90,196 % S_o
No. Tara 2	7	Saturazione finale	97,264 % S_f
Peso tara 2	26,810 g	Indice dei vuoti iniziale	0,360 e_o
Tara + peso umido finale	218,840 g	Indice dei vuoti finale	0,294 e_f
Tara + peso secco	200,620 g	Densità secca finale	2,109 g/cm ³ γ_{df}
Peso specifico dei grani	2,730 g/cm ³		

Elaborazione dati acquisiti

Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa
0,00	11,39	0,00	2,40	11,67	229,71	4,56	11,94	244,96
0,05	11,40	10,67	2,47	11,68	231,62	4,63	11,95	243,88
0,19	11,42	23,58	2,54	11,69	233,75	4,71	11,96	243,23
0,29	11,43	34,03	2,61	11,70	235,66	4,78	11,97	242,84
0,38	11,44	55,25	2,76	11,72	238,53	4,84	11,97	242,21
0,45	11,45	73,61	2,83	11,73	239,96			
0,54	11,46	88,87	2,91	11,74	240,93			
0,62	11,47	102,22	2,98	11,74	242,35			
0,70	11,47	114,85	3,06	11,75	243,77			
0,78	11,48	126,28	3,21	11,77	245,70			
0,86	11,49	136,52	3,27	11,78	246,90			
0,94	11,50	146,03	3,34	11,79	247,87			
1,10	11,52	161,97	3,42	11,80	248,13			
1,18	11,53	169,10	3,57	11,82	248,90			
1,26	11,54	175,98	3,64	11,82	249,39			
1,34	11,55	181,46	3,71	11,83	249,44			
1,42	11,56	186,68	3,78	11,84	249,27			
1,57	11,58	195,96	3,85	11,85	249,08			
1,73	11,59	204,26	3,99	11,87	248,71			
1,81	11,60	208,06	4,07	11,88	248,52			
1,88	11,61	211,63	4,14	11,89	248,10			
1,95	11,62	214,97	4,20	11,89	247,48			
2,02	11,63	217,58	4,28	11,90	246,38			
2,17	11,65	222,35	4,34	11,91	246,43			
2,24	11,66	225,20	4,42	11,92	245,56			
2,32	11,66	227,11	4,49	11,93	244,94			

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

PROVA TRIASSIALE UU (ASTM D2850)

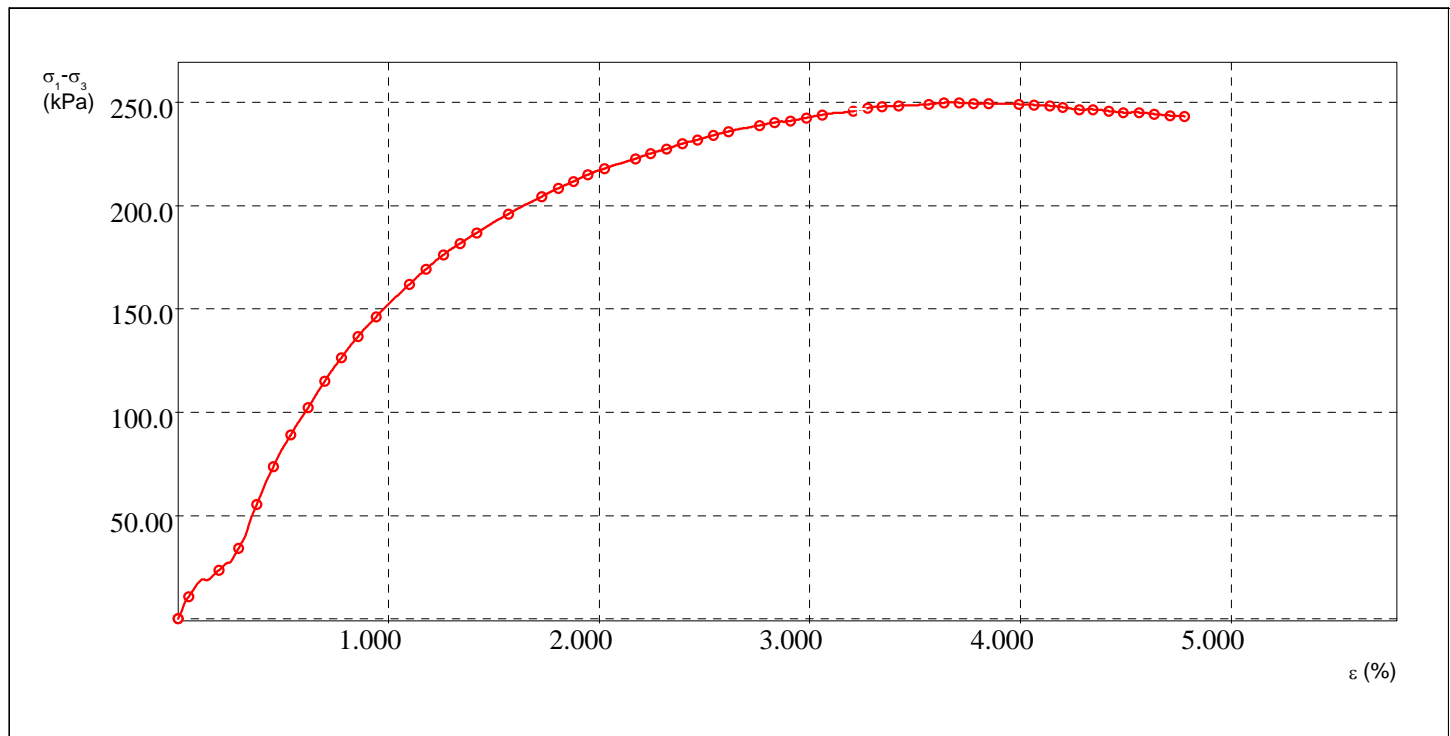
Provino A

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Balzo
Sondaggio	1
Campione	1
Profondità	3.60-4.00

Dati acquisiti

dH mm	dN N	dH mm	dN N	dH mm	dN N
0,00	0,00	0,96	203,07	1,93	273,29
0,04	12,17	1,02	209,56	1,99	275,72
0,15	26,92	1,08	215,77	2,10	279,50
0,22	38,89	1,19	226,84	2,15	281,39
0,29	63,19	1,31	236,83	2,21	282,74
0,35	84,25	1,37	241,42	2,27	284,63
0,41	101,81	1,43	245,74	2,33	286,52
0,47	117,20	1,48	249,79	2,44	289,22
0,53	131,78	1,54	253,03	2,49	290,84
0,59	145,01	1,65	258,97	2,54	292,19
0,65	156,90	1,71	262,48	2,60	292,73
0,71	167,97	1,76	264,92	2,71	294,08
0,84	186,60	1,82	268,16	2,77	294,89
0,90	194,97	1,88	270,59	2,82	295,16



Il Direttore del Laboratorio

[Signature]

Lo Sperimentatore

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rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

PROVA TRIASSIALE UU (ASTM D2850)

Provino A

dH mm	dN N
3,25	293,27
3,30	293,54
3,36	292,73
3,41	292,19
3,47	292,46
3,52	291,38
3,58	290,84
3,63	290,57
3,68	290,03

Restituzione fotografica dopo la prova



Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino B

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli		
Indirizzo			
Cantiere	Balzo		
Sondaggio	1		
Campione	1		
Profondità	3.60-4.00		

Dati del provino

Data del sondaggio			
Sezione provino	11,394 cm ²	Densità umida iniziale	2,178 g/cm ³ γ_n
Altezza iniziale	76,000 mm	Densità umida finale	2,308 g/cm ³ γ_f
Altezza finale	71,268 mm	Densità secca	1,970 g/cm ³ γ_d
No. Tara 1	1	Umidità iniziale	10,561 % W_o
Peso tara 1	10,000 g	Umidità finale	9,852 % W_f
Tara + peso umido iniziale	198,64 g	Saturazione iniziale	74,783 % S_o
No. Tara 2	45	Saturazione finale	89,871 % S_f
Peso tara 2	30,900 g	Indice dei vuoti iniziale	0,386 e_o
Tara + peso umido finale	218,330 g	Indice dei vuoti finale	0,299 e_f
Tara + peso secco	201,520 g	Densità secca finale	2,101 g/cm ³ γ_{df}
Peso specifico dei grani	2,730 g/cm ³		

Elaborazione dati acquisiti

Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa
0,00	11,39	1,36	1,96	11,62	313,54	3,72	11,83	342,56
0,07	11,40	4,74	2,03	11,63	316,87	3,79	11,84	343,30
0,15	11,41	5,68	2,10	11,64	320,20	3,84	11,85	344,02
0,22	11,42	7,80	2,16	11,65	322,44	3,90	11,86	344,79
0,30	11,43	12,05	2,23	11,65	324,21	3,96	11,86	345,33
0,36	11,44	28,57	2,30	11,66	325,52	4,02	11,87	345,65
0,43	11,44	65,84	2,36	11,67	327,08	4,13	11,88	346,46
0,50	11,45	93,38	2,42	11,68	328,61	4,19	11,89	346,60
0,57	11,46	117,35	2,48	11,68	329,69	4,24	11,90	346,75
0,65	11,47	139,40	2,55	11,69	330,75	4,30	11,91	346,80
0,72	11,48	159,07	2,62	11,70	332,44	4,42	11,92	346,75
0,79	11,48	177,29	2,68	11,71	332,44	4,48	11,93	346,44
0,86	11,49	194,08	2,75	11,72	333,11	4,54	11,94	346,36
1,00	11,51	221,26	2,81	11,72	333,96	4,66	11,95	345,57
1,07	11,52	233,54	2,87	11,73	334,91	4,73	11,96	345,78
1,14	11,53	245,08	2,94	11,74	334,85	4,78	11,97	345,48
1,21	11,53	254,98	3,01	11,75	336,50	4,85	11,97	345,08
1,28	11,54	264,63	3,08	11,76	337,16	4,91	11,98	345,32
1,35	11,55	273,09	3,21	11,77	337,49	4,98	11,99	345,61
1,42	11,56	281,32	3,28	11,78	338,31	5,04	12,00	345,68
1,56	11,57	286,96	3,35	11,79	339,29	5,11	12,01	345,42
1,63	11,58	291,33	3,41	11,80	339,20	5,18	12,02	344,97
1,70	11,59	296,79	3,48	11,80	340,41	5,25	12,03	344,50
1,76	11,60	301,62	3,54	11,81	340,55	5,38	12,04	343,41
1,83	11,61	305,45	3,60	11,82	341,47	5,45	12,05	343,43
1,89	11,61	309,74	3,66	11,83	341,84	5,52	12,06	342,81

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino B

Epsilon %	A cm2	s1-s3 kPa
5,65	12,08	342,34
5,72	12,09	341,47
5,79	12,09	341,31
5,86	12,10	340,51
5,94	12,11	340,84
6,01	12,12	340,01
6,08	12,13	339,37
6,15	12,14	339,04
6,23	12,15	338,07

Restituzione fotografica dopo la prova



Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

PROVA TRIASSIALE UU (ASTM D2850)

Provino B

Dati del Cliente

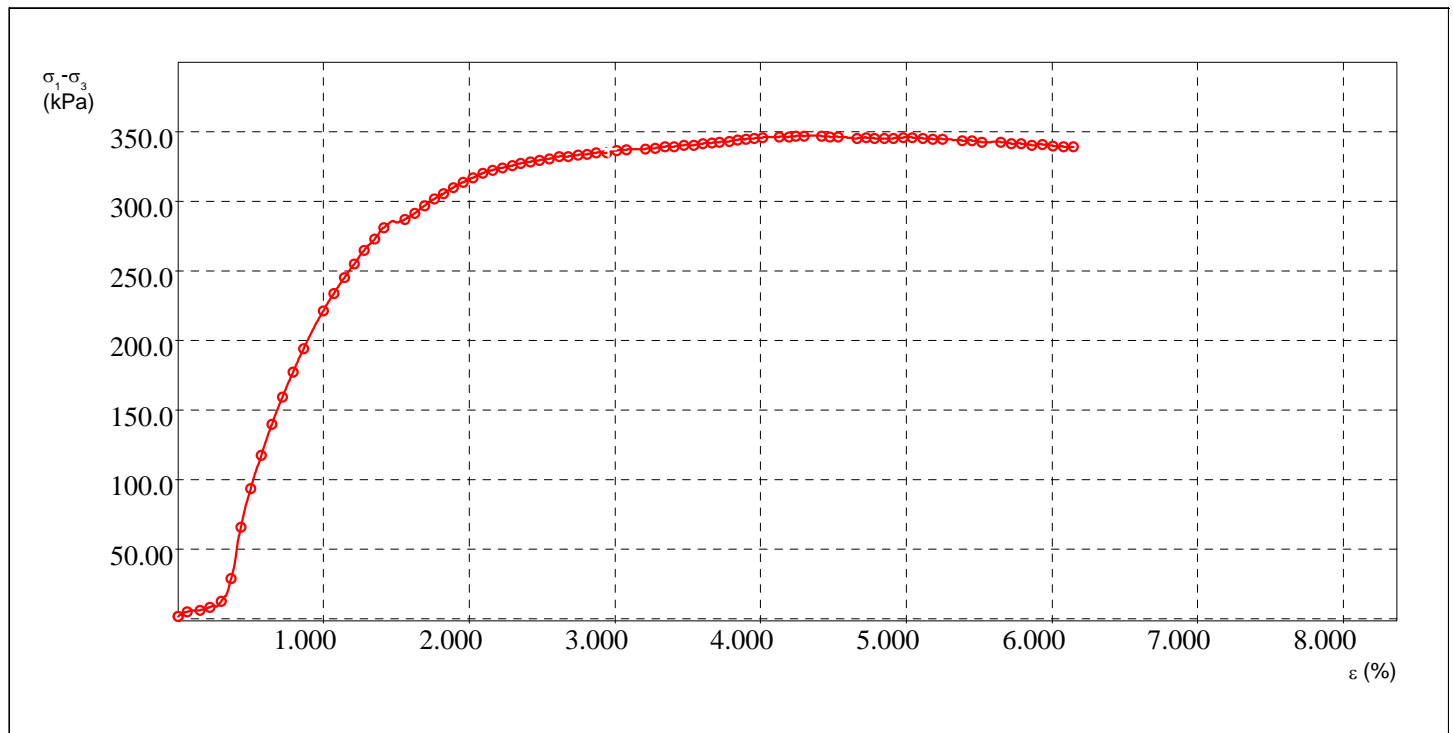
Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Balzo
Sondaggio	1
Campione	1
Profondità	3.60-4.00

Dati acquisiti

dH mm	dN N
0,00	1,55
0,05	5,40
0,12	6,48
0,17	8,91
0,23	13,77
0,28	32,68
0,33	75,34
0,38	106,94
0,44	134,48
0,49	159,87
0,54	182,55
0,60	203,61
0,66	223,06
0,76	254,65
0,81	268,97
0,87	282,47

dH mm	dN N
0,92	294,08
0,97	305,42
1,03	315,41
1,08	325,14
1,19	332,15
1,24	337,44
1,29	344,00
1,34	349,83
1,39	354,50
1,44	359,71
1,49	364,39
1,54	368,52
1,59	372,65
1,64	375,51
1,69	377,83
1,74	379,61

dH mm	dN N
1,79	381,66
1,84	383,71
1,89	385,22
1,94	386,73
1,99	388,97
2,04	389,21
2,09	390,26
2,13	391,50
2,18	392,90
2,24	393,09
2,29	395,31
2,34	396,36
2,44	397,30
2,49	398,54
2,54	399,97
2,59	400,13



Il Direttore del Laboratorio

[Signature]

Lo Sperimentatore

[Signature]

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino B

dH mm	dN N
2,64	401,83
2,69	402,26
2,74	403,61
2,78	404,31
2,83	405,39
2,88	406,55
2,92	407,63
2,96	408,79
3,01	409,68
3,05	410,30
3,14	411,75
3,19	412,20
3,22	412,59
3,27	412,88
3,36	413,34
3,40	413,24
3,45	413,40
3,54	412,99
3,59	413,53
3,64	413,42
3,69	413,23
3,73	413,78
3,78	414,42
3,83	414,78
3,89	414,78
3,94	414,54
3,99	414,28
4,09	413,54
4,14	413,86
4,20	413,42
4,29	413,42
4,35	412,70
4,40	412,78
4,46	412,14
4,51	412,86
4,56	412,16
4,62	411,72
4,67	411,61
4,73	410,77

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

PROVA TRIASSIALE UU (ASTM D2850)

Provino C

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli		
Indirizzo			
Cantiere	Balzo		
Sondaggio	1		
Campione	1		
Profondità	3.60-4.00		

Dati del provino

Data del sondaggio			
Sezione provino	11,394 cm ²	Densità umida iniziale	2,196 g/cm ³ γ_n
Altezza iniziale	76,000 mm	Densità umida finale	2,280 g/cm ³ γ_f
Altezza finale	72,873 mm	Densità secca	1,982 g/cm ³ γ_d
No. Tara 1	1	Umidità iniziale	10,784 % W_o
Peso tara 1	10,000 g	Umidità finale	10,277 % W_f
Tara + peso umido iniziale	200,15 g	Saturazione iniziale	78,027 % S_o
No. Tara 2	1	Saturazione finale	87,501 % S_f
Peso tara 2	28,470 g	Indice dei vuoti iniziale	0,377 e_o
Tara + peso umido finale	217,750 g	Indice dei vuoti finale	0,321 e_f
Tara + peso secco	200,110 g	Densità secca finale	2,067 g/cm ³ γ_{df}
Peso specifico dei grani	2,730 g/cm ³		

Elaborazione dati acquisiti

Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa
0,00	11,39	2,61	1,64	11,58	328,46	3,83	11,85	368,35
0,06	11,40	16,82	1,71	11,59	333,59	3,90	11,86	368,75
0,11	11,41	21,54	1,78	11,60	338,48	3,98	11,87	369,14
0,17	11,41	27,45	1,85	11,61	341,71	4,05	11,87	370,00
0,20	11,42	28,62	1,92	11,62	345,19	4,11	11,88	370,20
0,23	11,42	32,16	1,99	11,63	349,13			
0,27	11,42	35,69	2,14	11,64	355,33			
0,31	11,43	38,04	2,21	11,65	357,17			
0,37	11,44	42,27	2,28	11,66	359,45			
0,50	11,45	97,16	2,35	11,67	361,50			
0,57	11,46	129,37	2,42	11,68	363,32			
0,63	11,47	156,61	2,57	11,69	365,79			
0,70	11,47	180,04	2,64	11,70	366,44			
0,76	11,48	199,70	2,72	11,71	367,07			
0,82	11,49	217,90	2,79	11,72	368,42			
0,89	11,50	232,08	2,86	11,73	369,06			
0,96	11,50	246,23	2,93	11,74	369,23			
1,03	11,51	259,44	3,01	11,75	369,18			
1,10	11,52	269,79	3,09	11,76	368,88			
1,16	11,53	280,63	3,16	11,77	368,85			
1,23	11,54	289,57	3,24	11,78	368,54			
1,30	11,54	297,79	3,32	11,78	367,78			
1,36	11,55	305,54	3,46	11,80	368,14			
1,44	11,56	311,62	3,54	11,81	368,07			
1,50	11,57	317,96	3,61	11,82	367,58			
1,57	11,58	324,02	3,75	11,84	368,17			

Il Direttore del Laboratorio


Lo Sperimentatore


rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

PROVA TRIASSIALE UU (ASTM D2850)

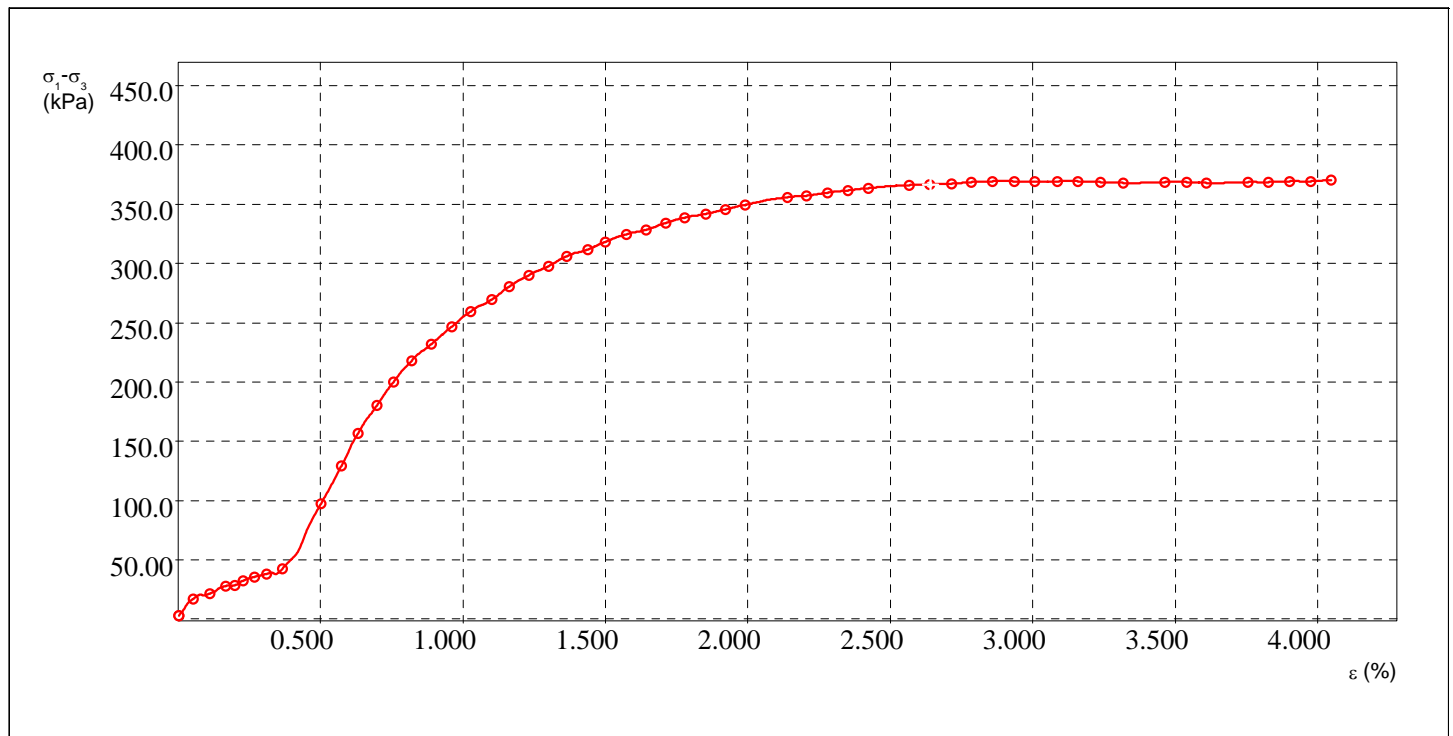
Provino C

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Balzo
Sondaggio	1
Campione	1
Profondità	3.60-4.00

Dati acquisiti

dH mm	dN N	dH mm	dN N	dH mm	dN N
0,00	2,97	0,73	283,28	1,63	413,71
0,04	19,17	0,78	298,67	1,68	416,14
0,09	24,57	0,84	310,82	1,73	419,11
0,13	31,33	0,88	323,52	1,79	421,81
0,15	32,68	0,94	334,05	1,84	424,24
0,17	36,73	0,99	343,77	1,95	427,75
0,20	40,78	1,04	352,95	2,01	428,83
0,24	43,48	1,09	360,24	2,06	429,91
0,28	48,34	1,14	367,80	2,12	431,80
0,38	111,26	1,20	375,09	2,17	432,88
0,44	148,26	1,25	380,50	2,23	433,42
0,48	179,58	1,30	386,71	2,29	433,69
0,53	206,59	1,35	392,65	2,35	433,69
0,58	229,27	1,41	396,70	2,40	433,96
0,62	250,33	1,46	401,02	2,46	433,96
0,68	266,81	1,51	405,88	2,52	433,42



Il Direttore del Laboratorio

[Signature]

Lo Sperimentatore

[Signature]

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

PROVA TRIASSIALE UU (ASTM D2850)

Provino C

dH mm	dN N
2,63	434,50
2,69	434,77
2,74	434,50
2,85	435,85
2,91	436,39
2,96	437,20
3,02	438,01
3,08	439,37
3,13	439,91

Restituzione fotografica dopo la prova



Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

DESCRIZIONE E RIPRESA FOTOGRAFICA DELLA CAROTA ESTRUSA

Committente: GeoItalia srl - Roma

Cantiere/Località: Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

Sondaggio: 3

Campione: 1

Profondità prelievo: 3.60-4.10

Data prelievo: 09/08/2010

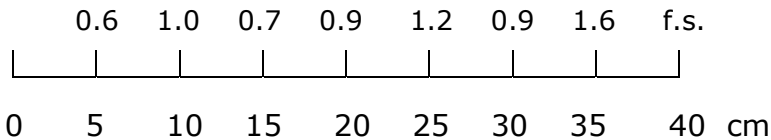
Data apertura: 21/09/2010

Verbale accettazione n° 165

Descrizione: da 3.60 a 4.02 argilla con limo debolmente sabbiosa, presenza di sostanza organica; da 4.02 a 4.10 argillite (Raccomandazioni AGI 1977). Argilla limosa (UNI EN ISO 14688-2).

Colore: HUE 5Y VALUE 5 CHROMA 4 (Munsell Soil Color Chart)

Pocket (kg/cm²):



Lunghezza carota: 50 cm
Diametro carota: 88,9 mm



Modalità di prelievo: sondaggio a rotazione

Tipo di fustella: Shelby

Classe di qualità del campione: Q5 (Raccomandazioni AGI 1977)

C1 (Eurocodice 7)

Prove eseguite:

Cont. Acqua W	X	Granulom. Gr	X	T. Residuo TR	-
Peso Volume y	X	Compress. ELL	X	Triass. TX UU	-
Peso Specifico Gs	X	Edometria Ed	X	Triass. TX CU	-
Limiti Cons. LL	X	T. Diretto TD	X	Triass. TX CD	-



Committente

Geotalia srl – Roma

pagina 1 di 2

Cantiere

Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Data prova	29/09/2010
Data certificato	19/10/2010
Verb. Accettazione	165
N. certificato	2516/2010

Norma di riferimento	ASTM D5550-00
----------------------	---------------

AccuPyc II 1340 V1.00

Unit 1

Serial #: 488

Page 1

Sample: VA165_S3_1_m 3,60-4,00
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S3_1.SMP

Analysis Gas: Helium
 Reported: 29/09/2010 15.57.07
 Sample Mass: 7.5600 g
 Temperature: 24.17 °C
 Number of Purges: 5

Analysis Start: 29/09/2010 15.34.54
 Analysis End: 29/09/2010 15.57.06
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2265 cm³
 Cell Volume: 11.8010 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 3, Campione 1, Prof. (m) 3,60-4,00

Combined Report

Cycle#	Volume (cm ³)	Volume Deviation (cm ³)	Tabular 1		Total Pore Volume (cm ³)	Total Pore Volume Deviation (cm ³)
			Density (g/cm ³)	Density Deviation (g/cm ³)		
1	2.8509	-0.0118	2.6518	0.0109	0.2341	0.0016
2	2.8602	-0.0025	2.6431	0.0023	0.2329	0.0003
3	2.8651	0.0023	2.6387	-0.0022	0.2323	-0.0003
4	2.8648	0.0020	2.6390	-0.0019	0.2323	-0.0003
5	2.8658	0.0031	2.6380	-0.0028	0.2322	-0.0004
6	2.8658	0.0031	2.6380	-0.0028	0.2322	-0.0004
7	2.8667	0.0039	2.6372	-0.0036	0.2321	-0.0005

Summary Data	Average	Standard Deviation
Volume:	2.8628 cm ³	0.0052 cm ³
Density:	2.6408 g/cm ³	0.0048 g/cm ³
Total Pore Volume:	0.2326 cm ³	0.0007 cm ³

Note: _____

Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma **pagina 2 di 2**
Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Data prova 29/09/2010
 Data certificato 19/10/2010
 Verb. Accettazione 165
 N. certificato 2516/2010

Norma di riferimento ASTM D5550-00

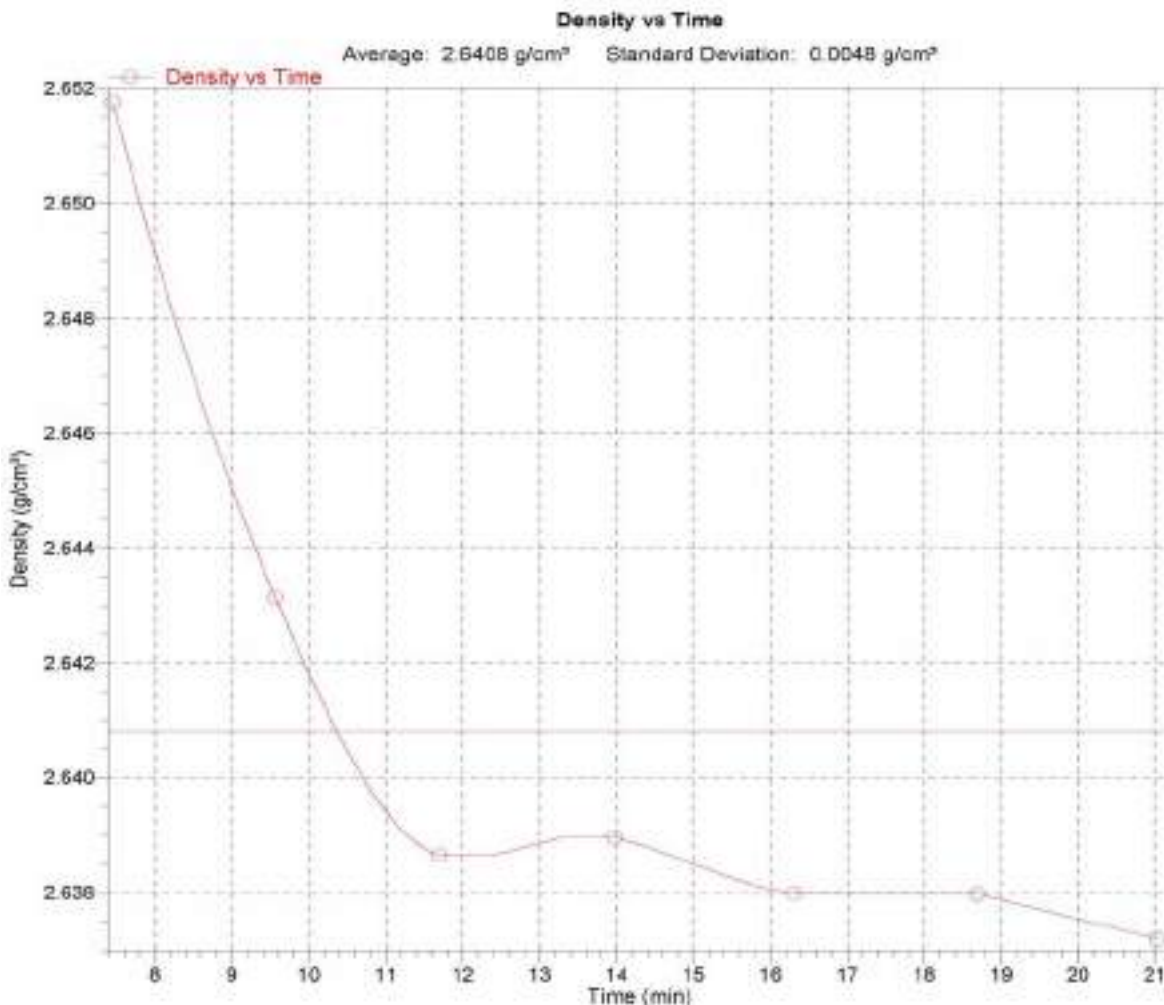
AccuPyc II 1340 V1.00 Unit 1 Serial #: 488 Page 2

Sample: VA165_S3_1_m 3,60-4,00
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S3_1.SMP

Analysis Gas: Helium
 Reported: 29/09/2010 15:57:07
 Sample Mass: 7.5600 g
 Temperature: 24.17 °C
 Number of Purges: 5

Analysis Start: 29/09/2010 15:34:54
 Analysis End: 29/09/2010 15:57:06
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2265 cm³
 Cell Volume: 11.8010 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 3, Campione 1, Prof. (m) 3,60-4,00



Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

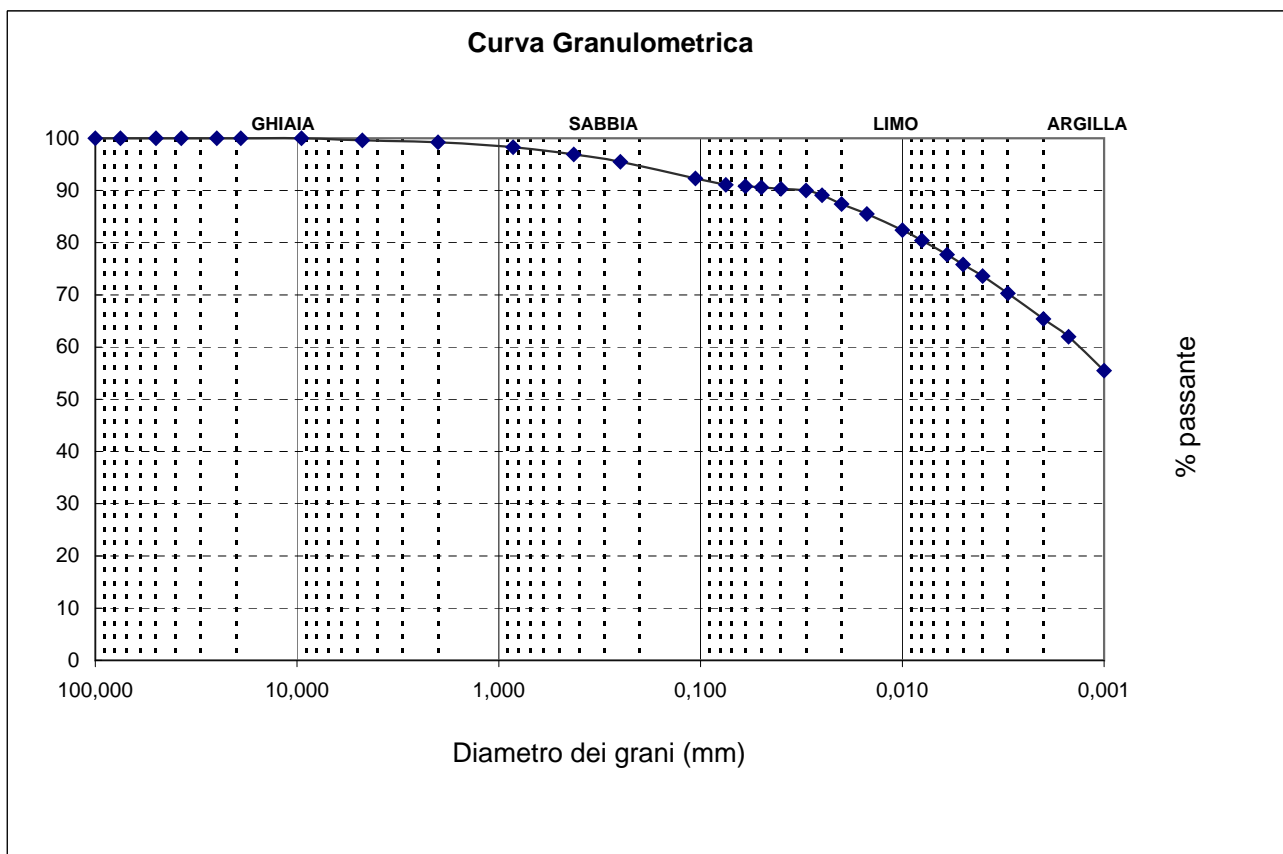
Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2463/2010

Pag. 1 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 3 Campione 1 Profondità 3.60-4.10

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)



Riepilogo dei risultati

Ciottoli	(> 60 mm)	0,0
Ghiaia	(60 - 2 mm)	0,8
Sabbia	(2 - 0,060 mm)	8,4
Limo	(0,060 - 0,002 mm)	25,4
Argilla	(< 0,002 mm)	65,4

D10	<0,002
D30	<0,002
D60	0,0013

Classificazione AGI 1994

Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2463/2010

Pag. 2 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 3 Campione 1 Profondità 3.60-4.10

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)

Setacciatura:

Massa materiale (g): 184.80

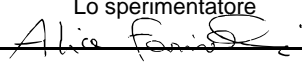
Vagli ASTM	Apertura vagli (mm)	Massa Trattenuta (g)	Trattenuto %	Passante %
3"	75,000	0,00	0,0	100,0
2"	50,000	0,00	0,0	100,0
1,5"	37,500	0,00	0,0	100,0
1"	25,000	0,00	0,0	100,0
3/4"	19,000	0,00	0,0	100,0
3/8"	9,500	0,00	0,0	100,0
No.4	4,750	0,76	0,4	99,6
No.10	2,000	0,67	0,8	99,2
No.20	0,850	1,72	1,7	98,3
No.40	0,425	2,56	3,1	96,9
No.60	0,250	2,60	4,5	95,5
No.140	0,106	5,89	7,7	92,3
No.200	0,075	2,30	8,9	91,1

Sedigrafia:

Material Mass (g): 4.846
 Material/Liquid: soil / 0.20% Sodium Metaphosphate (w/w)
 Measurement Principle: X-Ray monitored gravity sedimentation
 Calculation Method: Stokes sedimentation and Beer's law of extinction
 Test Number: 2
 Analyzed: 05/10/2010 13.09.42
 Reported: 06/10/2010 10.01.16
 Liquid Visc: 0.7682 mPa·s
 Analysis Temp: 32.0 °C
 Full Scale Mass: 91.1 %
 Analysis Type: High Speed(Adj)
 Run Time: 0:05 hrs:min
 Sample Density: 2.641 g/cm³
 Liquid Density: 0.9951 g/cm³
 Base/Full Scale: 134 / 93 kCnts/s
 Reynolds Number: 0.77

Diametro (mm)	Trattenuto %	Passante %
0,060	9,2	90,8
0,050	9,4	90,6
0,040	9,7	90,3
0,030	10,0	90,0
0,025	10,9	89,1
0,020	12,6	87,4
0,015	14,5	85,5
0,010	17,6	82,4
0,008	19,6	80,4
0,006	22,3	77,7
0,005	24,2	75,8
0,004	26,4	73,6
0,003	29,7	70,3
0,002	34,6	65,4
0,002	38,0	62,0
0,001	44,5	55,5

Il direttore del Laboratorio


Lo sperimentatore




Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

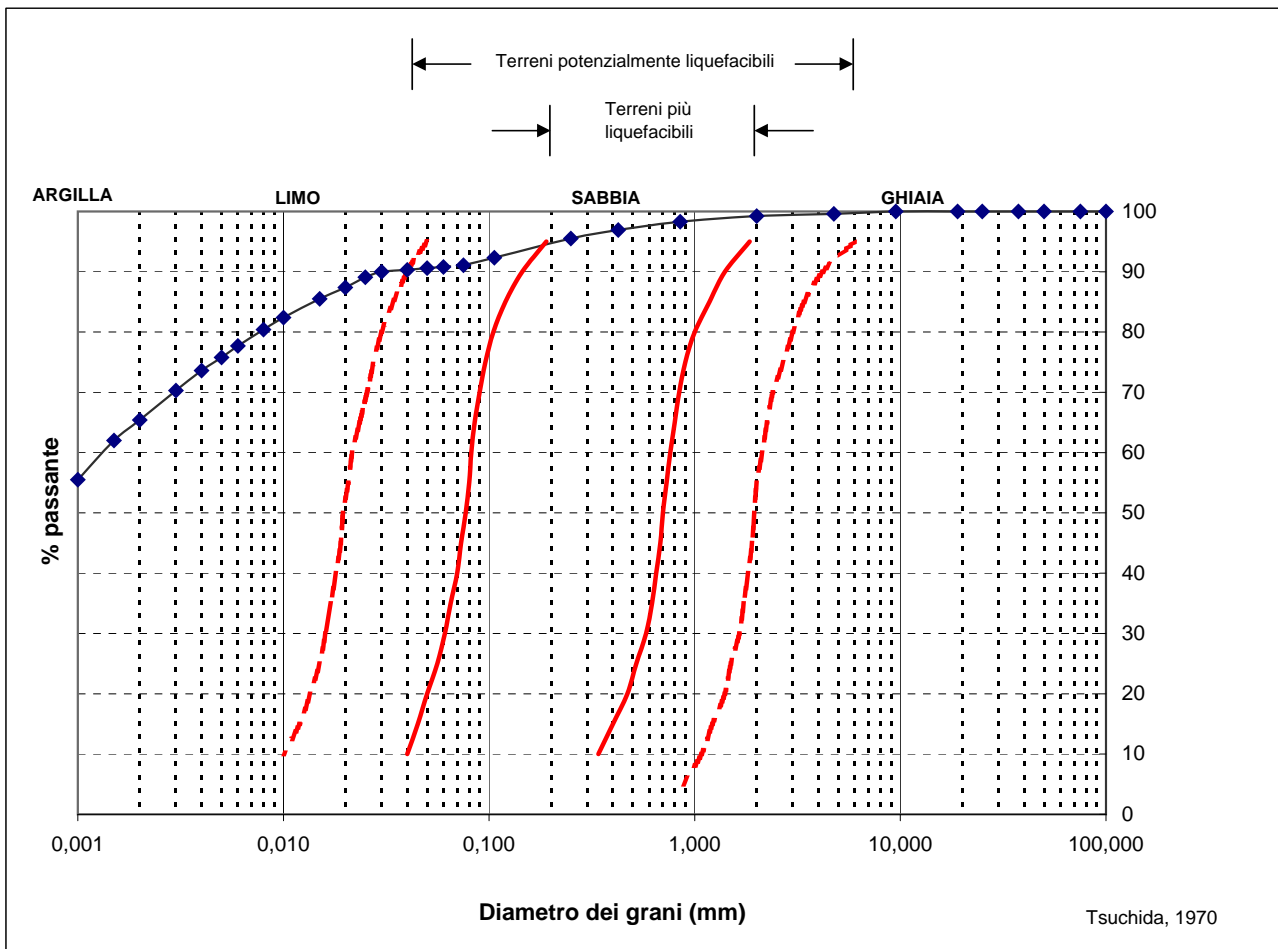
Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2463/2010

Pag. 3 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 3 Campione 1 Profondità 3.60-4.10

POTENZIALE DI LIQUEFACIBILITA'



Il direttore del Laboratorio
[Signature]

Lo sperimentatore
[Signature]



Committente Geotalia srl – Roma Pag. 1 di 1
 Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda

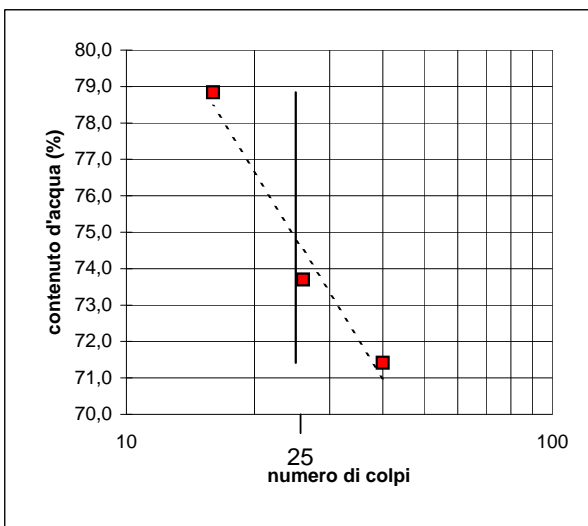
LIMITI DI CONSISTENZA

Norma di riferimento ASTM D4318

Data prova 24/09/10
 Data certificato 06/10/10
 Verb. Accettazione 165
 N. Certificato 2460/2010

Sondaggio 3 Campione 1 Profondità 3.60-4.10

Limite Liquido				74,8
Numero tara		B14	B16	A10
Numero dei colpi		40	26	16
P. umido + tara	g	66,27	59,73	59,13
P. secco + tara	g	46,03	41,88	40,80
Peso tara	g	17,69	17,66	17,55
Peso umido	g	48,58	42,07	41,58
Peso secco	g	28,34	24,22	23,25
Contenuto d'acqua	%	71,42	73,70	78,84

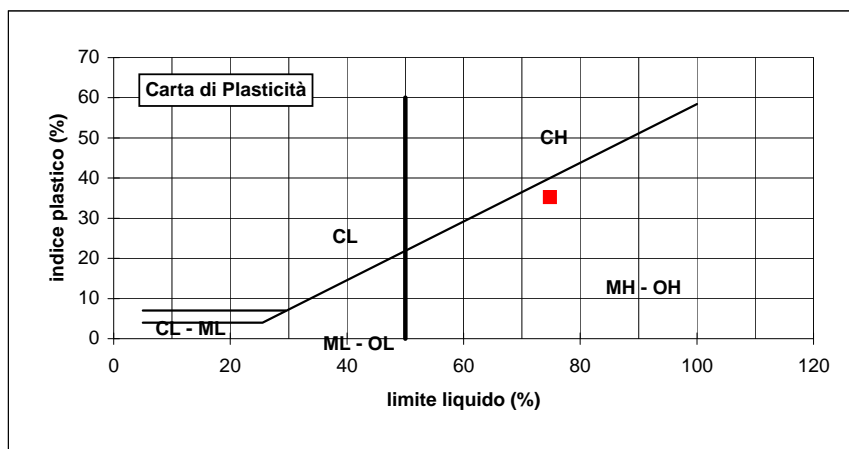


Limite Plastico				39,6
Numero tara		A3	A7	
P. umido + tara	g	30,83	28,56	
P. secco + tara	g	27,17	25,51	
Peso tara	g	17,98	17,77	
Peso umido	g	12,85	10,79	
Peso secco	g	9,19	7,74	
Contenuto d'acqua	%	39,83	39,41	

Umidità Naturale				37,9
Numero tara		B12		
P. umido + tara	g	68,53		
P. secco + tara	g	57,51		
Peso tara	g	28,42		
Peso umido	g	40,11		
Peso secco	g	29,09		
Contenuto d'acqua	%			37,9

Limite Liquido LL	74,8
Limite Plastico LP	39,6
Indice di Plasticità Ip	35,2
Umidità Naturale Wn	37,9
Indice di Consistenza Ic	1,0

$$I_p = LL - LP \quad I_c = \frac{LL - W_n}{I_p}$$



- ML** Limi inorganici di bassa plasticità
- MH** Limi inorganici di alta plasticità
- CL** Argille inorganiche di bassa plasticità
- CH** Argille inorganiche di alta plasticità
- OL** Argille organiche di bassa plasticità
- OH** Argille organiche di alta plasticità

Il direttore del Laboratorio

Lo sperimentatore



DETERMINAZIONE DELLA SOSTANZA ORGANICA

(ASTM D 2974 – 00 Standard Test Methods for Moisture, Ash and Organic Matter of Peat and Other Organic Soils)

Committente: GeoItalia srl - Roma

Cantiere: Parco Eolico Poggio Tre Vescovi – Casteldecì – Verghereto – Badia Tedalda

Sondaggio: 3

Campione: 1

Verbale accettazione n° 165

Profondità prelievo: 3.60-4.00

Data prova: 12/10/2010

Data certificato: 15/10/2010

N° certificato: 2502/2010

Prova 1:

Temperatura di prova = 600°C

Tempo di prova = 2 ore

Peso tara S1 = 31,105 g

Peso tara + campione a 105°C = 38,143 g

Peso tara + campione a 600°C = 37,527 g

Ceneri (%) = 91,25

Sostanza Organica (%) = 8,75

Prova 2:

Temperatura di prova = 600°C

Tempo di prova = 2 ore

Peso tara S2 = 31,332 g

Peso tara + campione a 105°C = 38,135 g

Peso tara + campione a 600°C = 37,523 g

Ceneri (%) = 91,00

Sostanza organica (%) = 9,00

Media tra le due terminazioni: Sostanza organica (%) = 8,88

Il direttore del laboratorio

Lo Sperimentatore

PROVA DI COMPRESSIONE SEMPLICE (ASTM D 2166)

Provino X

Nome File: 10ELL893

Certificato n°: 2542/2010

Data Prova: 7 OTT 2010

Pagina 1 di 2

Dati Cliente

Cliente GeoItalia srl
Indirizzo
Località Parco Eolico Badia Tedalda (AR)
Sondaggio 3
Campione 1
Profondità 3.60-4.10

Caratteristiche Fisiche

Data prelievo		Peso di volume iniziale	1,874 MN/m ³	γ_n
Sezione provino	11,394 cm ²	Peso di volume finale	1,939 MN/m ³	γ_f
Altezza iniziale	76,000 mm	Peso di volume secco	1,419 MN/m ³	γ_d
Altezza finale	71,570 mm	Contenuto d'acqua iniz.	32,075 %	W_0
No. Tara 1	1	Contenuto d'acqua finale	28,666 %	W_f
Peso Tara 1	10,000 g	Saturazione iniziale	98,448 %	S_0
Tara + p.umido iniz.	172,32 g	Saturazione finale	100,675 %	S_f
No. Tara 2	49	Indice dei vuoti iniziale	0,860	e_0
Peso Tara 2	32,520 g	Indice dei vuoti finale	0,752	e_f
Tara + p.umido finale	190,650 g	Peso di volume secco finale	1,507 MN/m ³	γ_{df}
Tara + p.provino secco	155,420 g			
Peso specifico dei grani	2,640 MN/m ³			

Restituzione fotografica dopo la prova



Il Direttore del Laboratorio



Lo Sperimentatore



rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA DI COMPRESSIONE SEMPLICE (ASTM D 2166)

Provino X

Nome File: 10ELL893

Certificato n°: 2542/2010

Data Prova: 7 OTT 2010

Pagina 2 di 2

Customer data

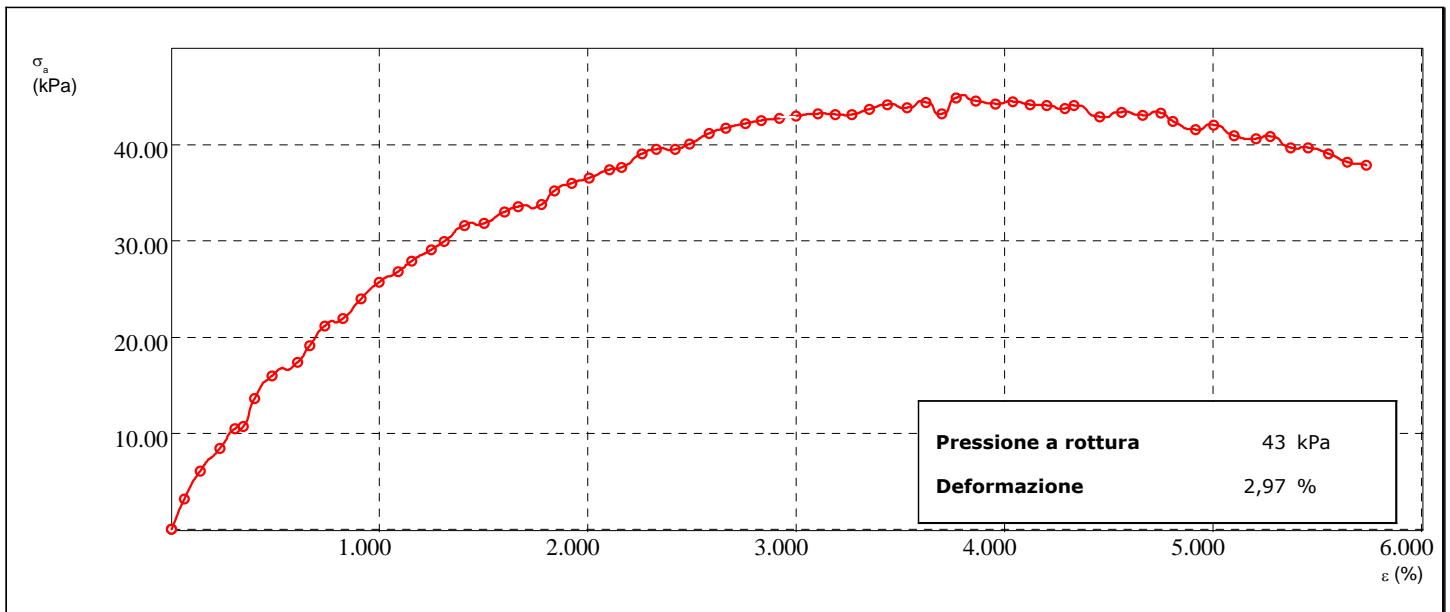
Cliente GeoItalia srl
Indirizzo
Località Parco Eolico Badia Tedalda (AR)
Sondaggio 3
Campione 1
Profondità 3.60-4.10

dH mm	dL N
0,00	0,00
0,05	3,65
0,11	6,97
0,18	9,63
0,23	11,95
0,26	12,29
0,31	15,61
0,37	18,26
0,46	19,92
0,50	21,91
0,56	24,24
0,63	25,23
0,69	27,56
0,76	29,55
0,83	30,88
0,88	32,21
0,95	33,53
1,00	34,53
1,07	36,52
1,14	36,85
1,21	38,18

dH mm	dL N
1,27	38,84
1,35	39,18
1,40	40,84
1,46	41,83
1,53	42,50
1,60	43,49
1,64	43,82
1,72	45,48
1,77	46,15
1,84	46,15
1,89	46,81
1,96	48,14
2,02	48,80
2,09	49,47
2,15	49,80
2,22	50,13
2,28	50,46
2,36	50,79
2,42	50,79
2,48	50,79
2,55	51,46

dH mm	dL N
2,61	52,12
2,69	51,79
2,75	52,45
2,81	51,12
2,86	53,12
2,94	52,78
3,01	52,45
3,07	52,78
3,13	52,45
3,19	52,45
3,26	52,12
3,29	52,45
3,39	51,12
3,47	51,79
3,55	51,46
3,61	51,79
3,66	50,79
3,74	49,80
3,80	50,46
3,88	49,13
3,96	48,80

dH mm	dL N
4,01	49,13
4,08	47,81
4,15	47,81
4,22	47,14
4,29	46,15
4,36	45,81
4,43	44,82



Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST REPORT - SUMMARY

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth	3.60/4.10
Borehole number	3	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical
Sample description	Argilla debolmente limosa con presenza di sostanza organica.		

Particle density (Mg/m ³)	2.64 (Measured)	Specimens tested
---------------------------------------	-----------------	------------------

INITIAL CONDITIONS	SPECIMEN 1	SPECIMEN 2	SPECIMEN 3
Specimen depth (m)	3.75/3.85	3.75/3.85	3.75/3.85
Height (mm)	20.0	20.0	20.0
-			
Diameter (mm)	60.0	60.0	60.0
Area (mm ²)	2827.4	2827.4	2827.4
Moisture content (measured) (%)	46	43	41
Moisture content (trimmings) (%)	39	38	39
Bulk density (Mg/m ³)	1.75	1.73	1.81
Dry density (Mg/m ³)	1.20	1.21	1.28
Voids ratio	1.206	1.186	1.060
Degree of saturation (%)	101	97	102

Voids ratio at the end of consolidation	1.145	1.040	0.891
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SHEARING	SPECIMEN 1	SPECIMEN 2	SPECIMEN 3
Rate of displacement (mm/min)	0.010000	0.010000	0.010000
Conditions at peak shear stress			
Normal stress (kPa)	100	200	400
Shear stress (kPa)	37	81	125
Horizontal displacement (mm)	3.47	5.01	4.44
Vertical deformation (mm)	0.423	0.781	0.572

Apparent cohesion (kPa)	14.0
Angle of shearing resistance (°)	16.7

Comments / variations from procedures:
 Verbale di accettazione N.
 Il presente certificato è costituito da n. 18 pagine.

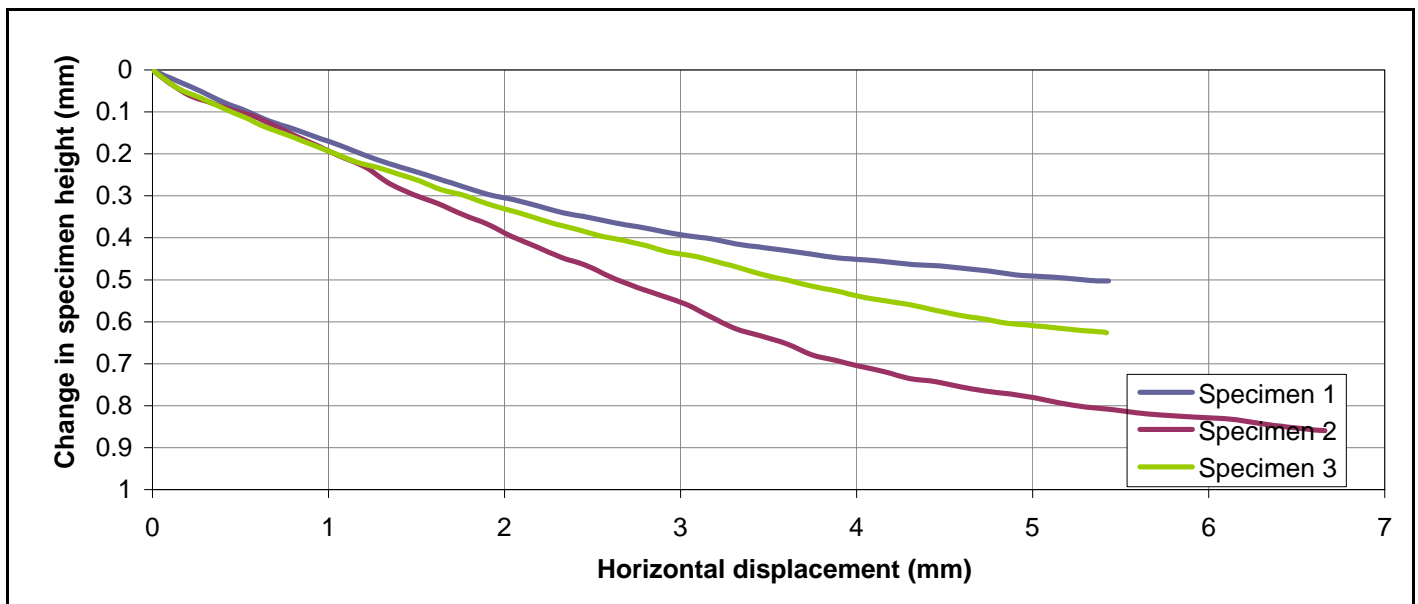
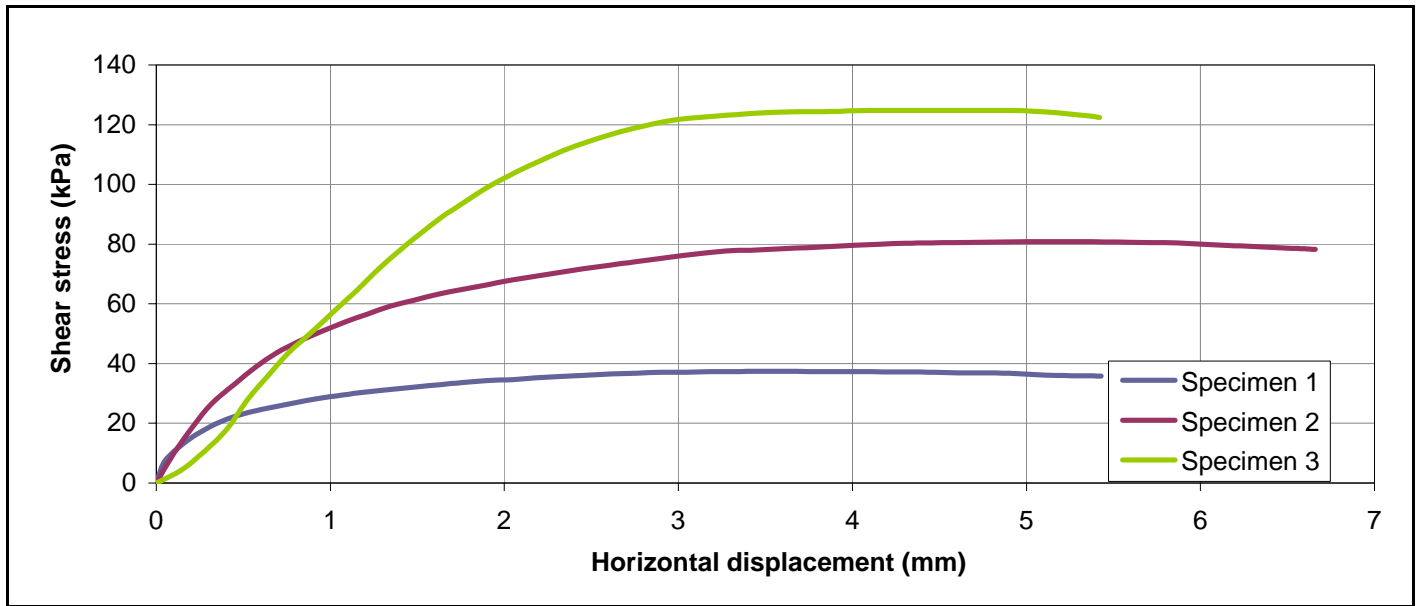
Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	20/10/2010	Date	21/10/2010	Date	No. 2534/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST REPORT - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth	3.60/4.10
Borehole number	3	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical



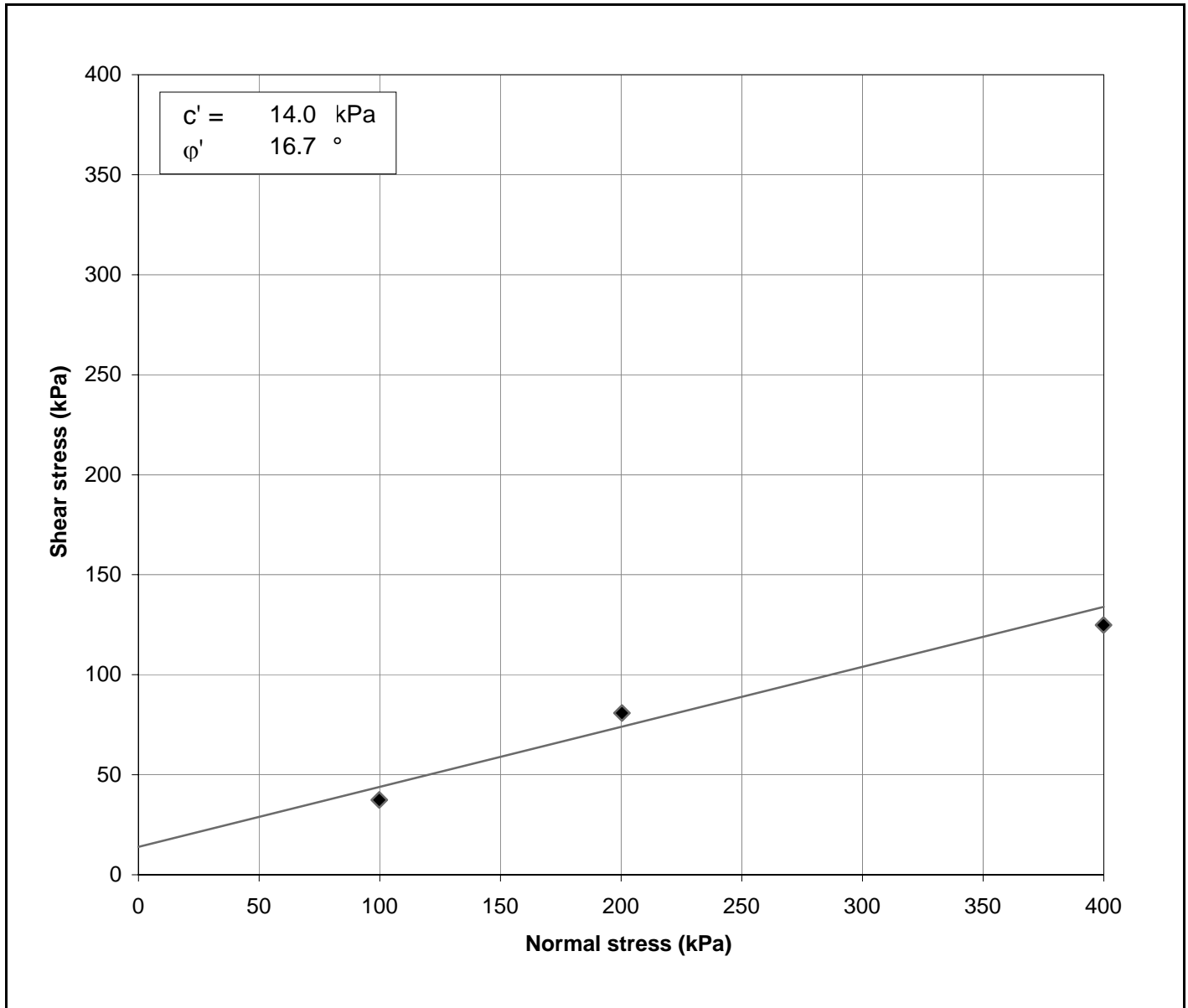
Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	20/10/2010	Date	21/10/2010	Date	No. 2534/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST REPORT - SHEARING

Project location	<i>GEOITALIA - Balzo</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>3.60/4.10</i>
Borehole number	<i>3</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>



Tested	<i>Farinelli</i>	Checked	<i>Sfalanga</i>	Approved	<i>Carmignani</i>
Date	<i>20/10/2010</i>	Date	<i>21/10/2010</i>	Date	<i>No. 2534/2010</i>



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	<i>GEOITALIA - Balzo</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>3.60/4.10</i>
Borehole number	<i>3</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 1	Normal stress (kPa)	100
-------------------	----------------------------	------------

Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	0.923	0.2	0.000
0.08	0.948	0.3	0.025
0.14	0.974	0.4	0.051
0.21	0.992	0.5	0.069
0.32	1.009	0.6	0.086
0.51	1.035	0.7	0.112
0.81	1.054	0.9	0.131
1.29	1.076	1.1	0.153
2.05	1.093	1.4	0.170
3.25	1.122	1.8	0.199
5.17	1.157	2.3	0.234
8.21	1.188	2.9	0.265
13.06	1.232	3.6	0.309
20.76	1.280	4.6	0.357
33.00	1.334	5.7	0.411
52.47	1.371	7.2	0.448
83.43	1.407	9.1	0.484
132.66	1.429	11.5	0.506
210.92	1.445	14.5	0.522
335.37	1.457	18.3	0.534
533.23	1.469	23.1	0.546
847.83	1.478	29.1	0.555
941.09	1.480	30.7	0.557

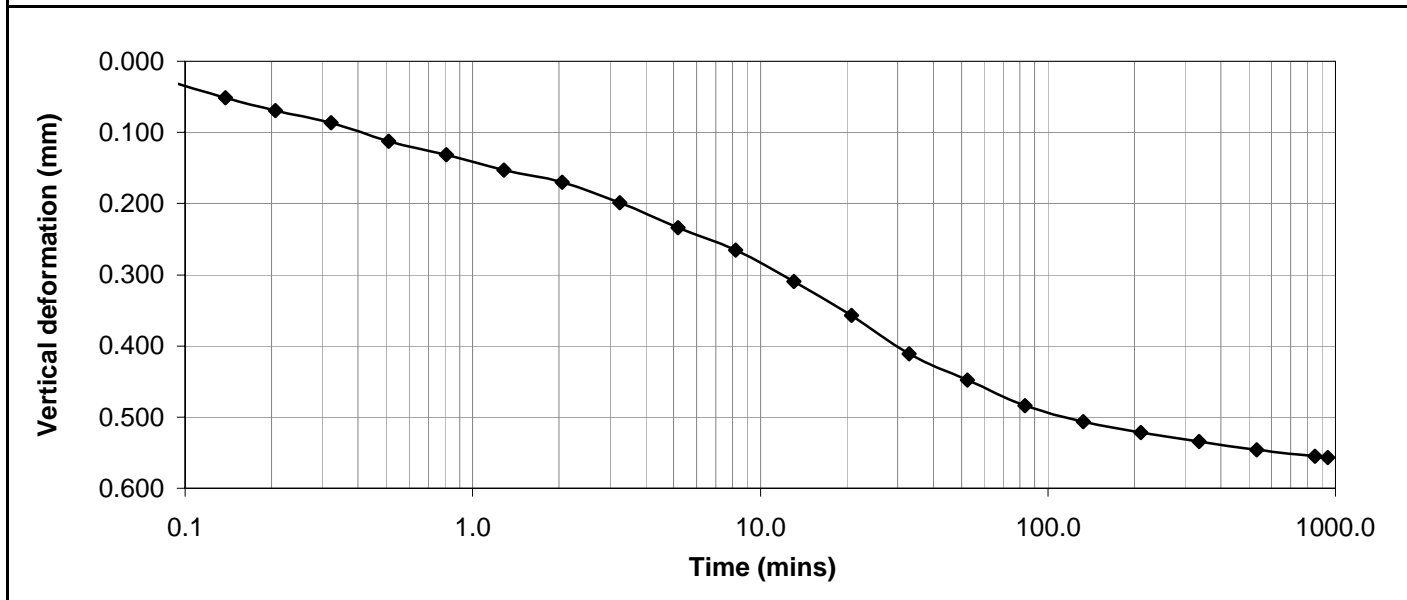
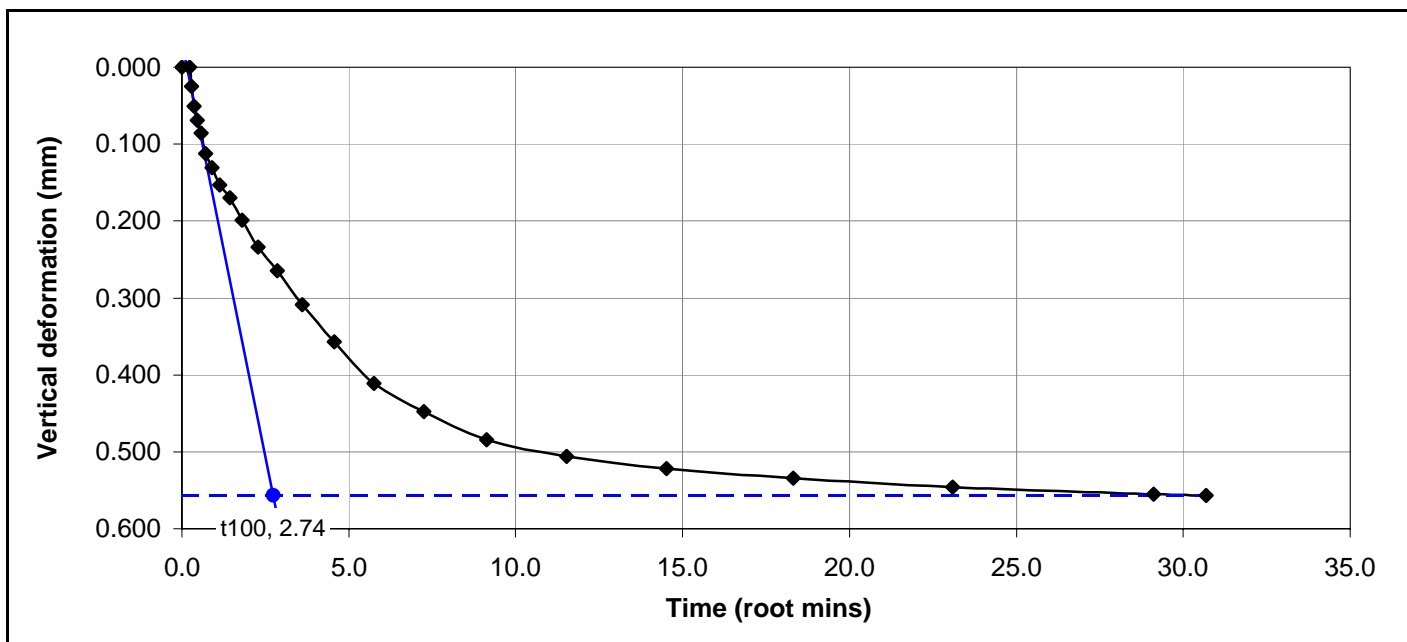


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Balzo		Sample depth	3.60/4.10
Project reference	Palazzi Giomarelli srl	Sample depth	3.60/4.10	
Borehole number	3	Sample type	Undisturbed cohesive	
Sample number	1	Specimen orientation	Vertical	

SPECIMEN 1 **Normal stress (kPa)** 100



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	13/10/2010	Date	21/10/2010	Date	No. 2534/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth	3.60/4.10
Borehole number	3	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 1 **Normal stress (kPa) 100**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
0.02	0.002	0.00	21.1	0.000	0.00	0.0	0.0
10.00	0.012	0.05	41.9	0.010	0.05	20.8	7.3
20.00	0.032	0.16	58.9	0.030	0.16	37.8	13.4
30.00	0.054	0.28	71.8	0.052	0.28	50.7	17.9
40.00	0.078	0.40	81.2	0.076	0.40	60.1	21.2
50.00	0.101	0.54	88.3	0.099	0.54	67.3	23.8
60.00	0.125	0.67	93.0	0.123	0.67	71.9	25.4
70.00	0.142	0.80	97.3	0.140	0.80	76.2	27.0
80.00	0.162	0.93	101.2	0.160	0.93	80.1	28.3
90.00	0.183	1.07	104.5	0.181	1.07	83.4	29.5
100.00	0.204	1.20	107.2	0.202	1.20	86.1	30.5
110.00	0.225	1.34	109.6	0.223	1.34	88.5	31.3
120.01	0.244	1.49	112.0	0.242	1.49	90.9	32.1
130.00	0.262	1.63	114.1	0.260	1.63	93.0	32.9
140.00	0.280	1.76	116.3	0.278	1.76	95.2	33.7
150.00	0.298	1.90	118.1	0.296	1.90	97.0	34.3
160.00	0.311	2.05	119.0	0.309	2.05	97.9	34.6
170.00	0.326	2.19	120.9	0.324	2.19	99.8	35.3
180.00	0.342	2.33	122.0	0.340	2.33	100.9	35.7
190.00	0.354	2.48	123.2	0.352	2.48	102.1	36.1
200.00	0.366	2.62	124.4	0.364	2.62	103.3	36.5
210.00	0.376	2.76	125.0	0.374	2.76	103.9	36.7
220.00	0.387	2.90	125.9	0.385	2.90	104.8	37.1
230.00	0.397	3.04	125.9	0.395	3.04	104.9	37.1
240.00	0.405	3.18	126.5	0.403	3.18	105.4	37.3
250.00	0.417	3.32	126.6	0.415	3.32	105.5	37.3
260.00	0.425	3.47	126.8	0.423	3.47	105.7	37.4
270.00	0.433	3.61	126.8	0.431	3.61	105.7	37.4
280.00	0.441	3.75	126.7	0.439	3.75	105.6	37.3
290.00	0.450	3.89	126.6	0.448	3.89	105.5	37.3
300.00	0.454	4.04	126.5	0.452	4.04	105.4	37.3
310.00	0.460	4.18	126.2	0.458	4.18	105.1	37.2
320.00	0.466	4.32	126.2	0.464	4.32	105.1	37.2
330.00	0.469	4.47	125.9	0.467	4.47	104.9	37.1



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA - Balzo</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>3.60/4.10</i>
Borehole number	<i>3</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 1	Normal stress (kPa)	100
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Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
340.00	0.475	4.61	125.3	0.473	4.61	104.3	36.9
350.00	0.481	4.75	125.3	0.479	4.75	104.3	36.9
360.00	0.490	4.90	124.9	0.488	4.90	103.8	36.7
370.00	0.494	5.04	123.9	0.492	5.04	102.8	36.4
380.00	0.498	5.18	122.8	0.496	5.18	101.7	36.0
390.00	0.504	5.33	122.5	0.502	5.33	101.5	35.9
396.64	0.505	5.43	122.3	0.503	5.43	101.2	35.8

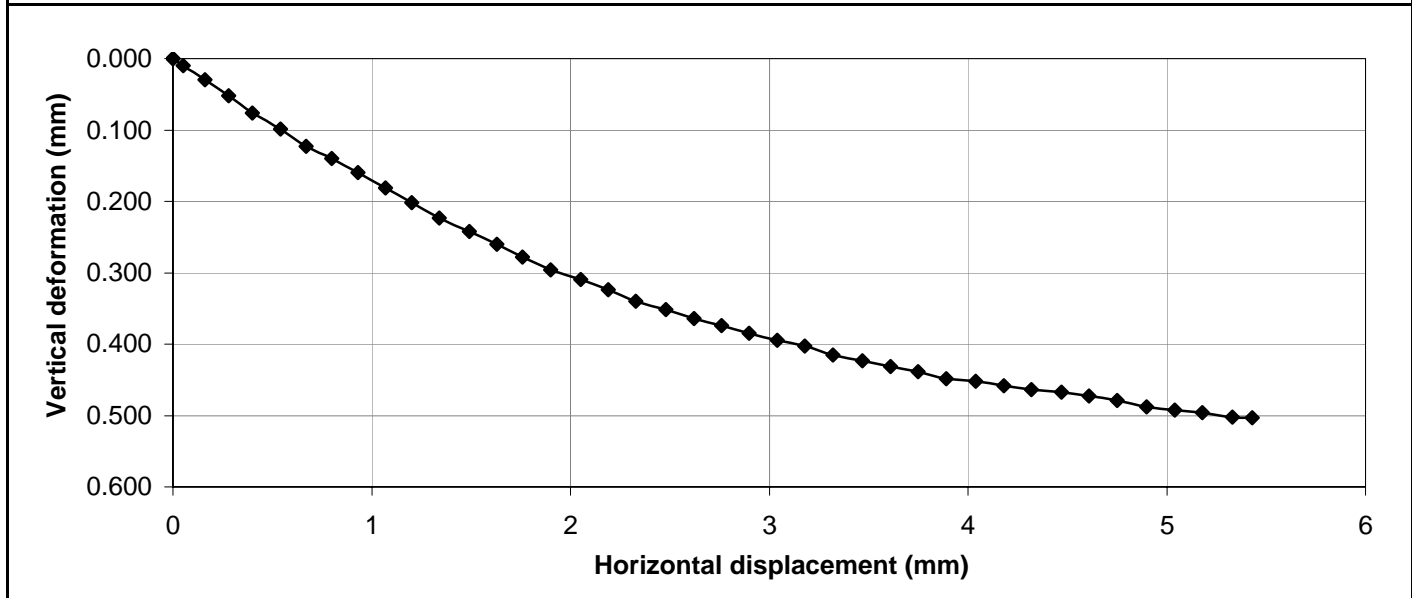
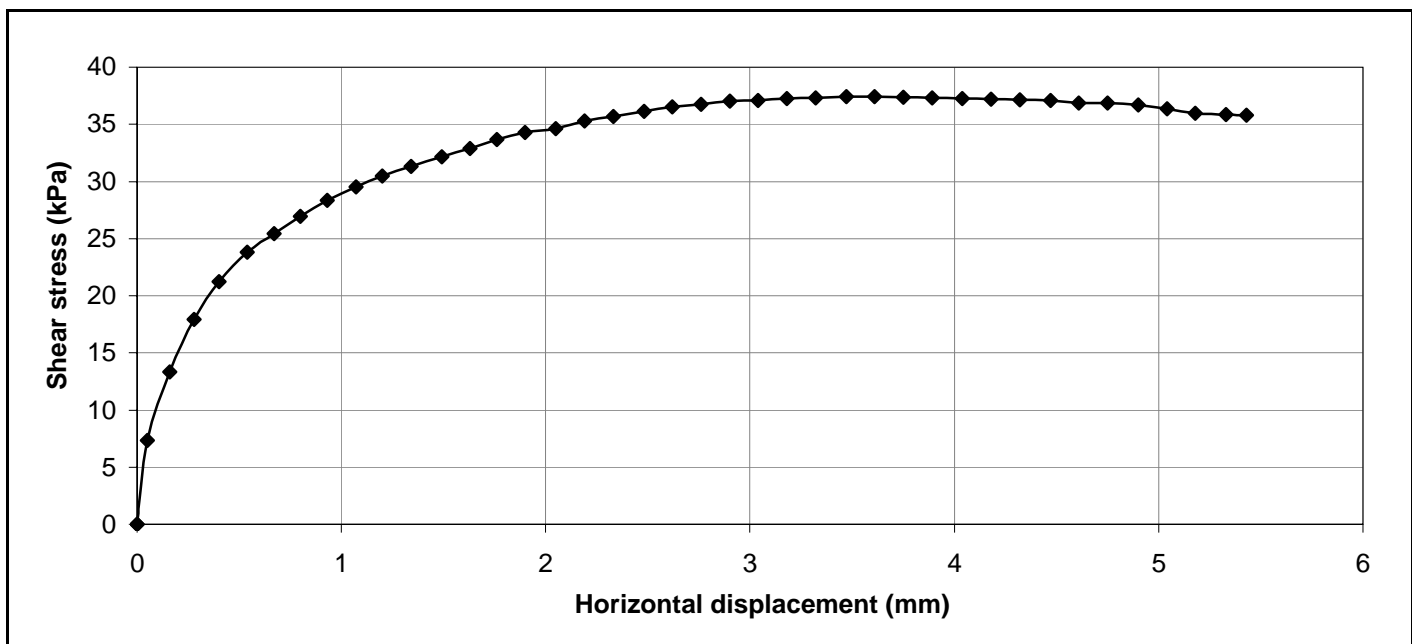


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth	3.60/4.10
Borehole number	3	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 1 **Normal stress (kPa) 100**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	14/10/2010	Date	21/10/2010	Date	No. 2534/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	<i>GEOITALIA - Balzo</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>3.60/4.10</i>
Borehole number	<i>3</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 2	Normal stress (kPa)	200
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Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	0.872	0.2	0.000
0.08	0.926	0.3	0.054
0.13	0.963	0.4	0.091
0.20	1.069	0.4	0.197
0.32	1.212	0.6	0.340
0.51	1.365	0.7	0.493
0.81	1.492	0.9	0.620
1.29	1.545	1.1	0.673
2.04	1.622	1.4	0.750
3.25	1.699	1.8	0.827
5.35	1.721	2.3	0.849
8.21	1.841	2.9	0.969
13.06	1.905	3.6	1.033
20.76	1.982	4.6	1.110
33.00	2.051	5.7	1.179
52.47	2.103	7.2	1.231
83.43	2.144	9.1	1.272
132.66	2.162	11.5	1.290
210.92	2.174	14.5	1.302
335.36	2.187	18.3	1.315
533.23	2.197	23.1	1.325
847.84	2.208	29.1	1.336
916.57	2.209	30.3	1.337

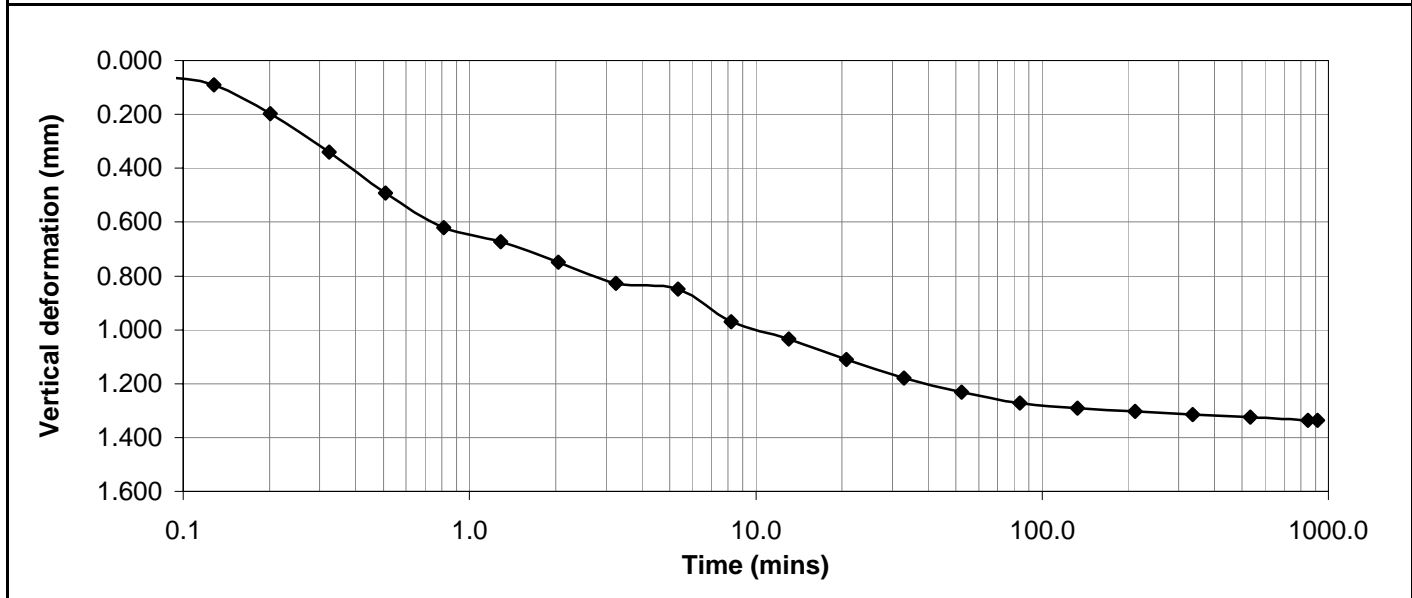
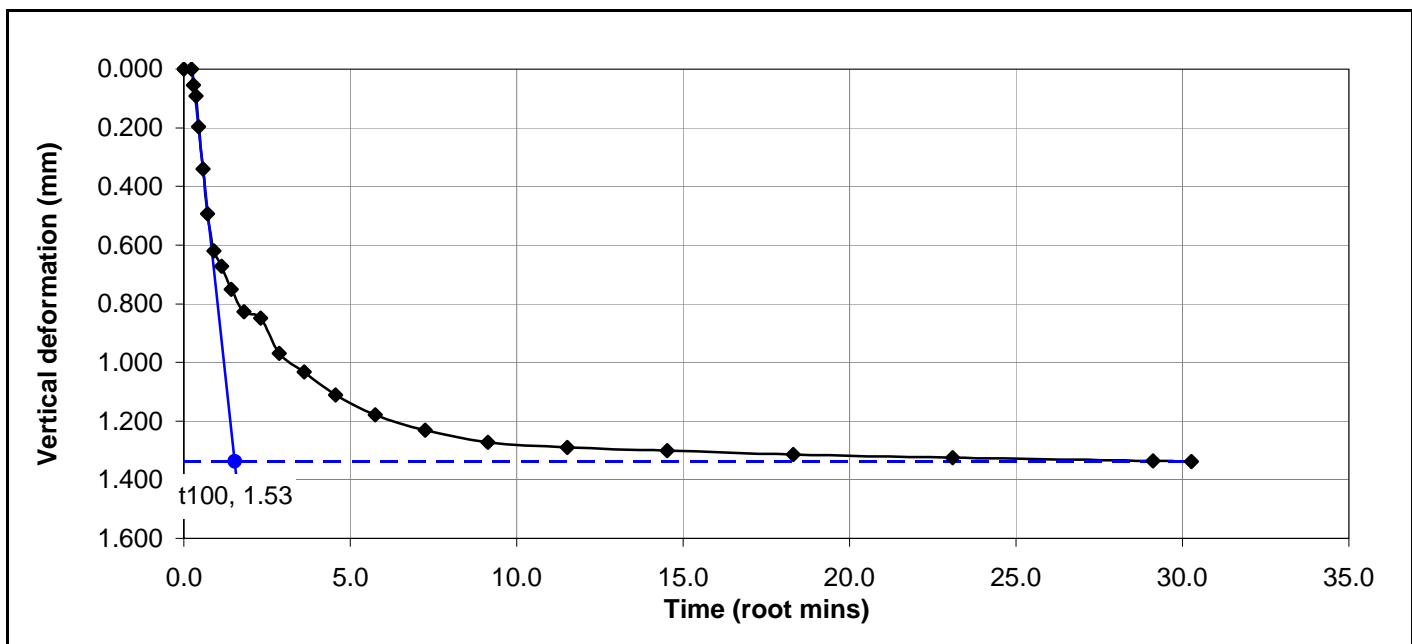


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Balzo		Sample depth	3.60/4.10
Project reference	Palazzi Giomarelli srl		Sample type	Undisturbed cohesive
Borehole number	3	Sample orientation	Vertical	
Sample number	1			

SPECIMEN 2 **Normal stress (kPa) 200**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	14/10/2010	Date	21/10/2010	Date	No. 2534/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth	3.60/4.10
Borehole number	3	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 2 **Normal stress (kPa) 200**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
0.02	0.001	0.01	18.0	0.000	0.00	0.0	0.0
10.00	0.033	0.11	46.0	0.032	0.10	27.9	9.9
20.00	0.062	0.22	71.5	0.061	0.21	53.5	18.9
30.00	0.077	0.33	93.4	0.076	0.32	75.3	26.6
40.00	0.096	0.46	111.7	0.095	0.45	93.7	33.1
50.00	0.111	0.58	127.8	0.110	0.57	109.7	38.8
60.00	0.133	0.70	141.0	0.132	0.69	123.0	43.5
70.00	0.160	0.83	152.2	0.159	0.82	134.1	47.4
80.00	0.184	0.96	161.8	0.183	0.95	143.7	50.8
90.00	0.209	1.09	170.1	0.208	1.08	152.0	53.8
100.00	0.233	1.22	177.7	0.232	1.21	159.6	56.5
110.00	0.270	1.35	185.3	0.269	1.34	167.3	59.2
120.00	0.298	1.49	191.2	0.297	1.48	173.2	61.3
130.00	0.319	1.63	197.0	0.318	1.62	179.0	63.3
140.00	0.345	1.77	201.4	0.344	1.76	183.4	64.9
150.00	0.368	1.91	205.6	0.367	1.90	187.6	66.3
160.00	0.398	2.05	210.1	0.397	2.04	192.1	67.9
170.00	0.422	2.19	213.8	0.421	2.18	195.8	69.2
180.00	0.447	2.33	217.4	0.446	2.32	199.4	70.5
190.00	0.466	2.47	221.1	0.465	2.46	203.1	71.8
200.00	0.494	2.61	224.2	0.493	2.60	206.2	72.9
210.00	0.519	2.76	227.6	0.518	2.75	209.6	74.1
220.00	0.539	2.90	230.6	0.538	2.89	212.6	75.2
230.00	0.559	3.04	233.5	0.558	3.03	215.4	76.2
240.00	0.587	3.17	236.1	0.586	3.16	218.0	77.1
250.00	0.617	3.32	238.2	0.616	3.31	220.1	77.9
260.00	0.634	3.46	238.6	0.633	3.45	220.5	78.0
270.00	0.653	3.61	239.8	0.652	3.60	221.8	78.4
280.00	0.679	3.75	240.9	0.678	3.74	222.8	78.8
290.00	0.693	3.89	242.2	0.692	3.88	224.1	79.3
300.00	0.707	4.03	243.1	0.706	4.02	225.1	79.6
310.00	0.720	4.17	244.0	0.719	4.16	226.0	79.9
320.00	0.736	4.31	245.2	0.735	4.30	227.1	80.3
330.00	0.744	4.46	245.3	0.743	4.45	227.2	80.4



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA - Balzo</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>3.60/4.10</i>
Borehole number	<i>3</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 2	Normal stress (kPa)	200
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Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
340.00	0.756	4.60	245.6	0.755	4.59	227.6	80.5
350.00	0.766	4.74	246.0	0.765	4.73	228.0	80.6
360.00	0.773	4.88	246.2	0.772	4.87	228.1	80.7
370.00	0.782	5.02	246.6	0.781	5.01	228.6	80.8
380.00	0.794	5.16	246.6	0.793	5.15	228.6	80.8
390.00	0.804	5.31	246.6	0.803	5.30	228.6	80.8
400.00	0.810	5.46	246.2	0.809	5.45	228.2	80.7
410.00	0.818	5.60	245.9	0.817	5.59	227.9	80.6
420.00	0.823	5.74	245.6	0.822	5.73	227.5	80.5
430.00	0.827	5.88	245.4	0.826	5.87	227.3	80.4
440.00	0.830	6.02	244.1	0.829	6.01	226.1	79.9
450.00	0.835	6.17	243.0	0.834	6.16	224.9	79.6
460.00	0.844	6.31	242.1	0.843	6.30	224.1	79.2
470.00	0.852	6.46	240.8	0.851	6.45	222.7	78.8
480.00	0.858	6.60	240.1	0.857	6.59	222.0	78.5
484.87	0.861	6.67	239.3	0.860	6.66	221.3	78.3

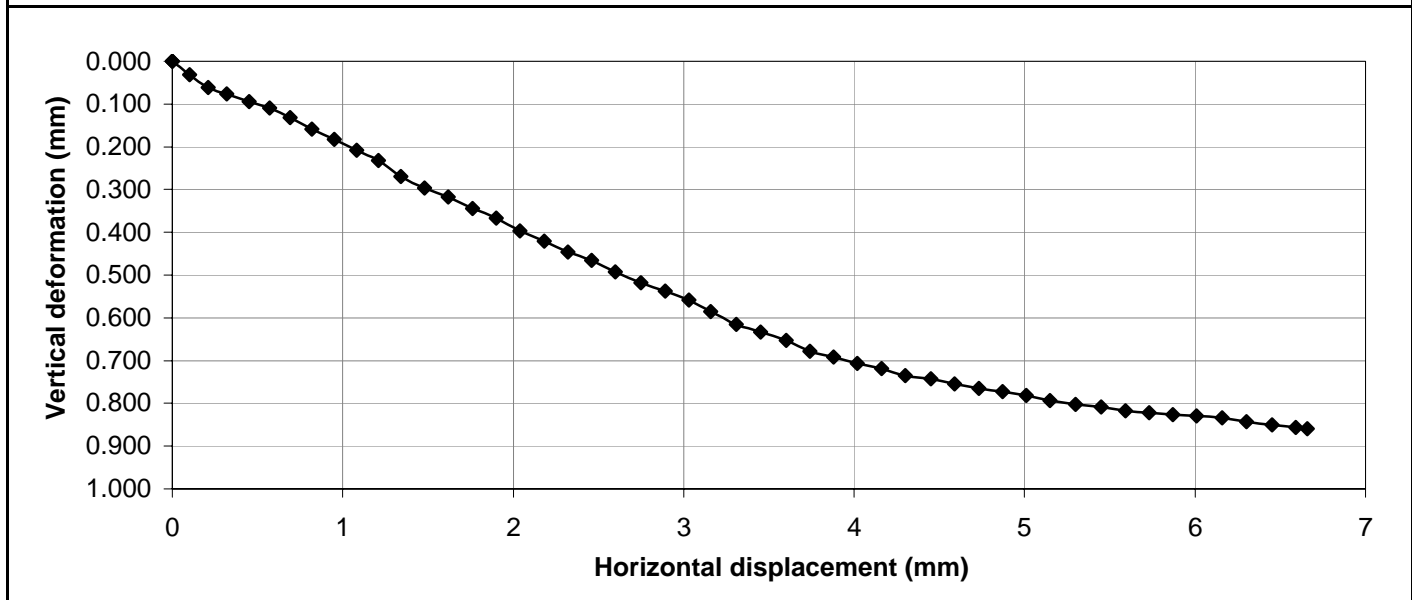
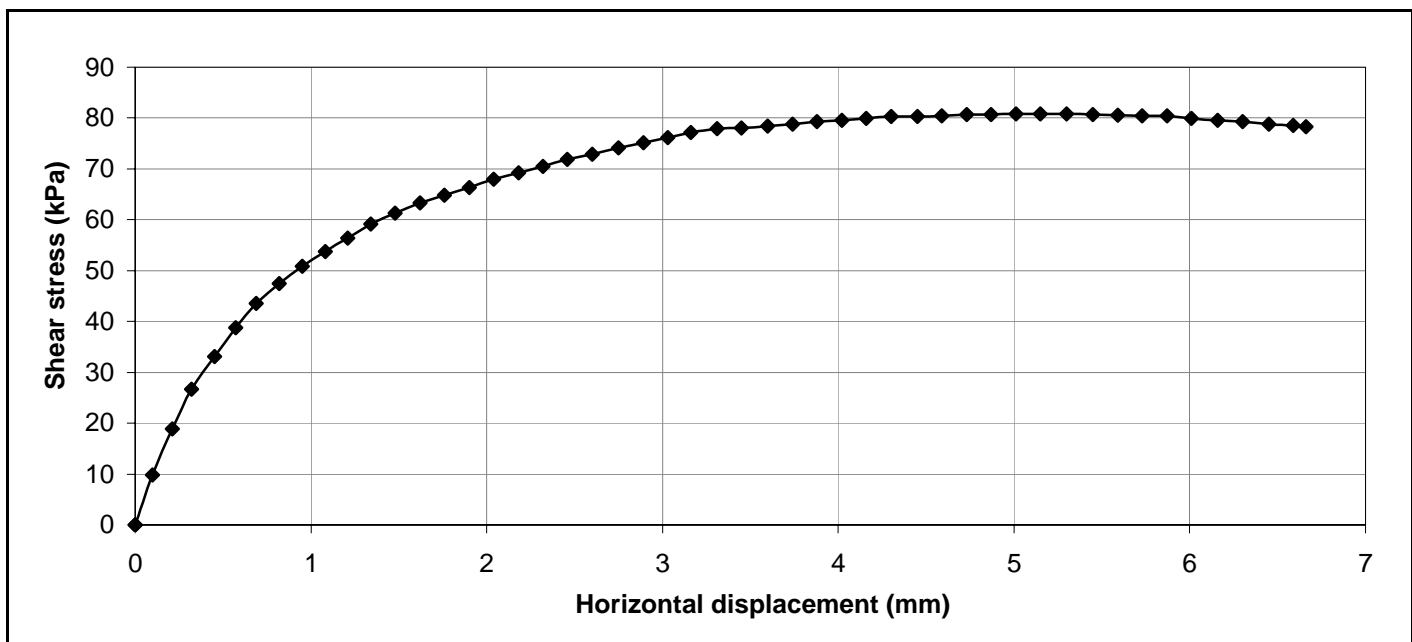


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth	3.60/4.10
Borehole number	3	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 2 **Normal stress (kPa) 200**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	15/10/2010	Date	21/10/2010	Date	No. 2534/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	<i>GEOITALIA - Balzo</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>3.60/4.10</i>
Borehole number	<i>3</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 3	Normal stress (kPa)	400
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Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	2.580	0.2	0.000
0.08	2.660	0.3	0.080
0.13	2.709	0.4	0.129
0.21	2.739	0.5	0.159
0.32	2.846	0.6	0.266
0.51	2.943	0.7	0.363
0.81	2.989	0.9	0.409
1.29	3.062	1.1	0.482
2.05	3.121	1.4	0.541
3.25	3.178	1.8	0.598
5.16	3.254	2.3	0.674
8.21	3.343	2.9	0.763
13.06	3.466	3.6	0.886
20.76	3.608	4.6	1.028
33.00	3.760	5.7	1.180
52.47	3.913	7.2	1.333
83.43	4.055	9.1	1.475
132.66	4.134	11.5	1.554
210.92	4.175	14.5	1.595
335.37	4.195	18.3	1.615
533.23	4.211	23.1	1.631
847.83	4.221	29.1	1.641
977.74	4.225	31.3	1.645

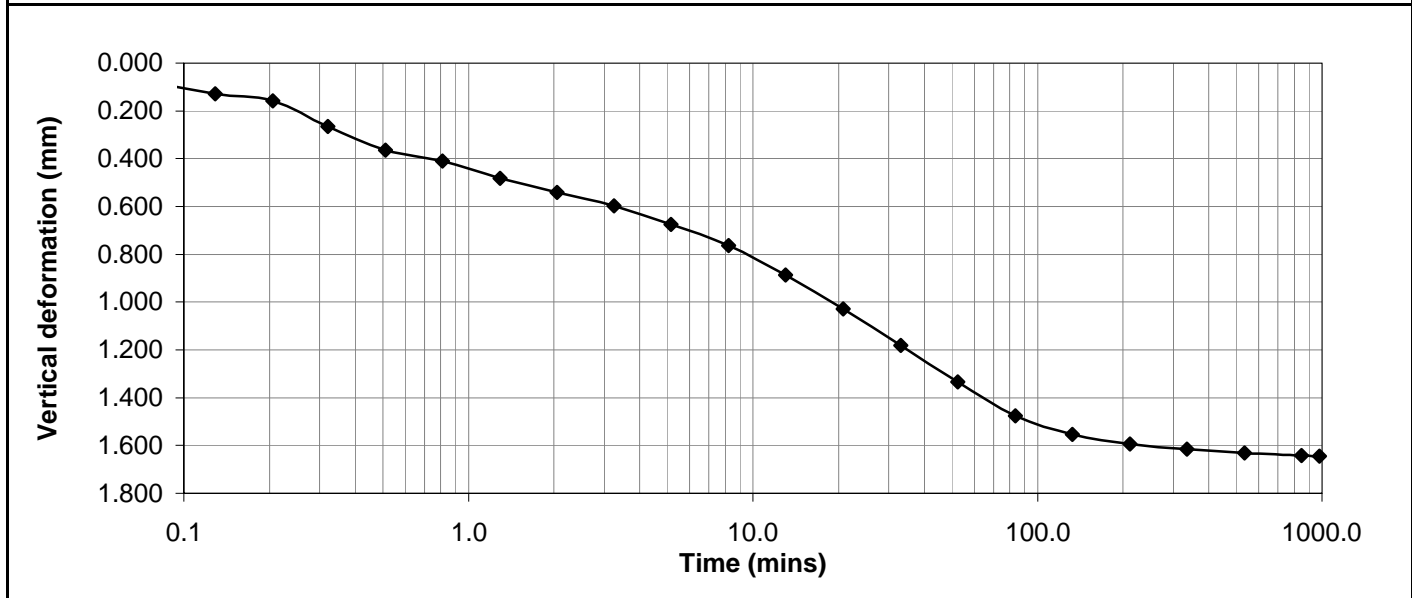
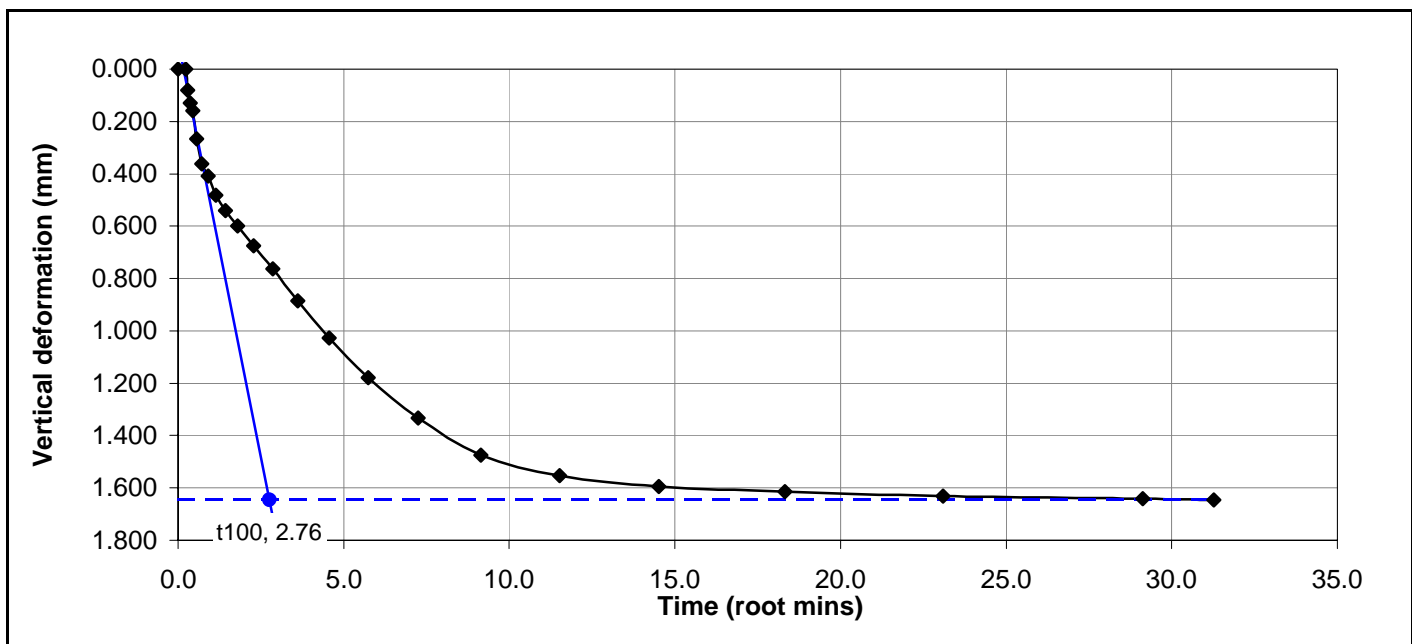


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Balzo		Sample depth	3.60/4.10
Project reference	Palazzi Giomarelli srl		Sample type	Undisturbed cohesive
Borehole number	3	Sample orientation	Vertical	
Sample number	1	Specimen orientation	Vertical	

SPECIMEN 3 **Normal stress (kPa) 400**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	18/10/2010	Date	21/10/2010	Date	No. 2534/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		
Project reference	Palazzi Giomarelli srl	Sample depth	3.60/4.10
Borehole number	3	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 3 **Normal stress (kPa) 400**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
0.02	0.007	0.00	22.4	0.000	0.00	0.0	0.0
10.00	0.050	0.14	34.2	0.043	0.14	11.8	4.2
20.00	0.075	0.28	52.8	0.068	0.28	30.4	10.8
30.00	0.100	0.41	74.3	0.093	0.41	51.8	18.3
40.00	0.119	0.52	100.5	0.112	0.52	78.1	27.6
50.00	0.143	0.64	123.7	0.136	0.64	101.2	35.8
60.00	0.161	0.76	145.8	0.154	0.76	123.4	43.6
70.00	0.184	0.90	166.5	0.177	0.90	144.1	51.0
80.00	0.205	1.03	186.3	0.198	1.03	163.9	58.0
90.00	0.227	1.16	206.2	0.220	1.16	183.8	65.0
100.00	0.240	1.28	225.6	0.233	1.28	203.1	71.8
110.00	0.256	1.40	242.8	0.249	1.40	220.4	77.9
120.00	0.272	1.52	258.8	0.265	1.52	236.4	83.6
130.00	0.292	1.64	274.1	0.285	1.64	251.7	89.0
140.00	0.306	1.77	288.2	0.299	1.77	265.8	94.0
150.00	0.324	1.89	301.2	0.317	1.89	278.8	98.6
160.00	0.340	2.02	312.9	0.333	2.02	290.5	102.7
170.00	0.356	2.15	323.5	0.349	2.15	301.1	106.5
180.00	0.373	2.28	333.0	0.366	2.28	310.6	109.8
190.00	0.387	2.41	341.6	0.380	2.41	319.2	112.9
200.00	0.402	2.54	349.0	0.395	2.54	326.6	115.5
210.00	0.413	2.67	355.2	0.406	2.67	332.8	117.7
220.00	0.425	2.80	360.5	0.418	2.80	338.0	119.6
230.00	0.441	2.93	364.8	0.434	2.93	342.3	121.1
240.00	0.450	3.07	367.9	0.443	3.07	345.5	122.2
250.00	0.465	3.21	369.8	0.458	3.21	347.3	122.8
260.00	0.479	3.34	371.4	0.472	3.34	349.0	123.4
270.00	0.495	3.47	372.8	0.488	3.47	350.3	123.9
280.00	0.508	3.61	373.6	0.501	3.61	351.2	124.2
290.00	0.523	3.75	374.0	0.516	3.75	351.6	124.3
300.00	0.534	3.89	374.5	0.527	3.89	352.0	124.5
310.00	0.547	4.02	374.8	0.540	4.02	352.4	124.6
320.00	0.557	4.16	375.1	0.550	4.16	352.7	124.7
330.00	0.566	4.30	375.3	0.559	4.30	352.8	124.8



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA - Balzo</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>3.60/4.10</i>
Borehole number	<i>3</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 3 **Normal stress (kPa) 400**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
340.00	0.579	4.44	375.3	0.572	4.44	352.9	124.8
350.00	0.591	4.58	375.3	0.584	4.58	352.9	124.8
360.00	0.600	4.71	375.3	0.593	4.71	352.9	124.8
370.00	0.610	4.85	375.2	0.603	4.85	352.8	124.8
380.00	0.616	4.99	375.0	0.609	4.99	352.5	124.7
390.00	0.621	5.12	373.6	0.614	5.12	351.1	124.2
400.00	0.627	5.26	371.5	0.620	5.26	349.1	123.5
410.00	0.632	5.40	369.1	0.625	5.40	346.7	122.6
410.95	0.633	5.42	368.7	0.626	5.42	346.2	122.5

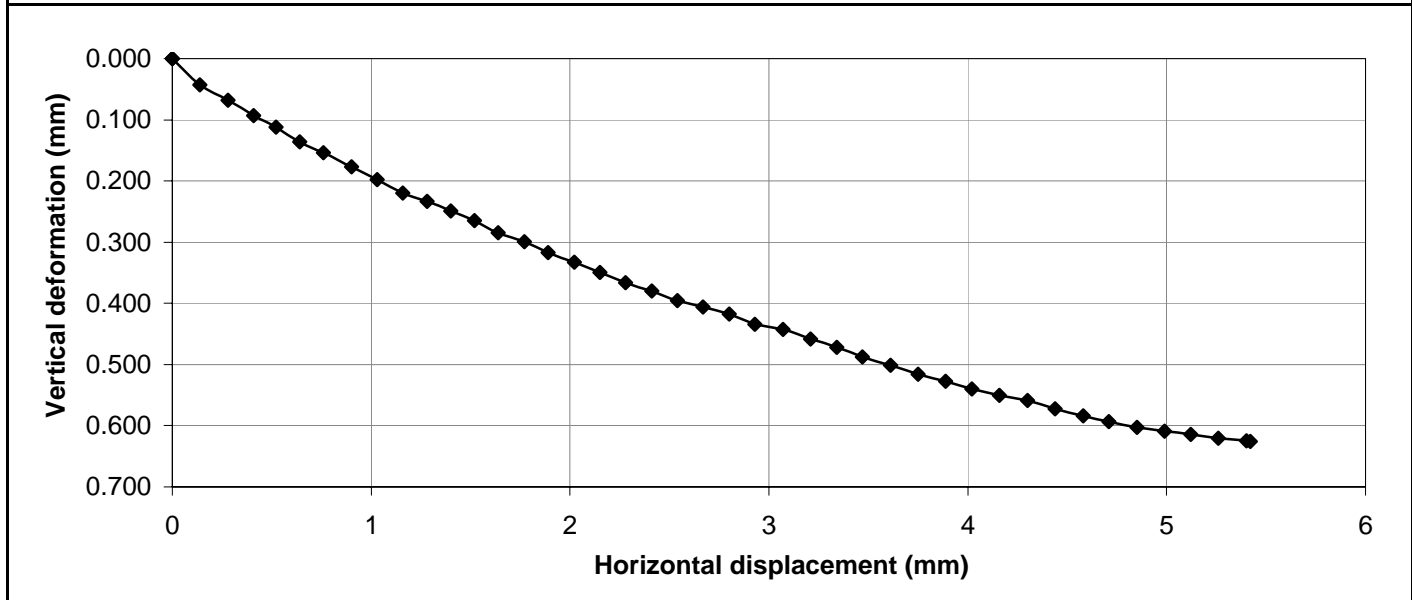
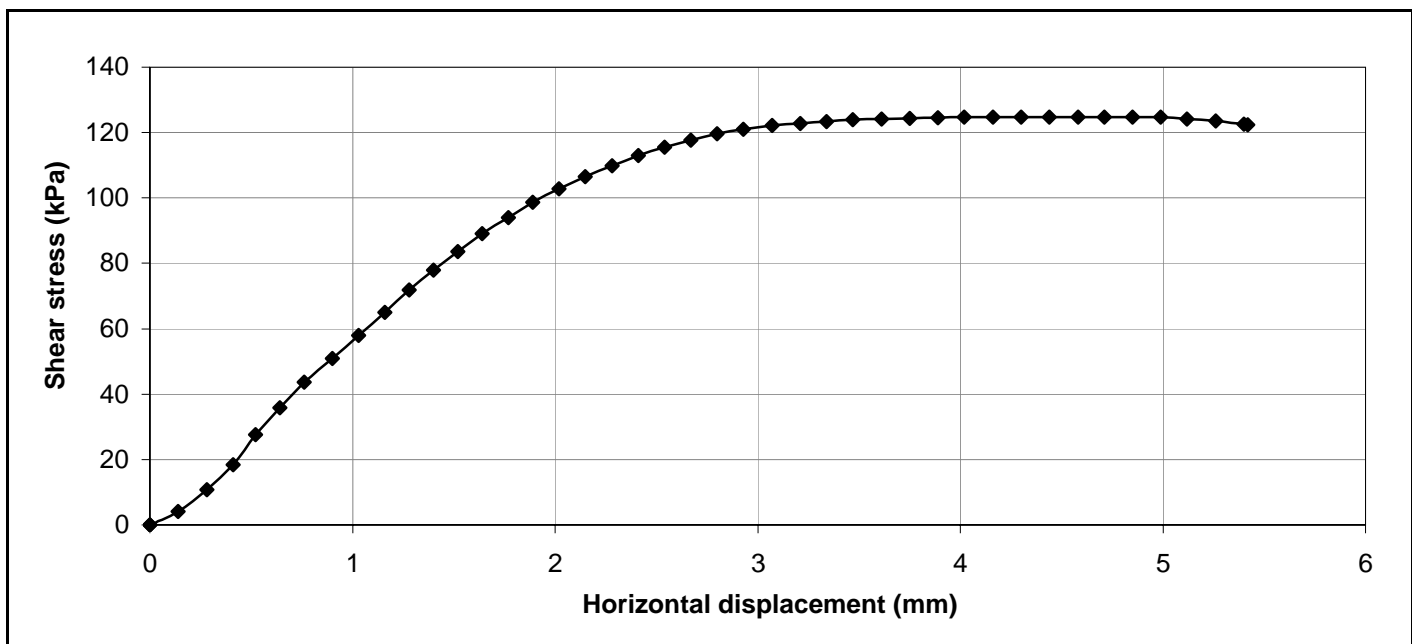


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Balzo		Sample depth	3.60/4.10
Project reference	Palazzi Giomarelli srl	Sample type	Undisturbed cohesive	
Borehole number	3	Specimen orientation	Vertical	
Sample number	1			

SPECIMEN 3 **Normal stress (kPa) 400**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	19/10/2010	Date	21/10/2010	Date	No. 2534/2010

PROVA EDOMETRICA (ASTM D2435)

Dati del Cliente

Cliente Geotecnica Palazzi Giomarelli
 Indirizzo
 Cantiere GEOIALIA - Balzo (FI)
 Sondaggio 3
 Campione 1
 Profondità 3.60 - 4.10

Dati del provino

Data del sondaggio			
Sezione	20.000 cm ²	Densità umida iniziale	1.761 g/cm ³ γ_n
Altezza iniziale	20.000 mm	Densità umida finale	1.907 g/cm ³ γ_f
Altezza finale	17.600 mm	Densità secca iniziale	1.284 g/cm ³ γ_d
No. Tara 1	5	Umidità iniziale	37.150 % W_0
Peso tara 1	60.130 g	Umidità finale	30.685 % W_f
Tara + peso umido iniz.	130.57 g	Saturazione iniziale	92.867 % S_0
No. Tara 2	9	Saturazione finale	100.092 % S_f
Peso tara 2	28.850 g	Indice dei vuoti iniziale	1.056 e_0
Tara + peso umido fin.	95.970 g	Indice dei vuoti finale	0.809 e_f
Tara + peso secco finale	80.210 g	Densità secca finale	1.459 g/cm ³ γ_{df}
Peso specifico dei grani	2.640 g/cm ³		

Note : Campione con circa il 9% di Sostanza Organica.

Gradino	P' kPa	ϵ %	e	M MPa	Cv cm ² /s	K m/s	Metodo	C alfa %
1	12.5	0.679	1.042					0.000
2	25.0	1.327	1.029	1.93				0.000
3	50.0	2.319	1.008	2.52	1.854e-003	7.217e-010	Casagrande	0.069
4	100.0	3.931	0.975	3.10	8.120e-004	2.567e-010	Casagrande	0.088
5	200.0	6.576	0.921	3.78	6.350e-004	1.647e-010	Casagrande	0.172
6	400.0	10.013	0.850	5.82	4.160e-004	7.008e-011	Casagrande	0.192
7	800.0	14.274	0.763	9.39	2.250e-004	2.349e-011	Casagrande	0.196
8	1600.0	19.063	0.664	16.71				0.000
9	800.0	18.463	0.676					
10	400.0	17.342	0.700					
11	200.0	16.265	0.722					
12	100.0	15.243	0.743					
13	50.0	14.098	0.766					
14	25.0	13.405	0.780					
15	12.5	12.500	0.799					

Il Direttore del Laboratorio

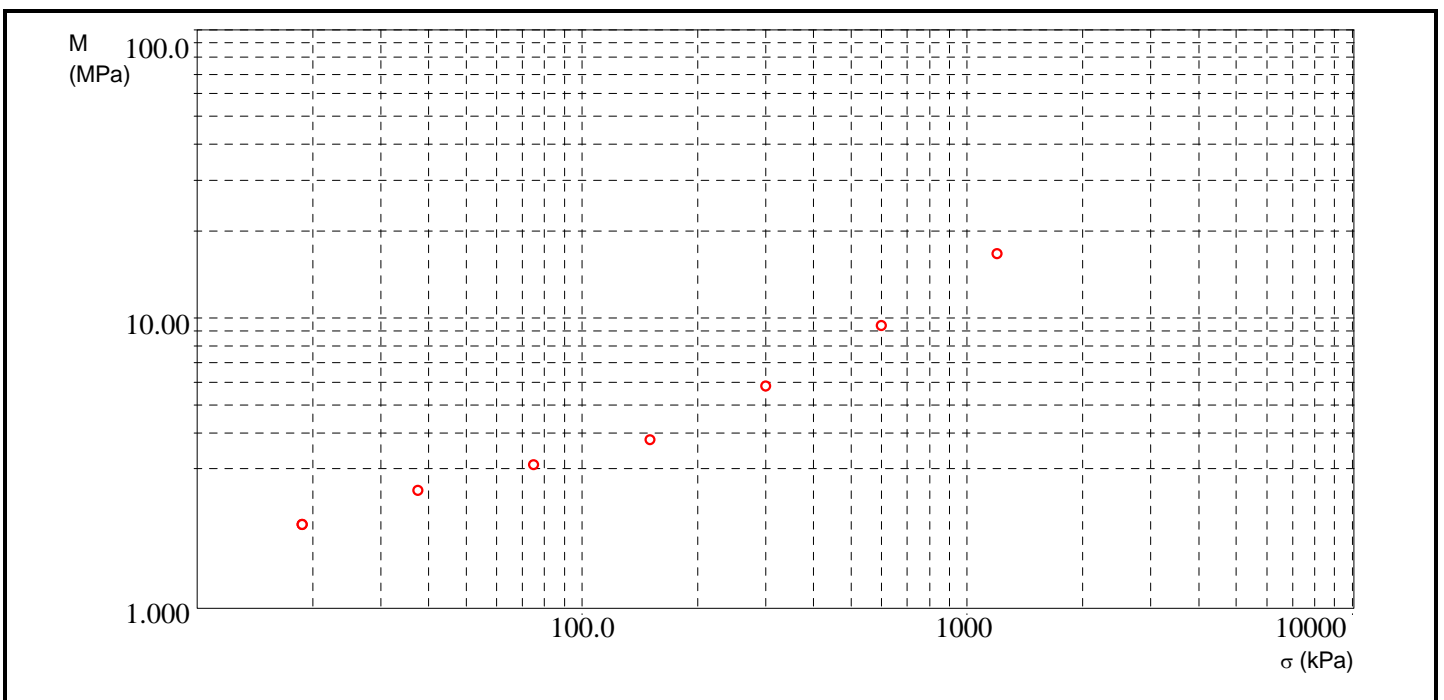
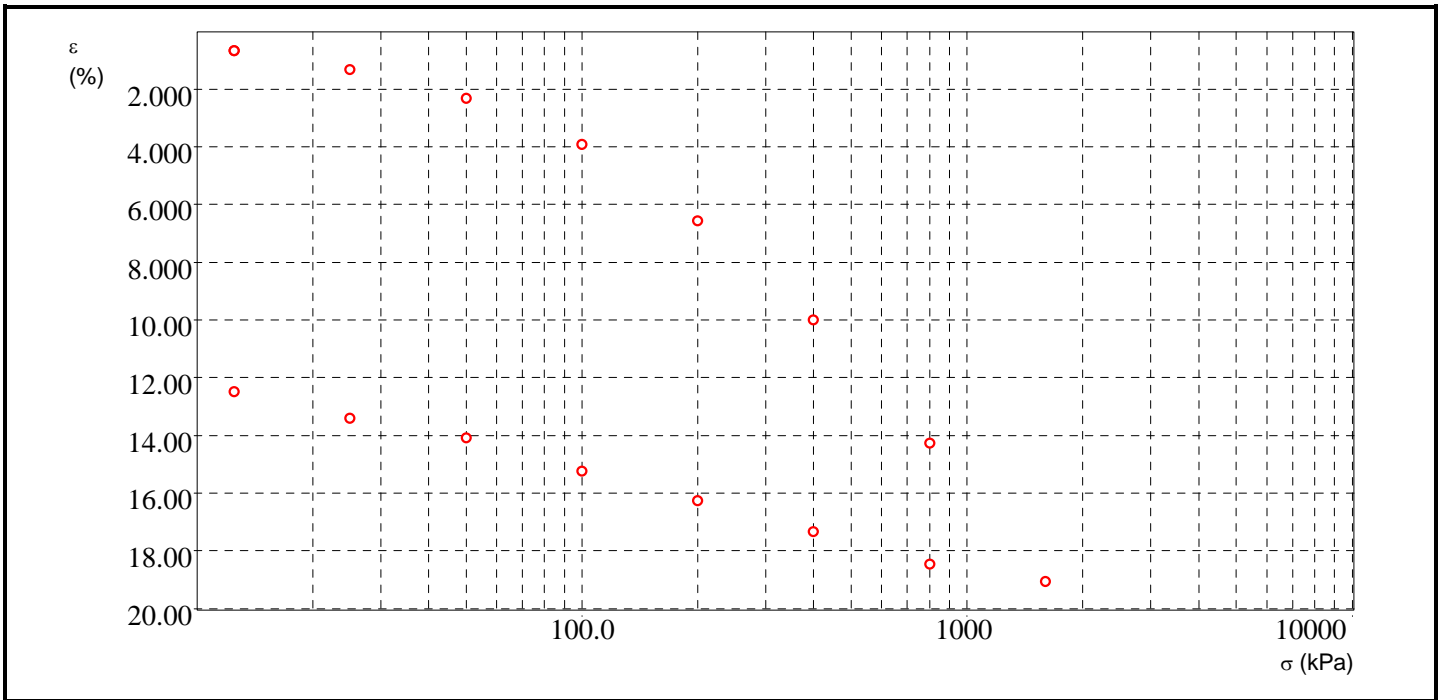

Lo Sperimentatore




PROVA EDOMETRICA (ASTM D2435)

Dati del Cliente

Cliente	Geotecnica Palazzi Giomarelli
Indirizzo	
Cantiere	GEOIALIA - Balzo (FI)
Sondaggio	3
Campione	1
Profondità	3.60 - 4.10



Il Direttore del Laboratorio

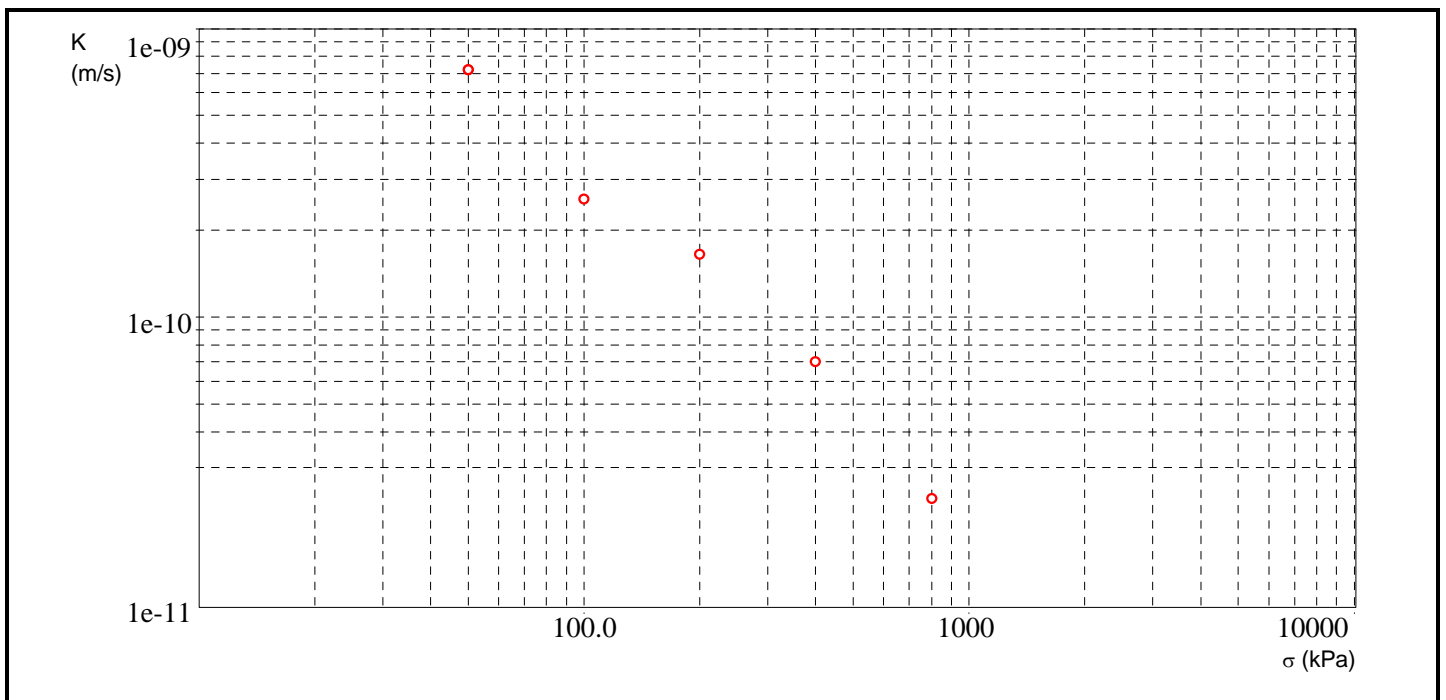
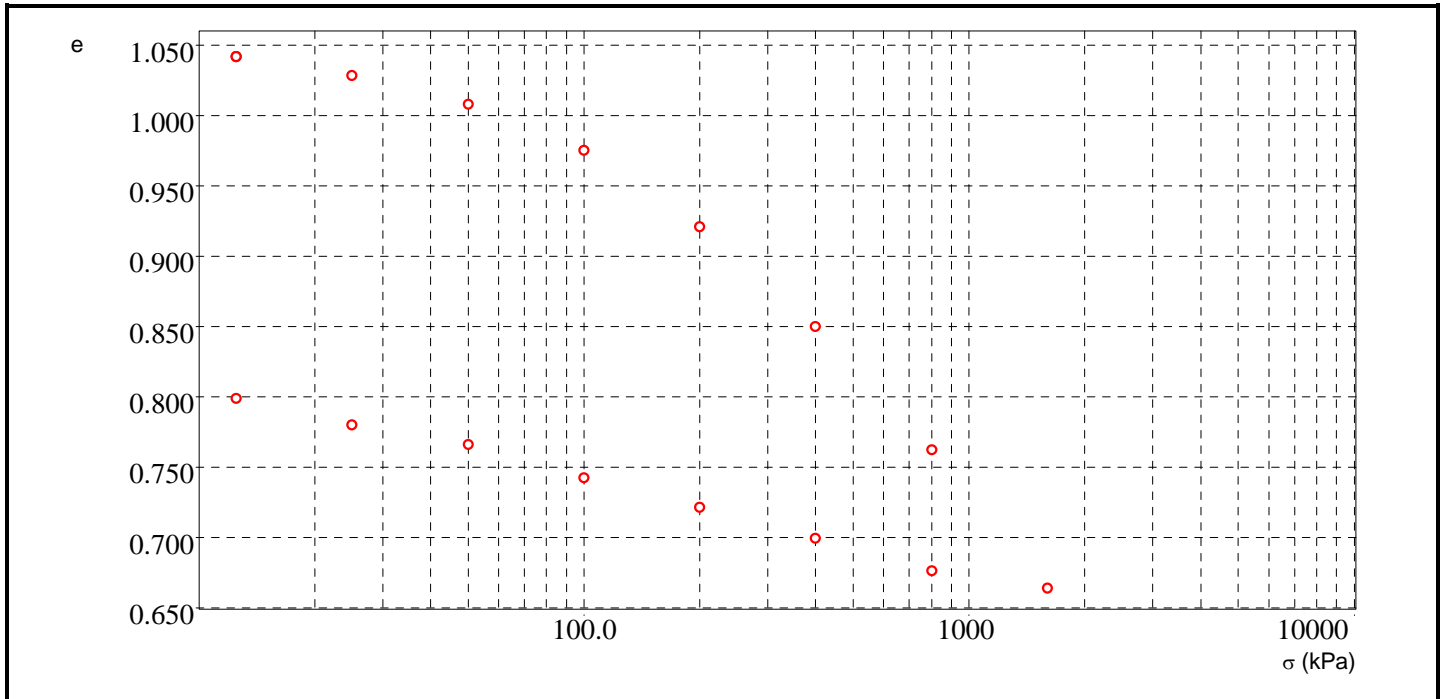
Lo Sperimentatore



PROVA EDOMETRICA (ASTM D2435)

Dati del Cliente

Cliente	Geotecnica Palazzi Giomarelli
Indirizzo	
Cantiere	GEOIALIA - Balzo (FI)
Sondaggio	3
Campione	1
Profondità	3.60 - 4.10



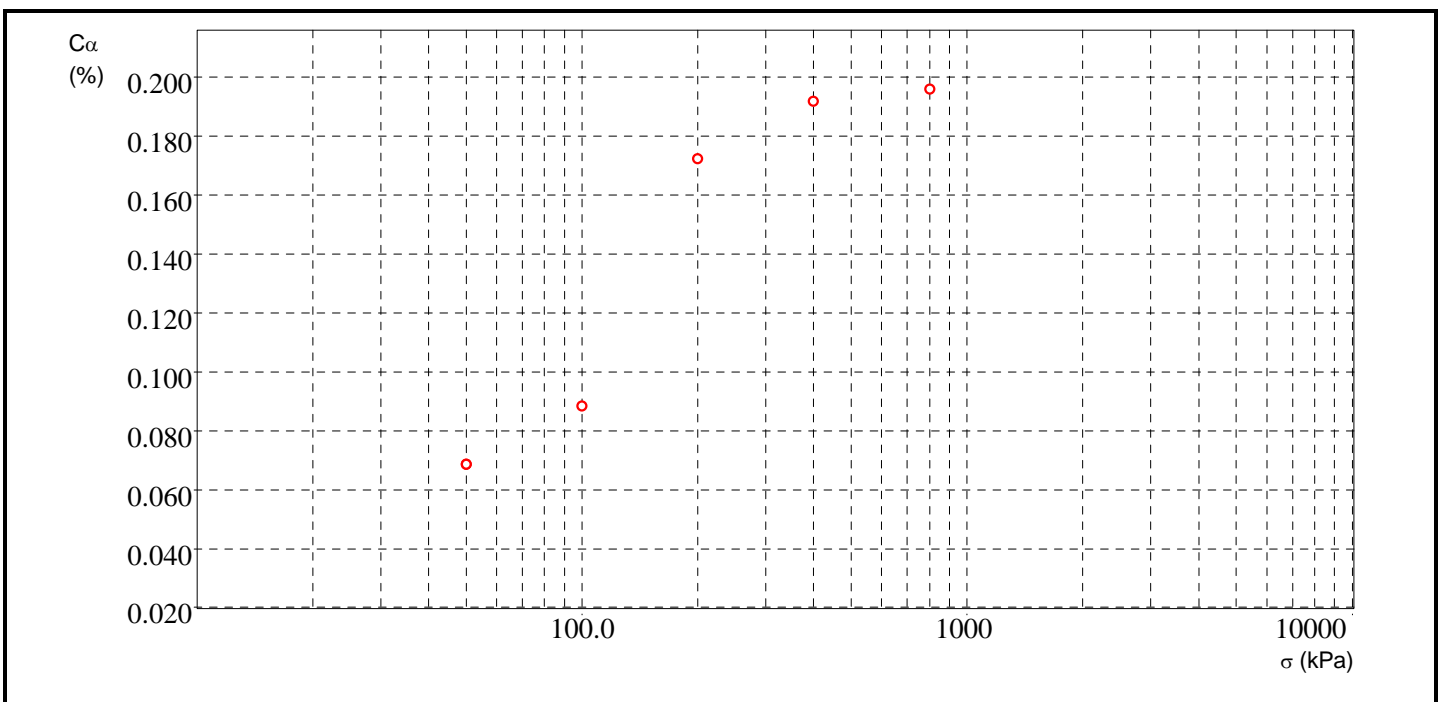
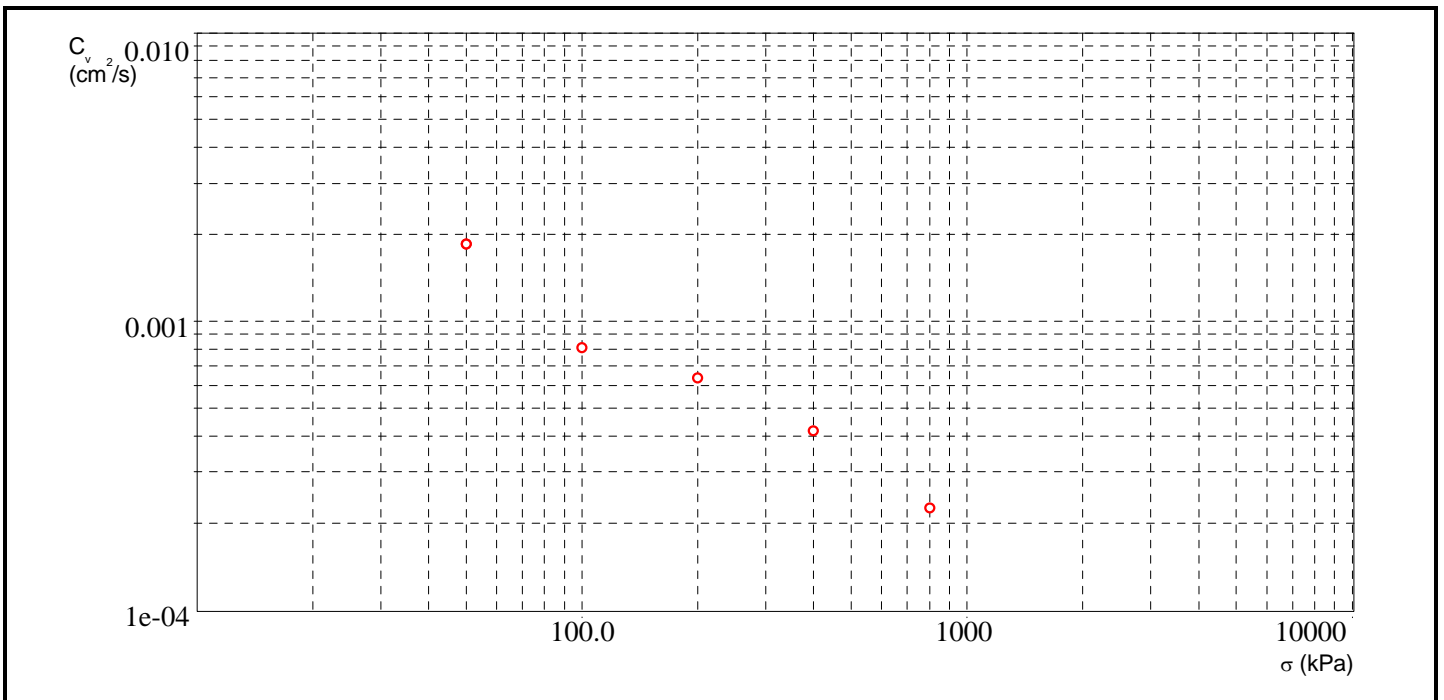
Il Direttore del Laboratorio

Lo Sperimentatore

PROVA EDOMETRICA (ASTM D2435)

Dati del Cliente

Cliente	Geotecnica Palazzi Giomarelli
Indirizzo	
Cantiere	GEOIALIA - Balzo (FI)
Sondaggio	3
Campione	1
Profondità	3.60 - 4.10



Il Direttore del Laboratorio


Lo Sperimentatore


PROVA EDOMETRICA (ASTM D2435)

Cliente Geotecnica Palazzi Giomarelli
 Cantiere GEOIALIA - Balzo (FI)
 Sondaggio 3
 Campione 1
 Profondità 3.60 - 4.10

Dati del provino

Data del sondaggio		Densità umida iniziale	1.761 g/cm ³ γ_n
Sezione	20.000 cm ²	Densità umida finale	1.907 g/cm ³ γ_f
Altezza iniziale	20.000 mm	Densità secca iniziale	1.284 g/cm ³ γ_d
Altezza finale	17.600 mm	Umidità iniziale	37.150 % W_0
No. Tara 1	5	Umidità finale	30.685 % W_f
Peso tara 1	60.130 g	Saturazione iniziale	92.867 % S_0
Tara + peso umido iniz.	130.57 g	Saturazione finale	100.092 % S_f
No. Tara 2	9	Indice dei vuoti iniziale	1.056 e_0
Peso tara 2	28.850 g	Indice dei vuoti finale	0.809 e_f
Tara + peso umido fin.	95.970 g	Densità secca finale	1.459 g/cm ³ γ_{df}
Tara + peso secco finale	80.210 g		
Peso specifico dei grani	2.640 g/cm ³		

Cedimenti in funzione del tempo

Gradino 01 12.5 kPa		Gradino 02 25.0 kPa		Gradino 03 50.0 kPa		Gradino 04 100.0 kPa	
dt min	dH mm	dt min	dH mm	dt min	dH mm	dt min	dH mm
0.050	0.038	0.050	0.194	0.050	0.296	0.050	0.553
0.080	0.038	0.080	0.195	0.080	0.306	0.080	0.567
0.126	0.038	0.126	0.197	0.126	0.311	0.126	0.577
0.201	0.039	0.201	0.199	0.201	0.318	0.201	0.590
0.320	0.040	0.320	0.200	0.320	0.326	0.320	0.598
0.508	0.063	0.508	0.202	0.508	0.338	0.508	0.604
0.808	0.067	0.808	0.205	0.808	0.349	0.808	0.614
1.285	0.069	1.285	0.210	1.285	0.358	1.285	0.627
2.042	0.070	2.042	0.217	2.042	0.371	2.042	0.638
3.247	0.073	3.247	0.220	3.247	0.380	3.247	0.655
5.163	0.076	5.163	0.222	5.163	0.389	5.163	0.677
8.210	0.079	8.210	0.224	8.210	0.397	8.210	0.700
13.054	0.081	13.054	0.226	13.054	0.405	13.054	0.723
20.755	0.086	20.755	0.227	20.755	0.417	20.755	0.734
33.001	0.089	33.001	0.229	33.001	0.427	33.001	0.741
52.472	0.092	52.472	0.233	52.472	0.430	52.472	0.750
83.430	0.100	83.430	0.240	83.430	0.437	83.430	0.759
132.654	0.106	132.654	0.245	132.654	0.441	132.654	0.768

Risultati

ϵ	0.679	%
e	1.042	
Metodo		
Cv		
Ca		
M		
K		

Risultati

ϵ	1.327	%
e	1.029	
Metodo		
Cv		
Ca		
M	1.929	MPa
K		

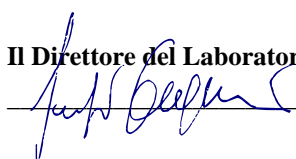
Risultati

ϵ	2.319	%
e	1.008	
Metodo	Casagrande	
Cv	1.854e-003	cm ² /s
Ca	0.069	%
M	2.520	MPa
K	7.217e-010	m/s


Risultati

ϵ	3.931	%
e	0.975	
Metodo	Casagrande	
Cv	8.120e-004	cm ² /s
Ca	0.088	%
M	3.102	MPa
K	2.567e-010	m/s

Il Direttore del Laboratorio



Lo Sperimentatore



PROVA EDOMETRICA (ASTM D2435)

Cliente	Geotecnica Palazzi Giomarelli
Cantiere	GEOIALIA - Balzo (FI)
Sondaggio	3
Campione	1
Profondità	3.60 - 4.10

Dati del provino

Data del sondaggio		Densità umida iniziale	1.761 g/cm ³ γ_n
Sezione	20.000 cm ²	Densità umida finale	1.907 g/cm ³ γ_f
Altezza iniziale	20.000 mm	Densità secca iniziale	1.284 g/cm ³ γ_d
Altezza finale	17.600 mm	Umidità iniziale	37.150 % W_0
No. Tara 1	5	Umidità finale	30.685 % W_f
Peso tara 1	60.130 g	Saturazione iniziale	92.867 % S_0
Tara + peso umido iniz.	130.57 g	Saturazione finale	100.092 % S_f
No. Tara 2	9	Indice dei vuoti iniziale	1.056 e_0
Peso tara 2	28.850 g	Indice dei vuoti finale	0.809 e_f
Tara + peso umido fin.	95.970 g	Densità secca finale	1.459 g/cm ³ γ_{df}
Tara + peso secco finale	80.210 g		
Peso specifico dei grani	2.640 g/cm ³		

Cedimenti in funzione del tempo

Gradino 05 200.0 kPa		Gradino 06 400.0 kPa		Gradino 07 800.0 kPa		Gradino 08 1600.0 kPa	
dt min	dH mm	dt min	dH mm	dt min	dH mm	dt min	dH mm
0.050	0.842	0.050	1.405	0.050	2.081	0.050	2.893
0.080	0.886	0.080	1.429	0.080	2.107	0.080	2.899
0.126	0.900	0.126	1.440	0.126	2.137	0.126	2.907
0.201	0.912	0.201	1.465	0.201	2.166	0.201	2.976
0.320	0.926	0.320	1.479	0.320	2.177	0.320	2.994
0.508	0.938	0.508	1.492	0.508	2.196	0.508	3.015
0.808	0.955	0.808	1.527	0.808	2.223	0.808	3.036
1.285	0.979	1.285	1.547	1.285	2.248	1.285	3.068
2.042	1.015	2.042	1.569	2.042	2.286	2.042	3.091
3.247	1.047	3.247	1.602	3.247	2.310	3.247	3.127
5.163	1.073	5.163	1.663	5.163	2.365	5.163	3.182
8.210	1.100	8.210	1.698	8.210	2.409	8.210	3.237
13.054	1.156	13.054	1.756	13.054	2.486	13.054	3.301
20.755	1.179	20.755	1.817	20.755	2.562	20.755	3.381
33.001	1.208	33.001	1.866	33.001	2.620	33.001	3.467
52.472	1.234	52.472	1.901	52.472	2.695	52.472	3.558
83.430	1.249	83.430	1.934	83.430	2.749	83.430	3.638
132.654	1.261	132.654	1.954	132.654	2.782	132.654	3.689

Risultati

ε	6.576	%
e	0.921	
Metodo	Casagrande	
Cv	6.350e-004	cm ³ /s
Ca	0.172	%
M	3.781	MPa
K	1.647e-010	m/s

Risultati

ε	10.013	%
e	0.850	
Metodo	Casagrande	
Cv	4.160e-004	cm ³ /s
Ca	0.192	%
M	5.819	MPa
K	7.008e-011	m/s

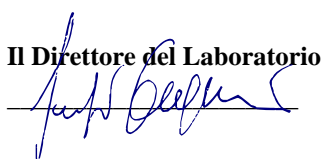
Risultati

ε	14.274	%
e	0.763	
Metodo	Casagrande	
Cv	2.250e-004	cm ³ /s
Ca	0.196	%
M	9.387	MPa
K	2.349e-011	m/s

Risultati

ε	19.063	%
e	0.664	
Metodo		
Cv		
Ca		
M	16.706	MPa
K		

Il Direttore del Laboratorio



Lo Sperimentatore



PROVA EDOMETRICA (ASTM D2435)

Cliente Geotecnica Palazzi Giomarelli
 Cantiere GEOIALIA - Balzo (FI)
 Sondaggio 3
 Campione 1
 Profondità 3.60 - 4.10

Dati del provino

Data del sondaggio		Densità umida iniziale	1.761 g/cm ³ γ_n
Sezione	20.000 cm ²	Densità umida finale	1.907 g/cm ³ γ_f
Altezza iniziale	20.000 mm	Densità secca iniziale	1.284 g/cm ³ γ_d
Altezza finale	17.600 mm	Umidità iniziale	37.150 % W_0
No. Tara 1	5	Umidità finale	30.685 % W_f
Peso tara 1	60.130 g	Saturazione iniziale	92.867 % S_0
Tara + peso umido iniz.	130.57 g	Saturazione finale	100.092 % S_f
No. Tara 2	9	Indice dei vuoti iniziale	1.056 e_0
Peso tara 2	28.850 g	Indice dei vuoti finale	0.809 e_f
Tara + peso umido fin.	95.970 g	Densità secca finale	1.459 g/cm ³ γ_{df}
Tara + peso secco finale	80.210 g		
Peso specifico dei grani	2.640 g/cm ³		

Cedimenti in funzione del tempo

Gradino 09 800.0 kPa		Gradino 10 400.0 kPa		Gradino 11 200.0 kPa		Gradino 12 100.0 kPa	
dt min	dH mm	dt min	dH mm	dt min	dH mm	dt min	dH mm
0.050	3.818	0.050	3.667	0.050	3.454	0.050	3.233
0.080	3.814	0.080	3.666	0.080	3.451	0.080	3.231
0.126	3.795	0.126	3.665	0.126	3.448	0.126	3.229
0.201	3.792	0.201	3.665	0.201	3.444	0.201	3.228
0.320	3.790	0.320	3.663	0.320	3.440	0.320	3.225
0.508	3.788	0.508	3.660	0.508	3.436	0.508	3.222
0.808	3.782	0.808	3.656	0.808	3.424	0.808	3.219
1.285	3.770	1.285	3.649	1.285	3.420	1.285	3.213
2.042	3.762	2.042	3.639	2.042	3.410	2.042	3.207
3.247	3.751	3.247	3.624	3.247	3.405	3.247	3.202
5.163	3.741	5.163	3.607	5.163	3.400	5.163	3.195
8.210	3.734	8.210	3.594	8.210	3.393	8.210	3.188
13.054	3.725	13.054	3.579	13.054	3.383	13.054	3.181
20.755	3.718	20.755	3.565	20.755	3.372	20.755	3.168
33.001	3.714	33.001	3.548	33.001	3.353	33.001	3.141
52.472	3.709	52.472	3.526	52.472	3.323	52.472	3.123
83.430	3.702	83.430	3.499	83.430	3.300	83.430	3.100
132.654	3.696	132.654	3.487	132.654	3.287	132.654	3.083

Risultati

ϵ	18.463	%
e	0.676	
Metodo		
Cv		
Ca		
M		
K		

Risultati

ϵ	17.342	%
e	0.700	
Metodo		
Cv		
Ca		
M		
K		

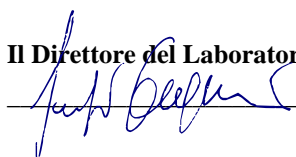
Risultati

ϵ	16.265	%
e	0.722	
Metodo		
Cv		
Ca		
M		
K		

Risultati

ϵ	15.243	%
e	0.743	
Metodo		
Cv		
Ca		
M		
K		

Il Direttore del Laboratorio



Lo Sperimentatore





PROVA EDOMETRICA (ASTM D2435)

Cliente Geotecnica Palazzi Giomarelli
 Cantiere GEOIALIA - Balzo (FI)
 Sondaggio 3
 Campione 1
 Profondità 3.60 - 4.10

Dati del provino

Data del sondaggio		Densità umida iniziale	1.761 g/cm ³	γ_n
Sezione	20.000 cm ²	Densità umida finale	1.907 g/cm ³	γ_f
Altezza iniziale	20.000 mm	Densità secca iniziale	1.284 g/cm ³	γ_d
Altezza finale	17.600 mm	Umidità iniziale	37.150 %	W_0
No. Tara 1	5	Umidità finale	30.685 %	W_f
Peso tara 1	60.130 g	Saturazione iniziale	92.867 %	S_0
Tara + peso umido iniz.	130.57 g	Saturazione finale	100.092 %	S_f
No. Tara 2	9	Indice dei vuoti iniziale	1.056	e_0
Peso tara 2	28.850 g	Indice dei vuoti finale	0.809	e_f
Tara + peso umido fin.	95.970 g	Densità secca finale	1.459 g/cm ³	γ_{df}
Tara + peso secco finale	80.210 g			
Peso specifico dei grani	2.640 g/cm ³			

Cedimenti in funzione del tempo

Gradino 13 50.0 kPa		Gradino 14 25.0 kPa		Gradino 15 12.5 kPa		
dt min	dH mm	dt min	dH mm	dt min	dH mm	
0.050	3.032	0.050	2.813	0.050	2.653	
0.080	3.032	0.080	2.813	0.080	2.652	
0.126	3.032	0.126	2.813	0.126	2.652	
0.201	3.030	0.201	2.813	0.201	2.651	
0.320	3.029	0.320	2.813	0.320	2.650	
0.508	3.027	0.508	2.812	0.508	2.648	
0.808	3.024	0.808	2.811	0.808	2.647	
1.285	3.020	1.285	2.810	1.285	2.647	
2.042	3.017	2.042	2.808	2.042	2.645	
3.247	3.015	3.247	2.808	3.247	2.641	
5.163	3.011	5.163	2.806	5.163	2.636	
8.210	3.003	8.210	2.803	8.210	2.630	
13.054	2.996	13.054	2.799	13.054	2.626	
20.755	2.983	20.755	2.793	20.755	2.624	
33.001	2.972	33.001	2.784	33.001	2.620	
52.472	2.953	52.472	2.775	52.472	2.617	
83.430	2.929	83.430	2.751	83.430	2.601	
132.654	2.904	132.654	2.724	132.654	2.590	

Risultati

ϵ	14.098	%
e	0.766	
Metodo		
Cv		
Ca		
M		
K		

Risultati

ϵ	13.405	%
e	0.780	
Metodo		
Cv		
Ca		
M		
K		

Risultati

ϵ	12.500	%
e	0.799	
Metodo		
Cv		
Ca		
M		
K		

Risultati

Il Direttore del Laboratorio

Lo Sperimentatore



PROVA EDOMETRICA (ASTM D2435)

Dati del Cliente

Cliente Geotecnica Palazzi Giomarelli
 Indirizzo
 Cantiere GEOIALIA - Balzo (FI)
 Sondaggio 3
 Campione 1
 Profondità 3.60 - 4.10

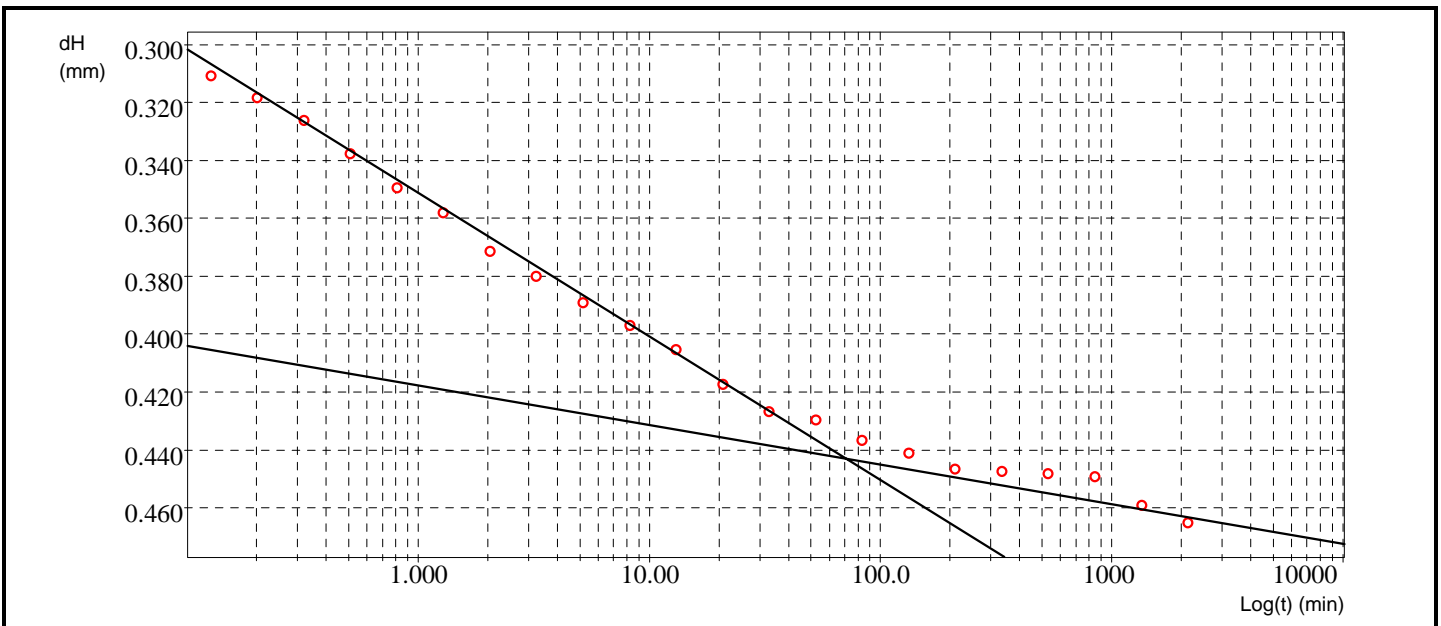
Dati acquisiti del gradino 03

σ_v 50.0 Kpa

dt min	dH mm
0.05	0.296
0.08	0.306
0.13	0.311
0.20	0.318
0.32	0.326
0.51	0.338
0.81	0.349
1.28	0.358
2.04	0.371
3.25	0.380
5.16	0.389

dt min	dH mm
8.21	0.397
13.05	0.405
20.76	0.417
33.00	0.427
52.47	0.430
83.43	0.437
132.65	0.441
210.92	0.447
335.36	0.448
533.23	0.448
847.83	0.449

dt min	dH mm
1348.05	0.459
2143.40	0.465



Risultati di elaborazione

ϵ	2.319	%
e	1.008	
Metodo	Casagrande	
Cv	1.85e-003	cm ² /s
Ca	0.069	%
M	2.520	MPa
K	7.22e-010	m/s

Il Direttore del Laboratorio

Lo Sperimentatore



PROVA EDOMETRICA (ASTM D2435)

Dati del Cliente

Cliente Geotecnica Palazzi Giomarelli
 Indirizzo
 Cantiere GEOIALIA - Balzo (FI)
 Sondaggio 3
 Campione 1
 Profondità 3.60 - 4.10

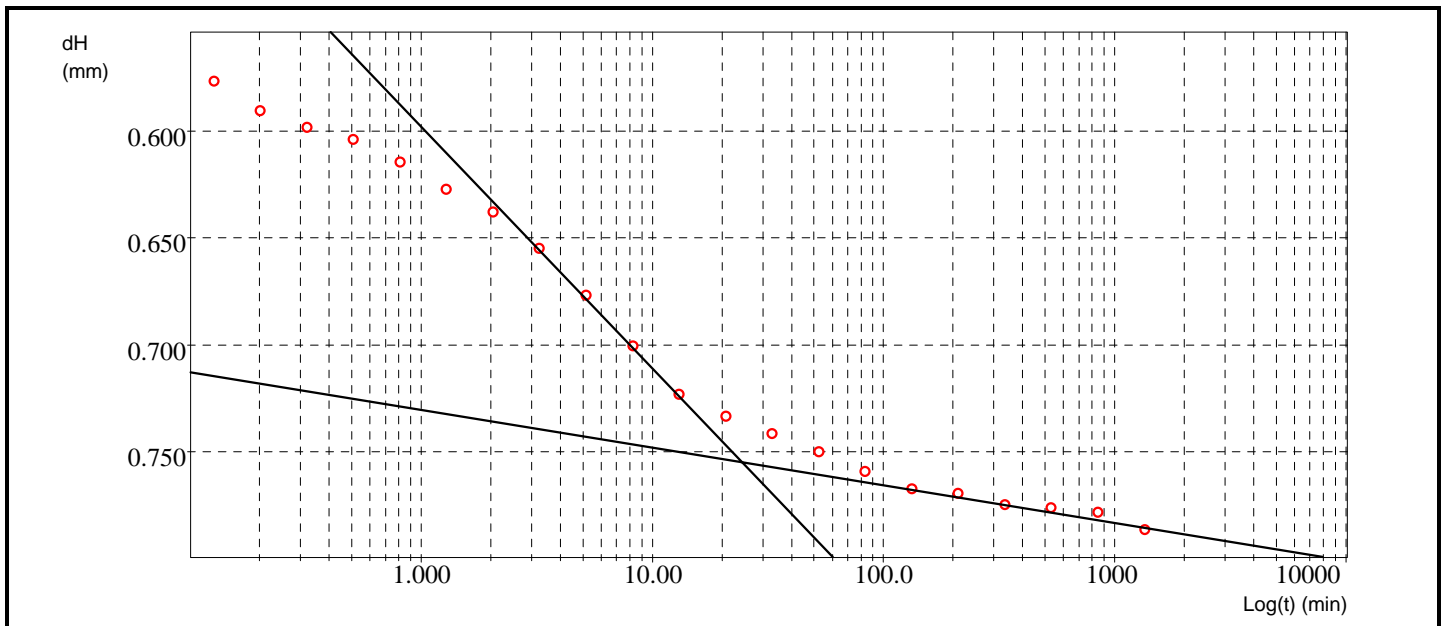
Dati acquisiti del gradino 04

σ_v 100.0 Kpa

dt min	dH mm
0.05	0.553
0.08	0.567
0.13	0.577
0.20	0.590
0.32	0.598
0.51	0.604
0.81	0.614
1.28	0.627
2.04	0.638
3.25	0.655
5.16	0.677

dt min	dH mm
8.21	0.700
13.05	0.723
20.76	0.734
33.00	0.741
52.47	0.750
83.43	0.759
132.65	0.768
210.92	0.770
335.36	0.775
533.23	0.776
847.83	0.778

dt min	dH mm
1348.05	0.787



Risultati di elaborazione

ϵ	3.931	%
e	0.975	
Metodo	Casagrande	
Cv	8.12e-004	cm ² /s
Ca	0.088	%
M	3.102	MPa
K	2.57e-010	m/s

Il Direttore del Laboratorio

Lo Sperimentatore

PROVA EDOMETRICA (ASTM D2435)

Dati del Cliente

Cliente Geotecnica Palazzi Giomarelli
 Indirizzo
 Cantiere GEOIALIA - Balzo (FI)
 Sondaggio 3
 Campione 1
 Profondità 3.60 - 4.10

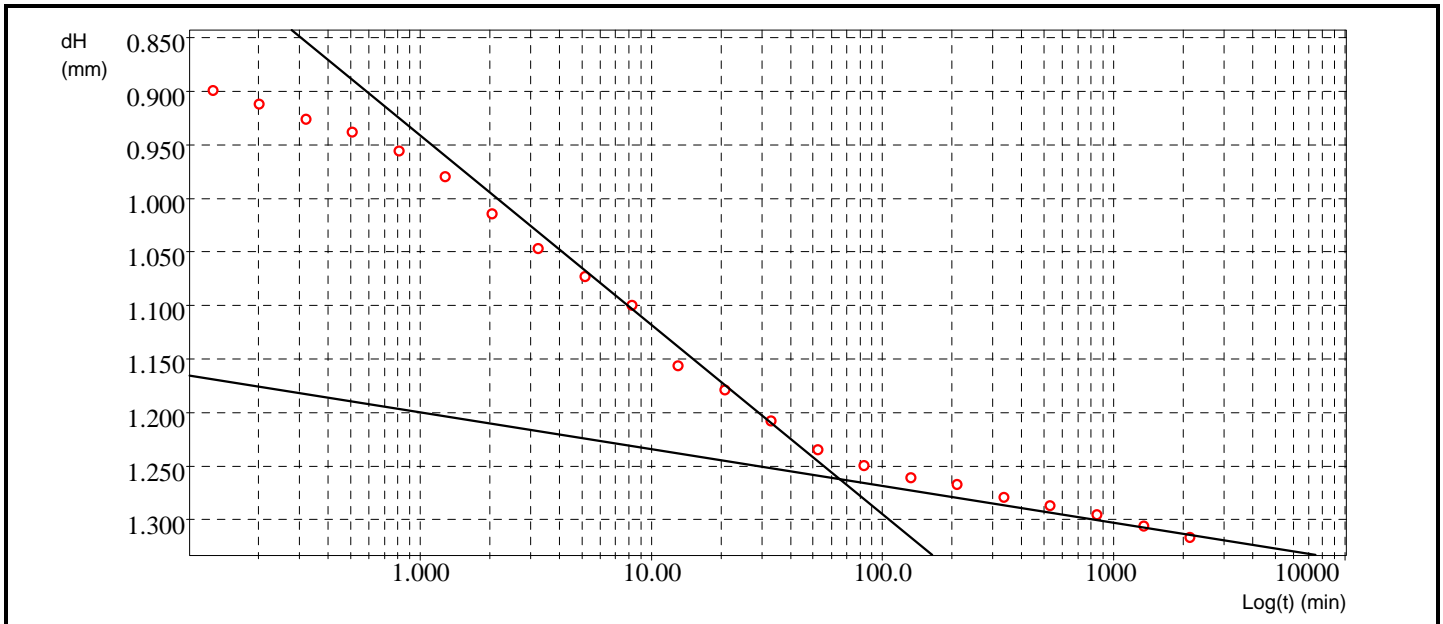
Dati acquisiti del gradino 05

σ_v 200.0 Kpa

dt min	dH mm
0.05	0.842
0.08	0.886
0.13	0.900
0.20	0.912
0.32	0.926
0.51	0.938
0.81	0.955
1.28	0.979
2.04	1.015
3.25	1.047
5.16	1.073

dt min	dH mm
8.21	1.100
13.05	1.156
20.76	1.179
33.00	1.208
52.47	1.234
83.43	1.249
132.65	1.261
210.92	1.267
335.36	1.279
533.23	1.287
847.83	1.295

dt min	dH mm
1348.05	1.306
2143.40	1.316



Risultati di elaborazione

ϵ	6.576	%
e	0.921	
Metodo	Casagrande	
Cv	6.35e-004	cm ² /s
Ca	0.172	%
M	3.781	MPa
K	1.65e-010	m/s

Il Direttore del Laboratorio



Lo Sperimentatore



PROVA EDOMETRICA (ASTM D2435)

Dati del Cliente

Cliente Geotecnica Palazzi Giomarelli
 Indirizzo
 Cantiere GEOIALIA - Balzo (FI)
 Sondaggio 3
 Campione 1
 Profondità 3.60 - 4.10

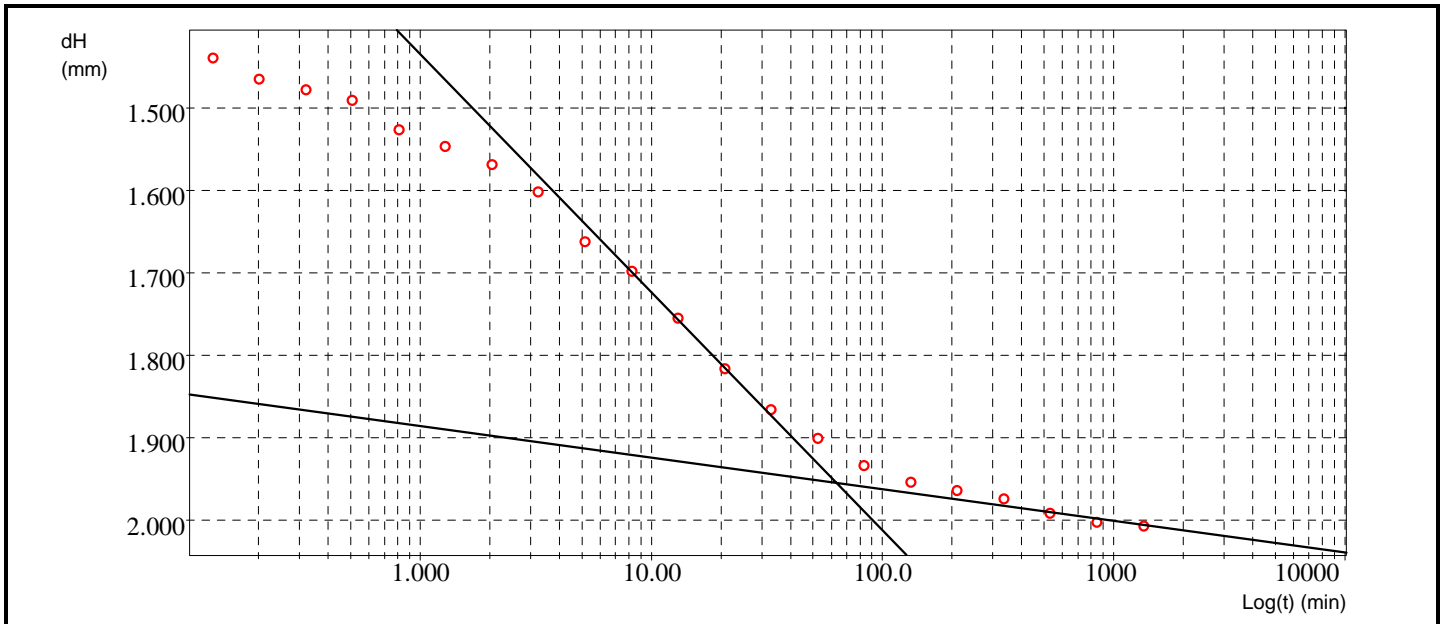
Dati acquisiti del gradino 06

σ_v 400.0 Kpa

dt min	dH mm
0.05	1.405
0.08	1.429
0.13	1.440
0.20	1.465
0.32	1.479
0.51	1.492
0.81	1.527
1.28	1.547
2.04	1.569
3.25	1.602
5.16	1.663

dt min	dH mm
8.21	1.698
13.05	1.756
20.76	1.817
33.00	1.866
52.47	1.901
83.43	1.934
132.65	1.954
210.92	1.965
335.36	1.975
533.23	1.992
847.83	2.002

dt min	dH mm
1348.05	2.007



Risultati di elaborazione

ϵ	10.013	%
e	0.850	
Metodo	Casagrande	
Cv	4.16e-004	cm ² /s
Ca	0.192	%
M	5.819	MPa
K	7.01e-011	m/s

Il Direttore del Laboratorio

[Signature]

Lo Sperimentatore

[Signature]

PROVA EDOMETRICA (ASTM D2435)

Dati del Cliente

Cliente Geotecnica Palazzi Giomarelli
 Indirizzo
 Cantiere GEOIALIA - Balzo (FI)
 Sondaggio 3
 Campione 1
 Profondità 3.60 - 4.10

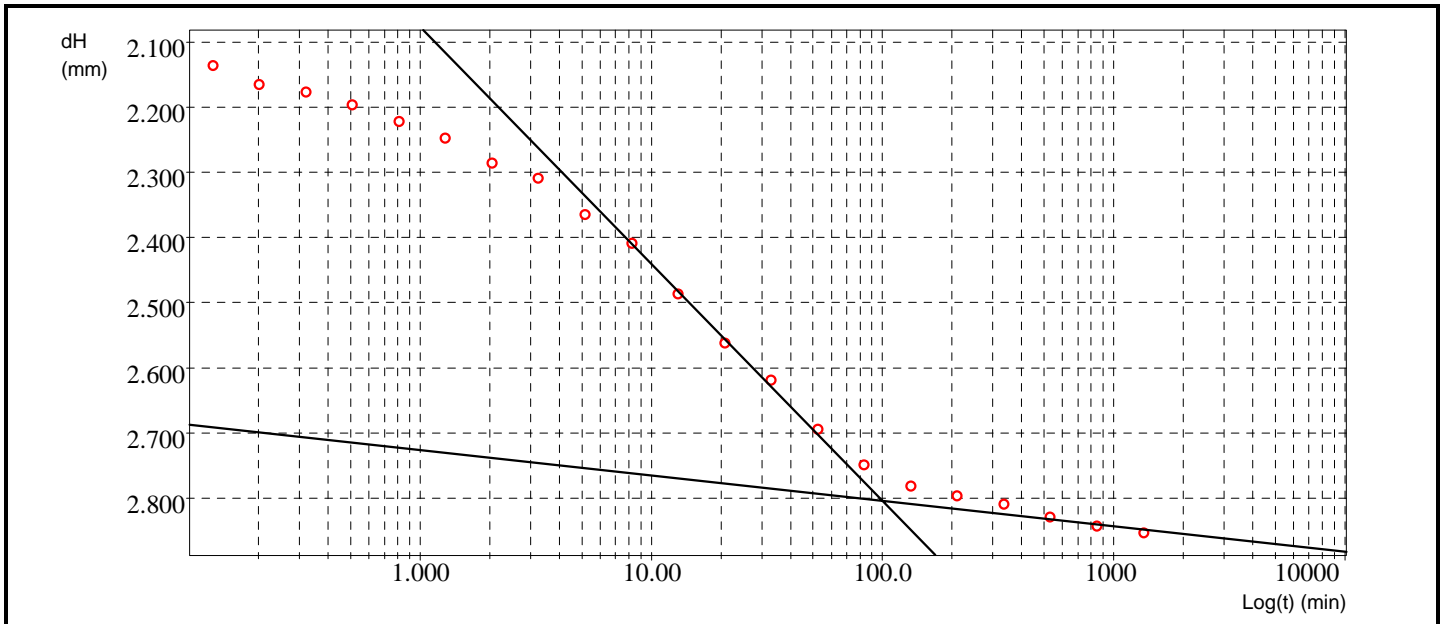
Dati acquisiti del gradino 07

σ_v 800.0 Kpa

dt min	dH mm
0.05	2.081
0.08	2.107
0.13	2.137
0.20	2.166
0.32	2.177
0.51	2.196
0.81	2.223
1.28	2.248
2.04	2.286
3.25	2.310
5.16	2.365

dt min	dH mm
8.21	2.409
13.05	2.486
20.76	2.562
33.00	2.620
52.47	2.695
83.43	2.749
132.65	2.782
210.92	2.797
335.36	2.810
533.23	2.829
847.83	2.843

dt min	dH mm
1348.05	2.854



Risultati di elaborazione

ϵ	14.274	%
e	0.763	
Metodo	Casagrande	
Cv	2.25e-004	cm ² /s
Ca	0.196	%
M	9.387	MPa
K	2.35e-011	m/s

Il Direttore del Laboratorio

[Signature]

Lo Sperimentatore

[Signature]



DESCRIZIONE E RIPRESA FOTOGRAFICA DELLA CAROTA ESTRUSA

Committente: GeoItalia srl - Roma

Cantiere/Località: Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

Sondaggio: 9

Campione: 1

Profondità prelievo: 5.60-6.00

Data prelievo: 18/08/2010

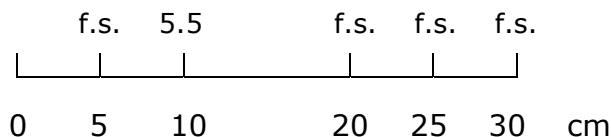
Data apertura: 29/09/2010

Verbale accettazione n° 165

Descrizione: limo con argilla debolmente sabbioso, presenti concrezioni carbonatiche (Raccomandazioni AGI 1977). Limo argilloso (UNI EN ISO 14688-2).

Colore: HUE 5Y VALUE 5 CHROMA 3 (Munsell Soil Color Chart)

Pocket (kg/cm²):



Lunghezza carota: 36 cm
Diametro carota: 88,9 mm



Modalità di prelievo: sondaggio a rotazione

Tipo di fustella: fustella in plastica

Classe di qualità del campione: Q4 (Raccomandazioni AGI 1977)
C2 (Eurocodice 7)

Prove eseguite:

Cont. Acqua W	X	Granulom. Gr	X	T. Residuo TR	-
Peso Volume γ	X	Compress. ELL	-	Triass. TX UU	-
Peso Specifico Gs	X	Edometria Ed	-	Triass. TX CU	-
Limiti Cons. LL	X	T. Diretto TD	-	Triass. TX CD	-



Committente

Geotalia srl – Roma

pagina 1 di 2

Cantiere

Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Data prova 01/10/2010

Data certificato 19/10/2010

Verb. Accettazione 165

N. certificato 2517/2010

Norma di riferimento ASTM D5550-00

AccuPyc II 1340 V1.00

Unit 1

Serial #. 488

Page 1

Sample: VA165_S9_1_m 5,60-6,00
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S9_1.SMP

Analysis Gas: Helium
 Reported: 01/10/2010 16.07.01
 Sample Mass: 8.6700 g
 Temperature: 24.89 °C
 Number of Purges: 5

Analysis Start: 01/10/2010 15.50.32
 Analysis End: 01/10/2010 16.07.01
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2265 cm³
 Cell Volume: 11.8010 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 9, Campione 1, Prof. (m) 5,60-6,00

Combined Report

Tabular 1

Cycle#	Volume (cm ³)	Volume Deviation (cm ³)	Density (g/cm ³)	Density Deviation (g/cm ³)	Total Pore Volume (cm ³)	Total Pore Volume Deviation (cm ³)
1	3.2107	-0.0035	2.7004	0.0029	0.1072	0.0004
2	3.2145	0.0004	2.6971	-0.0003	0.1068	0.0000
3	3.2147	0.0006	2.6970	-0.0005	0.1068	-0.0001
4	3.2158	0.0017	2.6960	-0.0014	0.1066	-0.0002
5	3.2149	0.0008	2.6968	-0.0007	0.1067	-0.0001

Summary Data

Average

Standard Deviation

Volume:	3.2141 cm ³	0.0018 cm ³
Density:	2.6975 g/cm ³	0.0015 g/cm ³
Total Pore Volume:	0.1068 cm ³	0.0002 cm ³

Note: _____

Il direttore del Laboratorio

Lo sperimentatore



Committente
Cantiere

Geotalia srl – Roma
 Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

pagina 2 di 2

PESO SPECIFICO DEI GRANI

Data prova 10/10/2010
 Data certificato 19/10/2010
 Verb. Accettazione 165
 N. certificato 2517/2010

Norma di riferimento ASTM D5550-00

AccuPyc II 1340 V1.00

Unit 1

Serial #: 488

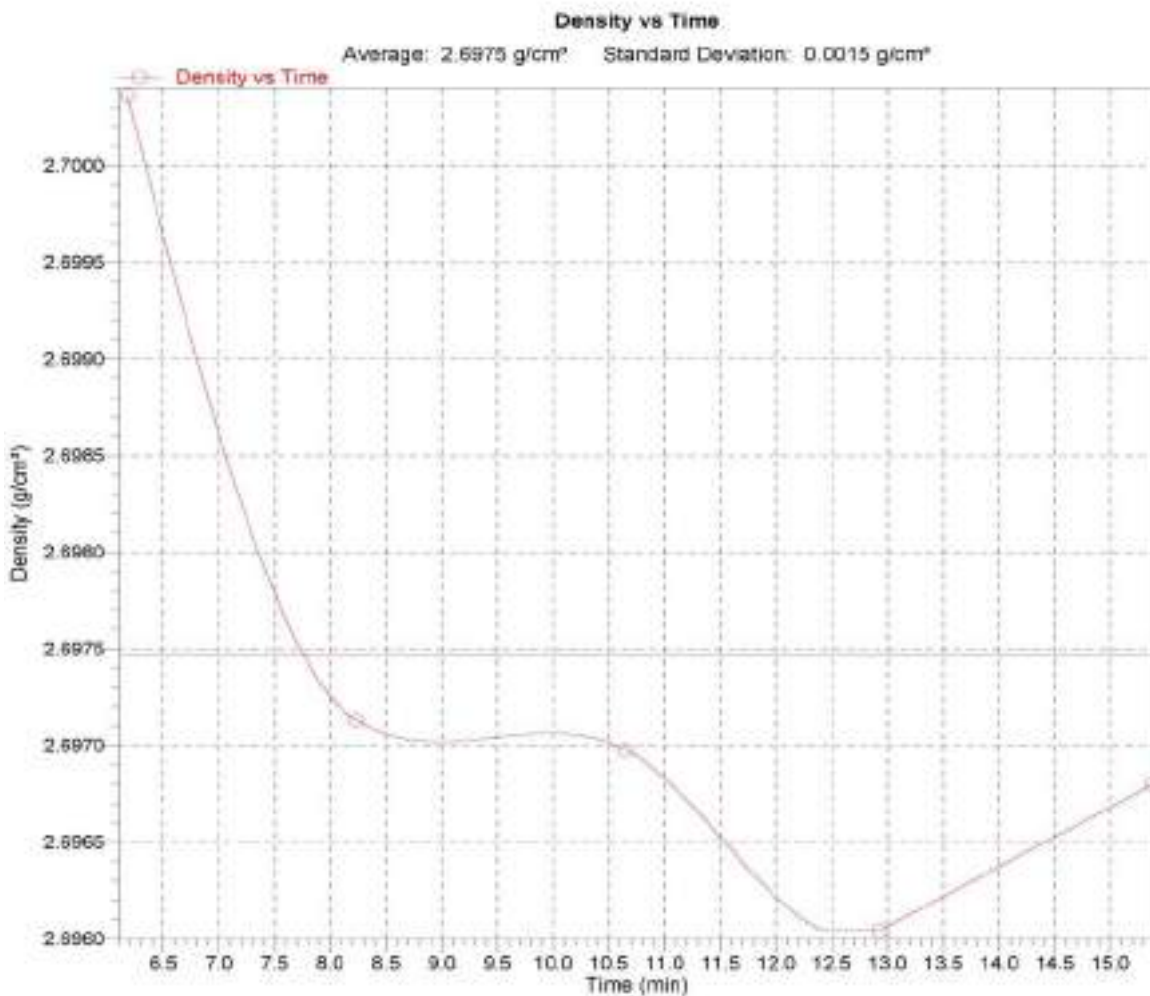
Page 2

Sample: VA165_S9_1_m 5,60-6,00
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S9_1.SMP

Analysis Gas: Helium
 Reported: 01/10/2010 16.07.01
 Sample Mass: 8.6700 g
 Temperature: 24.69 °C
 Number of Purges: 5

Analysis Start: 01/10/2010 15.50.32
 Analysis End: 01/10/2010 16.07.01
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2265 cm³
 Cell Volume: 11.8010 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 9, Campione 1, Prof. (m) 5,60-6,00



Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma

Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

Data prova 05/10/2010

Data certificato 06/10/2010

Verb. Accettazione 165

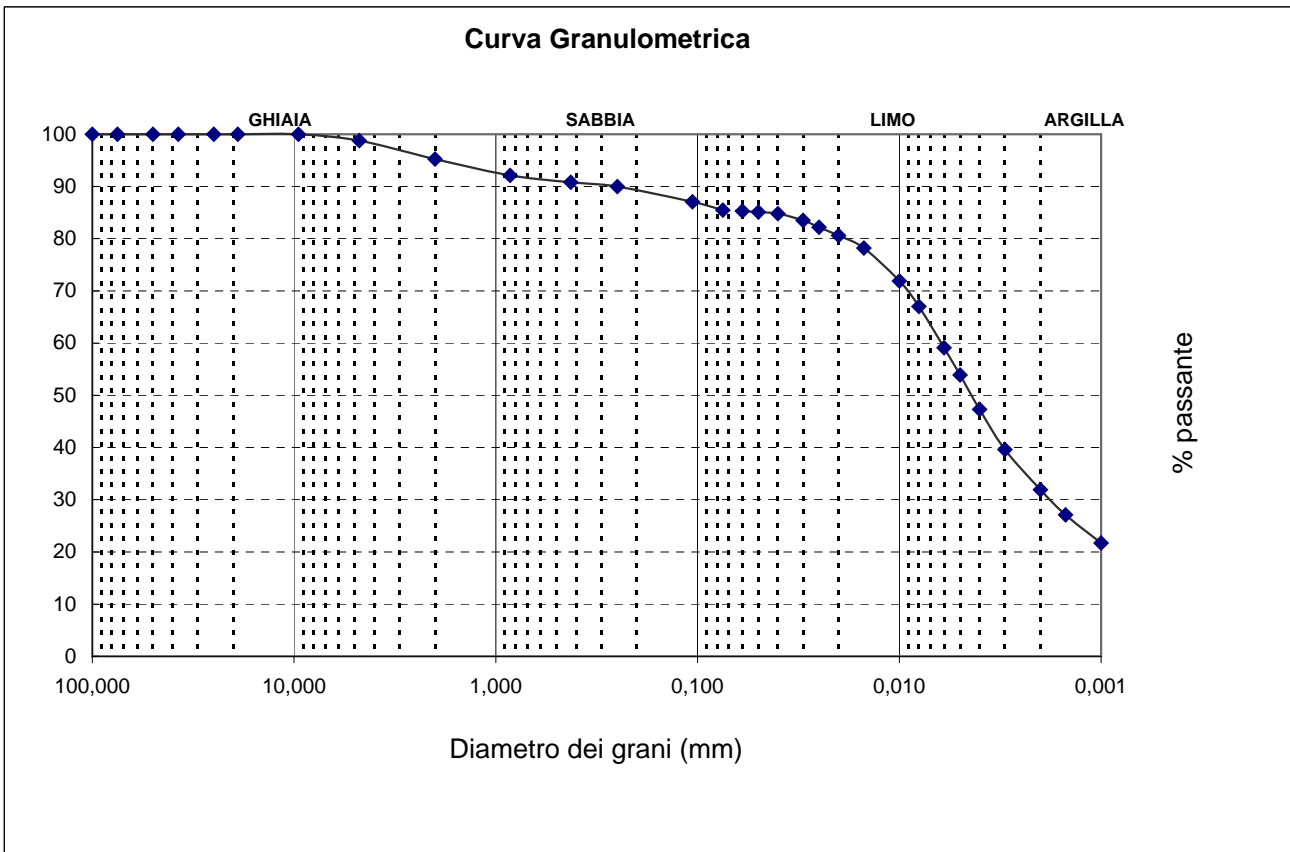
N. Certificato 2479/2010

Pag. 1 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 9 Campione 1 Profondità 5.60-6.00

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)



Riepilogo dei risultati

Ciottoli	(> 60 mm)	0,0
Ghiaia	(60 - 2 mm)	4,7
Sabbia	(2 - 0,060 mm)	10,0
Limo	(0,060 - 0,002 mm)	53,4
Argilla	(< 0,002 mm)	31,9

D10	<0,002
D30	0,0018
D60	0,0062

Classificazione AGI 1994

Il direttore del Laboratorio

[Signature]

Lo sperimentatore

[Signature]



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2479/2010

Pag. 2 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 9 Campione 1 Profondità 5.60-6.00

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)

Setacciatura:

Massa materiale (g): 195.92

Vagli ASTM	Apertura vagli (mm)	Massa Trattenuta (g)	Trattenuto %	Passante %
3"	75,000	0,00	0,0	100,0
2"	50,000	0,00	0,0	100,0
1,5"	37,500	0,00	0,0	100,0
1"	25,000	0,00	0,0	100,0
3/4"	19,000	0,00	0,0	100,0
3/8"	9,500	0,00	0,0	100,0
No.4	4,750	2,43	1,2	98,8
No.10	2,000	6,86	4,7	95,3
No.20	0,850	6,16	7,9	92,1
No.40	0,425	2,59	9,2	90,8
No.60	0,250	1,62	10,0	90,0
No.140	0,106	5,70	12,9	87,1
No.200	0,075	3,13	14,5	85,5

Sedigrafia:

Material Mass (g): 4.500
 Material/Liquid: soil / 0.20% Sodium Metaphosphate (w/w)
 Measurement Principle: X-Ray monitored gravity sedimentation
 Calculation Method: Stokes sedimentation and Beer's law of extinction
 Test Number: 2
 Analyzed: 05/10/2010 14.10.30
 Reported: 06/10/2010 10.01.15
 Liquid Visc: 0.7683 mPa.s
 Analysis Temp: 32.0 °C
 Full Scale Mass: 85.5 %
 Analysis Type: High Speed(Adj)
 Run Time: 0:05 hrs:min
 Sample Density: 2.698 g/cm³
 Liquid Density: 0.9951 g/cm³
 Base/Full Scale: 134 / 86 kCnts/s
 Reynolds Number: 0.80

Diametro (mm)	Trattenuto %	Passante %
0,060	14,7	85,3
0,050	14,9	85,1
0,040	15,2	84,8
0,030	16,5	83,5
0,025	17,8	82,2
0,020	19,4	80,6
0,015	21,8	78,2
0,010	28,1	71,9
0,008	33,0	67,0
0,006	40,9	59,1
0,005	46,1	53,9
0,004	52,7	47,3
0,003	60,4	39,6
0,002	68,1	31,9
0,002	72,9	27,1
0,001	78,3	21,7

Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

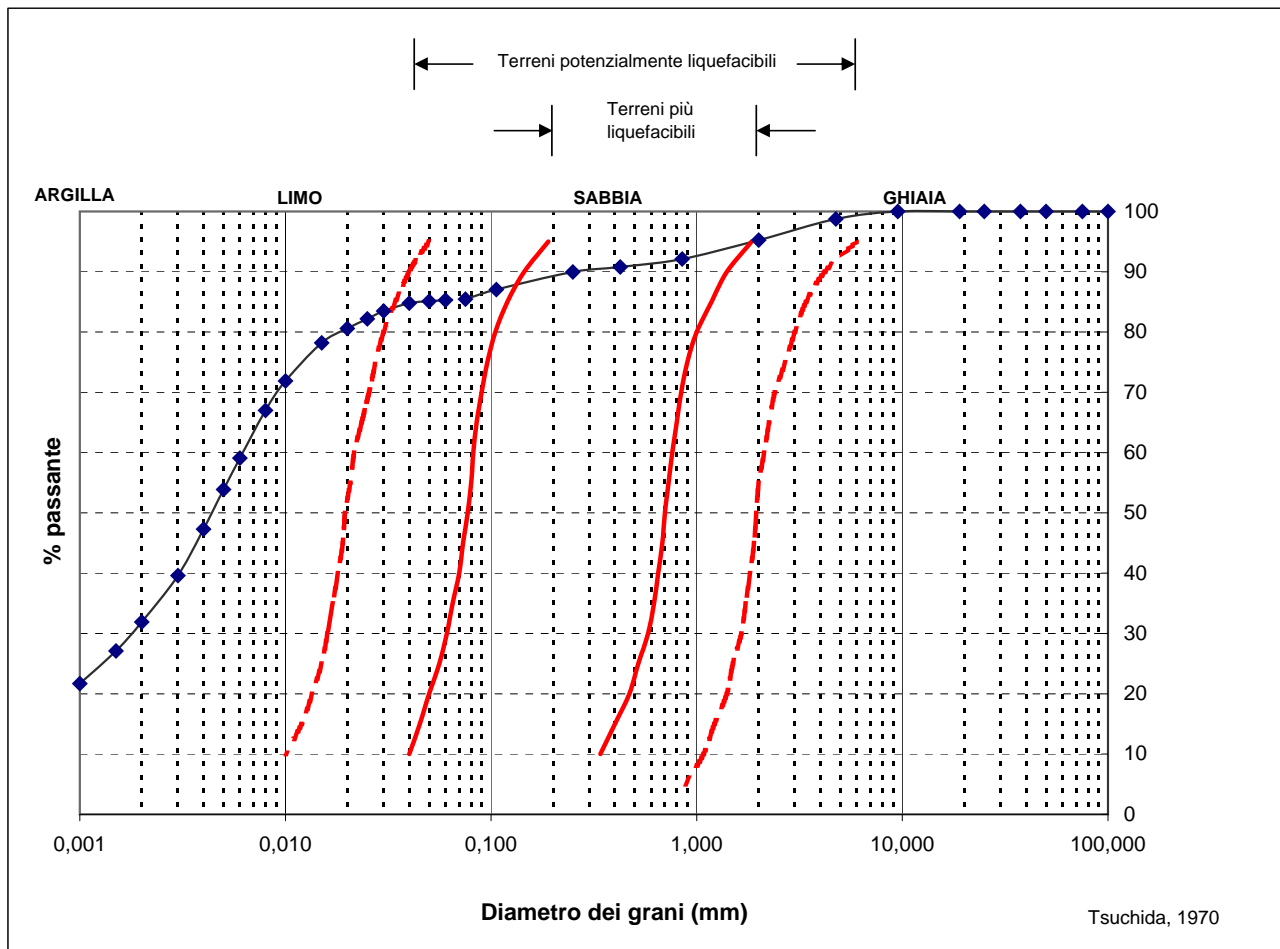
Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2479/2010

Pag. 3 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 9 Campione 1 Profondità 5.60-6.00

POTENZIALE DI LIQUEFACIBILITA'



Il direttore del Laboratorio
[Signature]

Lo sperimentatore
[Signature]



Committente Geotalia srl – Roma

Pag. 1 di 1

Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda

Data prova 05/10/10

Data certificato 06/10/10

Verb. Accettazione 165

N. Certificato 2471/2010

LIMITI DI CONSISTENZA

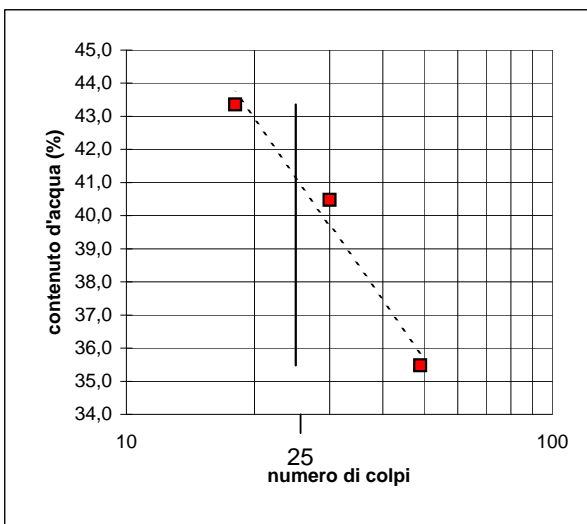
Norma di riferimento ASTM D4318

Sondaggio 9 Campione 1 Profondità 5.60-6.00

Limite Liquido				41,1
Numero tara		C10	C32	C20
Numero dei colpi		49	30	18
P. umido + tara	g	78,80	80,99	68,62
P. secco + tara	g	62,62	61,23	53,00
Peso tara	g	17,01	12,41	16,97
Peso umido	g	61,79	68,58	51,65
Peso secco	g	45,61	48,82	36,03
Contenuto d'acqua	%	35,47	40,48	43,35

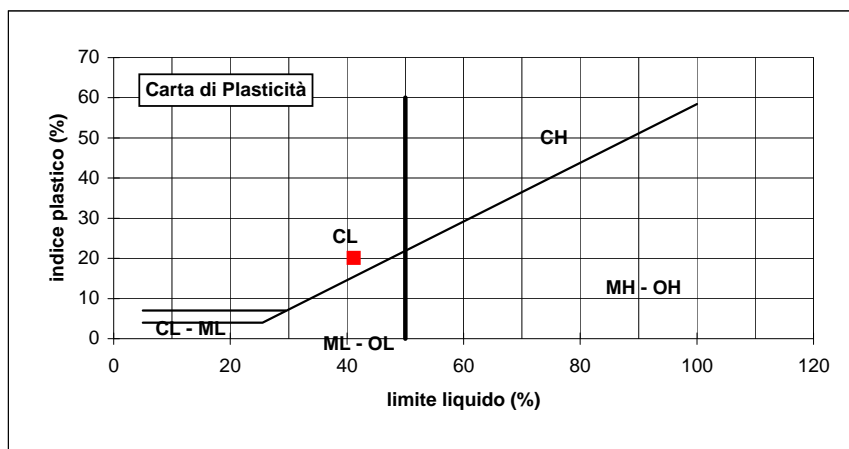
Limite Plastico				21,1
Numero tara		C14	C23	
P. umido + tara	g	32,69	31,48	
P. secco + tara	g	29,91	28,93	
Peso tara	g	16,87	16,71	
Peso umido	g	15,82	14,77	
Peso secco	g	13,04	12,22	
Contenuto d'acqua	%	21,32	20,87	

Umidità Naturale		
Numero tara		B51
P. umido + tara	g	208,74
P. secco + tara	g	185,09
Peso tara	g	31,19
Peso umido	g	177,55
Peso secco	g	153,90
Contenuto d'acqua	%	15,4



Limite Liquido LL	41,1
Limite Plastico LP	21,1
Indice di Plasticità Ip	20,1
Umidità Naturale Wn	15,4
Indice di Consistenza Ic	1,3

$$I_p = LL - LP \quad I_c = \frac{LL - W_n}{I_p}$$



- ML** Limi inorganici di bassa plasticità
- MH** Limi inorganici di alta plasticità
- CL** Argille inorganiche di bassa plasticità
- CH** Argille inorganiche di alta plasticità
- OL** Argille organiche di bassa plasticità
- OH** Argille organiche di alta plasticità

Il direttore del Laboratorio

Lo sperimentatore



DESCRIZIONE E RIPRESA FOTOGRAFICA DELLA CAROTA ESTRUSA

Committente: GeoItalia srl - Roma

Cantiere/Località: Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

Sondaggio: 10

Campione: 1

Profondità prelievo: 4.70-5.00

Data prelievo: 19/08/2010

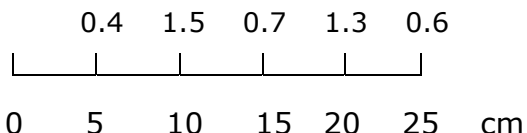
Data apertura: 29/09/2010

Verbale accettazione n° 165

Descrizione: limo con argilla debolmente sabbioso, presenti inclusi di natura argillitica (Raccomandazioni AGI 1977). Limo argilloso (UNI EN ISO 14688-2).

Colore: HUE 2.5Y VALUE 5 CHROMA 0 (Munsell Soil Color Chart)

Pocket (kg/cm²):



Lunghezza carota: 30 cm
Diametro carota: 88,9 mm



Modalità di prelievo: sondaggio a rotazione

Tipo di fustella: fustella in plastica

Classe di qualità del campione: Q4 (Raccomandazioni AGI 1977)
C2 (Eurocodice 7)

Prove eseguite:

Cont. Acqua W	X	Granulom. Gr	X	T. Residuo TR	-
Peso Volume γ	X	Compress. ELL	-	Triass. TX UU	-
Peso Specifico Gs	X	Edometria Ed	-	Triass. TX CU	-
Limiti Cons. LL	X	T. Diretto TD	-	Triass. TX CD	-



Committente Geotalia srl – Roma **pagina 1 di 2**
Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Norma di riferimento ASTM D5550-00

Data prova	01/10/2010
Data certificato	19/10/2010
Verb. Accettazione	165
N. certificato	2518/2010

AccuPyc II 1340 V1.00 Unit 1 Serial #. 488 Page 1

Sample: VA165_S10_1_m 4,70-5,00
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S10_1.SMP

Analysis Gas: Helium
 Reported: 05/10/2010 15.41.26
 Sample Mass: 10.1400 g
 Temperature: 25.30 °C
 Number of Purges: 5

Analysis Start: 05/10/2010 15.26.09
 Analysis End: 05/10/2010 15.41.26
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2248 cm³
 Cell Volume: 11.8000 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 10, Campione 1, Prof. (m) 4,70-5,00

Combined Report

Tabular 1

Cycle#	Volume (cm ³)	Volume Deviation (cm ³)	Density (g/cm ³)	Density Deviation (g/cm ³)	Total Pore Volume (cm ³)	Total Pore Volume Deviation (cm ³)
1	3.7361	-0.0012	2.7140	0.0009	0.1109	0.0001
2	3.7372	-0.0002	2.7133	0.0002	0.1108	0.0000
3	3.7376	0.0003	2.7129	-0.0002	0.1108	0.0000
4	3.7379	0.0005	2.7128	-0.0003	0.1108	0.0000
5	3.7381	0.0007	2.7126	-0.0005	0.1107	-0.0001

Summary Data

Average

Standard Deviation

Volume:	3.7374 cm ³	0.0007 cm ³
Density:	2.7131 g/cm ³	0.0005 g/cm ³
Total Pore Volume:	0.1108 cm ³	0.0001 cm ³

Note: _____

Il direttore del Laboratorio

Lo sperimentatore



Committente

Geotalia srl – Roma

pagina 2 di 2

Cantiere

Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Data prova 01/10/2010

Data certificato 19/10/2010

Verb. Accettazione 165

N. certificato 2518/2010

Norma di riferimento ASTM D5550-00

AccuPyc II 1340 V1.00

Unit 1

Serial #: 488

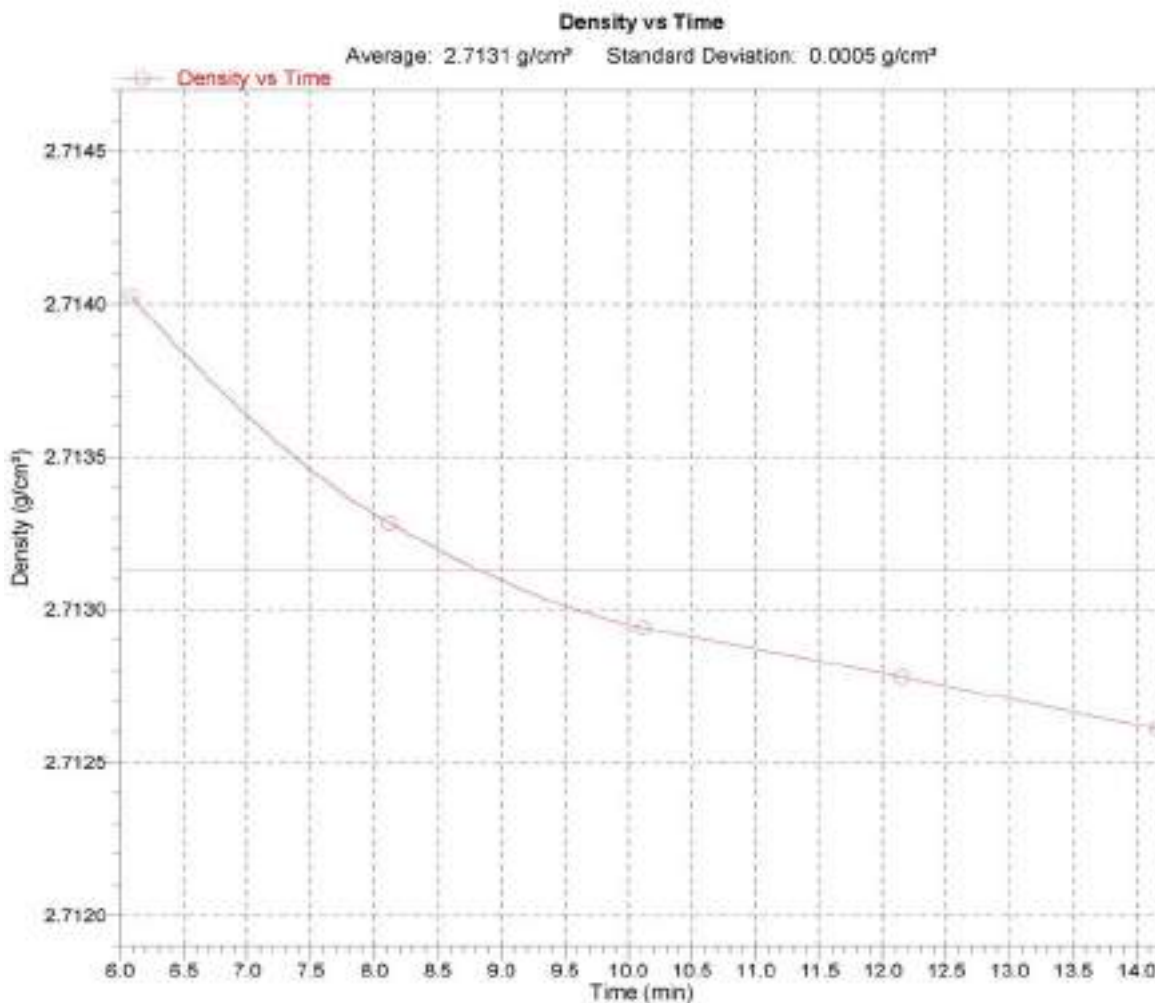
Page 2

Sample: VA165_S10_1_m 4,70-5,00
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S10_1.SMP

Analysis Gas: Helium
 Reported: 05/10/2010 15.41.26
 Sample Mass: 10.1400 g
 Temperature: 25.30 °C
 Number of Purges: 5

Analysis Start: 05/10/2010 15.26.09
 Analysis End: 05/10/2010 15.41.26
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2248 cm³
 Cell Volume: 11.8000 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 10, Campione 1, Prof. (m) 4,70-5,00



Il direttore del Laboratorio

[Signature]

Lo sperimentatore

[Signature]



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

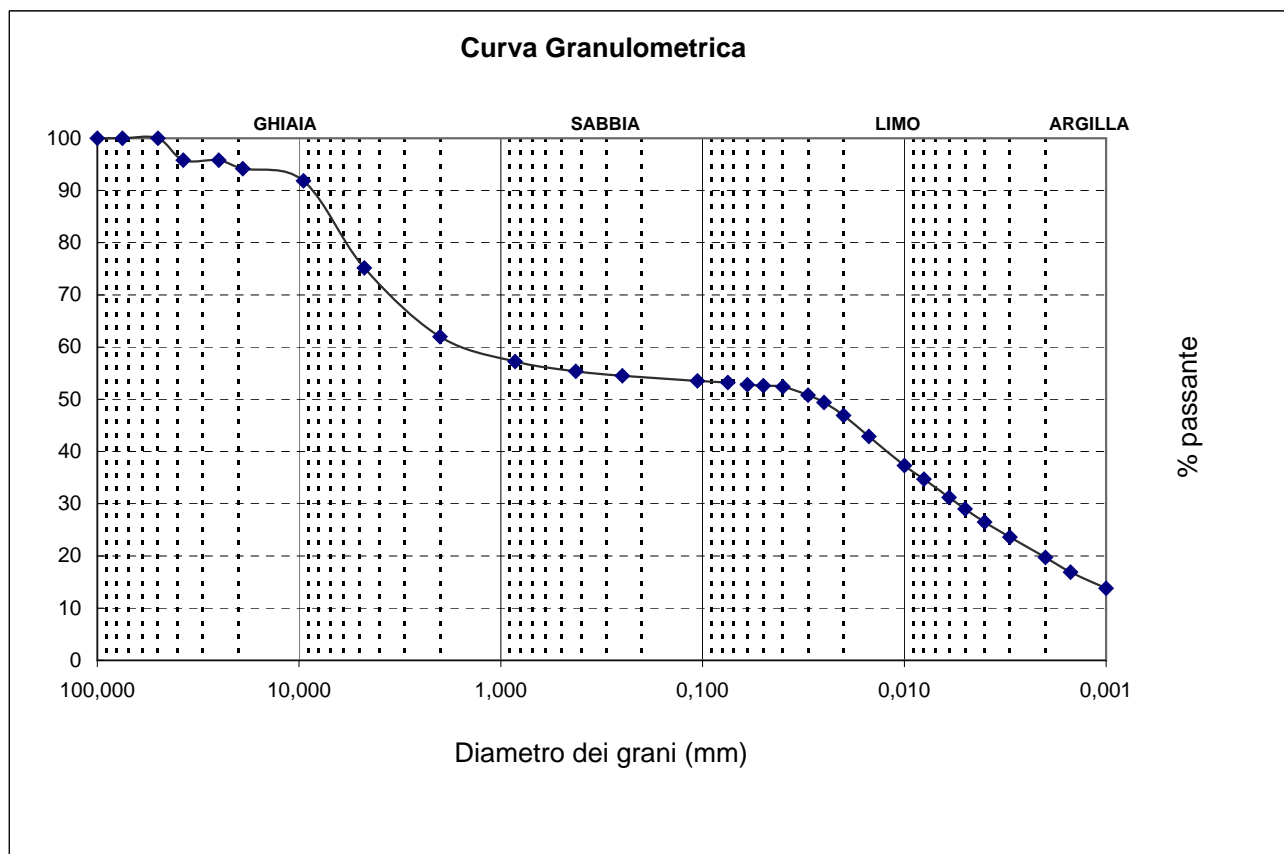
Data prova 06/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2484/2010

Pag. 1 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 10 Campione 1 Profondità 4.70-5.00

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)



Riepilogo dei risultati

Ciottoli	(> 60 mm)	0,0
Ghiaia	(60 - 2 mm)	38,0
Sabbia	(2 - 0,060 mm)	9,2
Limo	(0,060 - 0,002 mm)	33,1
Argilla	(< 0,002 mm)	19,7

D10	<0,002
D30	0,0055
D60	1,5197

Classificazione AGI 1994

Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

Data prova 06/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2484/2010

Pag. 2 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 10 Campione 1 Profondità 4.70-5.00

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)

Setacciatura grossa:

Massa materiale (g): 1673.50

Setacciatura fine:

Massa materiale (g): 200.31

Vagli ASTM	Apertura vagli (mm)	Massa Trattenuta (g)	Trattenuto %	Passante %
3"	75,000	0,00	0,0	100,0
2"	50,000	0,00	0,0	100,0
1,5"	37,500	70,28	4,2	95,8
1"	25,000	0,00	4,2	95,8
3/4"	19,000	27,20	5,8	94,2
3/8"	9,500	39,11	8,2	91,8
No.4	4,750	36,34	24,8	75,2
No.10	2,000	28,78	38,0	62,0
No.20	0,850	10,35	42,8	57,2
No.40	0,425	4,05	44,6	55,4
No.60	0,250	1,90	45,5	54,5
No.140	0,106	2,16	46,5	53,5
No.200	0,075	0,68	46,8	53,2

Sedigrafia:

Material Mass (g): 4.638
 Material/Liquid: soil / 0.20% Sodium Metaphosphate (w/w)
 Measurement Principle: X-Ray monitored gravity sedimentation
 Calculation Method: Stokes sedimentation and Beer's law of extinction
 Test Number: 2
 Analyzed: 06/10/2010 10.19.28
 Reported: 06/10/2010 12.54.38
 Liquid Visc: 0.7686 mPa.s
 Analysis Temp: 32.0 °C
 Full Scale Mass: 53.2 %
 Analysis Type: High Speed(Adj)
 Run Time: 0:05 hrs:min
 Sample Density: 2.713 g/cm³
 Liquid Density: 0.9951 g/cm³
 Base/Full Scale: 134 / 89 kCnts/s
 Reynolds Number: 0.81

Diametro (mm)	Trattenuto %	Passante %
0,060	47,2	52,8
0,050	47,4	52,6
0,040	47,6	52,4
0,030	49,2	50,8
0,025	50,6	49,4
0,020	53,1	46,9
0,015	57,1	42,9
0,010	62,7	37,3
0,008	65,3	34,7
0,006	68,8	31,2
0,005	71,0	29,0
0,004	73,5	26,5
0,003	76,4	23,6
0,002	80,3	19,7
0,002	83,1	16,9
0,001	86,2	13,8

Il direttore del Laboratorio

Lo sperimentatore



Committente Geoltalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

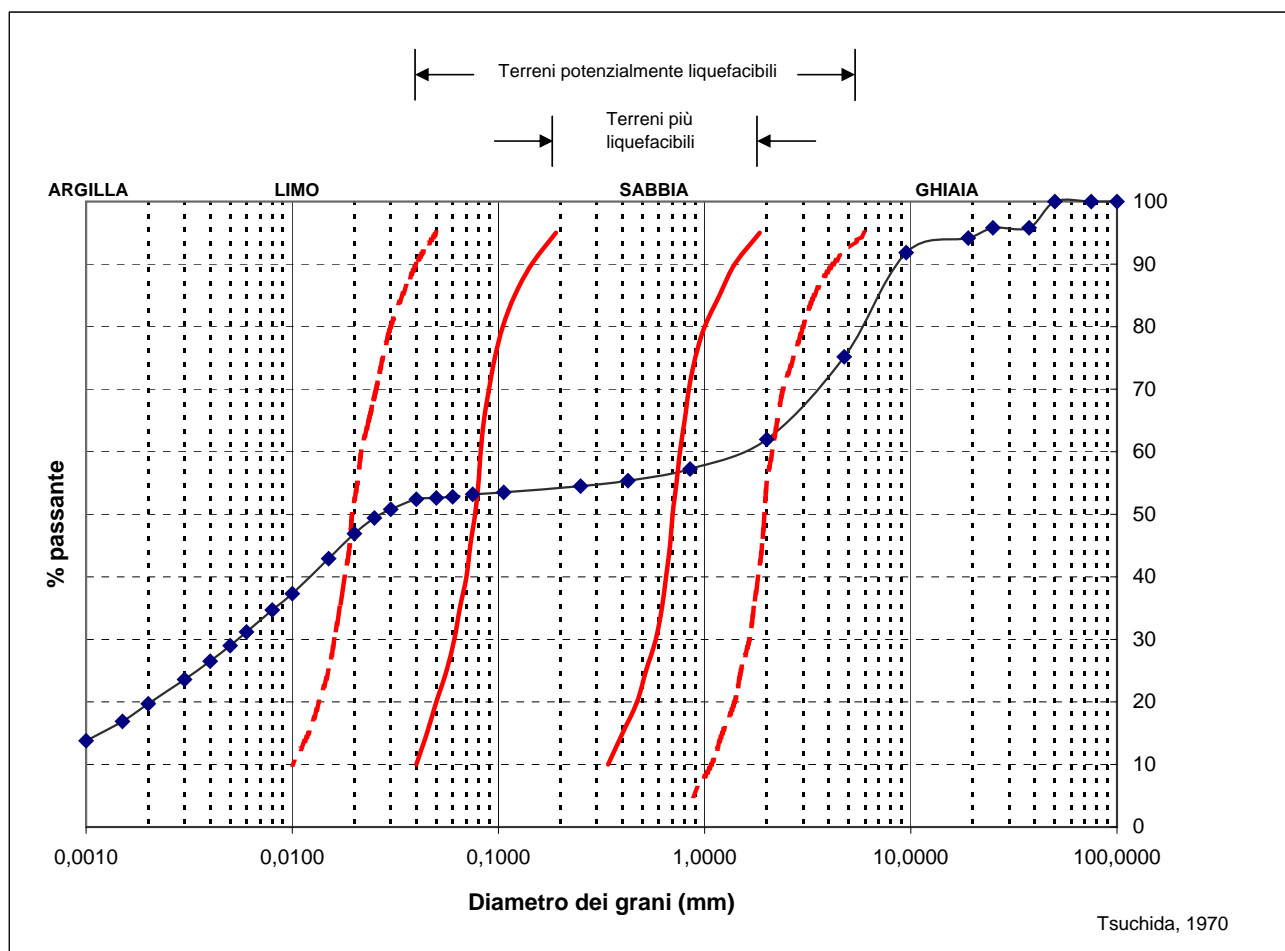
Data prova 06/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2484/2010

Pag. 3 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 10 Campione 1 Profondità 4.70-5.00

POTENZIALE DI LIQUEFACIBILITA'



Il direttore del Laboratorio

[Signature]

Lo sperimentatore

[Signature]



Committente Geotalia srl – Roma

Pag. 1 di 1

Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda

Data prova 05/10/10

Data certificato 06/10/10

Verb. Accettazione 165

N. Certificato 2472/2010

LIMITI DI CONSISTENZA

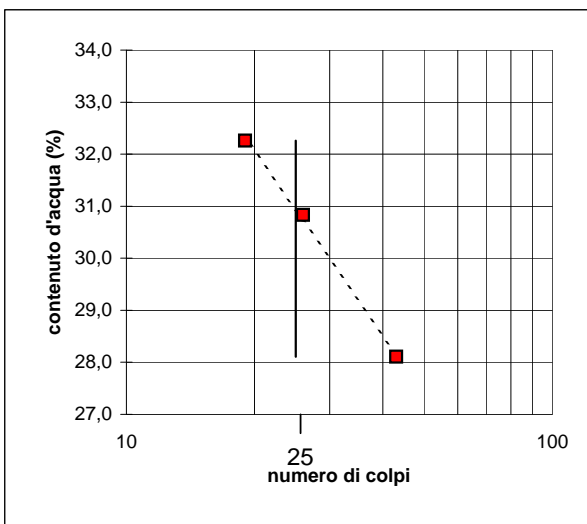
Norma di riferimento ASTM D4318

Sondaggio 10 Campione 1 Profondità 4.70-5.00

Limite Liquido				30,9
Numero tara		B15	A1	A6
Numero dei colpi		43	26	19
P. umido + tara	g	86,90	78,20	82,13
P. secco + tara	g	71,70	63,89	66,42
Peso tara	g	17,62	17,48	17,72
Peso umido	g	69,28	60,72	64,41
Peso secco	g	54,08	46,41	48,70
Contenuto d'acqua	%	28,11	30,83	32,26

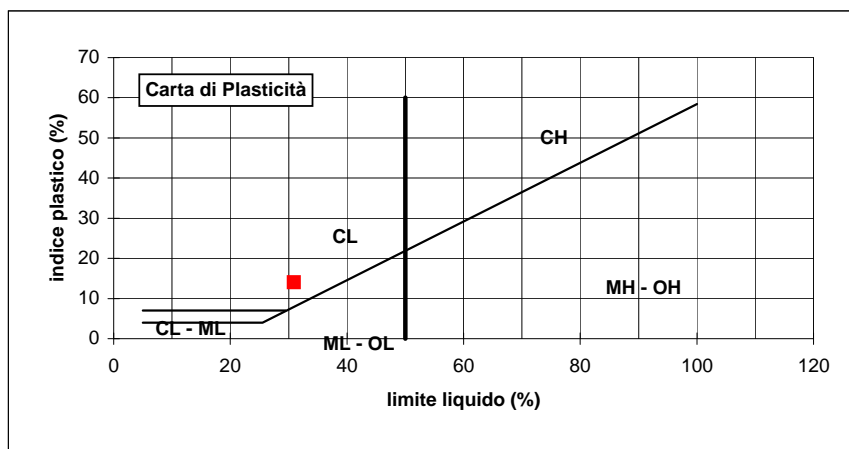
Limite Plastico				16,9
Numero tara		A13	B18	
P. umido + tara	g	38,70	39,45	
P. secco + tara	g	35,67	36,30	
Peso tara	g	17,72	17,68	
Peso umido	g	20,98	21,77	
Peso secco	g	17,95	18,62	
Contenuto d'acqua	%	16,88	16,92	

Umidità Naturale				18,8
Numero tara		B23		
P. umido + tara	g	68,41		
P. secco + tara	g	60,29		
Peso tara	g	17,06		
Peso umido	g	51,35		
Peso secco	g	43,23		
Contenuto d'acqua	%			18,8



Limite Liquido LL	30,9
Limite Plastico LP	16,9
Indice di Plasticità Ip	14,0
Umidità Naturale Wn	18,8
Indice di Consistenza Ic	0,9

$$I_p = LL - LP \quad I_c = \frac{LL - W_n}{I_p}$$



- ML** Limi inorganici di bassa plasticità
- MH** Limi inorganici di alta plasticità
- CL** Argille inorganiche di bassa plasticità
- CH** Argille inorganiche di alta plasticità
- OL** Argille organiche di bassa plasticità
- OH** Argille organiche di alta plasticità

Il direttore del Laboratorio

Lo sperimentatore

DESCRIZIONE E RIPRESA FOTOGRAFICA DELLA CAROTA ESTRUSA

Committente: GeoItalia srl - Roma

Cantiere/Località: Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

Sondaggio: 13

Campione: 1

Profondità prelievo: 4.00-4.40

Data prelievo: 16/08/2010

Data apertura: 29/09/2010

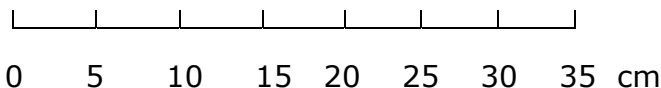
Verbale accettazione n° 165

Descrizione: argilla con limo sabbiosa, presenti inclusi di natura argillitica (*Raccomandazioni AGI 1977*). Argilla limosa (*UNI EN ISO 14688-2*).

Colore: HUE 2.5Y VALUE 4 CHROMA 0 (*Munsell Soil Color Chart*)

Pocket (kg/cm²):

f.s. 4.7 4.1 4.2 4.0 f.s. f.s.



Lunghezza carota: 41 cm
Diametro carota: 88,9 mm



Modalità di prelievo: sondaggio a rotazione

Tipo di fustella: fustella in plastica

Classe di qualità del campione: **Q4** (*Raccomandazioni AGI 1977*)
C2 (*Eurocodice 7*)

Prove eseguite:

Cont. Acqua W	X	Granulom. Gr	X	T. Residuo TR	-
Peso Volume γ	X	Compress. ELL	-	Triass. TX UU	-
Peso Specifico Gs	X	Edometria Ed	-	Triass. TX CU	-
Limiti Cons. LL	X	T. Diretto TD	-	Triass. TX CD	-



Committente

Geotalia srl – Roma

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Cantiere

Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Data prova 04/10/2010
 Data certificato 19/10/2010
 Verb. Accettazione 165
 N. certificato 2519/2010

Norma di riferimento ASTM D5550-00

AccuPyc II 1340 V1.00

Unit 1

Serial #: 488

Page 1

Sample: VA165_S13_1_m 4,00-4,40
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S13_1.SMP

Analysis Gas: Helium
 Reported: 04/10/2010 16.27.18
 Sample Mass: 9.5700 g
 Temperature: 24.72 °C
 Number of Purges: 5

Analysis Start: 04/10/2010 16.09.04
 Analysis End: 04/10/2010 16.27.17
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2248 cm³
 Cell Volume: 11.8000 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 13, Campione 1, Prof. (m) 4,00-4,40

Combined Report

Cycle#	Volume (cm ³)	Volume Deviation (cm ³)	Tabular 1		Total Pore Volume (cm ³)	Total Pore Volume Deviation (cm ³)
			Density (g/cm ³)	Density Deviation (g/cm ³)		
1	3.5125	-0.0072	2.7246	0.0055	0.1607	0.0007
2	3.5180	-0.0016	2.7203	0.0013	0.1601	0.0002
3	3.5205	0.0009	2.7183	-0.0007	0.1598	-0.0001
4	3.5220	0.0024	2.7172	-0.0018	0.1597	-0.0002
5	3.5222	0.0026	2.7170	-0.0020	0.1597	-0.0003
6	3.5225	0.0029	2.7168	-0.0022	0.1596	-0.0003
Summary Data			Average	Standard Deviation		
Volume:			3.5196 cm ³	0.0035 cm ³		
Density:			2.7190 g/cm ³	0.0027 g/cm ³		
Total Pore Volume:			0.1599 cm ³	0.0004 cm ³		

Note: _____

Il direttore del Laboratorio

Lo sperimentatore



Committente

Geotalia srl – Roma

pagina 2 di 2

Cantiere

Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

Data prova 04/10/2010

Data certificato 19/10/2010

Verb. Accettazione 165

N. certificato 2519/2010

PESO SPECIFICO DEI GRANI

Norma di riferimento ASTM D5550-00

AccuPyc II 1340 V1.00

Unit 1

Serial #: 488

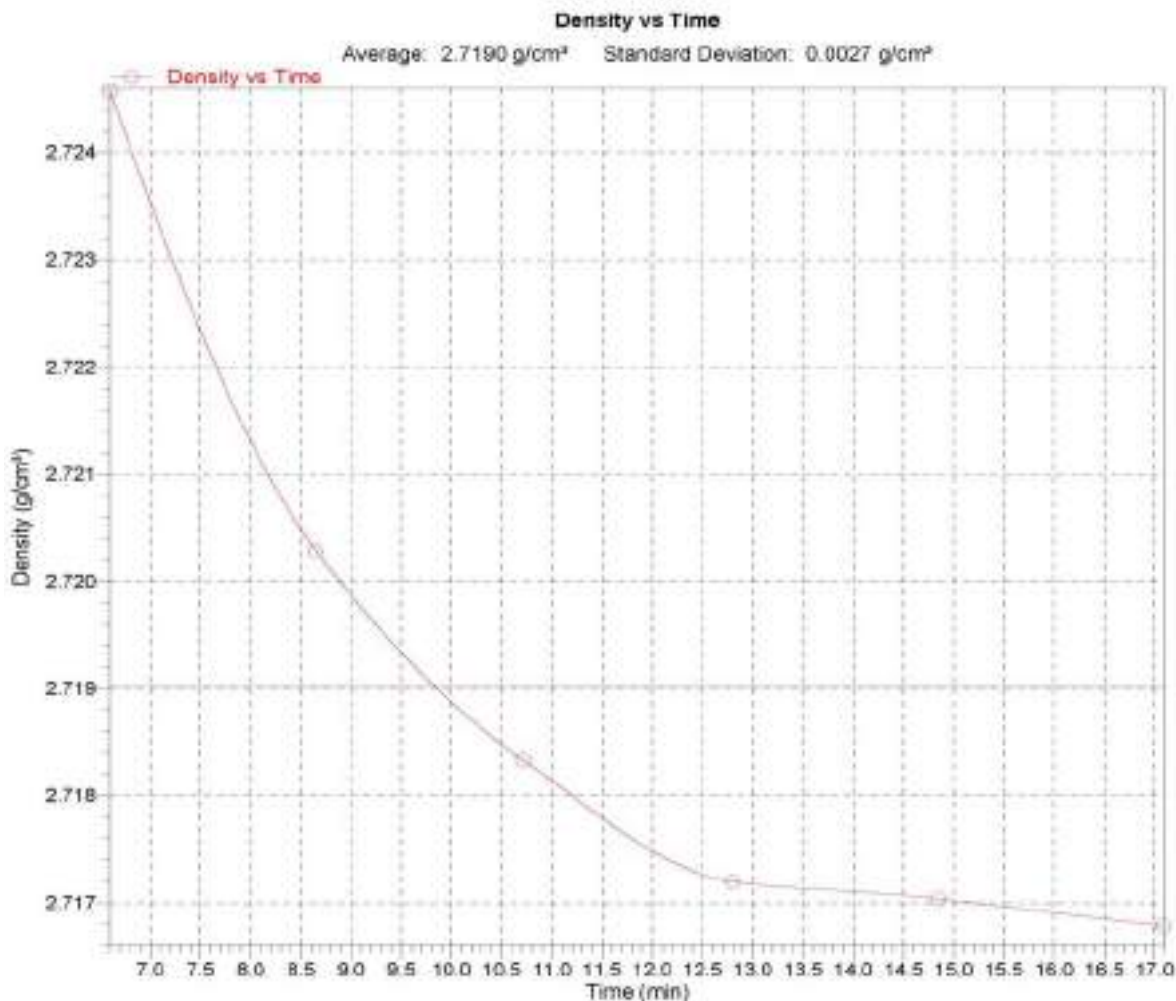
Page 2

Sample: VA165_S13_1_m 4,00-4,40
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S13_1.SMP

Analysis Gas: Helium
 Reported: 04/10/2010 16.27.18
 Sample Mass: 9.5700 g
 Temperature: 24.72 °C
 Number of Purges: 5

Analysis Start: 04/10/2010 16.09.04
 Analysis End: 04/10/2010 16.27.17
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2248 cm³
 Cell Volume: 11.8000 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 13, Campione 1, Prof. (m) 4,00-4,40



Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

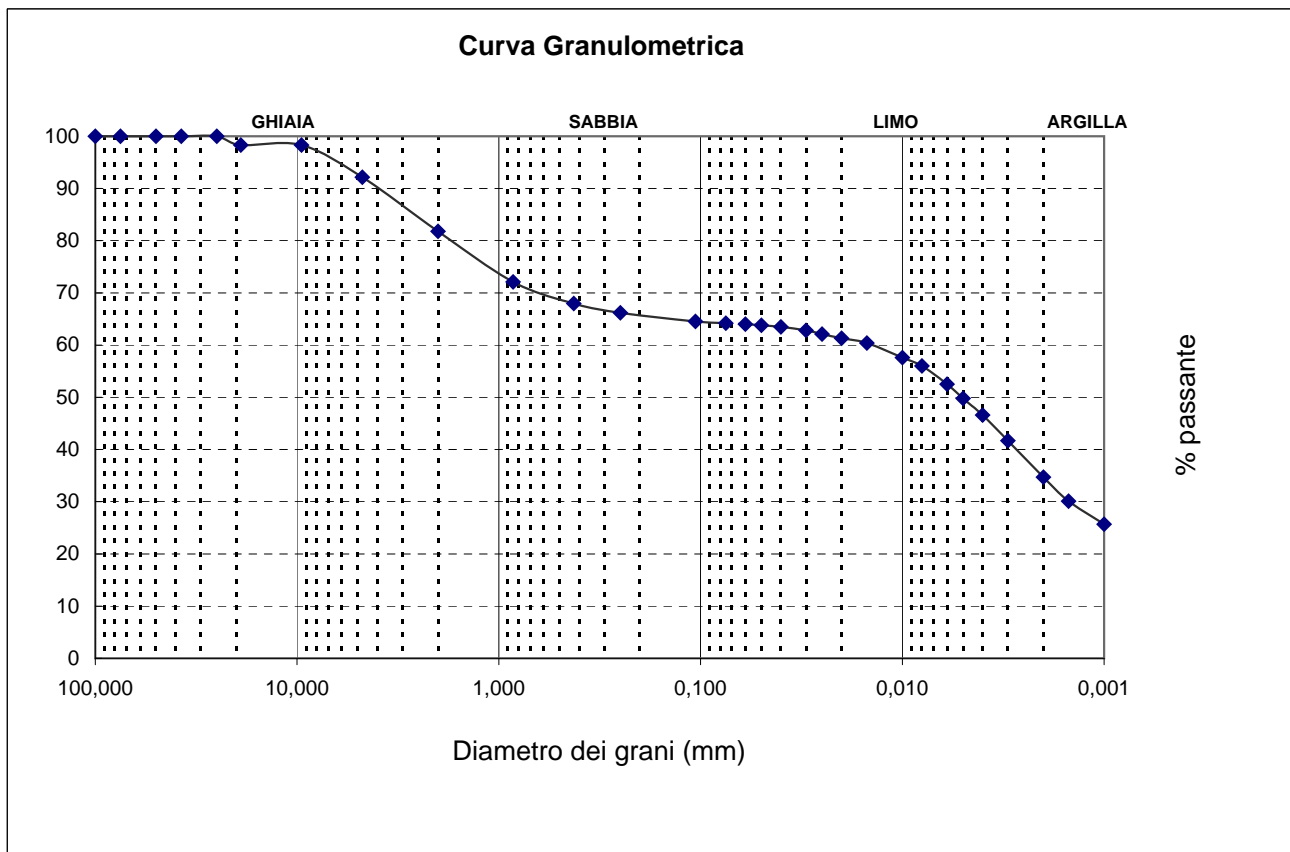
Data prova 06/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2485/2010

Pag. 1 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 13 Campione 1 Profondità 4.00-4.40

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)



Riepilogo dei risultati

Ciottoli	(> 60 mm)	0,0
Ghiaia	(60 - 2 mm)	18,2
Sabbia	(2 - 0,060 mm)	17,8
Limo	(0,060 - 0,002 mm)	29,3
Argilla	(< 0,002 mm)	34,7

D10	<0,002
D30	0,0015
D60	0,0143

Classificazione AGI 1994

Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

Data prova 06/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2485/2010

Pag. 2 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 13 Campione 1 Profondità 4.00-4.40

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)

Setacciatura grossa:

Massa materiale (g): 1770.14

Setacciatura fine:

Massa materiale (g): 177.62

Vagli ASTM	Apertura vagli (mm)	Massa Trattenuta (g)	Trattenuto %	Passante %
3"	75,000	0,00	0,0	100,0
2"	50,000	0,00	0,0	100,0
1,5"	37,500	0,00	0,0	100,0
1"	25,000	0,00	0,0	100,0
3/4"	19,000	29,70	1,7	98,3
3/8"	9,500	0,00	1,7	98,3
No.4	4,750	11,17	7,9	92,1
No.10	2,000	18,70	18,2	81,8
No.20	0,850	17,51	27,9	72,1
No.40	0,425	7,44	32,0	68,0
No.60	0,250	3,24	33,8	66,2
No.140	0,106	2,98	35,5	64,5
No.200	0,075	0,62	35,8	64,2

Sedigrafia:

Material Mass (g): 4.529
 Material/Liquid: soil / 0.20% Sodium Metaphosphate (w/w)
 Measurement Principle: X-Ray monitored gravity sedimentation
 Calculation Method: Stokes sedimentation and Beer's law of extinction
 Test Number: 2
 Analyzed: 06/10/2010 10.50.04
 Reported: 06/10/2010 12.54.37
 Liquid Visc: 0.7684 mPa.s
 Analysis Temp: 32.0 °C
 Full Scale Mass: 64.2 %
 Analysis Type: High Speed(Adj)
 Run Time: 0:05 hrs:min
 Sample Density: 2.719 g/cm³
 Liquid Density: 0.9951 g/cm³
 Base/Full Scale: 134 / 94 kCnts/s
 Reynolds Number: 0.81

Diametro (mm)	Trattenuto %	Passante %
0,060	36,0	64,0
0,050	36,2	63,8
0,040	36,5	63,5
0,030	37,2	62,8
0,025	37,9	62,1
0,020	38,7	61,3
0,015	39,6	60,4
0,010	42,4	57,6
0,008	44,0	56,0
0,006	47,5	52,5
0,005	50,2	49,8
0,004	53,4	46,6
0,003	58,3	41,7
0,002	65,3	34,7
0,002	69,9	30,1
0,001	74,3	25,7

Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

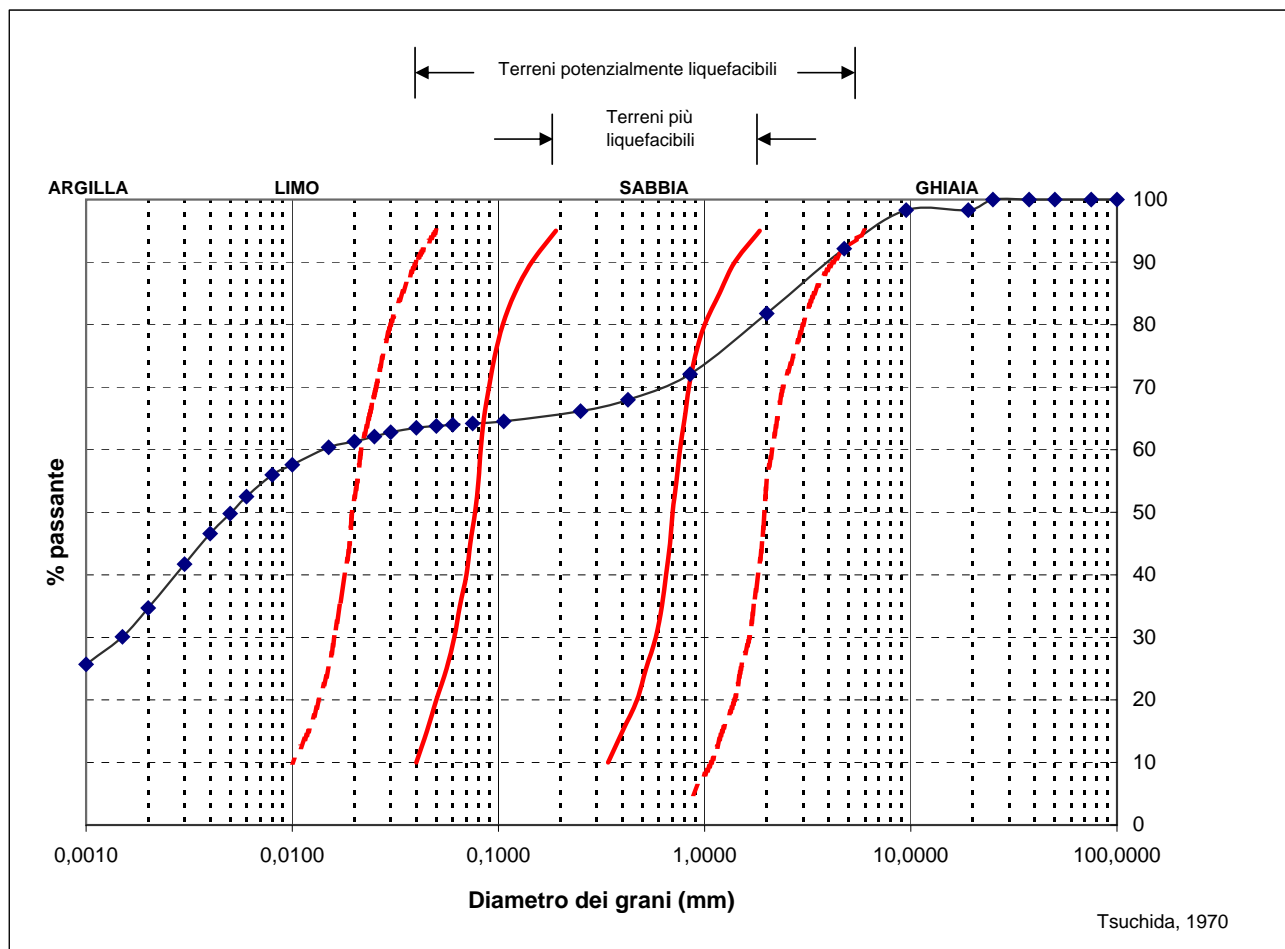
Data prova 06/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2485/2010

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rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 13 Campione 1 Profondità 4.00-4.40

POTENZIALE DI LIQUEFACIBILITA'



Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma Pag. 1 di 1
 Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda

LIMITI DI CONSISTENZA

Norma di riferimento ASTM D4318

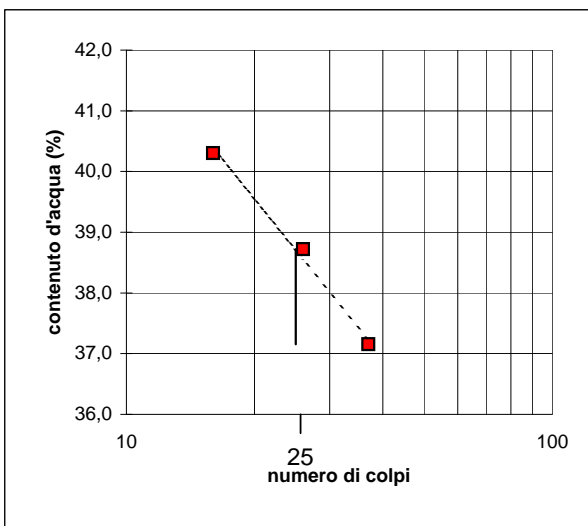
Data prova 05/10/10
 Data certificato 06/10/10
 Verb. Accettazione 165
 N. Certificato 2473/2010

Sondaggio 13 Campione 1 Profondità 4.00-4.40

Limite Liquido				38,7
Numero tara		C5	B19	B31
Numero dei colpi		37	16	26
P. umido + tara	g	80,29	59,43	79,26
P. secco + tara	g	63,08	47,42	62,03
Peso tara	g	16,76	17,62	17,53
Peso umido	g	63,53	41,81	61,73
Peso secco	g	46,32	29,80	44,50
Contenuto d'acqua	%	37,15	40,30	38,72

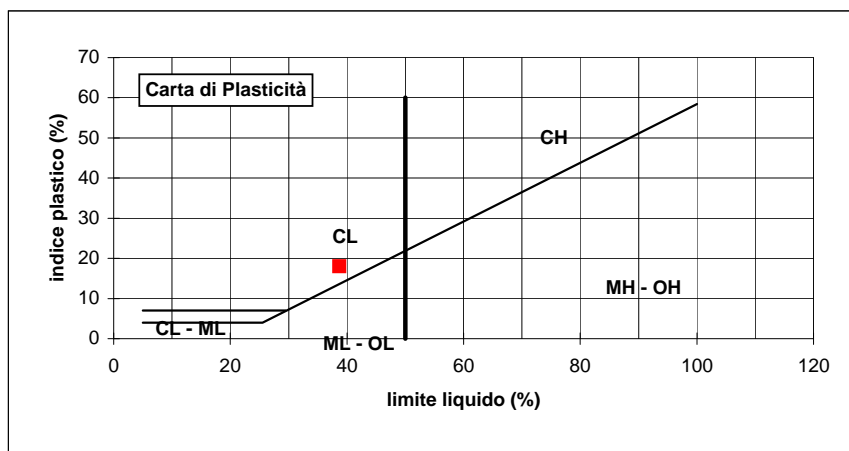
Limite Plastico				20,7
Numero tara		C6	C9	
P. umido + tara	g	30,39	33,42	
P. secco + tara	g	28,06	30,57	
Peso tara	g	16,81	16,83	
Peso umido	g	13,58	16,59	
Peso secco	g	11,25	13,74	
Contenuto d'acqua	%	20,71	20,74	

Umidità Naturale		
Numero tara		B28
P. umido + tara	g	57,50
P. secco + tara	g	52,56
Peso tara	g	17,58
Peso umido	g	39,92
Peso secco	g	34,98
Contenuto d'acqua	%	14,1



Limite Liquido LL	38,7
Limite Plastico LP	20,7
Indice di Plasticità Ip	18,0
Umidità Naturale Wn	14,1
Indice di Consistenza Ic	1,4

$$I_p = LL - LP \quad I_c = \frac{LL - W_n}{I_p}$$



- ML** Limi inorganici di bassa plasticità
- MH** Limi inorganici di alta plasticità
- CL** Argille inorganiche di bassa plasticità
- CH** Argille inorganiche di alta plasticità
- OL** Argille organiche di bassa plasticità
- OH** Argille organiche di alta plasticità

Il direttore del Laboratorio

Lo sperimentatore

DESCRIZIONE E RIPRESA FOTOGRAFICA DELLA CAROTA ESTRUSA

Committente: GeoItalia srl - Roma

Cantiere/Località: Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

Sondaggio: 13

Campione: 2

Profondità prelievo: 8.45-8.73

Data prelievo: 16/08/2010

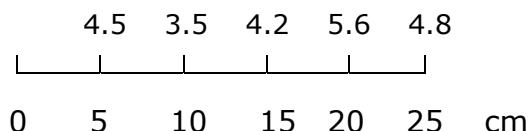
Data apertura: 29/09/2010

Verbale accettazione n° 165

Descrizione: argilla con limo, presente qualche incluso di natura argillitica (*Raccomandazioni AGI 1977*). Argilla limosa (*UNI EN ISO 14688-2*).

Colore: HUE 2.5Y VALUE 4 CHROMA 0 (*Munsell Soil Color Chart*)

Pocket (kg/cm²):



Lunghezza carota: 32 cm
Diametro carota: 88,9 mm



Modalità di prelievo: sondaggio a rotazione

Tipo di fustella: fustella in plastica

Classe di qualità del campione: **Q4** (*Raccomandazioni AGI 1977*)
C2 (*Eurocodice 7*)

Prove eseguite:

Cont. Acqua W	X	Granulom. Gr	X	T. Residuo TR	-
Peso Volume γ	X	Compress. ELL	-	Triass. TX UU	-
Peso Specifico Gs	X	Edometria Ed	-	Triass. TX CU	-
Limiti Cons. LL	X	T. Diretto TD	-	Triass. TX CD	-



Committente Geotalia srl – Roma **pagina 1 di 2**
Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Norma di riferimento ASTM D5550-00

Data prova	01/10/2010
Data certificato	19/10/2010
Verb. Accettazione	165
N. certificato	2520/2010

AccuPyc II 1340 V1.00 Unit 1 Serial #: 488 Page 1

Sample: VA165_S13_2_m 8,45-8,73
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S13_2.SMP

Analysis Gas: Helium
 Reported: 01/10/2010 15.15.34
 Sample Mass: 8.6700 g
 Temperature: 24.83 °C
 Number of Purges: 5

Analysis Start: 01/10/2010 14.56.54
 Analysis End: 01/10/2010 15.15.34
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2265 cm³
 Cell Volume: 11.8010 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 13, Campione 2, Prof. (m) 8,45-8,73

Combined Report

Cycle#	Volume (cm ³)	Volume Deviation (cm ³)	Tabular 1		Total Pore Volume (cm ³)	Total Pore Volume Deviation (cm ³)
			Density (g/cm ³)	Density Deviation (g/cm ³)		
1	3.1716	-0.0072	2.7336	0.0062	0.1515	0.0008
2	3.1774	-0.0014	2.7286	0.0012	0.1508	0.0002
3	3.1802	0.0013	2.7263	-0.0012	0.1505	-0.0002
4	3.1807	0.0018	2.7258	-0.0016	0.1505	-0.0002
5	3.1812	0.0024	2.7254	-0.0020	0.1504	-0.0003
6	3.1820	0.0031	2.7247	-0.0027	0.1503	-0.0004

Summary Data	Average	Standard Deviation
Volume:	3.1788 cm ³	0.0035 cm ³
Density:	2.7274 g/cm ³	0.0030 g/cm ³
Total Pore Volume:	0.1507 cm ³	0.0004 cm ³

Note: _____

Il direttore del Laboratorio

Lo sperimentatore



Committente
Cantiere

Geotalia srl – Roma
 Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

pagina 2 di 2

PESO SPECIFICO DEI GRANI

Data prova	01/10/2010
Data certificato	19/10/2010
Verb. Accettazione	165
N. certificato	2520/2010

Norma di riferimento **ASTM D5550-00**

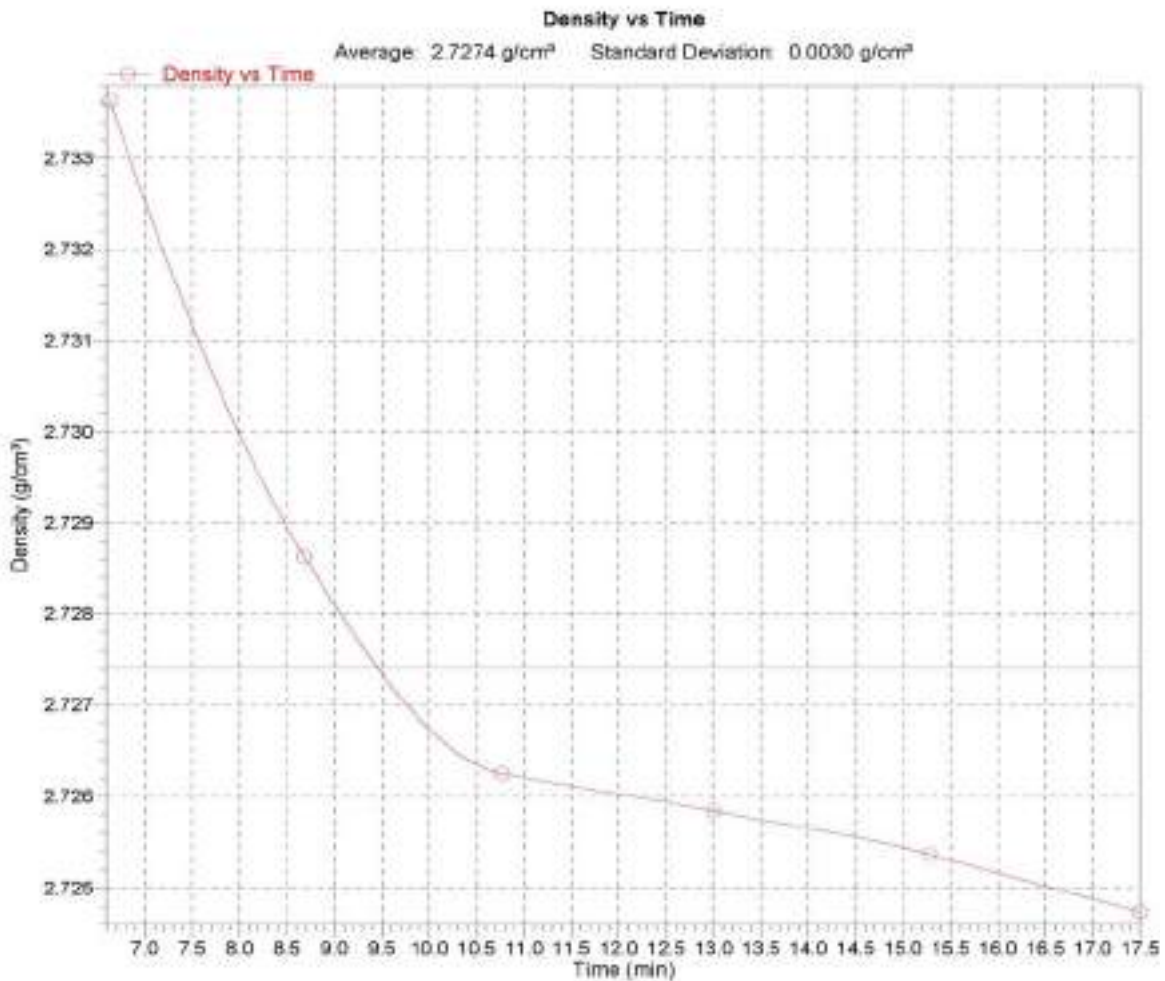
AccuPyc II 1340 V1.00 Unit 1 Serial #: 488 Page 2

Sample: VA165_S13_2_m 8,45-8,73
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S13_2.SMP

Analysis Gas: Helium
 Reported: 01/10/2010 15,15,34
 Sample Mass: 8.6700 g
 Temperature: 24.83 °C
 Number of Purges: 5

Analysis Start: 01/10/2010 14,56,54
 Analysis End: 01/10/2010 15,15,34
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9,2265 cm³
 Cell Volume: 11,8010 cm³

Comments: VA 165; Geotalia srl; Parco Eolico Badia Tedalda (Ar); Sondaggio 13; Campione 2; Prof. (m) 8,45-8,73



Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma

Cantiere Parco Eolico Poggio Tre Vescovi - Castel delci - Verghereto - Badia Tedalda

Data prova 05/10/2010

Data certificato 06/10/2010

Verb. Accettazione 165

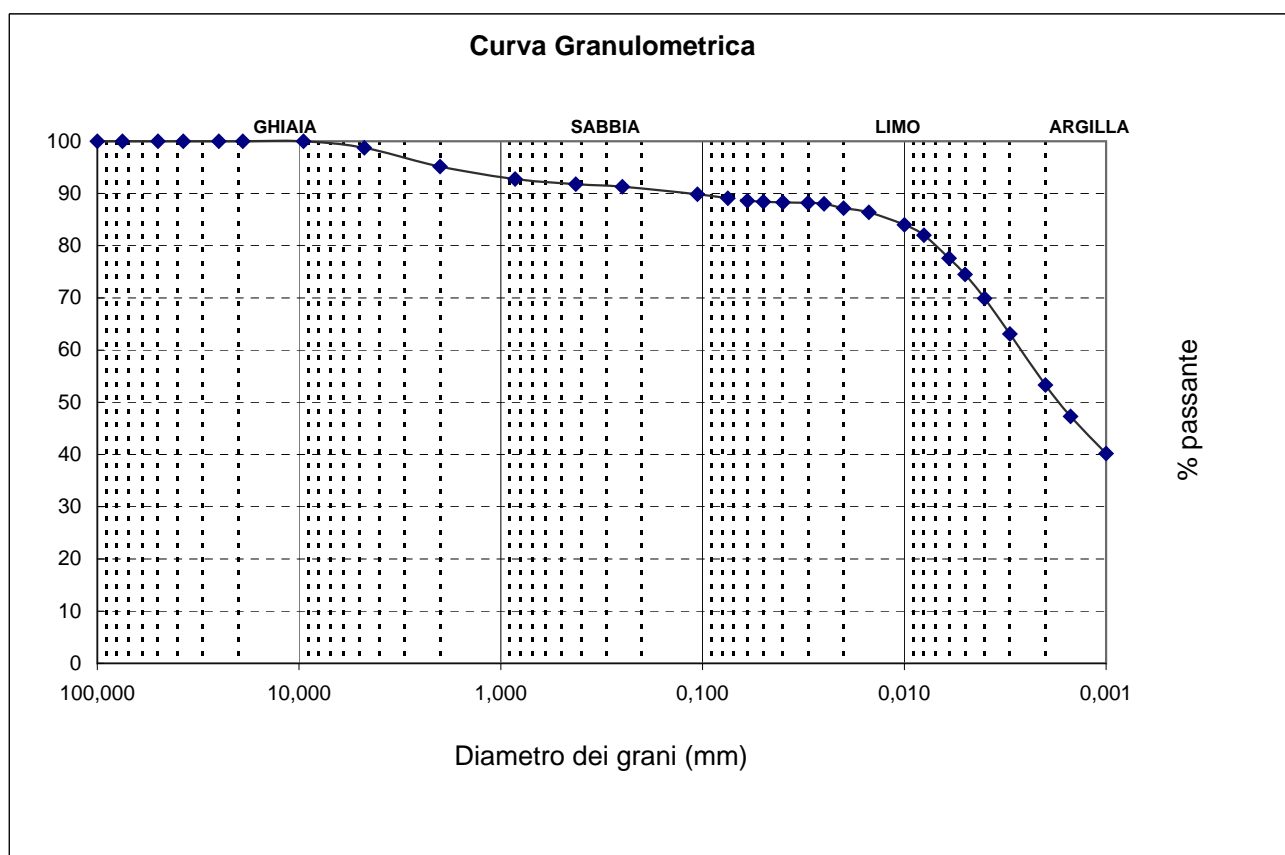
N. Certificato 2480/2010

Pag. 1 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 13 Campione 2 Profondità 8.45-8.73

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)



Riepilogo dei risultati

Ciottoli	(> 60 mm)	0,0
Ghiaia	(60 - 2 mm)	4,8
Sabbia	(2 - 0,060 mm)	6,6
Limo	(0,060 - 0,002 mm)	35,3
Argilla	(< 0,002 mm)	53,3

D10	<0,002
D30	<0,002
D60	0,0027

Classificazione AGI 1994

Il direttore del Laboratorio

Lo sperimentatore



Committente	Geotalia srl – Roma
Cantiere	Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

Data prova	05/10/2010
Data certificato	06/10/2010
Verb. Accettazione	165
N. Certificato	2480/2010

Pag. 2 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio	13	Campione	2	Profondità	8.45-8.73
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ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)

Setacciatura:


Massa materiale (g): 212.18

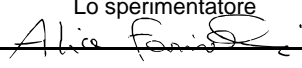
Vagli ASTM	Apertura vagli (mm)	Massa Trattenuta (g)	Trattenuto %	Passante %
3"	75,000	0,00	0,0	100,0
2"	50,000	0,00	0,0	100,0
1,5"	37,500	0,00	0,0	100,0
1"	25,000	0,00	0,0	100,0
3/4"	19,000	0,00	0,0	100,0
3/8"	9,500	0,00	0,0	100,0
No.4	4,750	2,64	1,2	98,8
No.10	2,000	7,62	4,8	95,2
No.20	0,850	5,09	7,2	92,8
No.40	0,425	2,07	8,2	91,8
No.60	0,250	1,08	8,7	91,3
No.140	0,106	3,03	10,1	89,9
No.200	0,075	1,65	10,9	89,1

Sedigrafia:

Material Mass (g): 4.519
 Material/Liquid: soil / 0.20% Sodium Metaphosphate (w/w)
 Measurement Principle: X-Ray monitored gravity sedimentation
 Calculation Method: Stokes sedimentation and Beer's law of extinction
 Test Number: 2
 Analyzed: 05/10/2010 14.40.47
 Reported: 06/10/2010 10.01.15
 Liquid Visc: 0.7683 mPa·s
 Analysis Temp: 32.0 °C
 Full Scale Mass: 89.1 %
 Analysis Type: High Speed(Adj)
 Run Time: 0:04 hrs:min
 Sample Density: 2.727 g/cm³
 Liquid Density: 0.9951 g/cm³
 Base/Full Scale: 134 / 95 kCnts/s
 Reynolds Number: 0.81

Diametro (mm)	Trattenuto %	Passante %
0,060	11,4	88,6
0,050	11,6	88,4
0,040	11,7	88,3
0,030	11,8	88,2
0,025	12,0	88,0
0,020	12,8	87,2
0,015	13,6	86,4
0,010	16,0	84,0
0,008	18,0	82,0
0,006	22,4	77,6
0,005	25,5	74,5
0,004	30,1	69,9
0,003	36,9	63,1
0,002	46,7	53,3
0,002	52,7	47,3
0,001	59,8	40,2

Il direttore del Laboratorio


Lo sperimentatore




Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

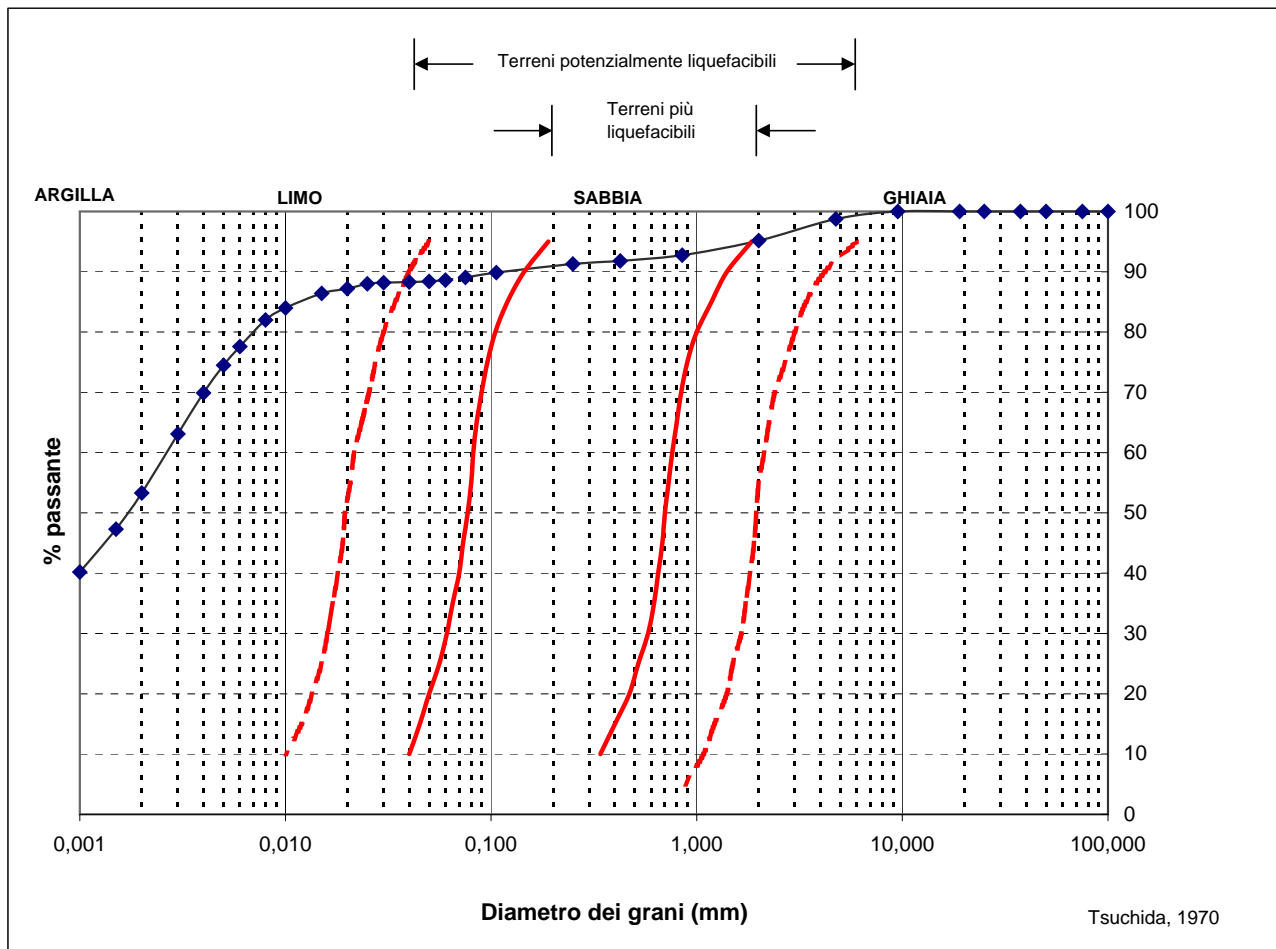
Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2480/2010

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rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 13 Campione 2 Profondità 8.45-8.73

POTENZIALE DI LIQUEFACIBILITA'



Il direttore del Laboratorio
[Signature]

Lo sperimentatore
[Signature]



Committente Geotalia srl – Roma Pag. 1 di 1
 Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda

LIMITI DI CONSISTENZA

Norma di riferimento ASTM D4318

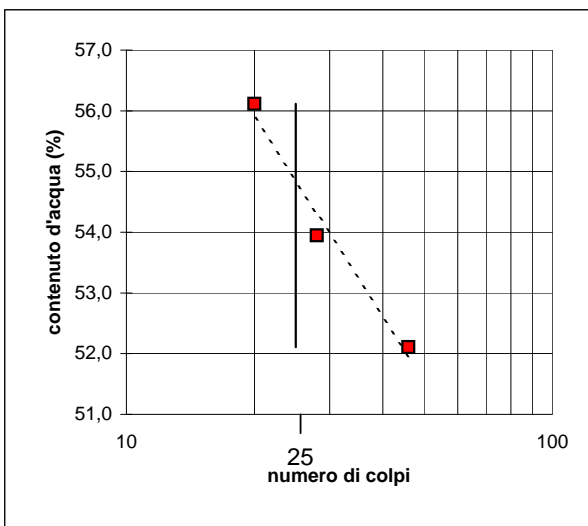
Data prova 05/10/10
 Data certificato 06/10/10
 Verb. Accettazione 165
 N. Certificato 2474/2010

Sondaggio 13 Campione 2 Profondità 8.45-8.73

Limite Liquido				54,8
Numero tara		B40	B16	B17
Numero dei colpi		46	28	20
P. umido + tara	g	64,16	66,83	66,64
P. secco + tara	g	48,46	49,60	48,97
Peso tara	g	18,33	17,66	17,48
Peso umido	g	45,83	49,17	49,16
Peso secco	g	30,13	31,94	31,49
Contenuto d'acqua	%	52,11	53,94	56,11

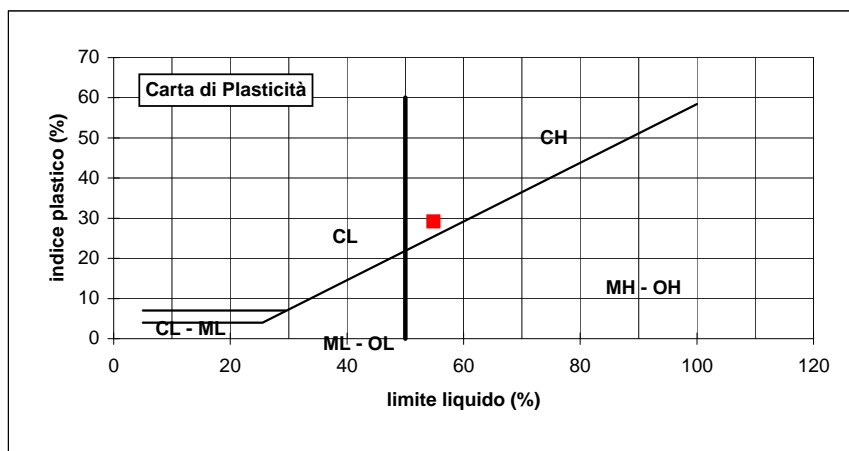
Limite Plastico				25,7
Numero tara		B42	A3	
P. umido + tara	g	31,25	32,12	
P. secco + tara	g	28,55	29,22	
Peso tara	g	18,00	17,98	
Peso umido	g	13,25	14,14	
Peso secco	g	10,55	11,24	
Contenuto d'acqua	%	25,59	25,80	

Umidità Naturale				
Numero tara		A12		
P. umido + tara	g	49,49		
P. secco + tara	g	45,11		
Peso tara	g	18,23		
Peso umido	g	31,26		
Peso secco	g	26,88		
Contenuto d'acqua	%	16,3		



Limite Liquido LL	54,8
Limite Plastico LP	25,7
Indice di Plasticità Ip	29,1
Umidità Naturale Wn	16,3
Indice di Consistenza Ic	1,3

$$I_p = LL - LP \quad I_c = \frac{LL - W_n}{I_p}$$



- ML** Limi inorganici di bassa plasticità
- MH** Limi inorganici di alta plasticità
- CL** Argille inorganiche di bassa plasticità
- CH** Argille inorganiche di alta plasticità
- OL** Argille organiche di bassa plasticità
- OH** Argille organiche di alta plasticità

Il direttore del Laboratorio

Lo sperimentatore

DESCRIZIONE E RIPRESA FOTOGRAFICA DELLA CAROTA ESTRUSA

Committente: GeoItalia srl - Roma

Cantiere/Località: Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

Sondaggio: 15

Campione: 2

Profondità prelievo: 6.00-6.30

Data prelievo: 12/08/2010

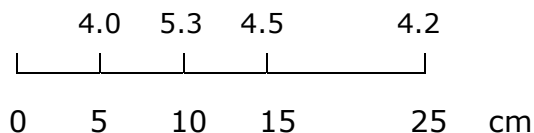
Data apertura: 29/09/2010

Verbale accettazione n° 165

Descrizione: limo con argilla debolmente sabbioso (*Raccomandazioni AGI 1977*). Argilla limosa (*UNI EN ISO 14688-2*).

Colore: HUE 5Y VALUE 4 CHROMA 2 (*Munsell Soil Color Chart*)

Pocket (kg/cm²):



Lunghezza carota: 24 cm
Diametro carota: 88,9 mm



Modalità di prelievo: sondaggio a rotazione

Tipo di fustella: fustella in plastica

Classe di qualità del campione: Q4 (*Raccomandazioni AGI 1977*)
C2 (*Eurocodice 7*)

Prove eseguite:

Cont. Acqua W	X	Granulom. Gr	X	T. Residuo TR	X
Peso Volume γ	X	Compress. ELL	X	Triass. TX UU	-
Peso Specifico Gs	X	Edometria Ed	-	Triass. TX CU	-
Limiti Cons. LL	X	T. Diretto TD	-	Triass. TX CD	-



Committente Geotalia srl – Roma **pagina 1 di 2**
Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Norma di riferimento ASTM D5550-00

Data prova	01/10/2010
Data certificato	19/10/2010
Verb. Accettazione	165
N. certificato	2521/2010

AccuPyc II 1340 V1.00 Unit 1 Serial #: 488 Page 1

Sample: VA165_S15_2_m 6,00-6,30
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S15_2.SMP

Analysis Gas: Helium
 Reported: 01/10/2010 16.29.03
 Sample Mass: 9.5900 g
 Temperature: 24.89 °C
 Number of Purges: 5

Analysis Start: 01/10/2010 16.11.29
 Analysis End: 01/10/2010 16.29.03
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2265 cm³
 Cell Volume: 11.8010 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 15, Campione 2, Prof. (m) 6,00-6,30

Combined Report

Tabular 1

Cycle#	Volume (cm ³)	Volume Deviation (cm ³)	Density (g/cm ³)	Density Deviation (g/cm ³)	Total Pore Volume (cm ³)	Total Pore Volume Deviation (cm ³)
1	3.4849	-0.0035	2.7519	0.0028	0.1336	0.0004
2	3.4877	-0.0007	2.7496	0.0006	0.1333	0.0001
3	3.4890	0.0005	2.7486	-0.0004	0.1332	-0.0001
4	3.4896	0.0011	2.7482	-0.0009	0.1331	-0.0001
5	3.4903	0.0019	2.7476	-0.0015	0.1331	-0.0002
6	3.4893	0.0008	2.7484	-0.0006	0.1332	-0.0001

Summary Data

Average

Standard Deviation

Volume:	3.4885 cm ³	0.0018 cm ³
Density:	2.7491 g/cm ³	0.0014 g/cm ³
Total Pore Volume:	0.1333 cm ³	0.0002 cm ³

Note: _____

Il direttore del Laboratorio

Lo sperimentatore



Committente
Cantiere

Geotalia srl – Roma
 Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

pagina 2 di 2

PESO SPECIFICO DEI GRANI

Data prova 01/10/2010
 Data certificato 19/10/2010
 Verb. Accettazione 165
 N. certificato 2521/2010

Norma di riferimento ASTM D5550-00

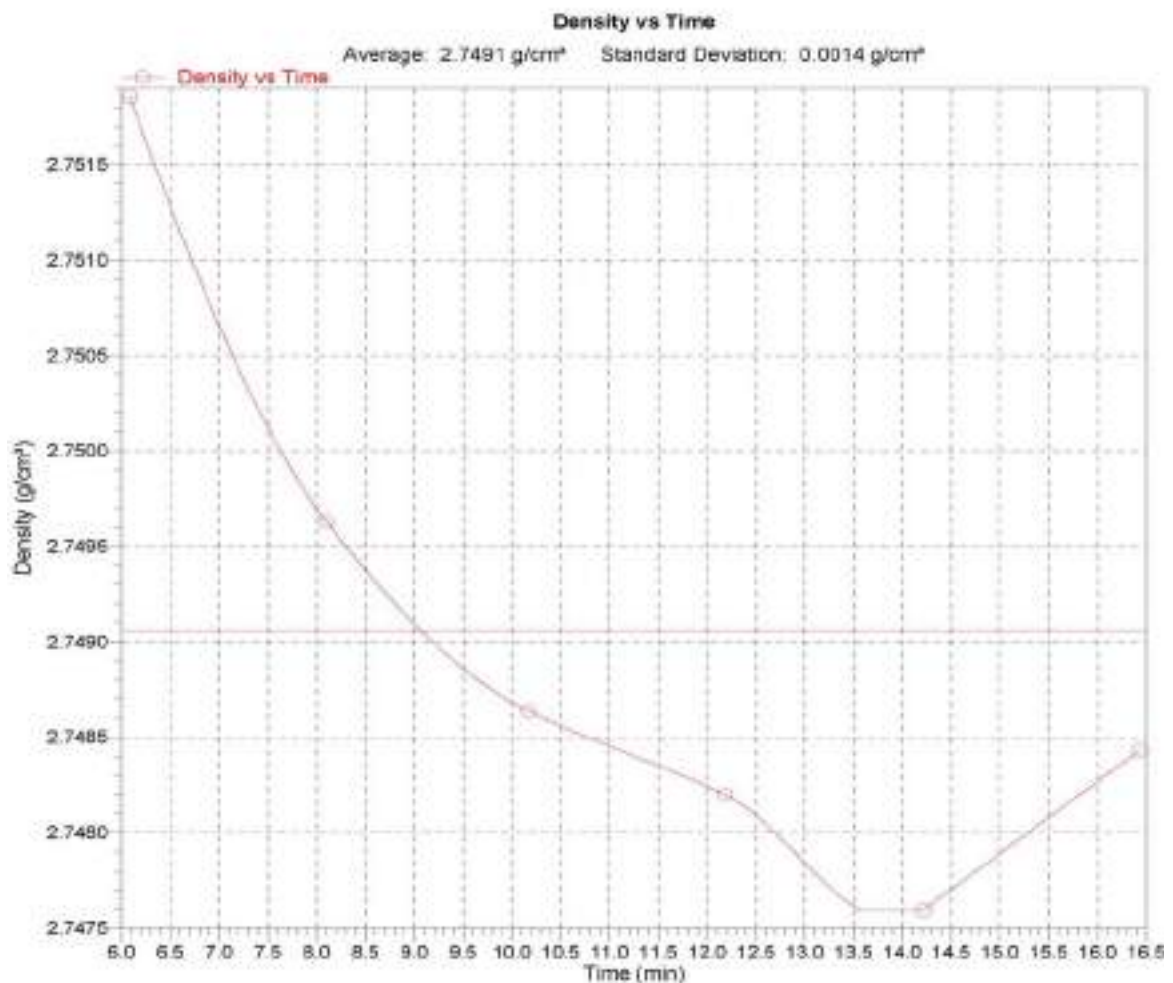
AccuPyc II 1340 V1.00 Unit 1 Serial #: 488 Page 2

Sample: VA165_S15_2_m 5,00-6,30
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S15_2.SMP

Analysis Gas: Helium
 Reported: 01/10/2010 16:29:03
 Sample Mass: 9.5900 g
 Temperature: 24.89 °C
 Number of Purges: 5

Analysis Start: 01/10/2010 16:11:28
 Analysis End: 01/10/2010 16:29:03
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2265 cm³
 Cell Volume: 11.8010 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 15, Campione 2, Prof. (m) 6,00-6,30



Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

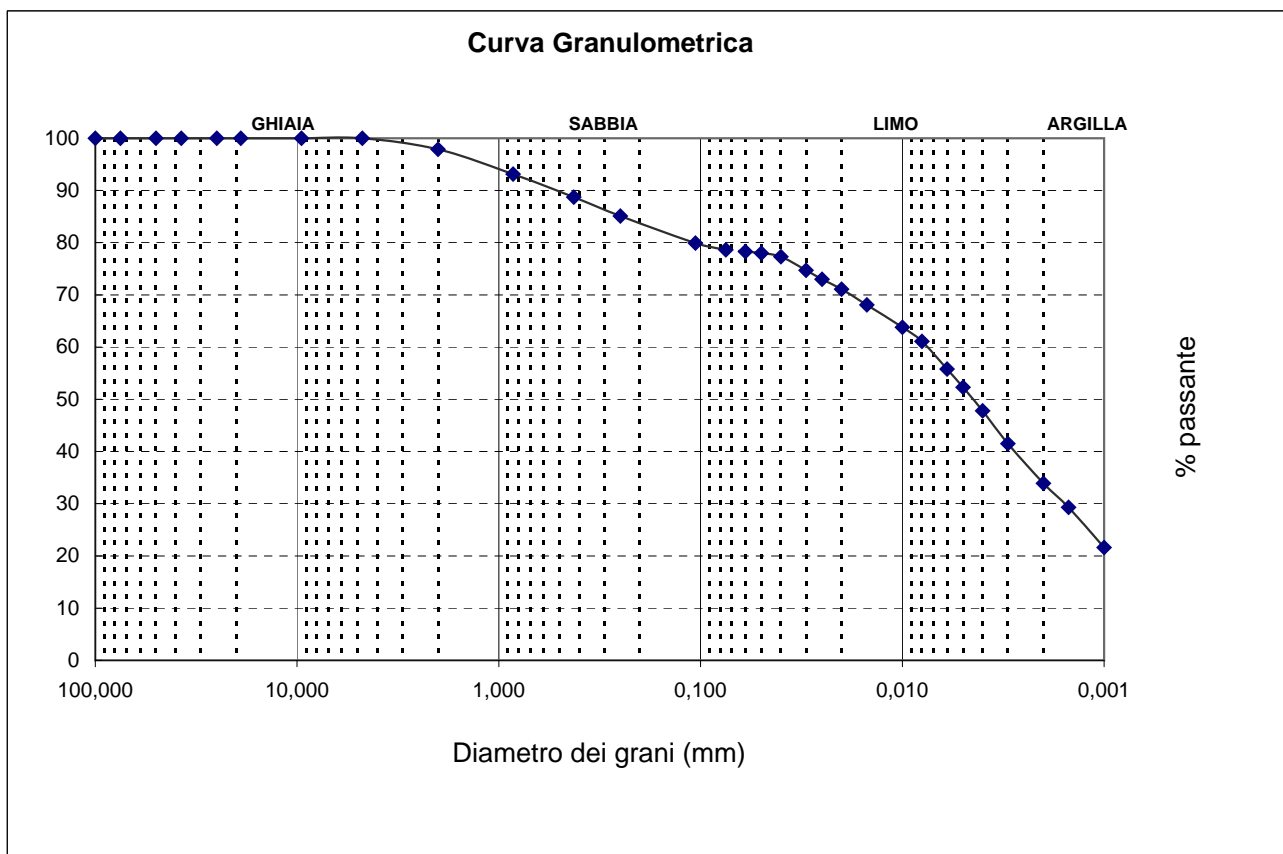
Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2481/2010

Pag. 1 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 15 Campione 2 Profondità 6.00-6.30

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)

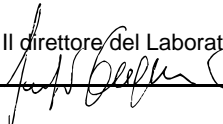


Riepilogo dei risultati

Ciottoli	(> 60 mm)	0,0
Ghiaia	(60 - 2 mm)	2,1
Sabbia	(2 - 0,060 mm)	19,6
Limo	(0,060 - 0,002 mm)	44,4
Argilla	(< 0,002 mm)	33,9

D10	<0,002
D30	0,0016
D60	0,0076

Classificazione AGI 1994

Il direttore del Laboratorio


Lo sperimentatore




Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2481/2010

Pag. 2 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 15 Campione 2 Profondità 6.00-6.30

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)

Setacciatura:

Massa materiale (g): 200.49

Vagli ASTM	Apertura vagli (mm)	Massa Trattenuta (g)	Trattenuto %	Passante %
3"	75,000	0,00	0,0	100,0
2"	50,000	0,00	0,0	100,0
1,5"	37,500	0,00	0,0	100,0
1"	25,000	0,00	0,0	100,0
3/4"	19,000	0,00	0,0	100,0
3/8"	9,500	0,00	0,0	100,0
No.4	4,750	0,00	0,0	100,0
No.10	2,000	4,27	2,1	97,9
No.20	0,850	9,51	6,9	93,1
No.40	0,425	8,81	11,3	88,7
No.60	0,250	7,29	14,9	85,1
No.140	0,106	10,35	20,1	79,9
No.200	0,075	2,60	21,4	78,6

Sedigrafia:

Material Mass (g): 4.621
 Material/Liquid: soil / 0.20% Sodium Metaphosphate (w/w)
 Measurement Principle: X-Ray monitored gravity sedimentation
 Calculation Method: Stokes sedimentation and Beer's law of extinction
 Test Number: 2
 Analyzed: 05/10/2010 15.10.40
 Reported: 06/10/2010 10.01.14
 Liquid Visc: 0.7683 mPa·s
 Analysis Temp: 32.0 °C
 Full Scale Mass: 78.6 %
 Analysis Type: High Speed(Adj)
 Run Time: 0:04 hrs:min
 Sample Density: 2.749 g/cm³
 Liquid Density: 0.9951 g/cm³
 Base/Full Scale: 134 / 92 kCnts/s
 Reynolds Number: 0.82

Diametro (mm)	Trattenuto %	Passante %
0,060	21,7	78,3
0,050	22,0	78,0
0,040	22,7	77,3
0,030	25,3	74,7
0,025	27,0	73,0
0,020	28,9	71,1
0,015	31,9	68,1
0,010	36,2	63,8
0,008	38,9	61,1
0,006	44,2	55,8
0,005	47,7	52,3
0,004	52,2	47,8
0,003	58,5	41,5
0,002	66,1	33,9
0,002	70,7	29,3
0,001	78,4	21,6

Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

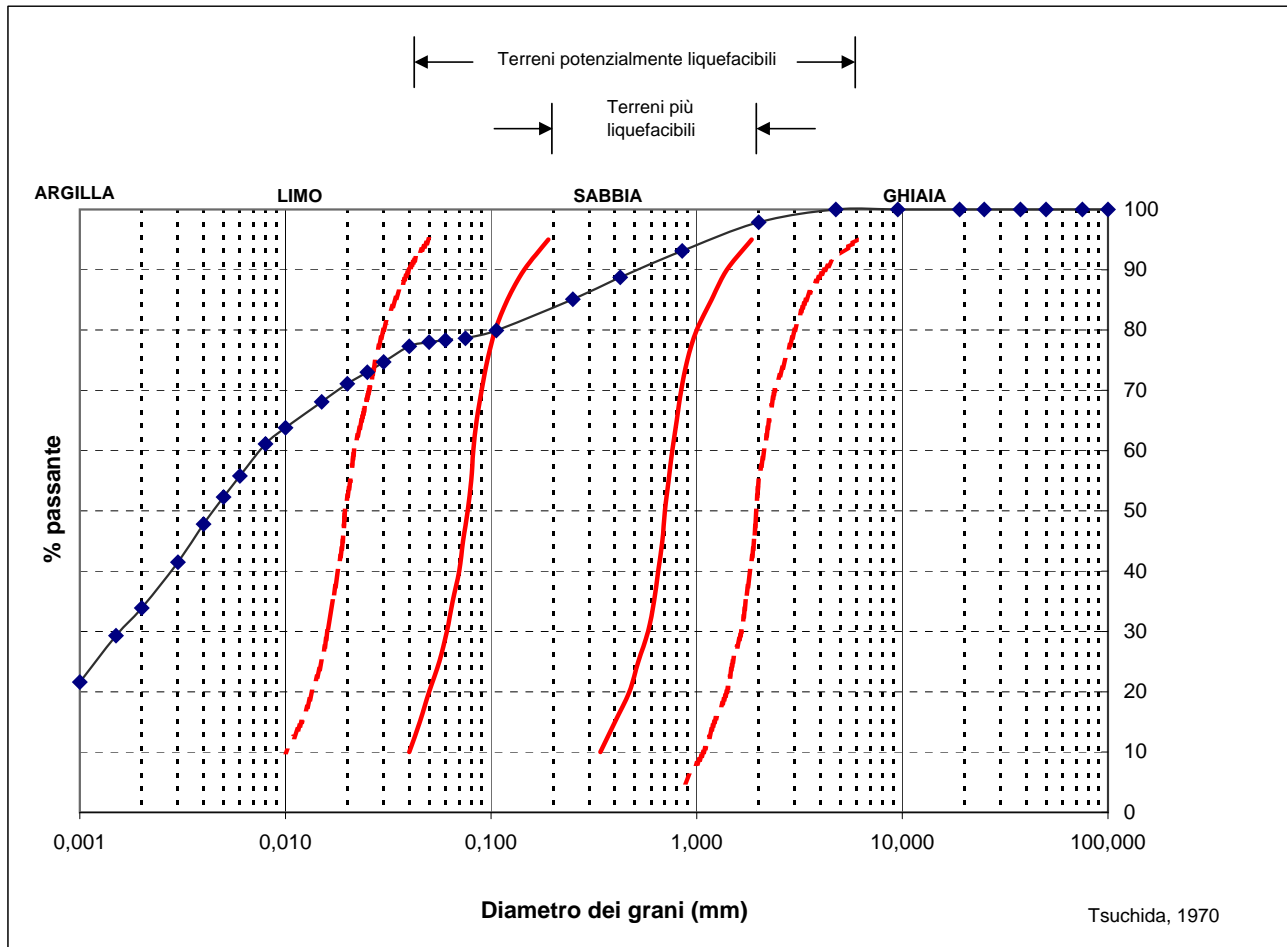
Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2481/2010

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rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 15 Campione 2 Profondità 6.00-6.30

POTENZIALE DI LIQUEFACIBILITA'



Il direttore del Laboratorio
[Signature]

Lo sperimentatore
[Signature]



Committente Geotalia srl – Roma Pag. 1 di 1
 Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda

LIMITI DI CONSISTENZA

Norma di riferimento ASTM D4318

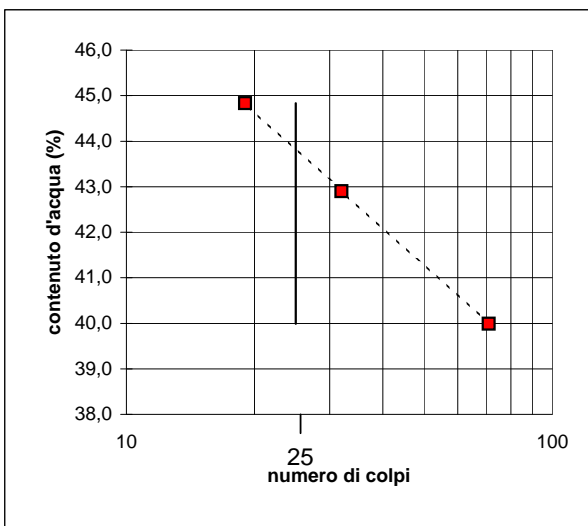
Data prova 11/10/10
 Data certificato 14/10/10
 Verb. Accettazione 165
 N. Certificato 2497/2010

Sondaggio 15 Campione 2 Profondità 6.00-6.30

Limite Liquido				43,8
Numero tara		A1	A9	B34
Numero dei colpi		71	32	19
P. umido + tara	g	96,59	99,65	97,26
P. secco + tara	g	73,99	75,22	72,73
Peso tara	g	17,48	18,27	18,02
Peso umido	g	79,11	81,38	79,24
Peso secco	g	56,51	56,95	54,71
Contenuto d'acqua	%	39,99	42,90	44,84

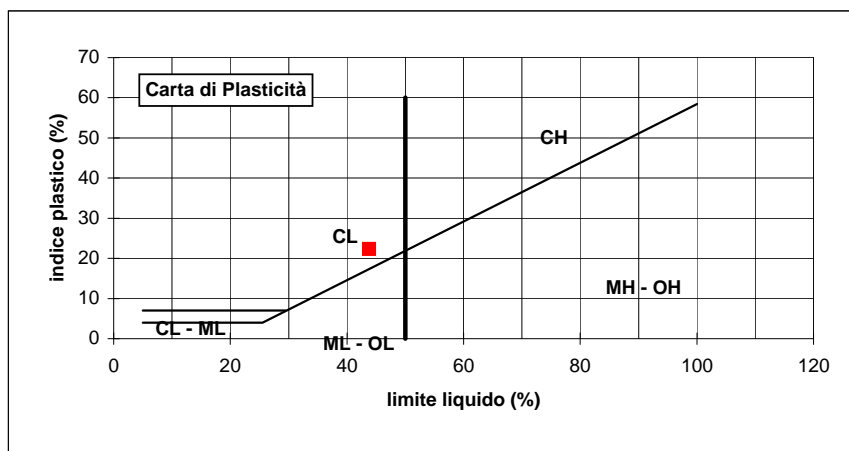
Limite Plastico				21,5
Numero tara		B27	B20	
P. umido + tara	g	32,70	38,94	
P. secco + tara	g	30,06	35,10	
Peso tara	g	17,58	17,49	
Peso umido	g	15,12	21,45	
Peso secco	g	12,48	17,61	
Contenuto d'acqua	%	21,15	21,81	

Umidità Naturale				14,5
Numero tara		B22		
P. umido + tara	g	58,98		
P. secco + tara	g	53,74		
Peso tara	g	17,57		
Peso umido	g	41,41		
Peso secco	g	36,17		
Contenuto d'acqua	%			14,5



Limite Liquido LL	43,8
Limite Plastico LP	21,5
Indice di Plasticità Ip	22,3
Umidità Naturale Wn	14,5
Indice di Consistenza Ic	1,3

$$I_p = LL - LP \quad I_c = \frac{LL - W_n}{I_p}$$



- ML** Limi inorganici di bassa plasticità
- MH** Limi inorganici di alta plasticità
- CL** Argille inorganiche di bassa plasticità
- CH** Argille inorganiche di alta plasticità
- OL** Argille organiche di bassa plasticità
- OH** Argille organiche di alta plasticità

Il direttore del Laboratorio

Lo sperimentatore

PROVA DI COMPRESSIONE SEMPLICE (ASTM D 2166)

Provino X

Nome File: 10ELL894

Certificato n°: 2543/2010

Data Prova: 7 OTT 2010

Pagina 1 di 2

Dati Cliente

Cliente GeoItalia srl
Indirizzo
Località Poggio Tre Vescovi
Sondaggio 15
Campione 2
Profondità 6.00-6.30

Caratteristiche Fisiche

Data prelievo		Peso di volume iniziale	2,142 MN/m ³	γ_n
Sezione provino	11,394 cm ²	Peso di volume finale	2,205 MN/m ³	γ_f
Altezza iniziale	76,000 mm	Peso di volume secco	1,859 MN/m ³	γ_d
Altezza finale	72,940 mm	Contenuto d'acqua iniz.	15,199 %	W_0
No. Tara 1	1	Contenuto d'acqua finale	13,845 %	W_f
Peso Tara 1	10,000 g	Saturazione iniziale	87,240 %	S_0
Tara + p.umido iniz.	195,47 g	Saturazione finale	90,749 %	S_f
No. Tara 2	52	Indice dei vuoti iniziale	0,479	e_0
Peso Tara 2	31,480 g	Indice dei vuoti finale	0,420	e_f
Tara + p.umido finale	214,770 g	Peso di volume secco finale	1,937 MN/m ³	γ_{df}
Tara + p.provino secco	192,480 g			
Peso specifico dei grani	2,750 MN/m ³			

Restituzione fotografica dopo la prova



Il Direttore del Laboratorio



Lo Sperimentatore



rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA DI COMPRESIONE SEMPLICE (ASTM D 2166)

Provino X

Nome File: 10ELL894

Certificato n°: 2543/2010

Data Prova: 7 OTT 2010

Pagina 2 di 2

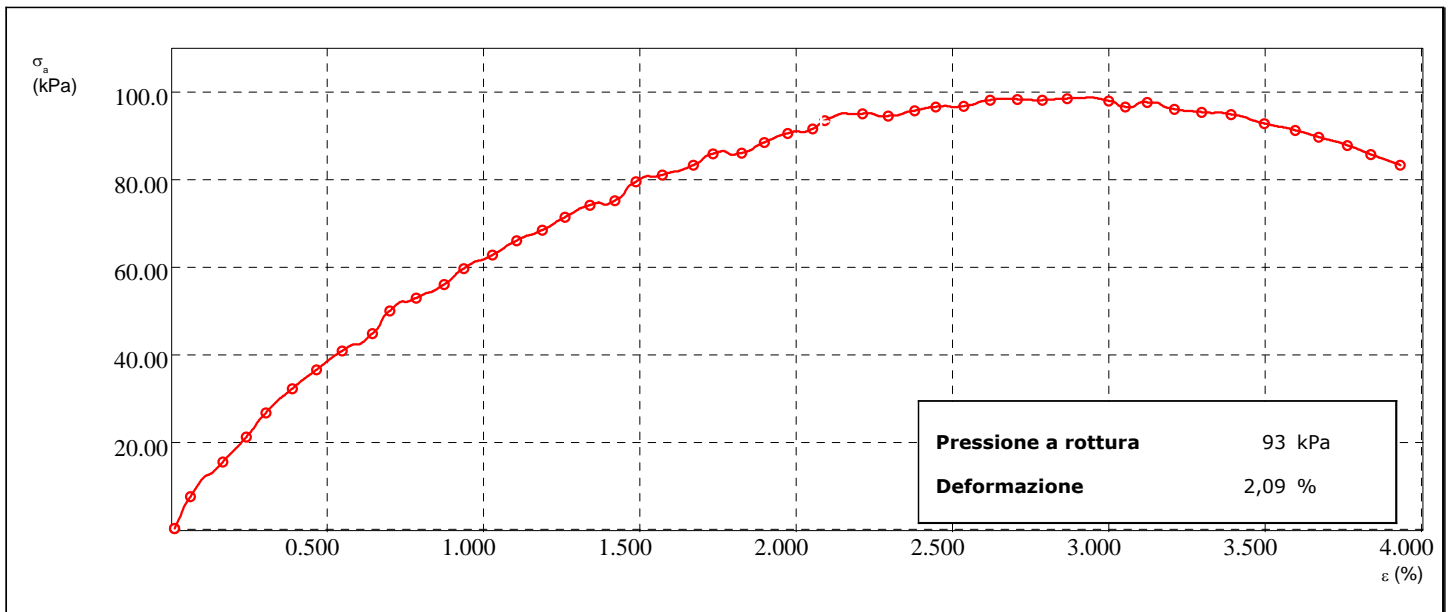
Customer data

Cliente GeoItalia srl
Indirizzo
Località Poggio Tre Vescovi
Sondaggio 15
Campione 2
Profondità 6.00-6.30

dH mm	dL N
0,01	0,33
0,05	8,63
0,13	17,60
0,18	24,24
0,23	30,55
0,29	36,85
0,35	41,83
0,42	46,81
0,49	51,46
0,53	57,43
0,60	60,75
0,66	64,40
0,71	68,71
0,78	72,36
0,84	76,01
0,90	79,00
0,96	82,31
1,02	85,63
1,08	86,96
1,13	91,93
1,19	93,92

dH mm	dL N
1,27	96,58
1,32	99,56
1,39	99,89
1,44	102,88
1,50	105,20
1,56	106,53
1,59	108,85
1,68	110,84
1,74	110,18
1,81	111,83
1,86	112,83
1,93	113,16
1,99	114,82
2,06	115,15
2,12	115,15
2,18	115,48
2,28	115,15
2,32	113,49
2,37	114,82
2,44	113,16
2,51	112,50

dH mm	dL N
2,58	111,83
2,66	109,51
2,73	107,85
2,79	106,20
2,86	103,87
2,92	101,55
2,99	98,90
3,06	96,58



Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

SETUP DATA

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2	Test type	<input type="radio"/> Single stage <input checked="" type="radio"/> Multistage
Sample description	Materiale passante a 0.425 mm a contenuto d'acqua compreso tra LL e LP.		
Preparation method	Remoulded at a specified moisture content		

STAGE 1

Machine number	4.00	Specimen depth (m)	6.00/6.30
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Initial measurements

Diameter of internal ring (mm)	70.0	Internal radius (mm)	35.0
Diameter of external ring (mm)	100.0	External radius (mm)	50.0
Specimen thickness (mm)	5.0	Distance between force points (mm)	77.0
Mass of cell (g)	603.9	Specimen volume (cc)	20.0
Mass of cell + wet soil (g)	646.7	Mass of specimen (g)	42.8

Trimmings moisture content

Mass of wet soil + tin (g)	96.59
Mass of dry soil + tin (g)	73.99
Mass of tin (g)	17.48

Final moisture content

Mass of wet soil + tin (g)	43.86
Mass of dry soil + tin (g)	34.81
Mass of tin (g)	12.50

Applied stress

Mass directly applied (kg)	0.27	Total mass on specimen (kg)	5.27
Mass indirectly applied (kg)	0.50	Normal stress (kPa)	13
Load arm ratio (**:1)	10.0		

Consolidation stage

Initial vertical displacement reading (mm)*		
t100 (root mins)	3.64	
t100 (mins)	13.23	
Estimated linear displacement at failure (mm)	3.00	
Minimum time to failure (t_f) (mins)	168.00	
Rate of linear displacement (mm/min)	Calculated 0.018	Actual 0.018
Rate of angular displacement (°/min)	Calculated 0.024	Actual 0.024

Shear stage - initial readings

Vertical displacement (mm)*	
Shear force device A (N)*	
Shear force device B (N)*	
Angular rotation (°)*	

* If initial readings are not entered, values will be taken from the test data



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

SETUP DATA

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2	Test type	<input type="radio"/> Single stage <input checked="" type="radio"/> Multistage
Sample description	Materiale passante a 0.425 mm a contenuto d'acqua compreso tra LL e LP.		
Preparation method	Remoulded at a specified moisture content		

STAGE 2

Applied stress			
Mass directly applied (kg)	0.27	Total mass on specimen (kg)	10.27
Mass indirectly applied (kg)	1.00	Normal stress (kPa)	25
Load arm ratio (**:1)	10.0		

Consolidation stage			
Initial vertical displacement reading (mm)*			
t100 (root mins)		2.71	
t100 (mins)		7.36	
Estimated horizontal displacement at failure (mm)		3.00	
Minimum time to failure (t_f) (mins)		93.47	
Rate of linear displacement (mm/min)	Calculated	0.032	Actual 0.018
Rate of angular displacement (°/min)	Calculated	0.043	Actual 0.024

Shear stage - initial readings			
Vertical displacement (mm)*			
Shear force device A (N)*			
Shear force device B (N)*			
Angular rotation (°)*			

* If initial readings are not entered, values will be taken from the test data



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

SETUP DATA

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2	Test type	<input type="radio"/> Single stage <input checked="" type="radio"/> Multistage
Sample description	Materiale passante a 0.425 mm a contenuto d'acqua compreso tra LL e LP.		
Preparation method	Remoulded at a specified moisture content		

STAGE 3

Applied stress

Mass directly applied (kg)	0.27	Total mass on specimen (kg)	20.27
Mass indirectly applied (kg)	2.00	Normal stress (kPa)	50
Load arm ratio (**:1)	10.0		

Consolidation stage

Initial vertical displacement reading (mm)*			
t100 (root mins)		2.65	
t100 (mins)		7.02	
Estimated horizontal displacement at failure (mm)		3.00	
Minimum time to failure (t_f) (mins)		89.10	
Rate of linear displacement (mm/min)	Calculated	0.034	Actual 0.018
Rate of angular displacement (°/min)	Calculated	0.045	Actual 0.024

Shear stage - initial readings

Vertical displacement (mm)*	
Shear force device A (N)*	
Shear force device B (N)*	
Angular rotation (°)*	

* If initial readings are not entered, values will be taken from the test data



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST REPORT - SUMMARY

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		
Sample description	Materiale passante a 0.425 mm a contenuto d'acqua compreso tra LL e LP.		
Preparation method	Remoulded at a specified moisture content		

INITIAL CONDITIONS	Stage 1	Stage 2	Stage 3
Specimen depth (m)	6.00/6.30	-	-
Specimen thickness (mm)	5.0	-	-
External ring radius (mm)	50.0	-	-
Internal ring radius (mm)	35.0	-	-
Moisture content (trimmings) (%)	40	-	-

SHEARING	Stage 1	Stage 2	Stage 3
Average linear displacement (mm/min)	0.018	0.018	0.018
Rate of angular displacement (°/min)	0.024	0.024	0.024
Conditions at end of shear			
Normal stress (kPa)	13	25	50
Residual shear stress (kPa)	4	8	16
Average linear displacement (mm)	3.53	6.77	7.78
Angular displacement (°)	4.8	9.1	10.5

FINAL MEASUREMENTS	Stage 1	Stage 2	Stage 3
Moisture content (%)	41	-	-

Assumed cohesion (kPa)	0.0
Angle of residual shear resistance (°)	17.4

Comments / variations from procedures:

Il presente rapporto di prova è formato da n. 23 pagine.

Tested Date	Farinelli 15/10/2010	Checked Date	Sfalanga 18/10/2010	Approved Date	Carmignani 25/10/2010
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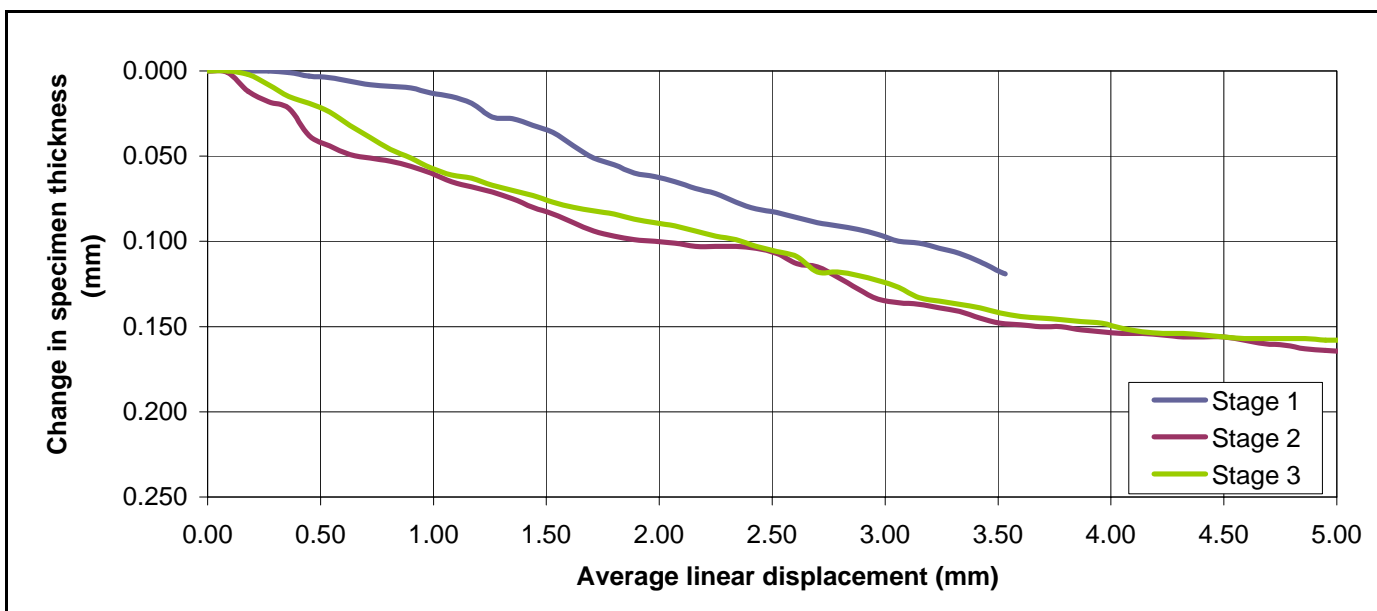
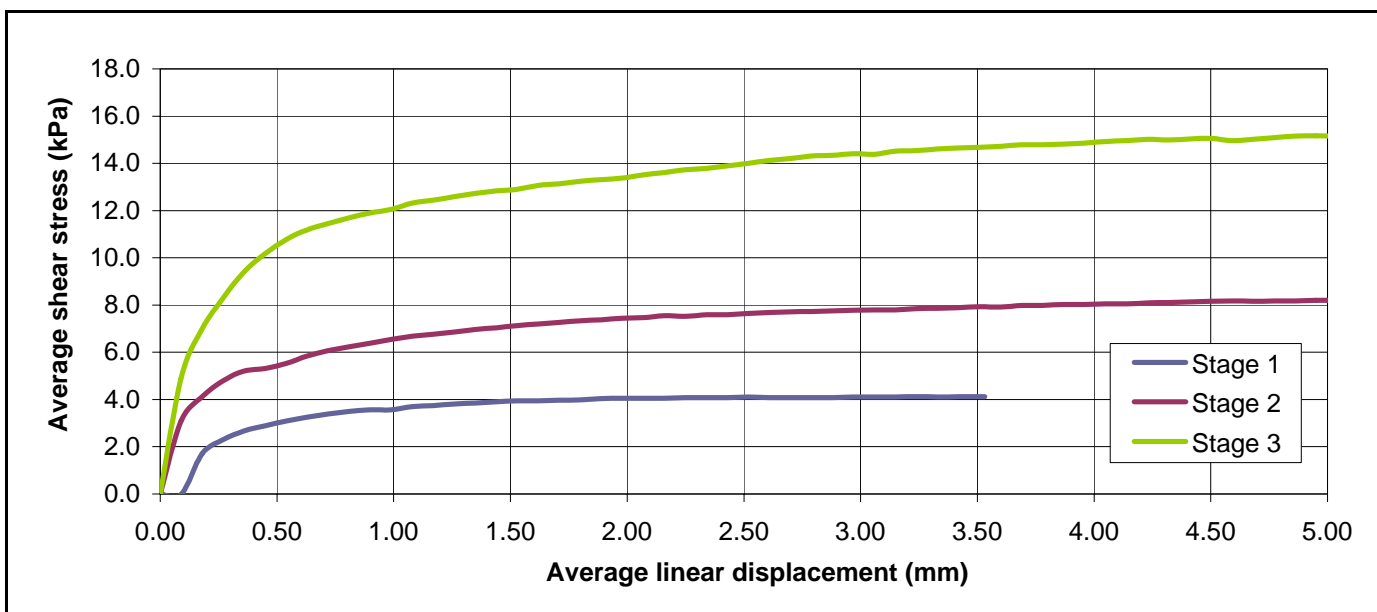


DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST REPORT - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi	Sample depth (m)	6.00/6.30
Project reference	Palazzi Giomarelli srl	Sample type	Remoulded
Borehole number	15		
Sample number	2		



Tested Date	Farinelli 15/10/2010	Checked Date	Sfalanga 18/10/2010	Approved Date	Carmignani 25/10/2010
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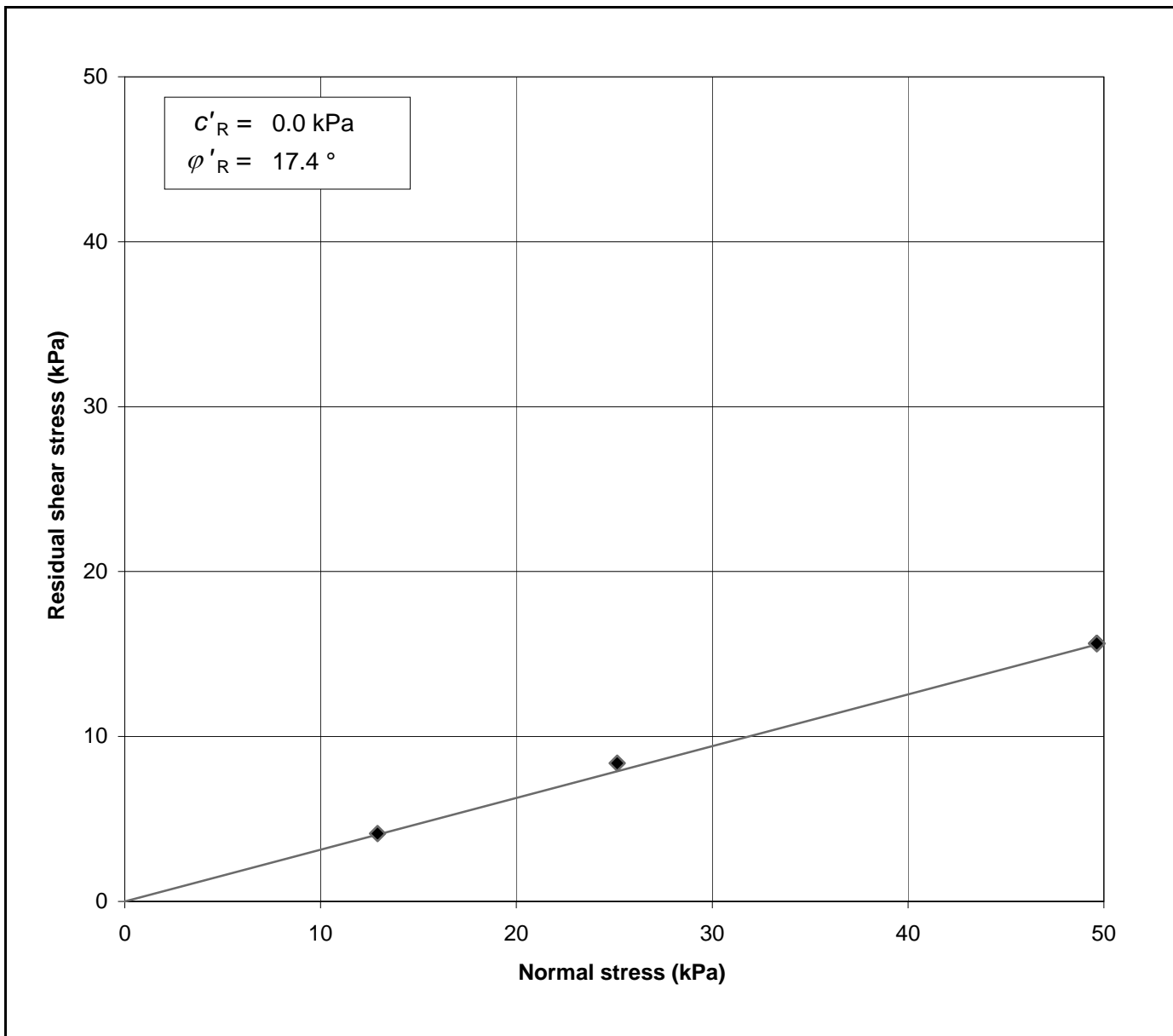


DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST REPORT - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi	Sample depth (m)	6.00/6.30
Project reference	Palazzi Giomarelli srl	Sample type	Remoulded
Borehole number	15		
Sample number	2		



Tested Date	Farinelli 15/10/2010	Checked Date	Sfalanga 18/10/2010	Approved Date	Carmignani 25/10/2010
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DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		

STAGE 1 **Normal stress (kPa)** **13**

Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	0.104	0.2	0.000
0.08	0.107	0.3	0.003
0.13	0.115	0.4	0.011
0.20	0.120	0.4	0.016
0.32	0.127	0.6	0.023
0.51	0.135	0.7	0.031
0.81	0.160	0.9	0.056
1.25	0.172	1.1	0.068
2.04	0.185	1.4	0.081
3.25	0.221	1.8	0.117
5.16	0.256	2.3	0.152
8.21	0.352	2.9	0.248
13.06	0.405	3.6	0.301
20.76	0.425	4.6	0.321
33.00	0.459	5.7	0.355
52.47	0.497	7.2	0.393
83.43	0.517	9.1	0.413
132.66	0.534	11.5	0.430
210.92	0.555	14.5	0.451
335.37	0.577	18.3	0.473
533.23	0.598	23.1	0.494
847.83	0.599	29.1	0.495
967.86	0.599	31.1	0.495



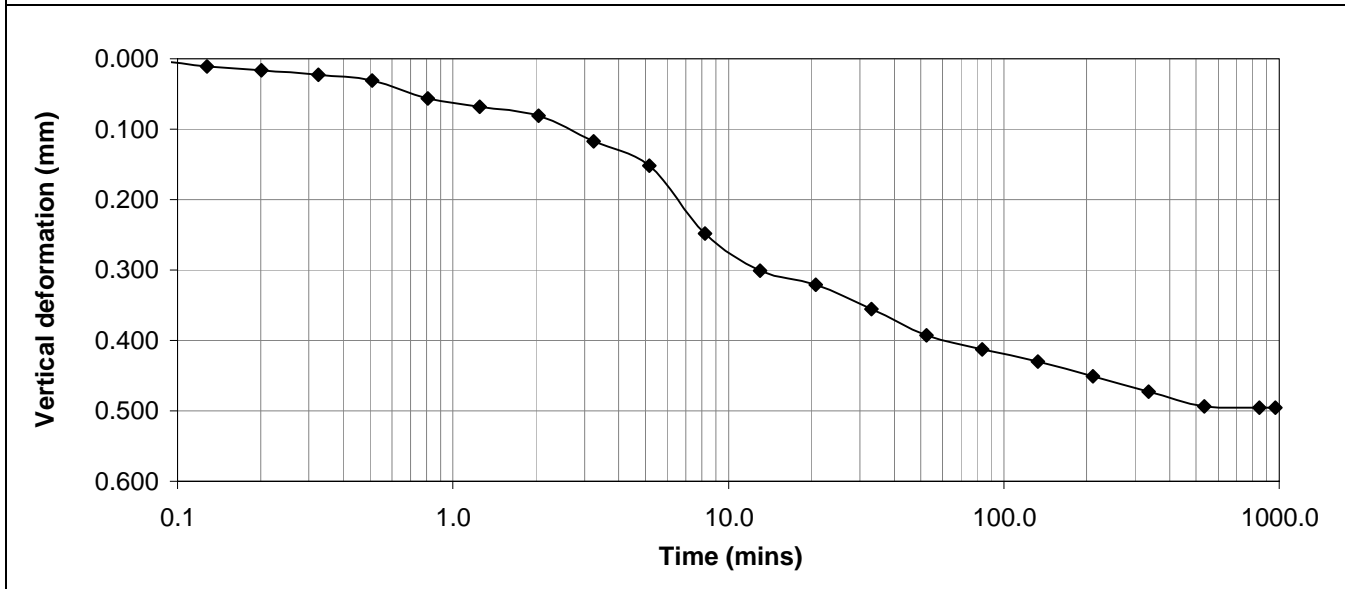
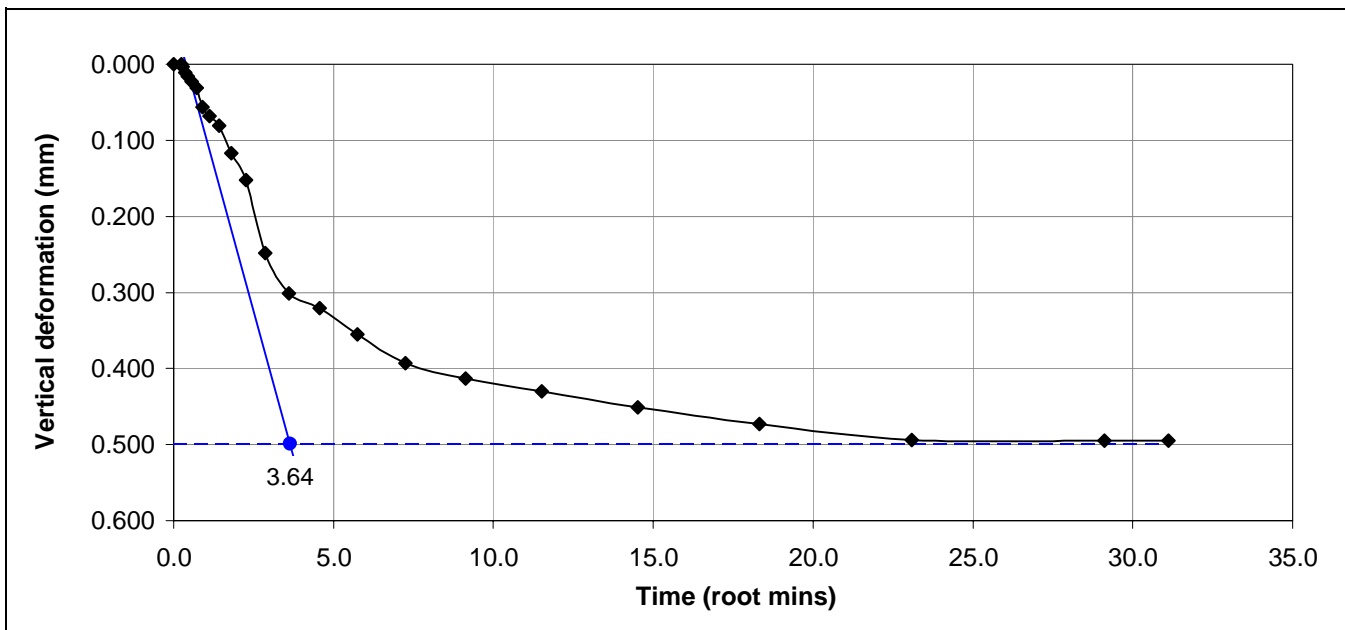
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		

STAGE 1	Normal stress (kPa)	13
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Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	11/10/2010	Date	18/10/2010	Date	25/10/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		

STAGE 1 **Normal stress (kPa)** **13**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
0.02	0.699	0.0	0.0	0.0	0.00	0.000	0.0	0.0
5.00	0.698	-0.1	0.0	0.1	0.09	-0.001	-0.1	0.0
10.00	0.699	3.5	4.1	0.2	0.18	0.000	3.8	1.7
15.00	0.699	4.7	5.6	0.4	0.27	0.000	5.2	2.3
20.00	0.700	5.5	6.4	0.5	0.36	0.001	6.0	2.7
25.00	0.702	6.0	6.9	0.6	0.45	0.003	6.5	2.9
30.00	0.703	6.4	7.4	0.7	0.54	0.004	6.9	3.1
35.00	0.705	6.7	7.8	0.8	0.63	0.006	7.3	3.2
40.00	0.707	6.9	8.2	1.0	0.72	0.008	7.6	3.4
45.00	0.708	7.2	8.4	1.1	0.81	0.009	7.8	3.5
50.00	0.709	7.2	8.7	1.2	0.90	0.010	8.0	3.6
55.00	0.712	7.0	8.9	1.3	0.99	0.013	8.0	3.6
60.00	0.714	7.3	9.2	1.5	1.08	0.015	8.3	3.7
65.00	0.718	7.3	9.4	1.6	1.17	0.019	8.4	3.7
70.00	0.726	7.4	9.6	1.7	1.26	0.027	8.5	3.8
75.00	0.727	7.4	9.8	1.8	1.35	0.028	8.6	3.9
80.00	0.731	7.5	9.9	1.9	1.44	0.032	8.7	3.9
85.00	0.735	7.5	10.1	2.1	1.53	0.036	8.8	3.9
90.00	0.743	7.5	10.1	2.2	1.62	0.044	8.8	3.9
95.00	0.750	7.5	10.2	2.3	1.71	0.051	8.9	4.0
100.00	0.754	7.5	10.3	2.4	1.80	0.055	8.9	4.0
105.00	0.759	7.6	10.4	2.5	1.89	0.060	9.0	4.0
110.00	0.761	7.6	10.5	2.7	1.98	0.062	9.1	4.1
115.00	0.764	7.5	10.6	2.8	2.07	0.065	9.1	4.1
120.00	0.768	7.5	10.6	2.9	2.16	0.069	9.1	4.1
125.00	0.771	7.5	10.7	3.0	2.25	0.072	9.1	4.1
130.00	0.776	7.5	10.7	3.2	2.34	0.077	9.1	4.1
135.00	0.780	7.5	10.7	3.3	2.43	0.081	9.1	4.1
140.00	0.782	7.5	10.8	3.4	2.52	0.083	9.2	4.1
145.00	0.785	7.5	10.7	3.5	2.61	0.086	9.1	4.1
150.00	0.788	7.6	10.6	3.6	2.70	0.089	9.1	4.1
155.00	0.790	7.6	10.6	3.8	2.79	0.091	9.1	4.1
160.00	0.792	7.5	10.7	3.9	2.88	0.093	9.1	4.1
165.00	0.795	7.6	10.7	4.0	2.97	0.096	9.2	4.1



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		

STAGE 1 **Normal stress (kPa)** **13**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
170.00	0.799	7.6	10.7	4.1	3.06	0.100	9.2	4.1
175.00	0.800	7.6	10.7	4.2	3.15	0.101	9.2	4.1
180.00	0.803	7.6	10.8	4.4	3.24	0.104	9.2	4.1
185.00	0.806	7.6	10.7	4.5	3.33	0.107	9.2	4.1
190.00	0.811	7.7	10.7	4.6	3.42	0.112	9.2	4.1
195.00	0.817	7.7	10.7	4.7	3.51	0.118	9.2	4.1
196.19	0.818	7.7	10.7	4.8	3.53	0.119	9.2	4.1



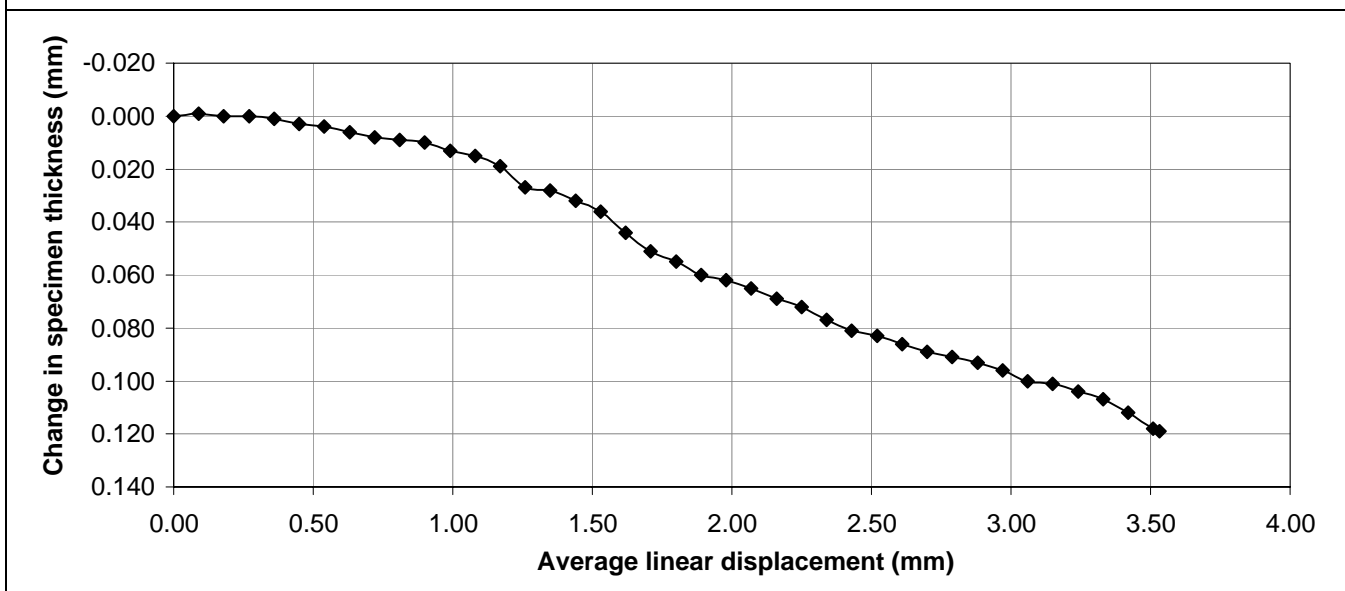
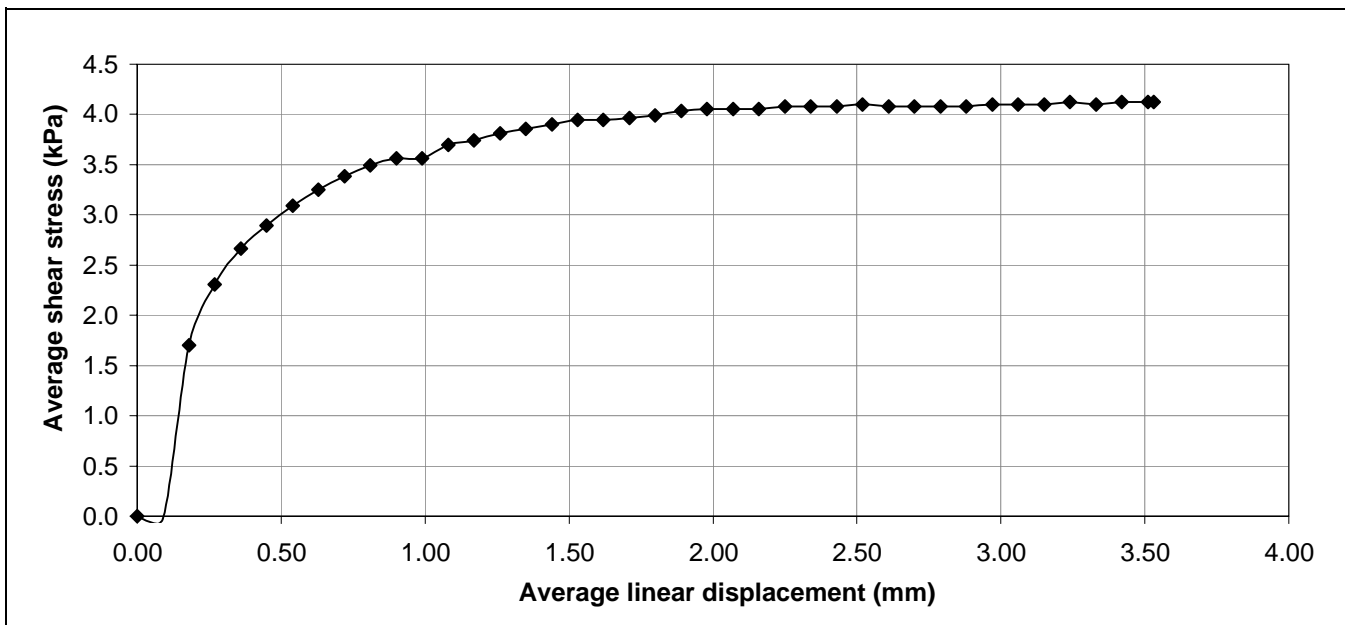
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		

STAGE 1 **Normal stress (kPa)** **13**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	12/10/2010	Date	18/10/2010	Date	25/10/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		

STAGE 2 **Normal stress (kPa)** **25**

Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	1.010	0.2	0.000
0.08	1.031	0.3	0.021
0.13	1.041	0.4	0.031
0.21	1.050	0.5	0.040
0.32	1.057	0.6	0.047
0.51	1.065	0.7	0.055
0.81	1.078	0.9	0.068
1.29	1.085	1.1	0.075
2.05	1.098	1.4	0.088
3.25	1.116	1.8	0.106
5.17	1.136	2.3	0.126
8.21	1.152	2.9	0.142
13.06	1.169	3.6	0.159
20.76	1.191	4.6	0.181
33.00	1.212	5.7	0.202
52.47	1.231	7.2	0.221
83.43	1.247	9.1	0.237
132.66	1.266	11.5	0.256
210.92	1.285	14.5	0.275
335.36	1.306	18.3	0.296
533.23	1.305	23.1	0.295
847.83	1.303	29.1	0.293
1247.52	1.301	35.3	0.291



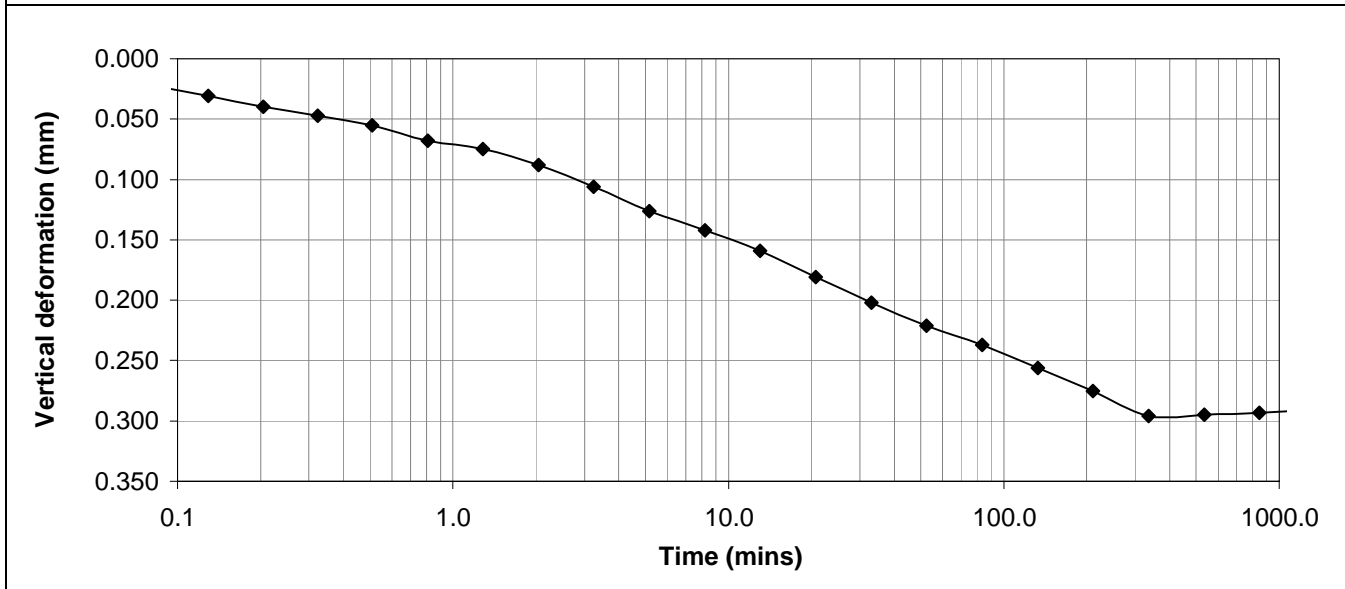
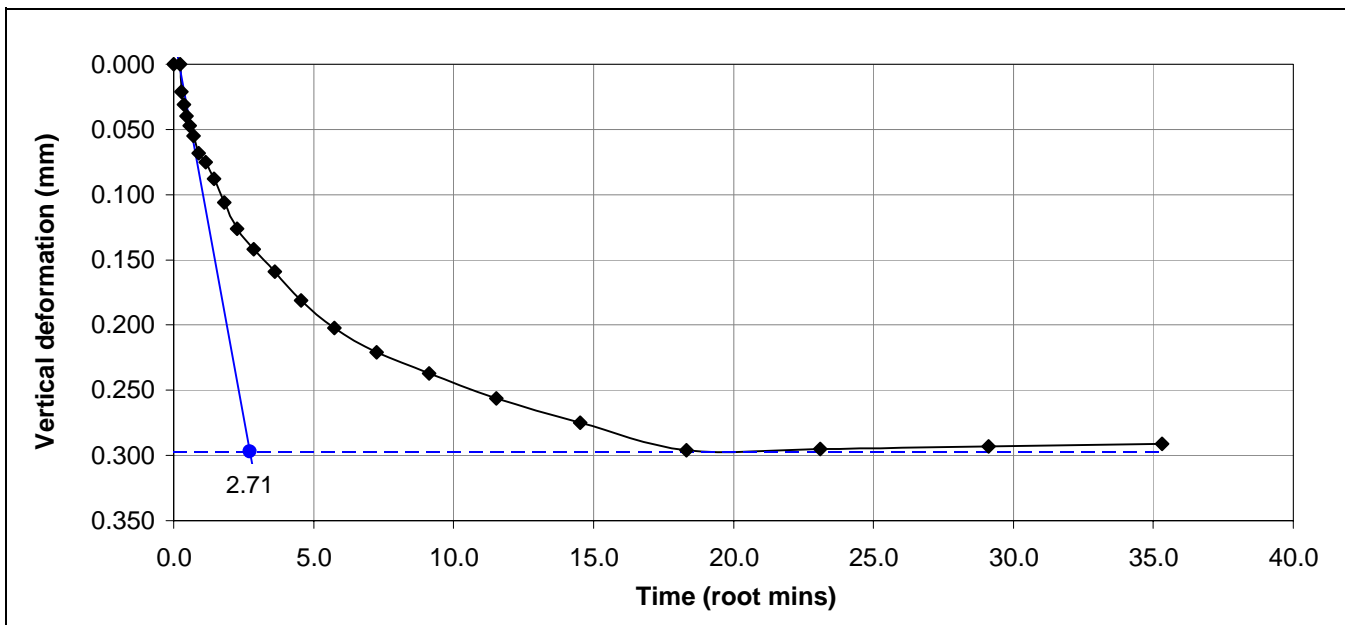
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		

STAGE 2 **Normal stress (kPa)** **25**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	12/10/2010	Date	18/10/2010	Date	25/10/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		

STAGE 2 **Normal stress (kPa)** **25**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
0.02	1.301	0.1	0.1	0.0	0.00	0.000	0.0	0.0
5.00	1.302	6.6	7.4	0.1	0.09	0.001	6.9	3.1
10.00	1.313	8.8	9.8	0.2	0.18	0.012	9.2	4.1
15.00	1.319	10.2	11.4	0.4	0.27	0.018	10.7	4.8
20.00	1.323	11.0	12.4	0.5	0.36	0.022	11.6	5.2
25.00	1.339	10.8	13.1	0.6	0.45	0.038	11.9	5.3
30.00	1.345	10.5	14.4	0.7	0.54	0.044	12.4	5.5
35.00	1.350	11.3	15.0	0.8	0.63	0.049	13.1	5.8
40.00	1.352	11.8	15.5	1.0	0.72	0.051	13.6	6.1
45.00	1.354	12.1	15.9	1.1	0.81	0.053	13.9	6.2
50.00	1.357	12.4	16.3	1.2	0.90	0.056	14.3	6.4
55.00	1.361	12.8	16.6	1.3	0.99	0.060	14.6	6.5
60.00	1.366	12.9	17.1	1.5	1.08	0.065	14.9	6.7
65.00	1.369	13.0	17.4	1.6	1.17	0.068	15.1	6.8
70.00	1.372	13.1	17.7	1.7	1.26	0.071	15.3	6.9
75.00	1.376	13.5	17.8	1.8	1.35	0.075	15.6	7.0
80.00	1.381	13.7	17.9	1.9	1.44	0.080	15.7	7.0
85.00	1.385	13.9	18.1	2.1	1.53	0.084	15.9	7.1
90.00	1.390	13.8	18.5	2.2	1.62	0.089	16.1	7.2
95.00	1.395	14.1	18.5	2.3	1.71	0.094	16.2	7.3
100.00	1.398	14.3	18.6	2.4	1.80	0.097	16.4	7.3
105.00	1.400	14.3	18.8	2.5	1.89	0.099	16.5	7.4
110.00	1.401	14.5	18.9	2.7	1.98	0.100	16.6	7.4
115.00	1.402	14.6	18.9	2.8	2.07	0.101	16.7	7.5
120.00	1.404	14.5	19.4	2.9	2.16	0.103	16.9	7.6
125.00	1.404	14.6	19.2	3.0	2.25	0.103	16.8	7.5
130.00	1.404	14.8	19.3	3.2	2.34	0.103	17.0	7.6
135.00	1.405	14.6	19.5	3.3	2.43	0.104	17.0	7.6
140.00	1.408	14.8	19.5	3.4	2.52	0.107	17.1	7.6
145.00	1.414	15.0	19.5	3.5	2.61	0.113	17.2	7.7
150.00	1.416	14.7	19.9	3.6	2.70	0.115	17.2	7.7
155.00	1.422	14.9	19.8	3.8	2.79	0.121	17.3	7.7
160.00	1.429	15.0	19.8	3.9	2.88	0.128	17.3	7.8
165.00	1.435	15.1	19.8	4.0	2.97	0.134	17.4	7.8



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		

STAGE 2 **Normal stress (kPa)** **25**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
170.00	1.437	15.1	19.9	4.1	3.06	0.136	17.4	7.8
175.00	1.438	15.1	19.9	4.2	3.15	0.137	17.4	7.8
180.00	1.440	15.0	20.2	4.4	3.24	0.139	17.5	7.8
185.00	1.442	15.1	20.2	4.5	3.33	0.141	17.6	7.9
190.00	1.446	15.2	20.2	4.6	3.42	0.145	17.6	7.9
195.00	1.449	15.3	20.3	4.7	3.51	0.148	17.7	7.9
200.00	1.450	14.9	20.6	4.9	3.60	0.149	17.7	7.9
205.00	1.451	15.2	20.6	5.0	3.69	0.150	17.8	8.0
210.00	1.451	15.2	20.6	5.1	3.78	0.150	17.8	8.0
215.00	1.453	15.4	20.6	5.2	3.87	0.152	17.9	8.0
220.00	1.454	15.3	20.7	5.3	3.96	0.153	17.9	8.0
225.00	1.455	15.4	20.7	5.5	4.05	0.154	18.0	8.0
230.00	1.455	15.4	20.7	5.6	4.14	0.154	18.0	8.0
235.00	1.456	15.0	21.3	5.7	4.23	0.155	18.1	8.1
240.00	1.457	15.2	21.2	5.8	4.32	0.156	18.1	8.1
245.00	1.457	15.3	21.2	5.9	4.41	0.156	18.2	8.1
250.00	1.457	15.4	21.2	6.1	4.50	0.156	18.2	8.2
255.00	1.459	15.5	21.2	6.2	4.59	0.158	18.3	8.2
260.00	1.461	15.5	21.1	6.3	4.68	0.160	18.2	8.2
265.00	1.462	15.6	21.1	6.4	4.77	0.161	18.3	8.2
270.00	1.464	15.6	21.1	6.6	4.86	0.163	18.3	8.2
275.00	1.465	15.7	21.1	6.7	4.95	0.164	18.3	8.2
280.00	1.466	15.7	21.1	6.8	5.04	0.165	18.3	8.2
285.00	1.469	15.8	21.1	6.9	5.13	0.168	18.4	8.2
290.00	1.471	15.8	21.1	7.0	5.22	0.170	18.4	8.2
295.00	1.473	15.8	21.1	7.2	5.31	0.172	18.4	8.2
300.00	1.473	15.9	21.1	7.3	5.40	0.172	18.4	8.2
305.00	1.475	15.9	21.0	7.4	5.49	0.174	18.4	8.2
310.00	1.475	15.9	21.0	7.5	5.58	0.174	18.4	8.2
315.00	1.478	16.0	21.0	7.6	5.67	0.177	18.4	8.2
320.00	1.481	15.7	21.6	7.8	5.76	0.180	18.6	8.3
325.00	1.483	15.8	21.5	7.9	5.85	0.182	18.6	8.3
330.00	1.484	15.9	21.5	8.0	5.94	0.183	18.6	8.3
335.00	1.485	16.0	21.3	8.1	6.03	0.184	18.6	8.3



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		

STAGE 2 **Normal stress (kPa)** **25**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
340.00	1.485	16.1	21.4	8.3	6.12	0.184	18.7	8.4
345.00	1.487	16.1	21.4	8.4	6.21	0.186	18.7	8.4
350.00	1.487	16.2	21.4	8.5	6.30	0.186	18.7	8.4
355.00	1.488	16.1	21.3	8.6	6.39	0.187	18.6	8.3
360.00	1.488	16.2	21.3	8.7	6.48	0.187	18.7	8.4
365.00	1.490	16.3	21.3	8.9	6.57	0.189	18.7	8.4
370.00	1.490	16.3	21.4	9.0	6.66	0.189	18.8	8.4
375.00	1.490	16.3	21.3	9.1	6.75	0.189	18.7	8.4
376.38	1.490	16.3	21.3	9.1	6.77	0.189	18.7	8.4



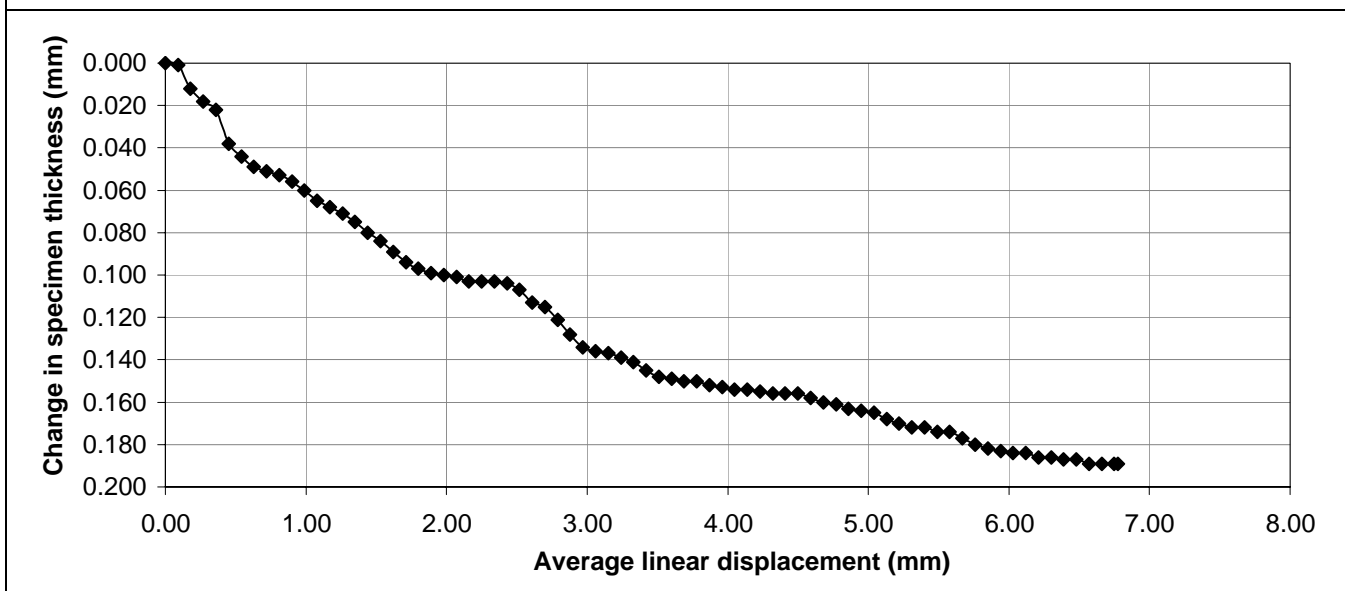
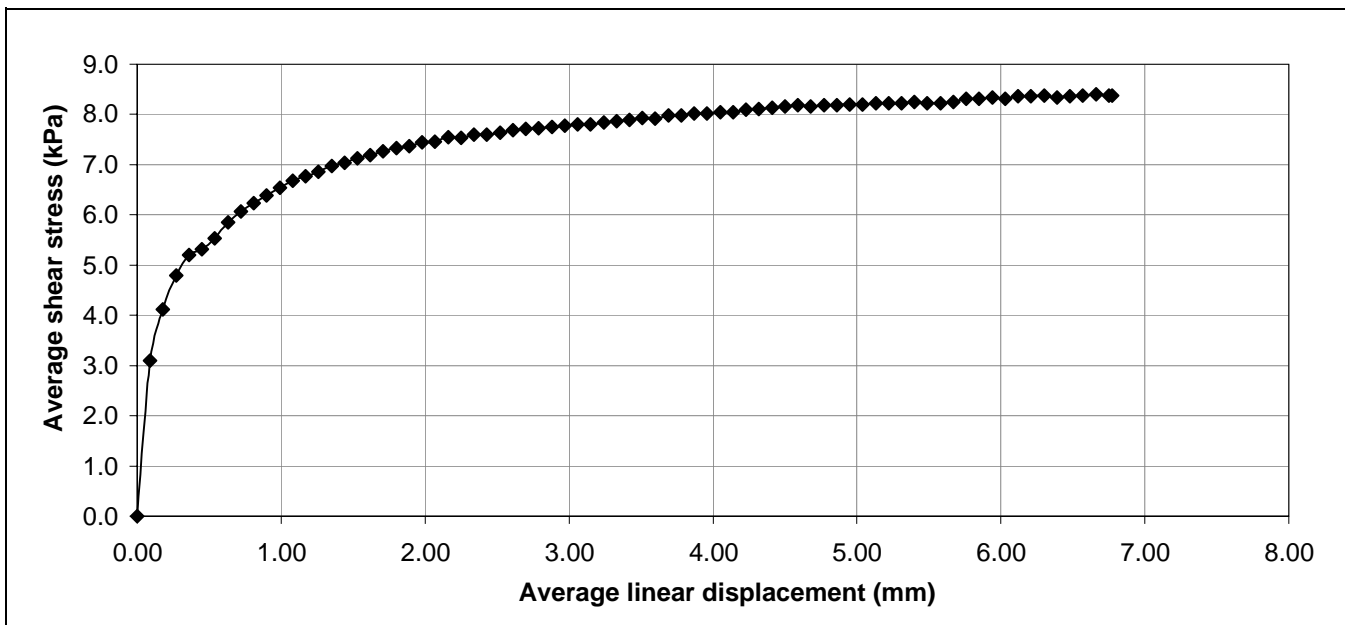
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		

STAGE 2 **Normal stress (kPa)** **25**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	13/10/2010	Date	18/10/2010	Date	25/10/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		

STAGE 3 **Normal stress (kPa)** **50**

Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	1.542	0.2	0.000
0.08	1.544	0.3	0.002
0.13	1.546	0.4	0.004
0.21	1.549	0.5	0.007
0.32	1.551	0.6	0.009
0.51	1.554	0.7	0.012
0.81	1.558	0.9	0.016
1.29	1.560	1.1	0.018
2.05	1.566	1.4	0.024
3.25	1.573	1.8	0.031
5.17	1.582	2.3	0.040
8.21	1.591	2.9	0.049
13.06	1.604	3.6	0.062
20.76	1.613	4.6	0.071
33.00	1.617	5.7	0.075
52.48	1.632	7.2	0.090
83.43	1.632	9.1	0.090
132.66	1.640	11.5	0.098
210.92	1.639	14.5	0.097
335.36	1.639	18.3	0.097
533.23	1.638	23.1	0.096
847.83	1.637	29.1	0.095
1045.85	1.637	32.3	0.095



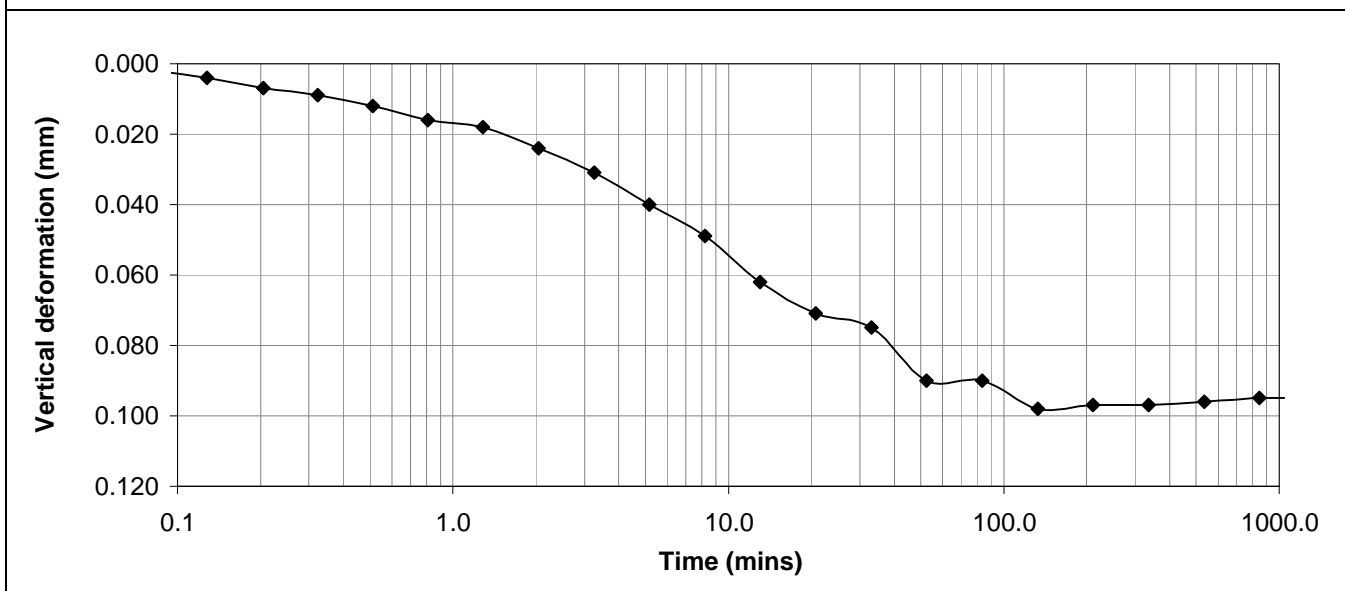
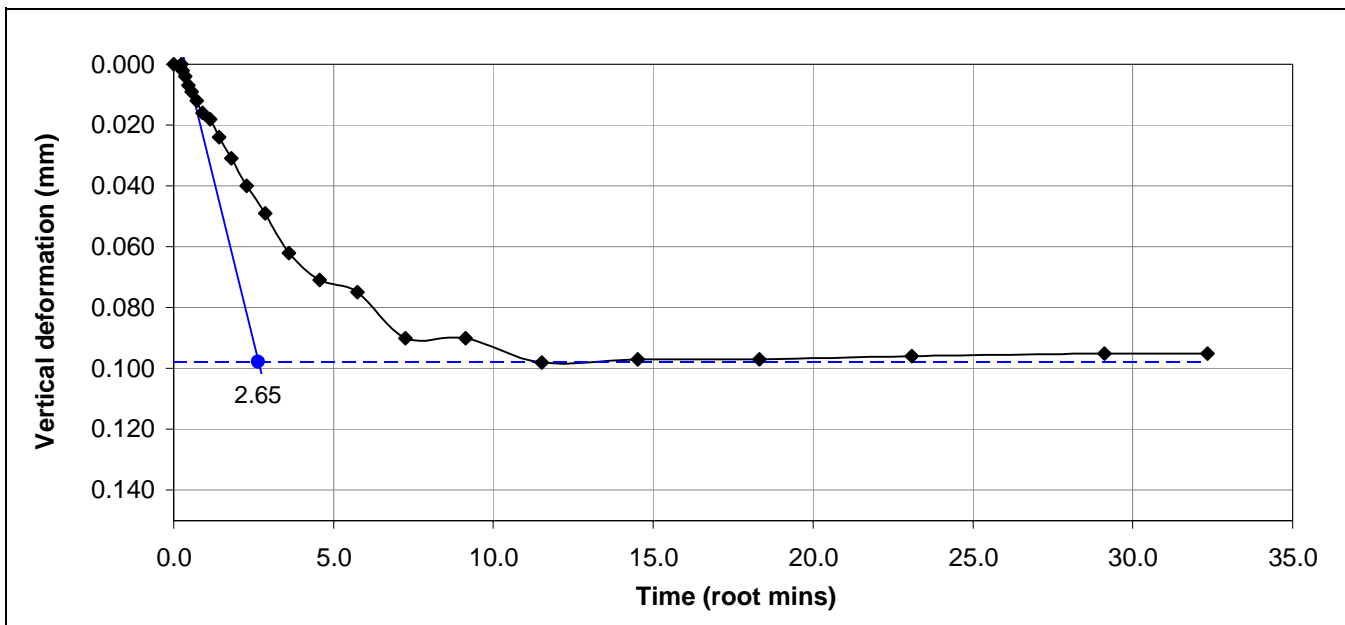
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		

STAGE 3 **Normal stress (kPa)** **50**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	13/10/2010	Date	18/10/2010	Date	25/10/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		

STAGE 3 **Normal stress (kPa)** **50**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
0.02	1.637	0.1	0.0	0.0	0.00	0.000	0.0	0.0
5.00	1.637	10.9	11.1	0.1	0.09	0.000	11.0	4.9
10.00	1.639	15.4	15.9	0.2	0.18	0.002	15.6	7.0
15.01	1.645	18.1	19.1	0.4	0.27	0.008	18.6	8.3
20.00	1.652	20.4	21.7	0.5	0.36	0.015	21.0	9.4
25.00	1.656	21.9	23.6	0.6	0.45	0.019	22.7	10.2
30.01	1.661	23.1	25.1	0.7	0.54	0.024	24.1	10.8
35.00	1.669	23.9	26.1	0.8	0.63	0.032	25.0	11.2
40.00	1.676	24.4	26.8	1.0	0.72	0.039	25.6	11.5
45.00	1.683	24.8	27.5	1.1	0.81	0.046	26.1	11.7
50.00	1.688	25.2	28.0	1.2	0.90	0.051	26.6	11.9
55.00	1.694	25.4	28.5	1.3	0.99	0.057	26.9	12.1
60.00	1.698	25.9	29.2	1.5	1.08	0.061	27.5	12.3
65.00	1.700	26.1	29.5	1.6	1.17	0.063	27.8	12.4
70.00	1.704	26.3	30.0	1.7	1.26	0.067	28.1	12.6
75.00	1.707	26.5	30.4	1.8	1.35	0.070	28.4	12.7
80.00	1.710	26.7	30.7	1.9	1.44	0.073	28.7	12.8
85.00	1.714	26.8	30.9	2.1	1.53	0.077	28.8	12.9
90.00	1.717	27.1	31.3	2.2	1.62	0.080	29.2	13.1
95.00	1.719	27.2	31.5	2.3	1.71	0.082	29.3	13.1
100.00	1.721	27.4	31.8	2.4	1.80	0.084	29.6	13.2
105.00	1.724	27.6	31.9	2.5	1.89	0.087	29.7	13.3
110.00	1.726	27.8	32.0	2.7	1.98	0.089	29.9	13.4
115.00	1.728	28.1	32.3	2.8	2.07	0.091	30.2	13.5
120.00	1.731	28.3	32.5	2.9	2.16	0.094	30.4	13.6
125.00	1.734	28.7	32.7	3.0	2.25	0.097	30.7	13.7
130.00	1.736	28.8	32.8	3.2	2.34	0.099	30.8	13.8
135.00	1.740	29.1	33.0	3.3	2.43	0.103	31.0	13.9
140.00	1.743	29.3	33.3	3.4	2.52	0.106	31.3	14.0
145.00	1.746	29.5	33.6	3.5	2.61	0.109	31.5	14.1
150.00	1.755	29.7	33.8	3.6	2.70	0.118	31.7	14.2
155.00	1.755	29.9	34.1	3.8	2.79	0.118	32.0	14.3
160.00	1.757	29.9	34.2	3.9	2.88	0.120	32.0	14.3
165.00	1.760	30.0	34.4	4.0	2.97	0.123	32.2	14.4



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		

STAGE 3 **Normal stress (kPa)** **50**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
170.00	1.764	29.9	34.4	4.1	3.06	0.127	32.1	14.4
175.00	1.770	30.2	34.7	4.2	3.15	0.133	32.4	14.5
180.00	1.772	30.2	34.8	4.4	3.24	0.135	32.5	14.5
185.00	1.774	30.3	35.0	4.5	3.33	0.137	32.6	14.6
190.00	1.776	30.3	35.2	4.6	3.42	0.139	32.7	14.7
195.00	1.779	30.3	35.3	4.7	3.51	0.142	32.8	14.7
200.00	1.781	30.3	35.5	4.9	3.60	0.144	32.9	14.7
205.00	1.782	30.4	35.7	5.0	3.69	0.145	33.0	14.8
210.00	1.783	30.3	35.8	5.1	3.78	0.146	33.0	14.8
215.00	1.784	30.3	35.9	5.2	3.87	0.147	33.1	14.8
220.00	1.785	30.3	36.1	5.3	3.96	0.148	33.2	14.9
225.00	1.788	30.4	36.3	5.5	4.05	0.151	33.3	14.9
230.00	1.790	30.4	36.5	5.6	4.14	0.153	33.4	15.0
235.00	1.791	30.5	36.6	5.7	4.23	0.154	33.5	15.0
240.00	1.791	30.4	36.6	5.8	4.32	0.154	33.5	15.0
245.00	1.792	30.5	36.7	5.9	4.41	0.155	33.6	15.0
250.00	1.793	30.5	36.8	6.1	4.50	0.156	33.6	15.1
255.00	1.794	30.3	36.6	6.2	4.59	0.157	33.4	15.0
260.00	1.794	30.5	36.6	6.3	4.68	0.157	33.5	15.0
265.00	1.794	30.6	36.8	6.4	4.77	0.157	33.7	15.1
270.00	1.794	30.7	37.0	6.6	4.86	0.157	33.8	15.1
275.00	1.795	30.7	37.1	6.7	4.95	0.158	33.9	15.2
280.00	1.795	30.6	37.1	6.8	5.04	0.158	33.8	15.1
285.00	1.796	30.5	37.1	6.9	5.13	0.159	33.8	15.1
290.00	1.796	30.6	37.3	7.0	5.22	0.159	33.9	15.2
295.00	1.797	30.8	37.3	7.2	5.31	0.160	34.0	15.2
300.00	1.798	30.9	37.5	7.3	5.40	0.161	34.2	15.3
305.00	1.798	30.7	37.4	7.4	5.49	0.161	34.0	15.2
310.00	1.798	30.9	37.6	7.5	5.58	0.161	34.2	15.3
315.00	1.799	30.9	37.7	7.6	5.67	0.162	34.3	15.3
320.00	1.800	31.0	37.8	7.8	5.76	0.163	34.4	15.4
325.00	1.801	31.1	37.8	7.9	5.85	0.164	34.4	15.4
330.00	1.801	31.2	37.9	8.0	5.94	0.164	34.5	15.5
335.00	1.802	31.3	38.1	8.1	6.03	0.165	34.7	15.5



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		

STAGE 3 **Normal stress (kPa)** **50**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
340.00	1.804	31.1	38.0	8.3	6.12	0.167	34.5	15.5
345.00	1.804	30.9	37.9	8.4	6.21	0.167	34.4	15.4
350.00	1.804	30.9	38.0	8.5	6.30	0.167	34.4	15.4
355.00	1.806	30.8	38.0	8.6	6.39	0.169	34.4	15.4
360.00	1.807	30.8	38.0	8.7	6.48	0.170	34.4	15.4
365.00	1.808	31.0	38.3	8.9	6.57	0.171	34.6	15.5
370.00	1.809	30.8	38.3	9.0	6.66	0.172	34.5	15.5
375.00	1.811	30.8	38.3	9.1	6.75	0.174	34.5	15.5
380.00	1.811	30.8	38.2	9.2	6.84	0.174	34.5	15.4
385.00	1.812	30.9	38.3	9.3	6.93	0.175	34.6	15.5
390.00	1.813	31.0	38.4	9.5	7.02	0.176	34.7	15.5
395.00	1.814	31.0	38.4	9.6	7.11	0.177	34.7	15.5
400.00	1.815	31.0	38.4	9.7	7.20	0.178	34.7	15.5
405.00	1.817	31.0	38.5	9.8	7.29	0.180	34.7	15.6
410.00	1.818	31.0	38.5	9.9	7.38	0.181	34.7	15.6
415.00	1.819	31.0	38.6	10.1	7.47	0.182	34.8	15.6
420.00	1.820	31.1	38.6	10.2	7.56	0.183	34.8	15.6
425.00	1.823	31.2	38.8	10.3	7.65	0.186	35.0	15.7
430.00	1.844	31.2	38.7	10.4	7.74	0.207	34.9	15.6
432.49	1.844	31.2	38.7	10.5	7.78	0.207	34.9	15.6



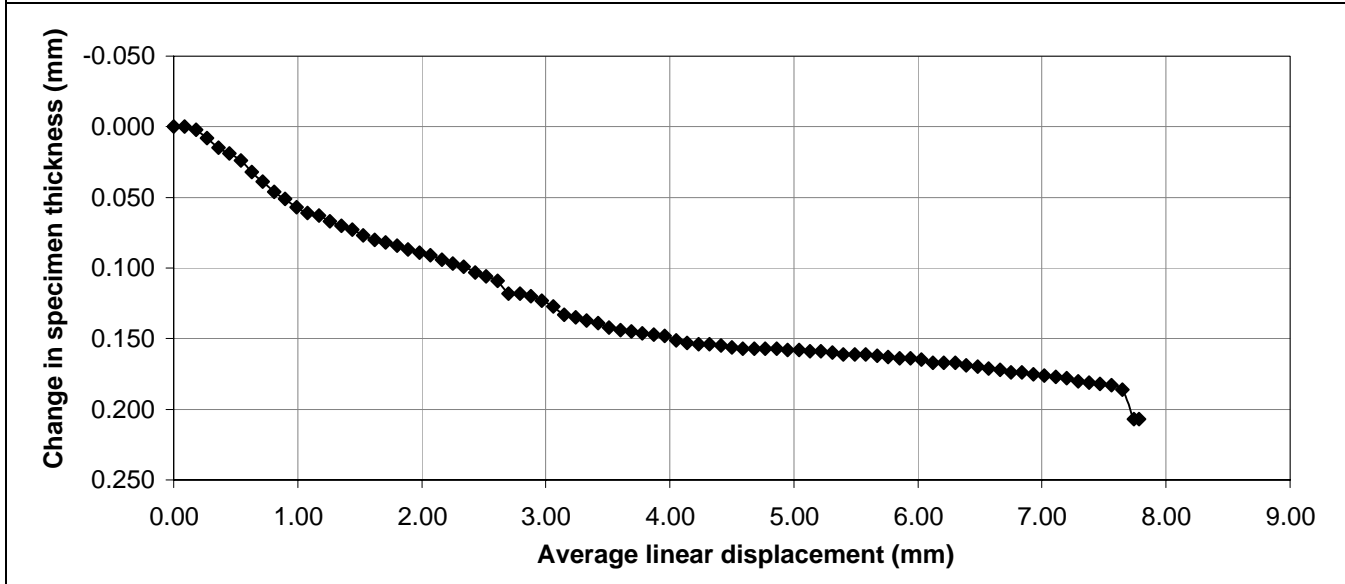
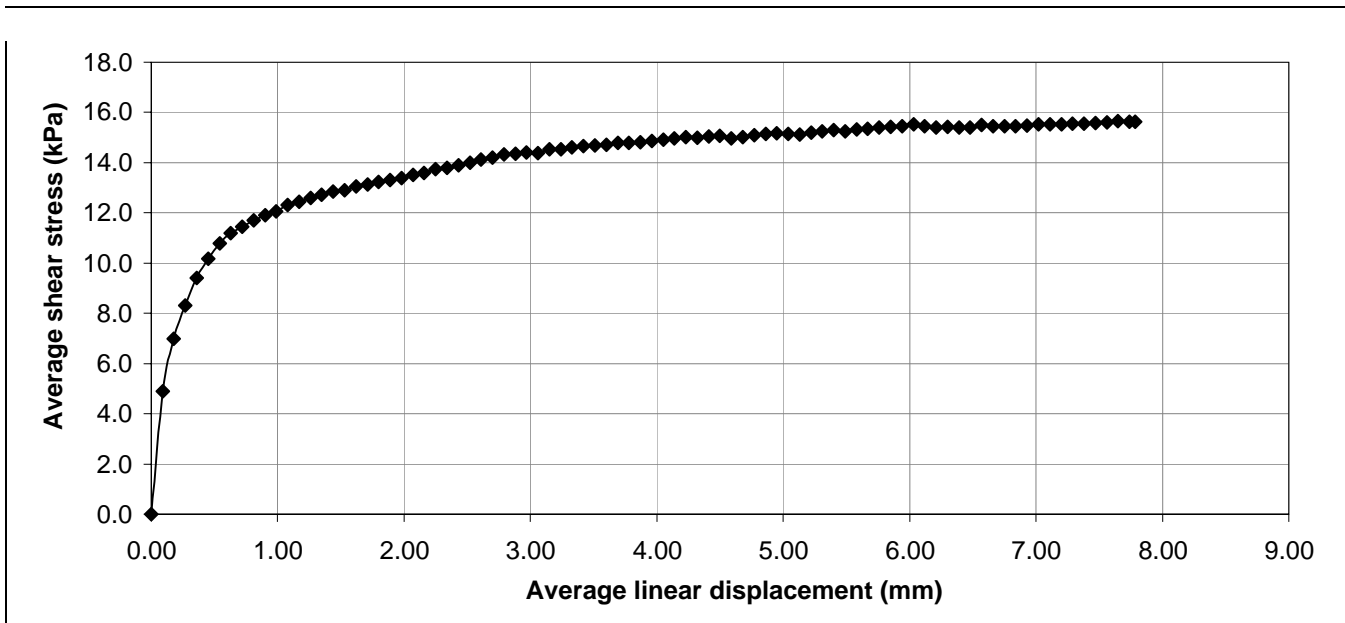
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	6.00/6.30
Borehole number	15	Sample type	Remoulded
Sample number	2		

STAGE 3	Normal stress (kPa)	50
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Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	14/10/2010	Date	18/10/2010	Date	No. 2540/2010

DESCRIZIONE E RIPRESA FOTOGRAFICA DELLA CAROTA ESTRUSA

Committente: GeoItalia srl - Roma

Cantiere/Località: Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

Sondaggio: 17

Campione: 2

Profondità prelievo: 9.50-9.90

Data prelievo: 03/08/2010

Data apertura: 29/09/2010

Verbale accettazione n° 165

Descrizione: argilla con limo (*Raccomandazioni AGI 1977*). Argilla limosa (*UNI EN ISO 14688-2*).

Colore: HUE 5Y VALUE 3 CHROMA 4 (*Munsell Soil Color Chart*)

Pocket (kg/cm²): fuori scala

Lunghezza carota: 43 cm
Diametro carota: 88,9 mm



Modalità di prelievo: sondaggio a rotazione

Tipo di fustella: fustella in plastica

Classe di qualità del campione: Q4 (*Raccomandazioni AGI 1977*)
C2 (*Eurocodice 7*)

Prove eseguite:

Cont. Acqua W	X	Granulom. Gr	X	T. Residuo TR	X
Peso Volume γ	X	Compress. ELL	-	Triass. TX UU	X
Peso Specifico Gs	X	Edometria Ed	-	Triass. TX CU	-
Limiti Cons. LL	X	T. Diretto TD	X	Triass. TX CD	-



Committente Geotalia srl – Roma **pagina 1 di 2**
Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Norma di riferimento ASTM D5550-00

Data prova	07/10/2010
Data certificato	19/10/2010
Verb. Accettazione	165
N. certificato	2522/2010

AccuPyc II 1340 V1.00 Unit 1 Serial #: 488 Page 1

Sample: VA165_S17_2_m 9,50-9,90
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S17_2.SMP

Analysis Gas: Helium
 Reported: 07/10/2010 15.14.14
 Sample Mass: 9.6800 g
 Temperature: 24.56 °C
 Number of Purges: 5

Analysis Start: 07/10/2010 14.54.02
 Analysis End: 07/10/2010 15.14.14
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2248 cm³
 Cell Volume: 11.8000 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 17, Campione 2, Prof. (m) 9,50-9,90

Combined Report

Tabular 1

Cycle#	Volume (cm ³)	Volume Deviation (cm ³)	Density (g/cm ³)	Density Deviation (g/cm ³)	Total Pore Volume (cm ³)	Total Pore Volume Deviation (cm ³)
1	3.4734	-0.0084	2.7869	0.0067	0.1174	0.0009
2	3.4794	-0.0024	2.7821	0.0019	0.1168	0.0002
3	3.4823	0.0006	2.7797	-0.0005	0.1164	-0.0001
4	3.4833	0.0016	2.7789	-0.0013	0.1163	-0.0002
5	3.4833	0.0016	2.7789	-0.0013	0.1163	-0.0002
6	3.4851	0.0034	2.7775	-0.0027	0.1162	-0.0004
7	3.4852	0.0035	2.7774	-0.0028	0.1161	-0.0004

Summary Data

Average

Standard Deviation

Volume:	3.4817 cm ³	0.0039 cm ³
Density:	2.7802 g/cm ³	0.0031 g/cm ³
Total Pore Volume:	0.1165 cm ³	0.0004 cm ³

Note: _____

Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma **pagina 2 di 2**
Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

Data prova 07/10/2010
 Data certificato 19/10/2010
 Verb. Accettazione 165
 N. certificato 2522/2010

PESO SPECIFICO DEI GRANI

Norma di riferimento **ASTM D5550-00**

AccuPyc II 1340 V1.00

Unit 1

Serial # 488

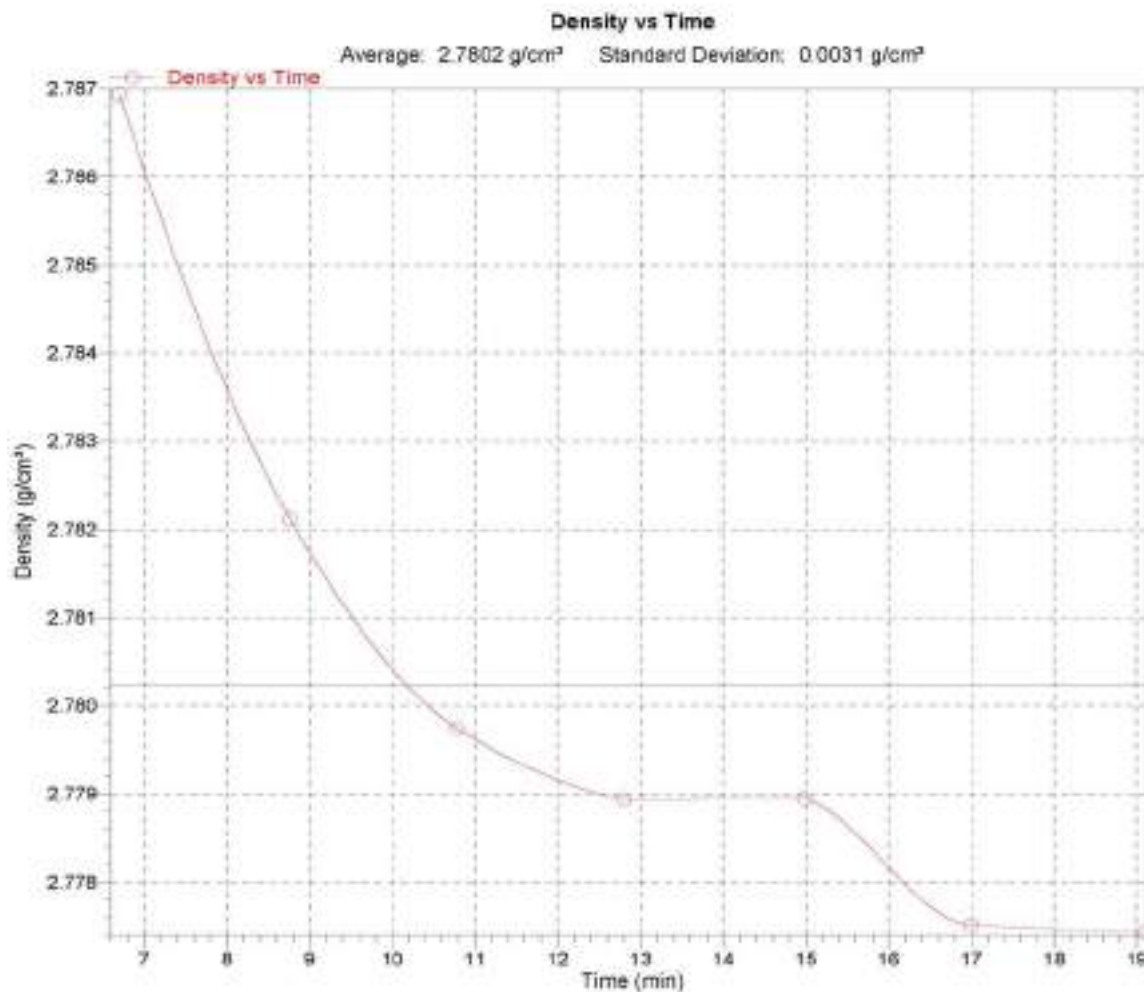
Page 2

Sample: VA165_S17_2_m 9.50-9.90
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S17_2.SMP

Analysis Gas: Helium
 Reported: 07/10/2010 15.14.14
 Sample Mass: 9.6800 g
 Temperature: 24.56 °C
 Number of Purges: 5

Analysis Start: 07/10/2010 14.54.02
 Analysis End: 07/10/2010 15.14.14
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2248 cm³
 Cell Volume: 11.8000 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 17, Campione 2, Prof. (m) 9.50-9.90



Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

Data prova 14/10/2010
 Data certificato 15/10/2010
 Verb. Accettazione 165
 N. Certificato 2500/2010

Pag. 2 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 17 Campione 2 Profondità 9.50-9.90

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)

Setacciatura:

Massa materiale (g): 100.06

Vagli ASTM	Apertura vagli (mm)	Massa Trattenuta (g)	Trattenuto %	Passante %
3"	75,000	0,00	0,0	100,0
2"	50,000	0,00	0,0	100,0
1,5"	37,500	0,00	0,0	100,0
1"	25,000	0,00	0,0	100,0
3/4"	19,000	0,00	0,0	100,0
3/8"	9,500	0,00	0,0	100,0
No.4	4,750	0,00	0,0	100,0
No.10	2,000	0,00	0,0	100,0
No.20	0,850	0,01	0,0	100,0
No.40	0,425	0,05	0,1	99,9
No.60	0,250	0,05	0,1	99,9
No.140	0,106	0,12	0,2	99,8
No.200	0,075	0,19	0,4	99,6

Sedigrafia:

Material Mass (g): 4.345
 Material/Liquid: soil / 0.20% Sodium Metaphosphate (w/w)
 Measurement Principle: X-Ray monitored gravity sedimentation
 Calculation Method: Stokes sedimentation and Beer's law of extinction
 Test Number: 2
 Analyzed: 14/10/2010 12.51.09
 Reported: 15/10/2010 11.12.07
 Liquid Visc: 0.7686 mPa·s
 Analysis Temp: 32.0 °C
 Full Scale Mass: 99.6 %
 Analysis Type: High Speed(Adj)
 Run Time: 0:04 hrs:min
 Sample Density: 2.780 g/cm³
 Liquid Density: 0.9951 g/cm³
 Base/Full Scale: 133 / 95 kCnts/s
 Reynolds Number: 0.84

Diametro (mm)	Trattenuto %	Passante %
0,060	0,6	99,4
0,050	0,8	99,2
0,040	0,9	99,1
0,030	1,0	99,0
0,025	1,4	98,6
0,020	1,6	98,4
0,015	2,0	98,0
0,010	2,7	97,3
0,008	3,5	96,5
0,006	5,9	94,1
0,005	7,8	92,2
0,004	10,7	89,3
0,003	15,9	84,1
0,002	24,5	75,5
0,002	31,4	68,6
0,001	40,2	59,8

Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

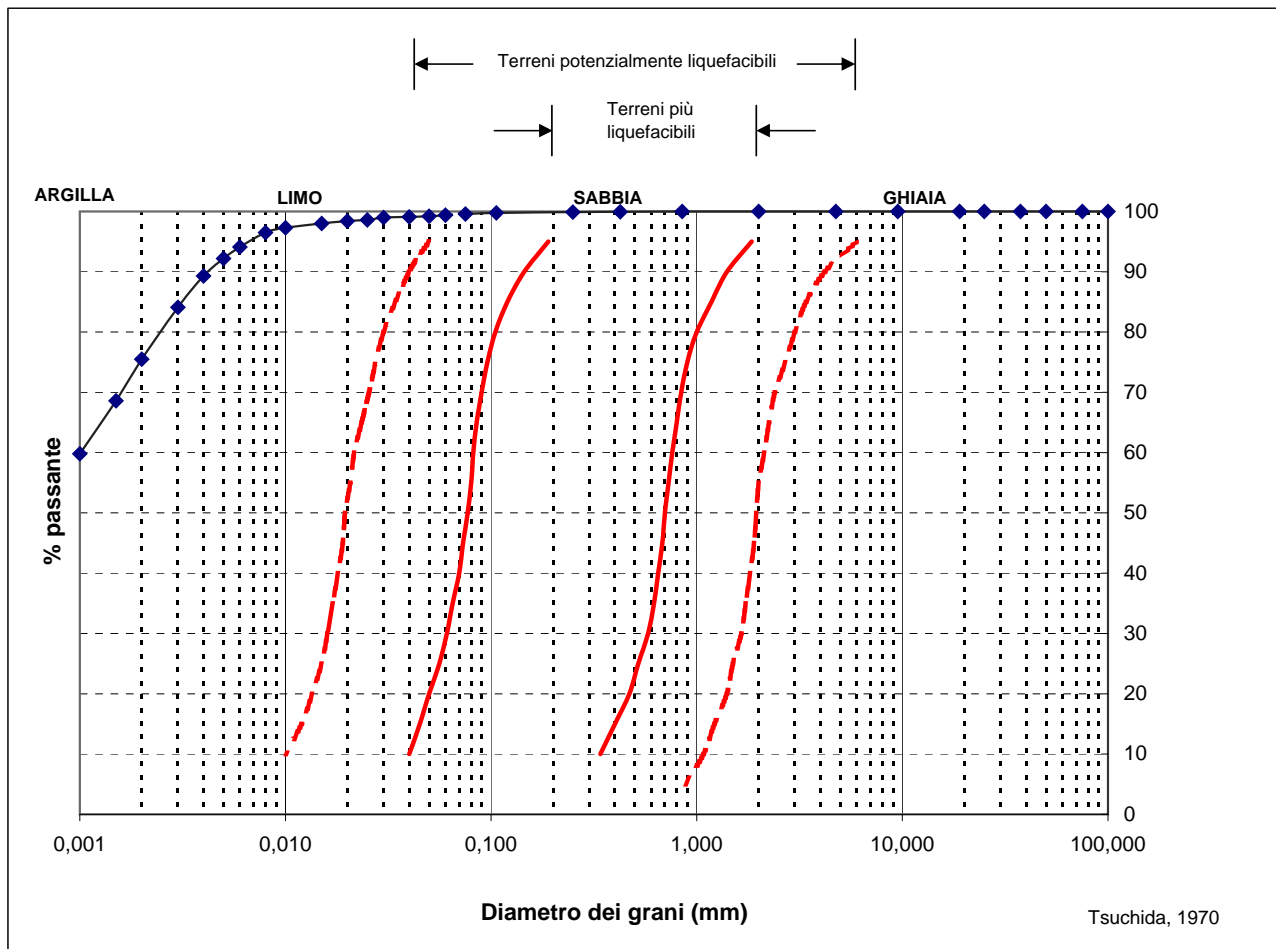
Data prova 14/10/2010
 Data certificato 15/10/2010
 Verb. Accettazione 165
 N. Certificato 2500/2010

Pag. 3 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 17 Campione 2 Profondità 9.50-9.90

POTENZIALE DI LIQUEFACIBILITA'



Il direttore del Laboratorio
[Signature]

Lo sperimentatore
[Signature]



Committente	Geotalia srl – Roma	Pag. 1 di 1
Cantiere	Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda	

LIMITI DI CONSISTENZA

Norma di riferimento	ASTM D4318
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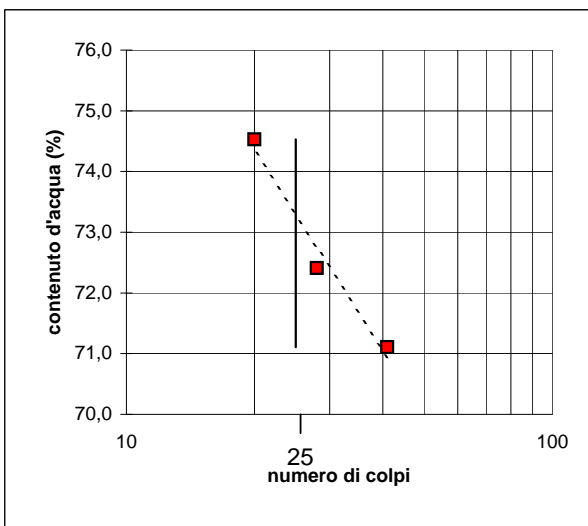
Data prova	18/10/10
Data certificato	19/10/10
Verb. Accettazione	165
N. Certificato	2511/2010

Sondaggio	17	Campione	2	Profondità	9.50-9.90
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Limite Liquido				73,3
Numero tara	C3	C8	C31	
Numero dei colpi	41	28	20	
P. umido + tara	g	80,41	85,97	86,30
P. secco + tara	g	53,93	56,94	54,90
Peso tara	g	16,69	16,85	12,77
Peso umido	g	63,72	69,12	73,53
Peso secco	g	37,24	40,09	42,13
Contenuto d'acqua	%	71,11	72,41	74,53

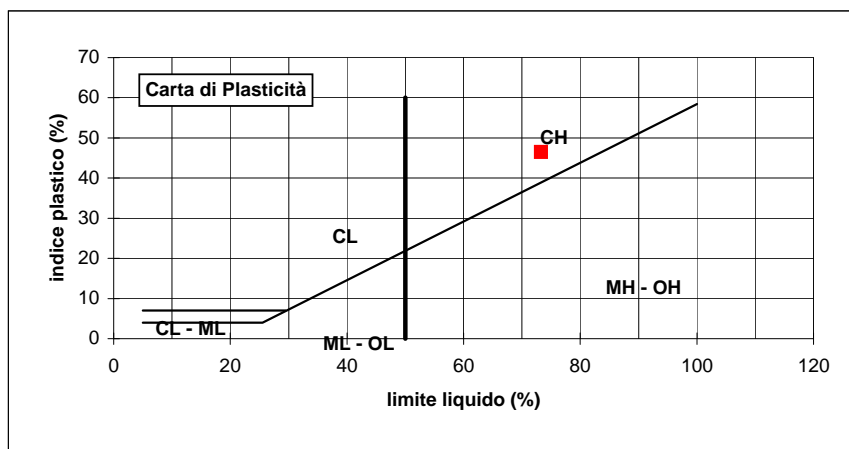
Limite Plastico			26,8
Numero tara	C5	C13	
P. umido + tara	g	30,98	34,33
P. secco + tara	g	28,01	30,61
Peso tara	g	16,76	16,91
Peso umido	g	14,22	17,42
Peso secco	g	11,25	13,70
Contenuto d'acqua	%	26,40	27,15

Umidità Naturale	
Numero tara	A11
P. umido + tara	g
P. secco + tara	g
Peso tara	g
Peso umido	g
Peso secco	g
Contenuto d'acqua	%



Limite Liquido LL	73,3
Limite Plastico LP	26,8
Indice di Plasticità Ip	46,5
Umidità Naturale Wn	13,5
Indice di Consistenza Ic	1,3

$$I_p = LL - LP \quad I_c = \frac{LL - W_n}{I_p}$$



- ML**
Limi inorganici di bassa plasticità
- MH**
Limi inorganici di alta plasticità
- CL**
Argille inorganiche di bassa plasticità
- CH**
Argille inorganiche di alta plasticità
- OL**
Argille organiche di bassa plasticità
- OH**
Argille organiche di alta plasticità

Il direttore del Laboratorio

Lo sperimentatore



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST REPORT - SUMMARY

Project location	<i>GEOITALIA-Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>9.50/9.90</i>
Borehole number	<i>17</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>2</i>	Specimen orientation	<i>Vertical</i>
Sample description	<i>Argilla debolmente limosa. Materiale con tendenza al rigonfiamento.</i>		

Particle density (Mg/m ³)	<i>2.78 (Measured)</i>	Specimens tested
---------------------------------------	------------------------	------------------

INITIAL CONDITIONS	SPECIMEN 1	SPECIMEN 2	SPECIMEN 3
Specimen depth (m)	<i>9.75/9.85</i>	<i>9.75/9.85</i>	<i>9.75/9.85</i>
Height (mm)	<i>20.0</i>	<i>20.0</i>	<i>20.0</i>
-			
Diameter (mm)	<i>60.0</i>	<i>60.0</i>	<i>60.0</i>
Area (mm ²)	<i>2827.4</i>	<i>2827.4</i>	<i>2827.4</i>
Moisture content (measured) (%)	<i>15</i>	<i>13</i>	<i>13</i>
Moisture content (trimmings) (%)	<i>14</i>	<i>14</i>	<i>13</i>
Bulk density (Mg/m ³)	<i>2.09</i>	<i>2.11</i>	<i>2.21</i>
Dry density (Mg/m ³)	<i>1.82</i>	<i>1.86</i>	<i>1.96</i>
Voids ratio	<i>0.530</i>	<i>0.493</i>	<i>0.421</i>
Degree of saturation (%)	<i>79</i>	<i>75</i>	<i>86</i>

Voids ratio at the end of consolidation	<i>0.558</i>	<i>0.482</i>	<i>0.356</i>
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SHEARING	SPECIMEN 1	SPECIMEN 2	SPECIMEN 3
Rate of displacement (mm/min)	<i>0.010000</i>	<i>0.010000</i>	<i>0.010000</i>
Conditions at peak shear stress			
Normal stress (kPa)	<i>150</i>	<i>300</i>	<i>600</i>
Shear stress (kPa)	<i>54</i>	<i>98</i>	<i>248</i>
Horizontal displacement (mm)	<i>1.50</i>	<i>1.36</i>	<i>2.00</i>
Vertical deformation (mm)	<i>0.025</i>	<i>0.016</i>	<i>0.199</i>

Apparent cohesion (kPa)	<i>3.3</i>
Angle of shearing resistance (°)	<i>20.5</i>

Comments / variations from procedures:
Verbale di accettazione N.
Il presente certificato è costituito da n. 18 pagine.

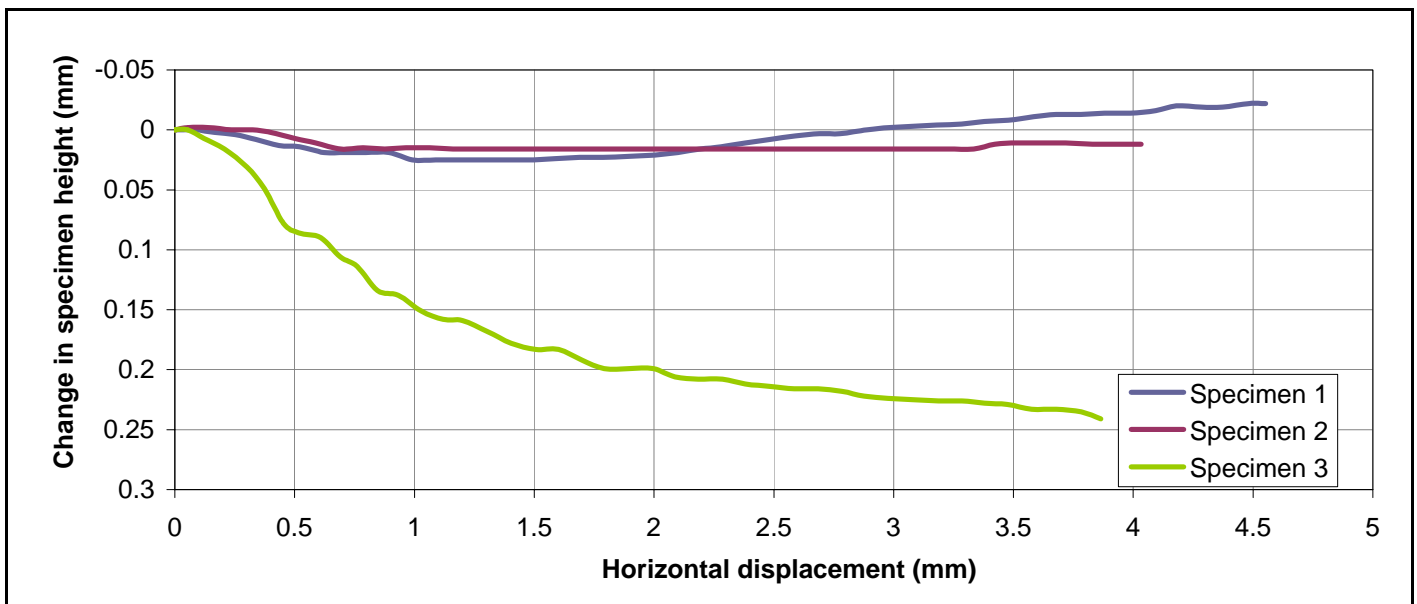
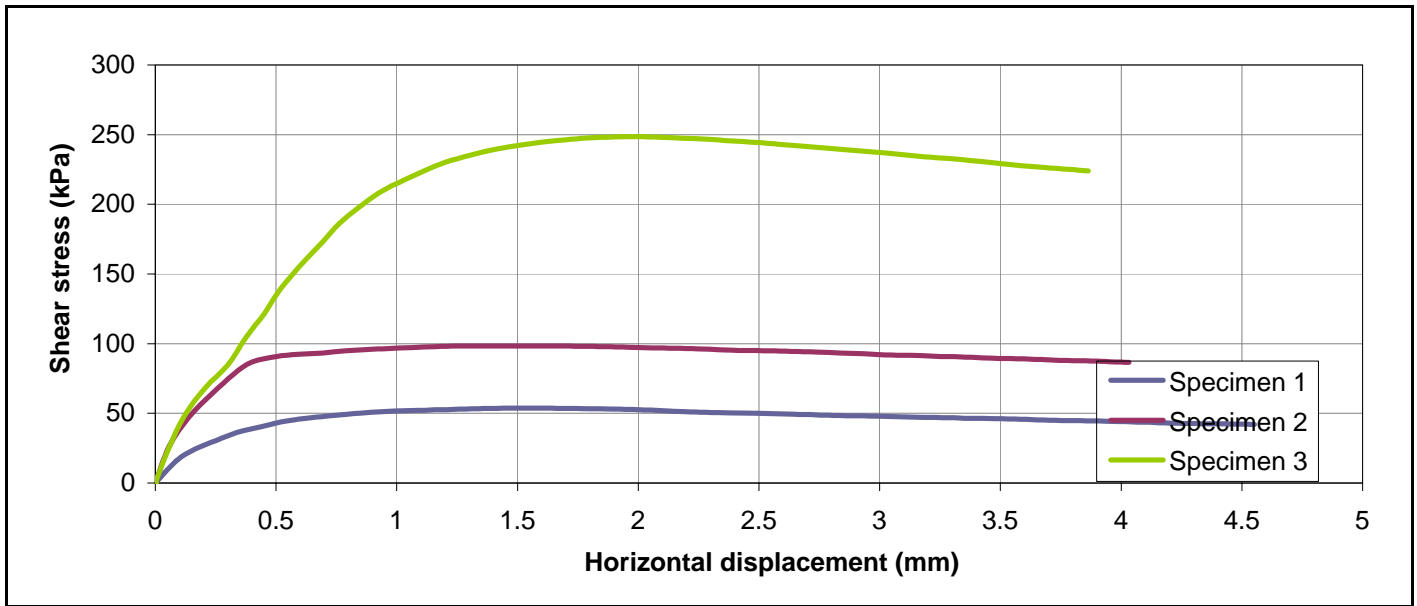
Tested	<i>Farinelli</i>	Checked	<i>Sfalanga</i>	Approved	<i>Carmignani</i>
Date	<i>13/10/2010</i>	Date	<i>15/10/2010</i>	Date	<i>No. 2535/2010</i>



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST REPORT - SHEARING

Project location	<i>GEOITALIA-Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>9.50/9.90</i>
Borehole number	<i>17</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>2</i>	Specimen orientation	<i>Vertical</i>



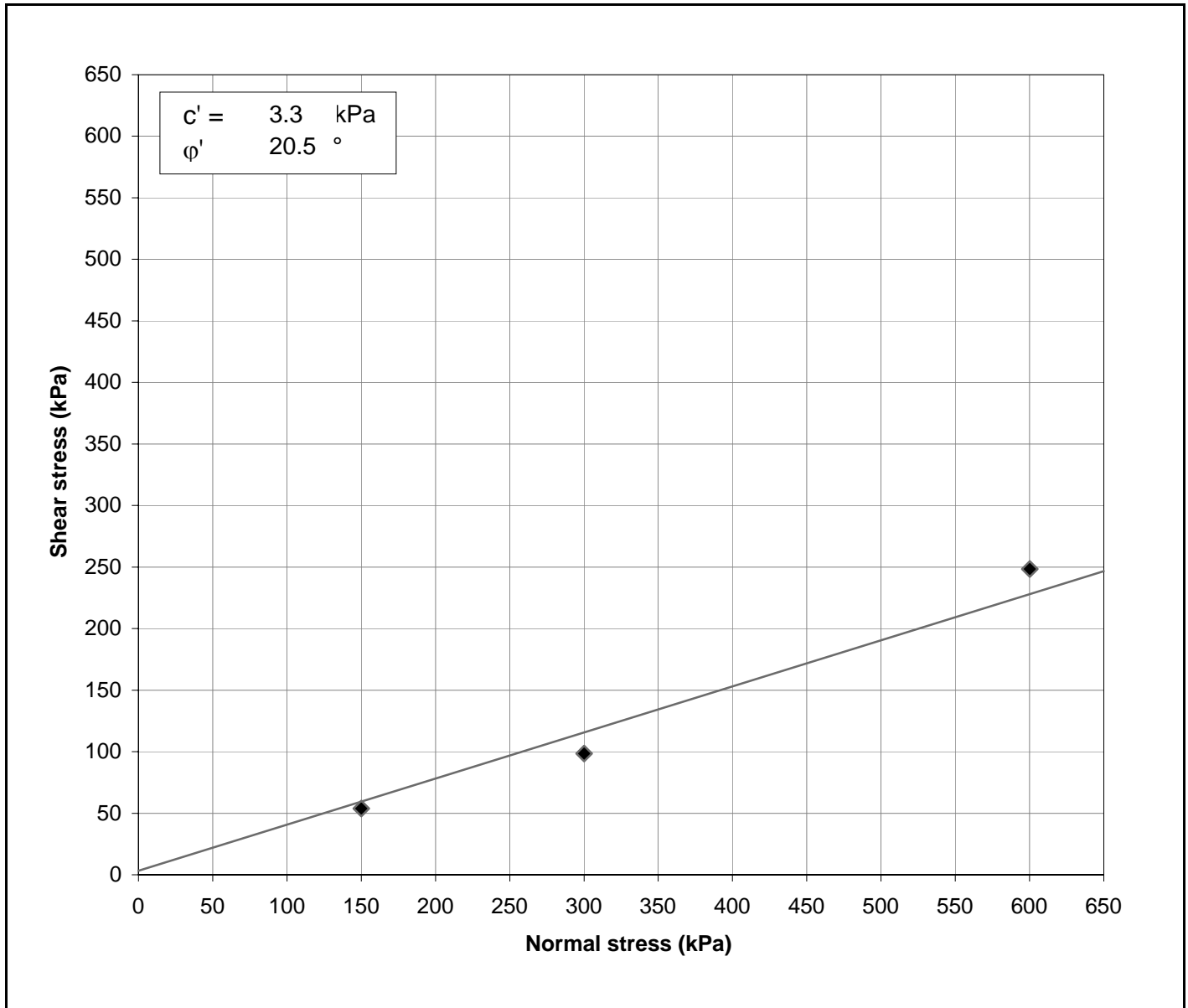
Tested	<i>Farinelli</i>	Checked	<i>Sfalanga</i>	Approved	<i>Carmignani</i>
Date	<i>13/10/2010</i>	Date	<i>15/10/2010</i>	Date	<i>No. 2535/2010</i>



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST REPORT - SHEARING

Project location	<i>GEOITALIA-Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>9.50/9.90</i>
Borehole number	<i>17</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>2</i>	Specimen orientation	<i>Vertical</i>



Tested	<i>Farinelli</i>	Checked	<i>Sfalanga</i>	Approved	<i>Carmignani</i>
Date	<i>13/10/2010</i>	Date	<i>15/10/2010</i>	Date	<i>No. 2535/2010</i>



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	<i>GEOITALIA-Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>9.50/9.90</i>
Borehole number	<i>17</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>2</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 1	Normal stress (kPa)	150
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Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	0.274	0.2	0.000
0.08	0.290	0.3	0.016
0.13	0.308	0.4	0.034
0.20	0.327	0.5	0.053
0.32	0.330	0.6	0.056
0.51	0.332	0.7	0.058
0.81	0.370	0.9	0.096
1.29	0.370	1.1	0.096
2.05	0.370	1.4	0.096
3.25	0.371	1.8	0.097
5.17	0.373	2.3	0.099
8.21	0.373	2.9	0.099
13.06	0.373	3.6	0.099
20.76	0.372	4.6	0.098
33.00	0.371	5.7	0.097
52.48	0.352	7.2	0.078
83.43	0.329	9.1	0.055
132.66	0.295	11.5	0.021
210.92	0.241	14.5	-0.033
335.36	0.146	18.3	-0.128
533.23	0.058	23.1	-0.216
847.84	-0.063	29.1	-0.337
943.66	-0.086	30.7	-0.360

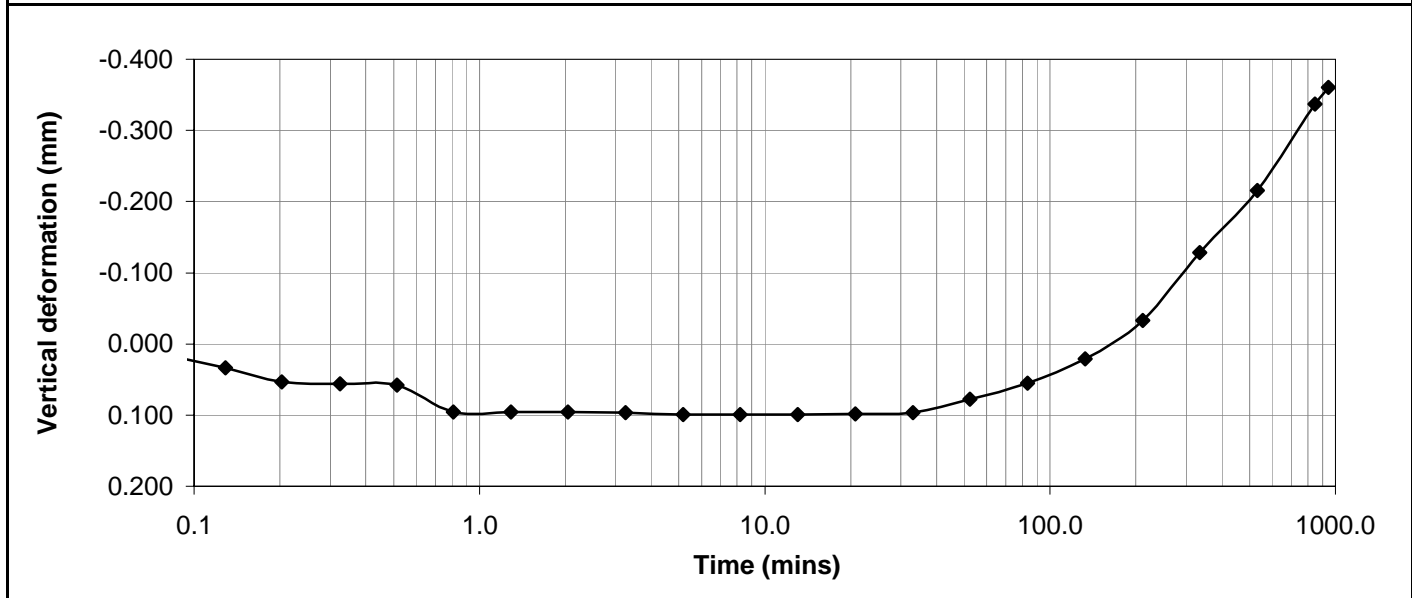
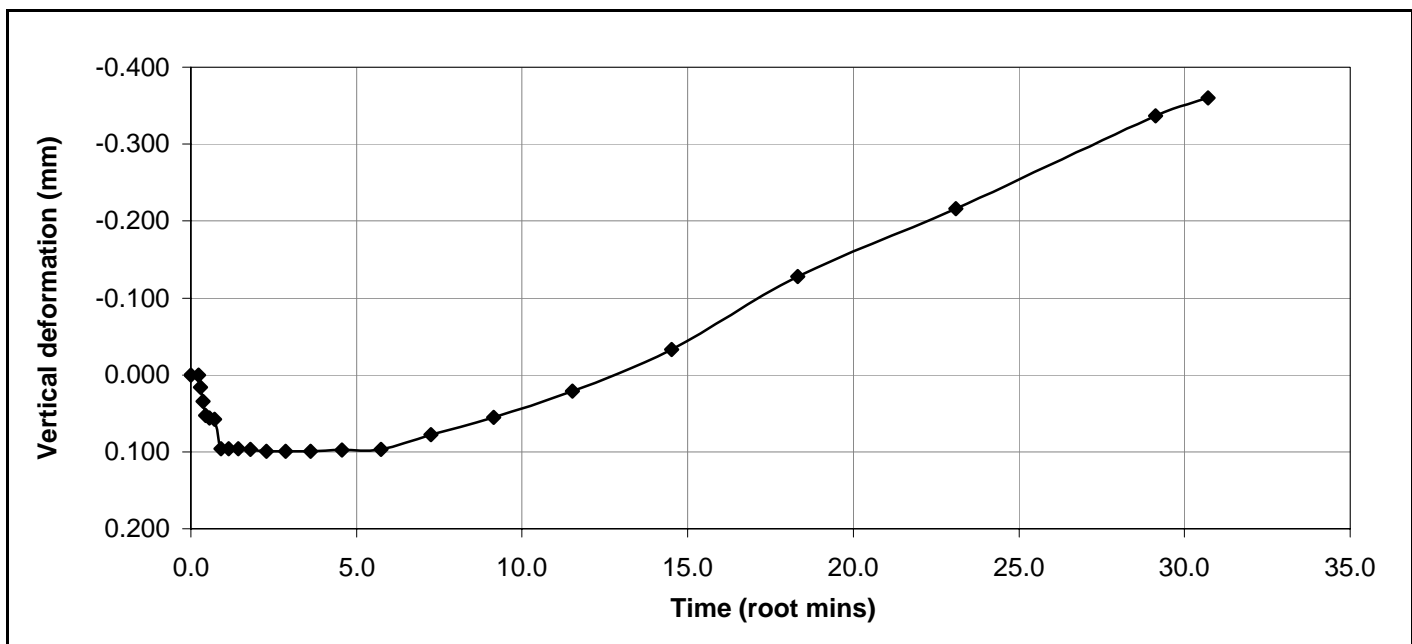


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	<i>GEOITALIA-Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>9.50/9.90</i>
Borehole number	<i>17</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>2</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 1 **Normal stress (kPa) 150**



Tested	<i>Farinelli</i>	Checked	<i>Sfalanga</i>	Approved	<i>Carmignani</i>
Date	<i>05/10/2010</i>	Date	<i>15/10/2010</i>	Date	<i>No. 2535/2010</i>



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA-Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>9.50/9.90</i>
Borehole number	<i>17</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>2</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 1 **Normal stress (kPa) 150**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
0.01	0.000	0.00	18.4	0.000	0.00	0.0	0.0
10.00	0.000	0.09	63.2	0.000	0.09	44.8	15.8
20.00	0.002	0.17	87.4	0.002	0.17	69.0	24.4
30.00	0.004	0.25	105.1	0.004	0.25	86.7	30.7
40.00	0.008	0.34	120.8	0.008	0.34	102.4	36.2
50.00	0.013	0.44	132.3	0.013	0.43	113.9	40.3
60.00	0.014	0.52	142.2	0.014	0.52	123.8	43.8
70.00	0.019	0.62	149.4	0.019	0.62	131.0	46.3
80.01	0.019	0.71	154.4	0.019	0.71	136.0	48.1
90.00	0.019	0.80	158.2	0.019	0.80	139.8	49.4
100.00	0.019	0.90	162.0	0.019	0.90	143.6	50.8
110.00	0.025	0.99	164.7	0.025	0.99	146.3	51.7
120.00	0.025	1.09	166.1	0.025	1.09	147.7	52.2
130.00	0.025	1.18	167.3	0.025	1.18	148.9	52.7
140.00	0.025	1.29	168.4	0.025	1.29	150.0	53.1
150.00	0.025	1.39	169.7	0.025	1.39	151.3	53.5
160.00	0.025	1.50	170.4	0.025	1.50	152.0	53.8
170.00	0.024	1.59	170.4	0.024	1.59	152.0	53.8
180.00	0.023	1.69	169.9	0.023	1.69	151.5	53.6
190.00	0.023	1.79	169.0	0.023	1.79	150.6	53.3
200.00	0.022	1.89	168.4	0.022	1.89	150.0	53.1
210.00	0.021	2.00	167.1	0.021	2.00	148.7	52.6
220.00	0.019	2.10	165.2	0.019	2.10	146.8	51.9
230.00	0.016	2.19	163.5	0.016	2.19	145.1	51.3
240.00	0.014	2.28	162.1	0.014	2.28	143.7	50.8
250.00	0.011	2.38	160.9	0.011	2.38	142.5	50.4
260.00	0.008	2.49	159.7	0.008	2.49	141.3	50.0
270.00	0.005	2.59	158.5	0.005	2.59	140.1	49.6
280.00	0.003	2.69	157.2	0.003	2.69	138.8	49.1
290.00	0.003	2.78	155.9	0.003	2.78	137.5	48.6
300.00	0.000	2.89	154.9	0.000	2.89	136.5	48.3
310.00	-0.002	2.98	154.0	-0.002	2.98	135.6	48.0
320.00	-0.003	3.08	152.7	-0.003	3.08	134.3	47.5
330.00	-0.004	3.18	151.6	-0.004	3.18	133.2	47.1



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA-Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>9.50/9.90</i>
Borehole number	<i>17</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>2</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 1 **Normal stress (kPa) 150**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
340.00	-0.005	3.29	150.6	-0.005	3.28	132.2	46.8
350.00	-0.007	3.38	149.6	-0.007	3.38	131.2	46.4
360.00	-0.008	3.48	148.7	-0.008	3.48	130.3	46.1
370.00	-0.011	3.59	147.7	-0.011	3.58	129.3	45.7
380.00	-0.013	3.68	146.6	-0.013	3.68	128.2	45.3
390.00	-0.013	3.78	145.3	-0.013	3.78	126.9	44.9
400.00	-0.014	3.88	144.2	-0.014	3.88	125.8	44.5
410.00	-0.014	3.99	143.2	-0.014	3.99	124.8	44.1
420.00	-0.016	4.10	142.0	-0.016	4.09	123.6	43.7
430.00	-0.020	4.18	140.6	-0.020	4.18	122.2	43.2
440.00	-0.019	4.29	139.4	-0.019	4.28	121.0	42.8
450.00	-0.019	4.38	138.5	-0.019	4.37	120.1	42.5
460.00	-0.022	4.49	137.9	-0.022	4.49	119.5	42.3
466.05	-0.022	4.55	137.3	-0.022	4.55	118.9	42.1



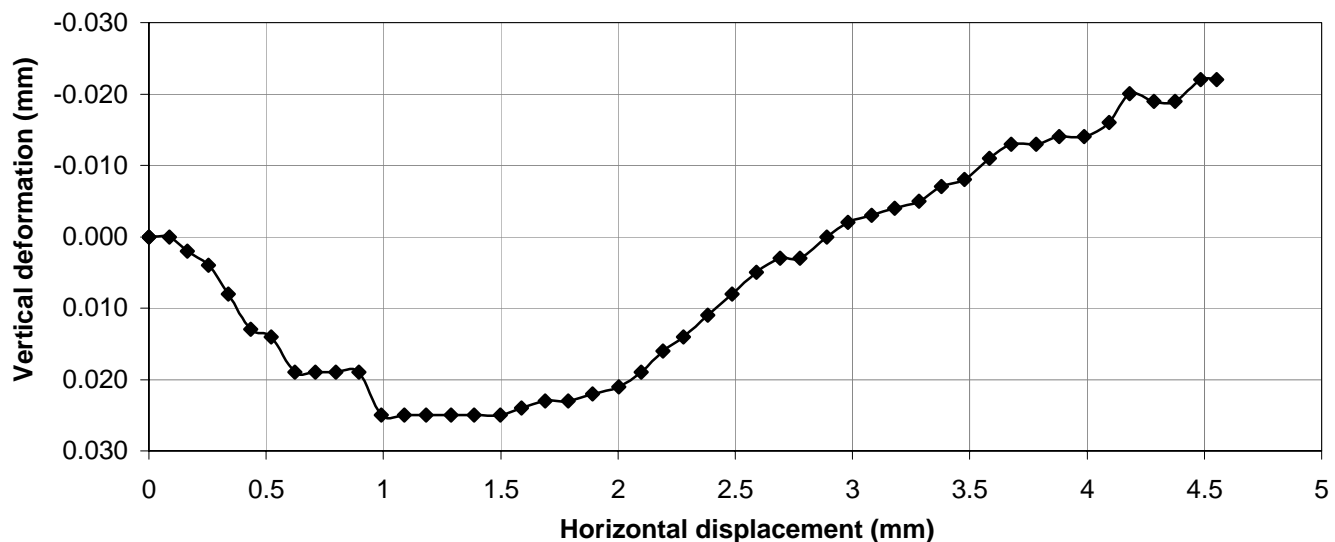
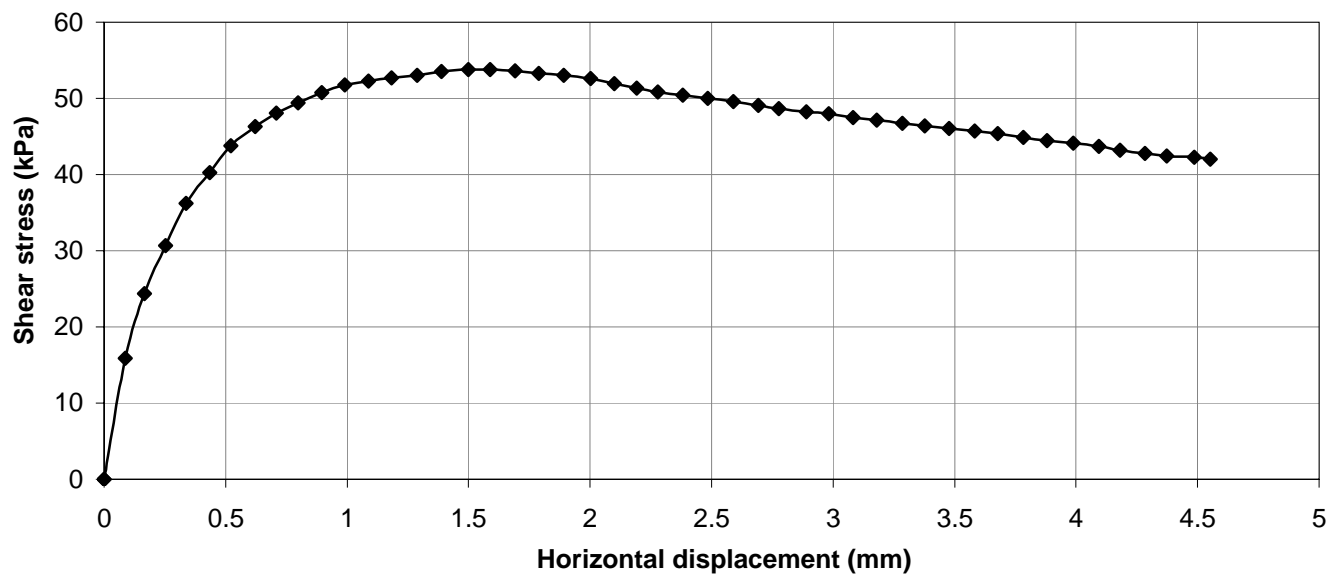
DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA-Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>9.50/9.90</i>
Borehole number	<i>17</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>2</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 1

Normal stress (kPa) 150



Tested	<i>Farinelli</i>	Checked	<i>Sfalanga</i>	Approved	<i>Carmignani</i>
Date	<i>06/10/2010</i>	Date	<i>15/10/2010</i>	Date	<i>No. 2535/2010</i>



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	<i>GEOITALIA-Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>9.50/9.90</i>
Borehole number	<i>17</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>2</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 2	Normal stress (kPa)	300
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Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.06	0.713	0.2	0.000
0.08	0.734	0.3	0.021
0.13	0.748	0.4	0.035
0.21	0.760	0.5	0.047
0.32	0.769	0.6	0.056
0.51	0.792	0.7	0.079
0.81	0.819	0.9	0.106
1.29	0.827	1.1	0.114
2.05	0.830	1.4	0.117
3.25	0.836	1.8	0.123
5.17	0.843	2.3	0.130
8.21	0.850	2.9	0.137
13.06	0.852	3.6	0.139
20.76	0.865	4.6	0.152
33.01	0.865	5.7	0.152
52.47	0.865	7.2	0.152
83.43	0.865	9.1	0.152
132.66	0.864	11.5	0.151
210.92	0.863	14.5	0.150
335.37	0.862	18.3	0.149
533.23	0.861	23.1	0.148
847.84	0.860	29.1	0.147
936.06	0.860	30.6	0.147

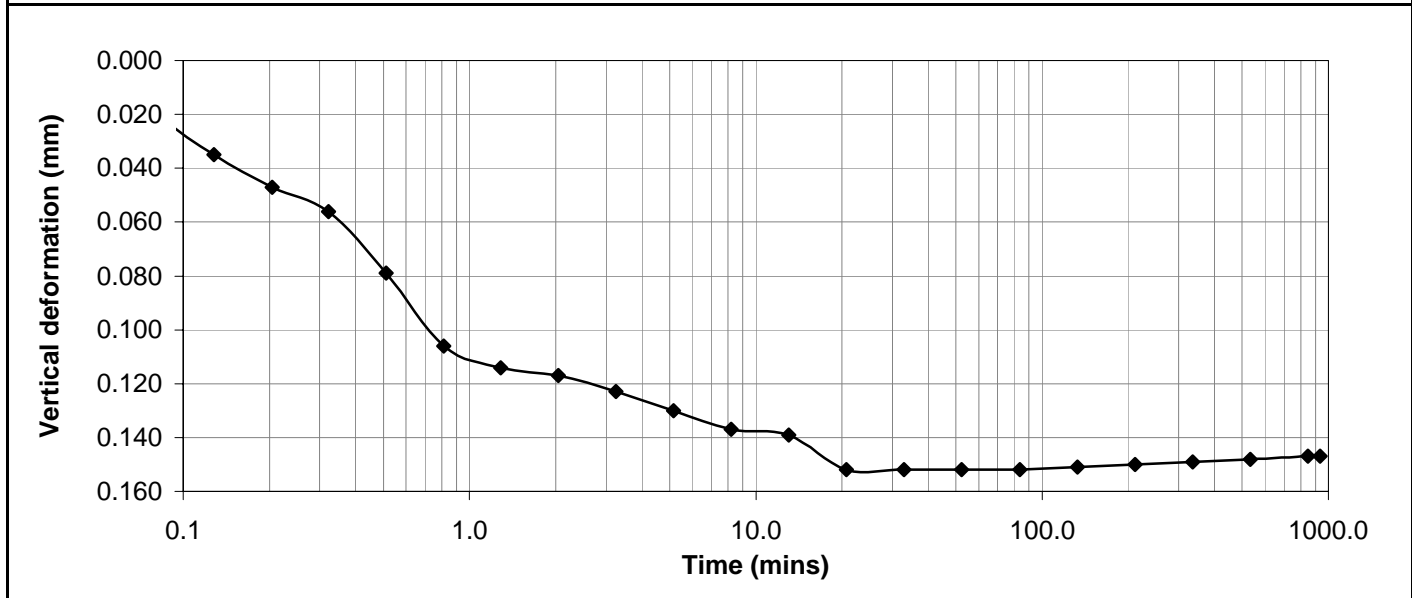
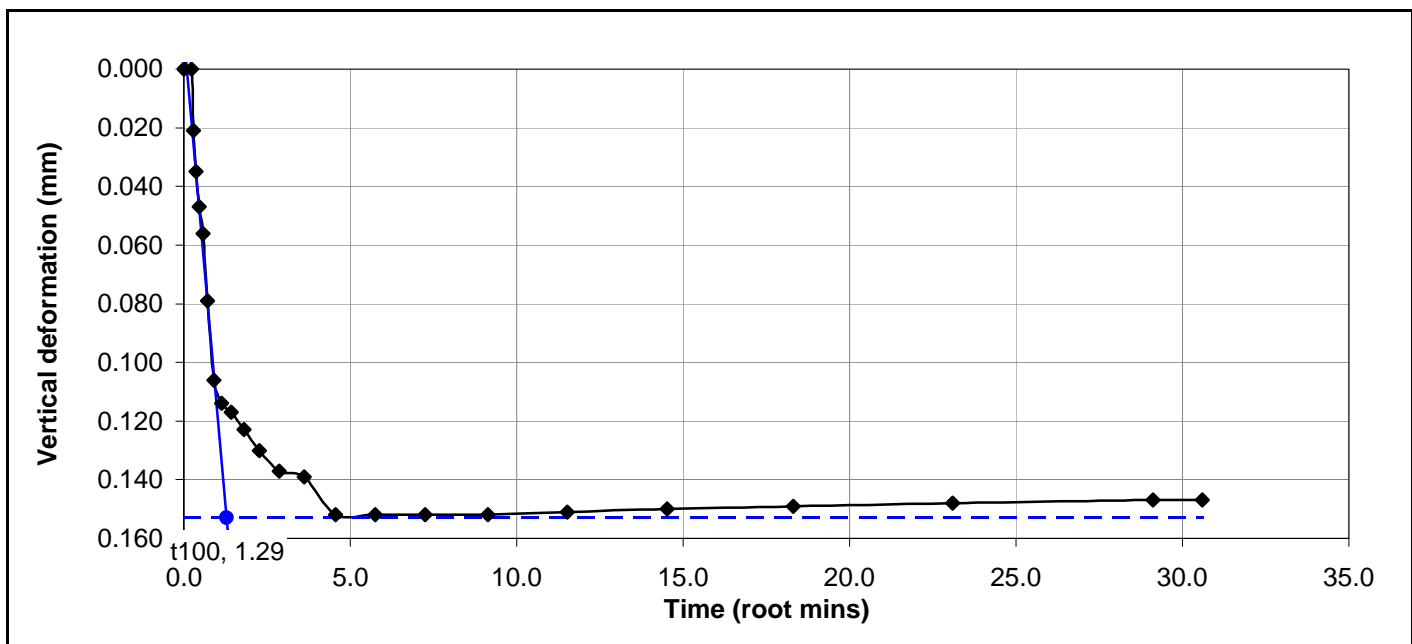


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	<i>GEOITALIA-Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>9.50/9.90</i>
Borehole number	<i>17</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>2</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 2 **Normal stress (kPa) 300**



Tested	<i>Farinelli</i>	Checked	<i>Sfalanga</i>	Approved	<i>Carmignani</i>
Date	<i>06/10/2010</i>	Date	<i>15/10/2010</i>	Date	<i>No. 2535/2010</i>



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA-Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth	9.50/9.90
Borehole number	17	Sample type	Undisturbed cohesive
Sample number	2	Specimen orientation	Vertical

SPECIMEN 2 **Normal stress (kPa) 300**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
0.02	0.000	0.00	13.1	0.000	0.00	0.0	0.0
10.01	-0.002	0.06	88.4	-0.002	0.06	75.3	26.6
20.00	-0.002	0.14	146.6	-0.002	0.14	133.5	47.2
30.00	0.000	0.24	194.7	0.000	0.24	181.6	64.2
40.00	0.000	0.33	234.2	0.000	0.33	221.1	78.2
50.00	0.002	0.40	258.3	0.002	0.40	245.2	86.7
60.00	0.007	0.50	269.5	0.007	0.50	256.4	90.7
70.00	0.011	0.59	274.5	0.011	0.59	261.4	92.5
80.00	0.016	0.70	277.1	0.016	0.69	264.0	93.4
90.00	0.015	0.79	281.4	0.015	0.79	268.3	94.9
100.00	0.016	0.88	284.1	0.016	0.88	271.0	95.8
110.00	0.015	0.97	286.0	0.015	0.97	272.9	96.5
120.00	0.015	1.07	287.9	0.015	1.06	274.8	97.2
130.00	0.016	1.16	290.0	0.016	1.16	276.9	97.9
140.00	0.016	1.26	291.0	0.016	1.26	277.9	98.3
150.00	0.016	1.36	291.4	0.016	1.36	278.3	98.4
160.00	0.016	1.46	291.4	0.016	1.46	278.3	98.4
170.00	0.016	1.57	291.4	0.016	1.56	278.3	98.4
180.00	0.016	1.66	291.4	0.016	1.66	278.3	98.4
190.00	0.016	1.77	290.7	0.016	1.77	277.6	98.2
200.00	0.016	1.86	289.8	0.016	1.86	276.7	97.9
210.00	0.016	1.96	288.5	0.016	1.96	275.4	97.4
220.00	0.016	2.06	287.1	0.016	2.06	274.0	96.9
230.00	0.016	2.15	286.6	0.016	2.15	273.5	96.7
240.00	0.016	2.25	285.0	0.016	2.25	271.9	96.2
250.00	0.016	2.35	283.3	0.016	2.34	270.2	95.6
260.00	0.016	2.44	282.3	0.016	2.44	269.2	95.2
270.00	0.016	2.54	281.2	0.016	2.54	268.1	94.8
280.00	0.016	2.64	280.0	0.016	2.63	266.9	94.4
290.00	0.016	2.74	278.6	0.016	2.74	265.5	93.9
300.00	0.016	2.84	276.7	0.016	2.84	263.6	93.2
310.00	0.016	2.93	275.2	0.016	2.93	262.1	92.7
320.00	0.016	3.03	273.1	0.016	3.02	260.0	92.0
330.00	0.016	3.13	272.1	0.016	3.12	259.0	91.6



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA-Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>9.50/9.90</i>
Borehole number	<i>17</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>2</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 2 **Normal stress (kPa) 300**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
340.00	0.016	3.23	270.5	0.016	3.23	257.4	91.0
350.00	0.016	3.34	269.0	0.016	3.33	255.9	90.5
360.00	0.012	3.42	267.3	0.012	3.42	254.2	89.9
370.00	0.011	3.52	265.9	0.011	3.52	252.8	89.4
380.00	0.011	3.62	264.5	0.011	3.62	251.4	88.9
390.00	0.011	3.72	262.8	0.011	3.72	249.7	88.3
400.00	0.012	3.83	261.4	0.012	3.83	248.3	87.8
410.00	0.012	3.92	259.7	0.012	3.92	246.6	87.2
420.00	0.012	4.02	258.1	0.012	4.02	245.0	86.7
421.19	0.012	4.04	258.1	0.012	4.03	245.0	86.7

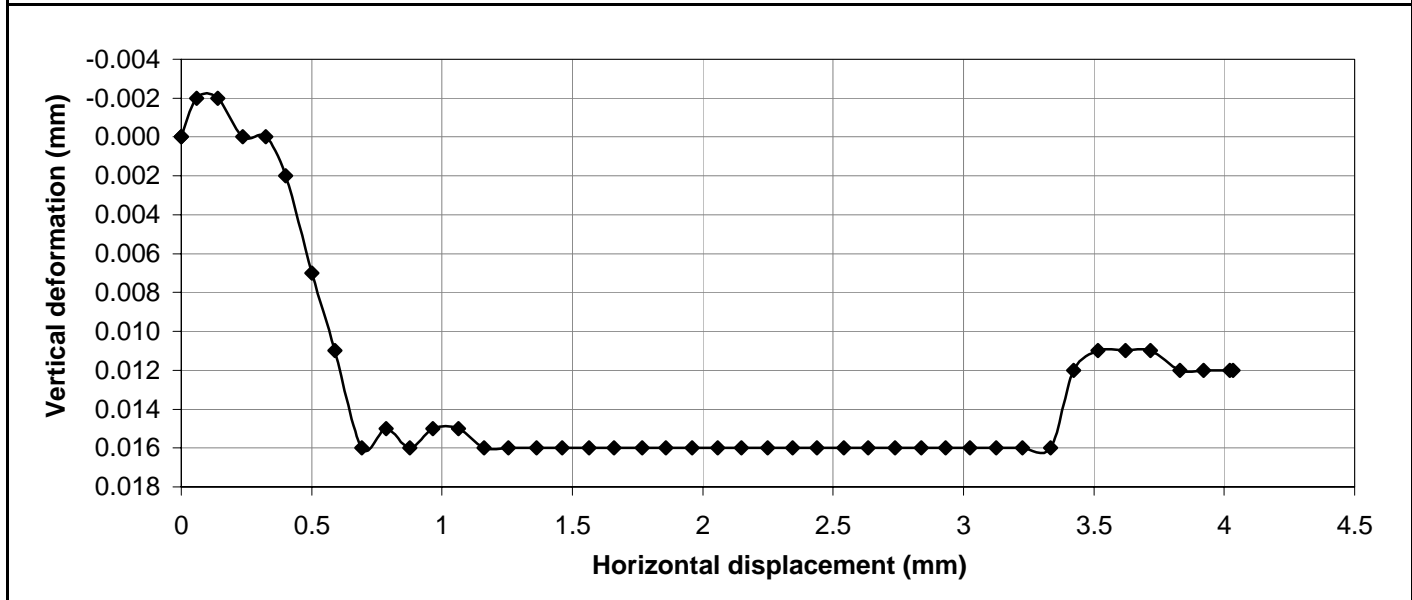
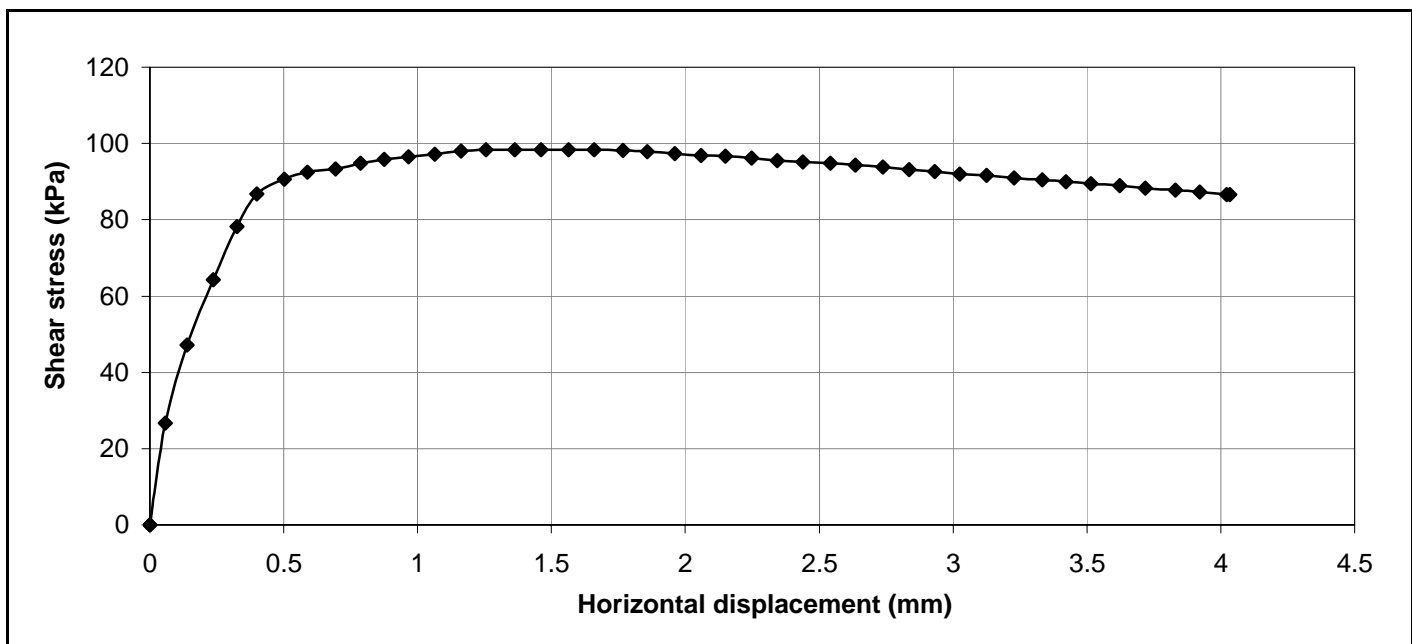


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA-Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>9.50/9.90</i>
Borehole number	<i>17</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>2</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 2 **Normal stress (kPa) 300**



Tested	<i>Farinelli</i>	Checked	<i>Sfalanga</i>	Approved	<i>Carmignani</i>
Date	<i>07/10/2010</i>	Date	<i>15/10/2010</i>	Date	<i>No. 2535/2010</i>



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	<i>GEOITALIA-Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>9.50/9.90</i>
Borehole number	<i>17</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>2</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 3	Normal stress (kPa)	600
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Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	0.366	0.2	0.000
0.08	0.379	0.3	0.013
0.13	0.390	0.4	0.024
0.21	0.612	0.5	0.246
0.32	0.654	0.6	0.288
0.51	0.670	0.7	0.304
0.81	0.685	0.9	0.319
1.29	0.694	1.1	0.328
2.04	0.703	1.4	0.337
3.25	0.722	1.8	0.356
5.17	0.734	2.3	0.368
8.21	0.748	2.9	0.382
13.06	0.770	3.6	0.404
20.76	0.814	4.6	0.448
33.00	0.831	5.7	0.465
52.48	0.869	7.2	0.503
83.43	1.066	9.1	0.700
132.66	1.255	11.5	0.889
210.92	1.278	14.5	0.912
335.37	1.280	18.3	0.914
533.23	1.279	23.1	0.913
847.83	1.285	29.1	0.919
931.76	1.286	30.5	0.920

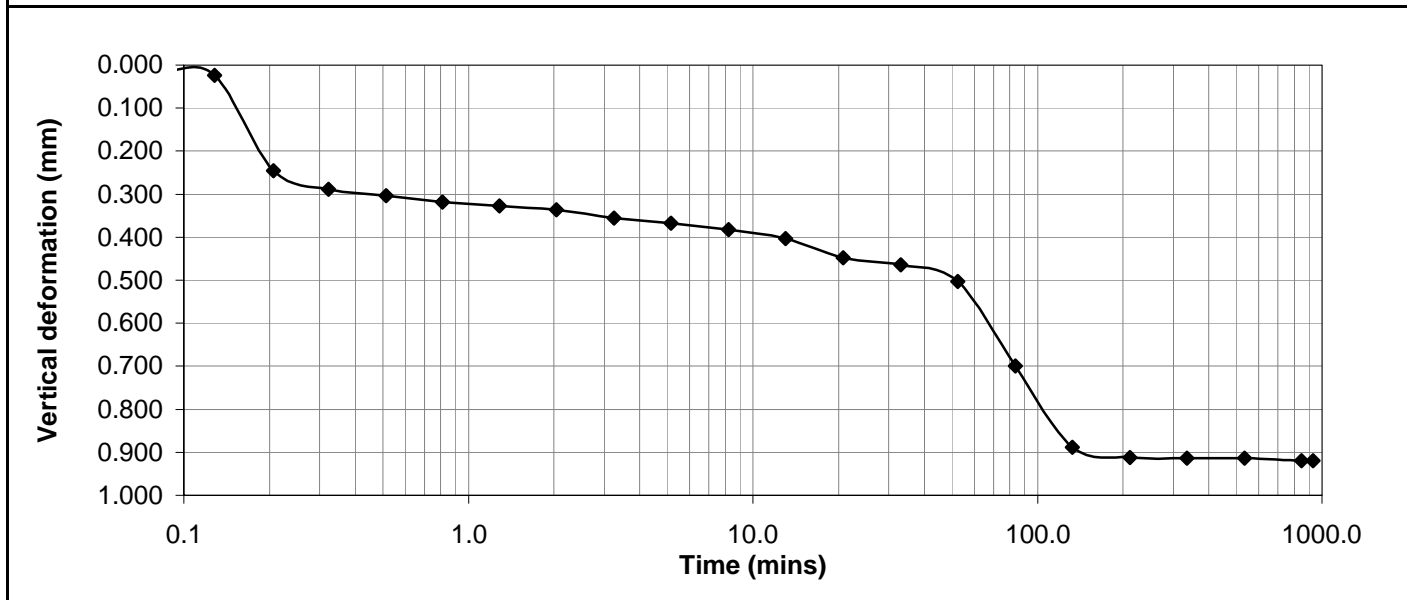
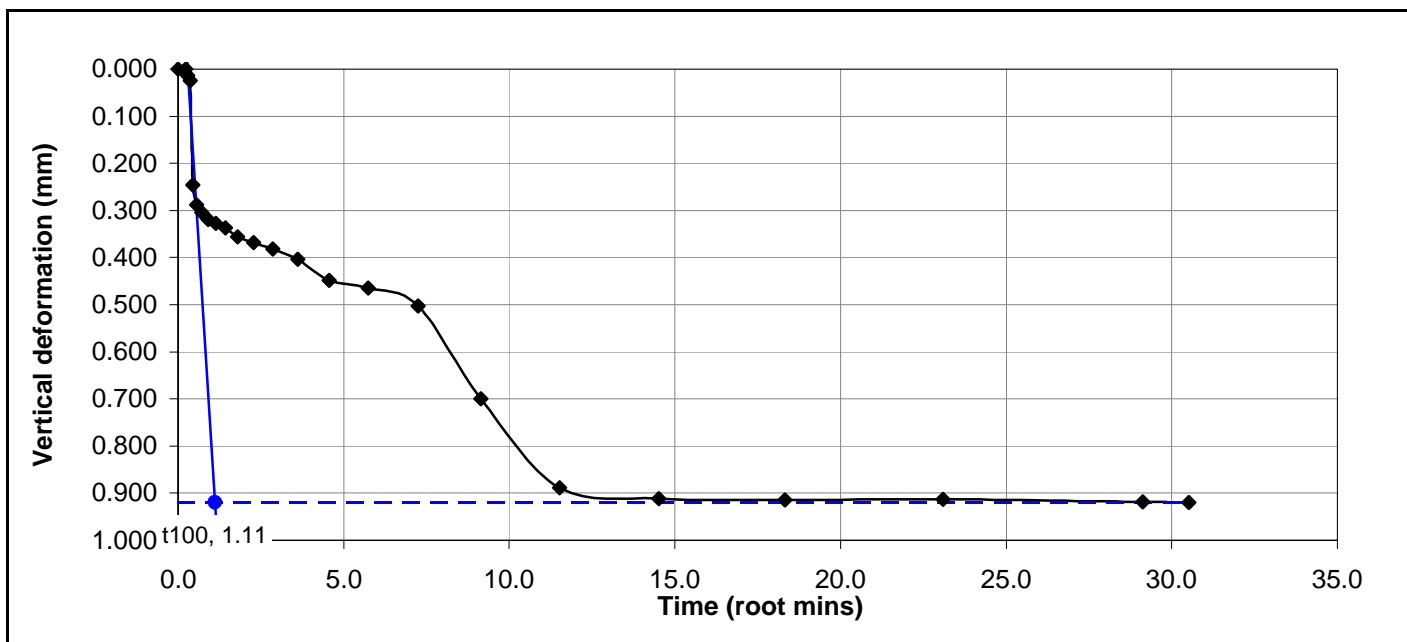


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	GEOITALIA-Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth	9.50/9.90
Borehole number	17	Sample type	Undisturbed cohesive
Sample number	2	Specimen orientation	Vertical

SPECIMEN 3 **Normal stress (kPa) 600**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	11/10/2010	Date	15/10/2010	Date	No. 2535/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA-Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>9.50/9.90</i>
Borehole number	<i>17</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>2</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 3 **Normal stress (kPa) 600**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
0.02	0.000	0.00	15.7	0.000	0.00	0.0	0.0
10.00	0.000	0.06	84.6	0.000	0.05	68.9	24.4
20.00	0.007	0.12	152.3	0.007	0.12	136.6	48.3
30.00	0.016	0.21	208.7	0.016	0.21	193.0	68.3
40.00	0.031	0.30	255.0	0.031	0.30	239.3	84.6
50.00	0.049	0.38	310.2	0.049	0.37	294.5	104.2
60.00	0.078	0.46	360.7	0.078	0.45	345.0	122.0
70.00	0.086	0.52	408.6	0.086	0.52	392.9	139.0
80.00	0.090	0.61	461.1	0.090	0.61	445.4	157.5
90.00	0.106	0.69	503.7	0.106	0.69	488.0	172.6
100.00	0.114	0.77	542.4	0.114	0.76	526.7	186.3
110.00	0.134	0.85	575.4	0.134	0.85	559.7	198.0
120.00	0.138	0.94	605.9	0.138	0.93	590.2	208.7
130.00	0.151	1.03	630.2	0.151	1.03	614.5	217.3
140.00	0.158	1.12	650.1	0.158	1.12	634.4	224.4
150.00	0.159	1.20	666.7	0.159	1.20	651.0	230.2
160.00	0.168	1.31	680.8	0.168	1.30	665.1	235.2
170.00	0.178	1.41	692.5	0.178	1.40	676.8	239.4
180.00	0.183	1.51	700.8	0.183	1.51	685.1	242.3
190.00	0.183	1.60	707.4	0.183	1.60	691.7	244.6
200.00	0.192	1.70	711.8	0.192	1.70	696.1	246.2
210.00	0.199	1.79	715.6	0.199	1.79	699.9	247.5
220.00	0.199	1.90	717.9	0.199	1.90	702.2	248.4
230.00	0.199	2.00	718.2	0.199	2.00	702.5	248.5
240.00	0.206	2.09	717.3	0.206	2.09	701.6	248.1
250.00	0.208	2.19	714.9	0.208	2.18	699.2	247.3
260.00	0.208	2.29	713.4	0.208	2.29	697.7	246.8
270.00	0.212	2.38	710.3	0.212	2.38	694.6	245.7
280.00	0.214	2.49	707.0	0.214	2.49	691.3	244.5
290.00	0.216	2.59	702.9	0.216	2.59	687.2	243.0
300.00	0.216	2.69	698.7	0.216	2.69	683.0	241.6
310.00	0.218	2.79	694.9	0.218	2.78	679.2	240.2
320.00	0.222	2.88	691.0	0.222	2.88	675.3	238.8
330.00	0.224	2.98	687.2	0.224	2.98	671.5	237.5



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA-Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>9.50/9.90</i>
Borehole number	<i>17</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>2</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 3 **Normal stress (kPa) 600**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
340.00	0.225	3.08	682.5	0.225	3.08	666.8	235.8
350.00	0.226	3.19	677.5	0.226	3.19	661.8	234.1
360.00	0.226	3.29	674.1	0.226	3.29	658.4	232.9
370.00	0.228	3.38	669.6	0.228	3.38	653.9	231.3
380.00	0.229	3.48	665.0	0.229	3.48	649.3	229.6
390.00	0.233	3.58	660.3	0.233	3.58	644.6	228.0
400.00	0.233	3.68	656.2	0.233	3.68	640.5	226.5
410.00	0.235	3.79	651.9	0.235	3.78	636.2	225.0
418.12	0.241	3.87	648.9	0.241	3.86	633.2	223.9



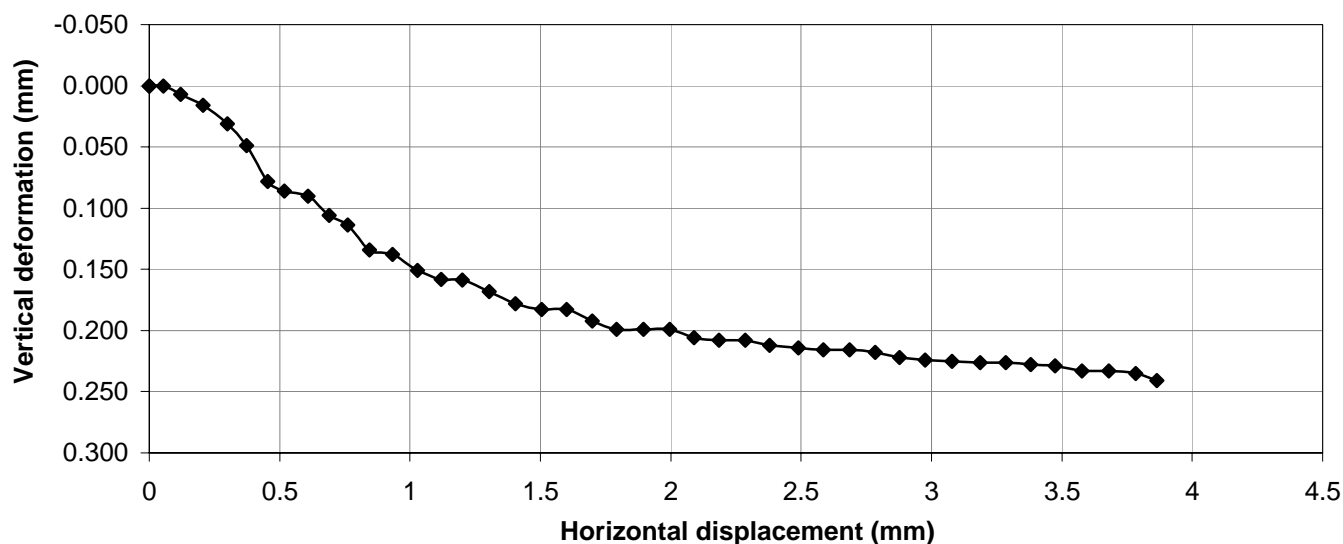
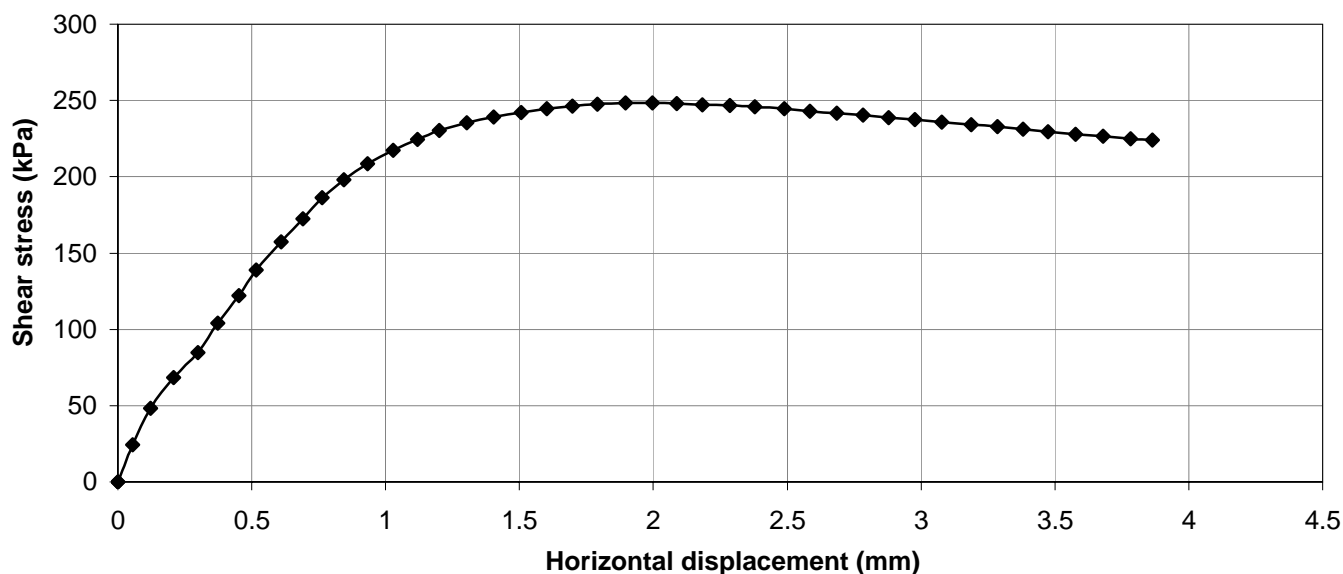
DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA-Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>9.50/9.90</i>
Borehole number	<i>17</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>2</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 3

Normal stress (kPa) 600



Tested	<i>Farinelli</i>	Checked	<i>Sfalanga</i>	Approved	<i>Carmignani</i>
Date	<i>12/10/2010</i>	Date	<i>15/10/2010</i>	Date	<i>No. 2535/2010</i>



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

SETUP DATA

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2	Test type	<input type="radio"/> Single stage <input checked="" type="radio"/> Multistage
Sample description	Materiale passante a 0.425 mm a contenuto d'acqua compreso tra LL e LP.		
Preparation method	Remoulded at a specified moisture content		

STAGE 1			
Machine number	4.00	Specimen depth (m)	9.50/9.90

Initial measurements			
Diameter of internal ring (mm)	70.0	Internal radius (mm)	35.0
Diameter of external ring (mm)	100.0	External radius (mm)	50.0
Specimen thickness (mm)	5.0	Distance between force points (mm)	77.0
Mass of cell (g)	603.7	Specimen volume (cc)	20.0
Mass of cell + wet soil (g)	641.3	Mass of specimen (g)	37.6

Trimmings moisture content		Final moisture content	
Mass of wet soil + tin (g)	81.82	Mass of wet soil + tin (g)	39.91
Mass of dry soil + tin (g)	55.43	Mass of dry soil + tin (g)	31.12
Mass of tin (g)	16.71	Mass of tin (g)	18.18

Applied stress			
Mass directly applied (kg)	0.27	Total mass on specimen (kg)	5.27
Mass indirectly applied (kg)	0.50	Normal stress (kPa)	13
Load arm ratio (**:1)	10.0		

Consolidation stage			
Initial vertical displacement reading (mm)*			
t100 (root mins)		3.66	
t100 (mins)		13.36	
Estimated linear displacement at failure (mm)		3.00	
Minimum time to failure (t_f) (mins)		169.70	
Rate of linear displacement (mm/min)	Calculated	0.018	Actual 0.018
Rate of angular displacement (°/min)	Calculated	0.024	Actual 0.024

Shear stage - initial readings			
Vertical displacement (mm)*			
Shear force device A (N)*			
Shear force device B (N)*			
Angular rotation (°)*			

* If initial readings are not entered, values will be taken from the test data



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS
 Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

SETUP DATA

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2	Test type	<input type="radio"/> Single stage <input checked="" type="radio"/> Multistage
Sample description	Materiale passante a 0.425 mm a contenuto d'acqua compreso tra LL e LP.		
Preparation method	Remoulded at a specified moisture content		

STAGE 2

Applied stress			
Mass directly applied (kg)	0.27	Total mass on specimen (kg)	10.27
Mass indirectly applied (kg)	1.00	Normal stress (kPa)	25
Load arm ratio (**:1)	10.0		

Consolidation stage			
Initial vertical displacement reading (mm)*			
t100 (root mins)		1.60	
t100 (mins)		2.56	
Estimated horizontal displacement at failure (mm)		3.00	
Minimum time to failure (t_f) (mins)		32.46	
Rate of linear displacement (mm/min)	Calculated	0.092	Actual 0.018
Rate of angular displacement (°/min)	Calculated	0.125	Actual 0.024

Shear stage - initial readings			
Vertical displacement (mm)*			
Shear force device A (N)*			
Shear force device B (N)*			
Angular rotation (°)*			

* If initial readings are not entered, values will be taken from the test data



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

SETUP DATA

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2	Test type	<input type="radio"/> Single stage <input checked="" type="radio"/> Multistage
Sample description	Materiale passante a 0.425 mm a contenuto d'acqua compreso tra LL e LP.		
Preparation method	Remoulded at a specified moisture content		

STAGE 3

Applied stress			
Mass directly applied (kg)	0.27	Total mass on specimen (kg)	20.27
Mass indirectly applied (kg)	2.00	Normal stress (kPa)	50
Load arm ratio (**:1)	10.0		

Consolidation stage			
Initial vertical displacement reading (mm)*			
t100 (root mins)		2.76	
t100 (mins)		7.62	
Estimated horizontal displacement at failure (mm)		3.00	
Minimum time to failure (t_f) (mins)		96.72	
Rate of linear displacement (mm/min)	Calculated	0.031	Actual 0.018
Rate of angular displacement (°/min)	Calculated	0.042	Actual 0.024

Shear stage - initial readings			
Vertical displacement (mm)*			
Shear force device A (N)*			
Shear force device B (N)*			
Angular rotation (°)*			

* If initial readings are not entered, values will be taken from the test data



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST REPORT - SUMMARY

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2		
Sample description	Materiale passante a 0.425 mm a contenuto d'acqua compreso tra LL e LP.		
Preparation method	Remoulded at a specified moisture content		

INITIAL CONDITIONS	Stage 1	Stage 2	Stage 3
Specimen depth (m)	9.50/9.90	-	-
Specimen thickness (mm)	5.0	-	-
External ring radius (mm)	50.0	-	-
Internal ring radius (mm)	35.0	-	-
Moisture content (trimmings) (%)	68	-	-

SHEARING	Stage 1	Stage 2	Stage 3
Average linear displacement (mm/min)	0.018	0.018	0.018
Rate of angular displacement (°/min)	0.024	0.024	0.024
Conditions at end of shear			
Normal stress (kPa)	13	25	50
Residual shear stress (kPa)	2	4	10
Average linear displacement (mm)	2.26	2.44	2.34
Angular displacement (°)	3.0	3.3	3.2

FINAL MEASUREMENTS	Stage 1	Stage 2	Stage 3
Moisture content (%)	68	-	-

Assumed cohesion (kPa)	0.0
Angle of residual shear resistance (°)	10.9

Comments / variations from procedures:

Il presente rapporto di prova è formato da n. 18 pagine.

Tested Date	Farinelli 21/10/2010	Checked Date	Sfalanga 21/10/2010	Approved Date	Carmignani 25/11/2010
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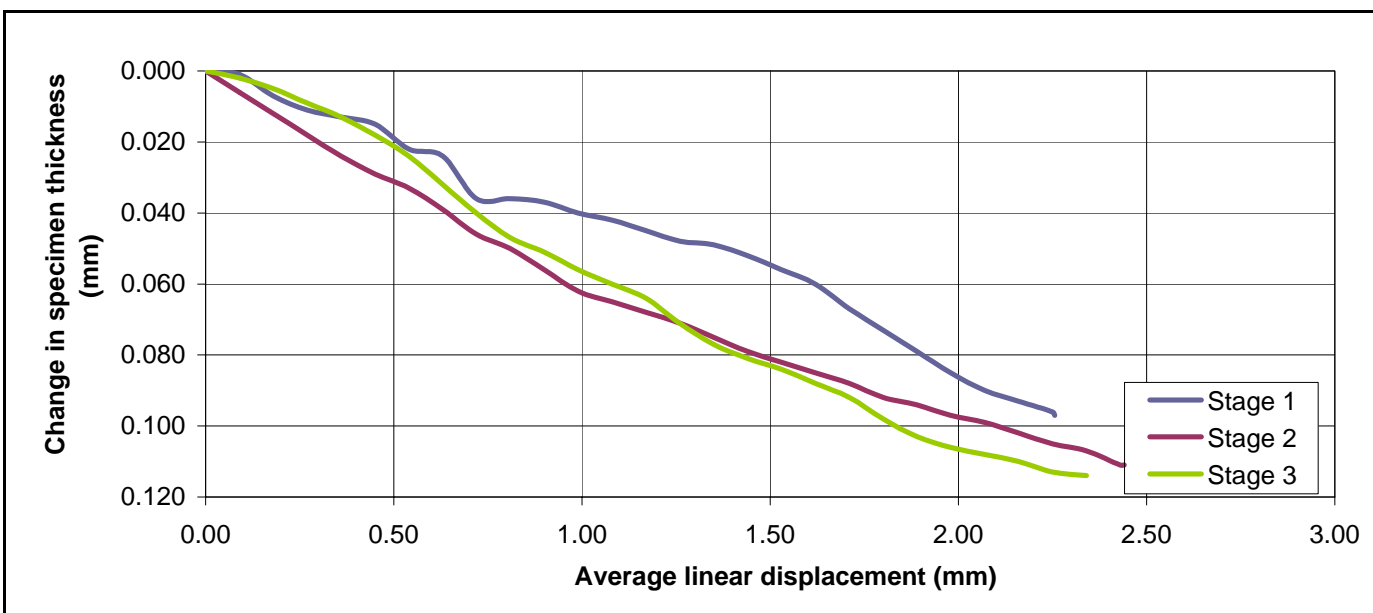
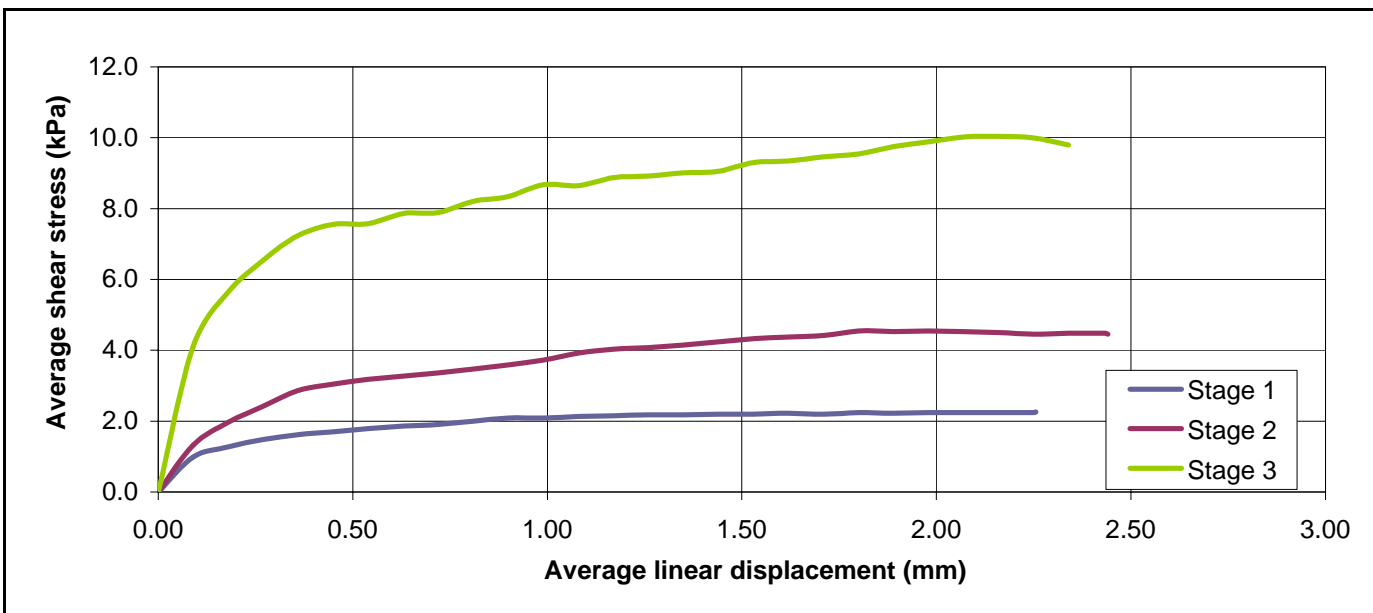


DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST REPORT - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2		



Tested Date	Farinelli 21/10/2010	Checked Date	Sfalanga 21/10/2010	Approved Date	Carmignani 25/11/2010
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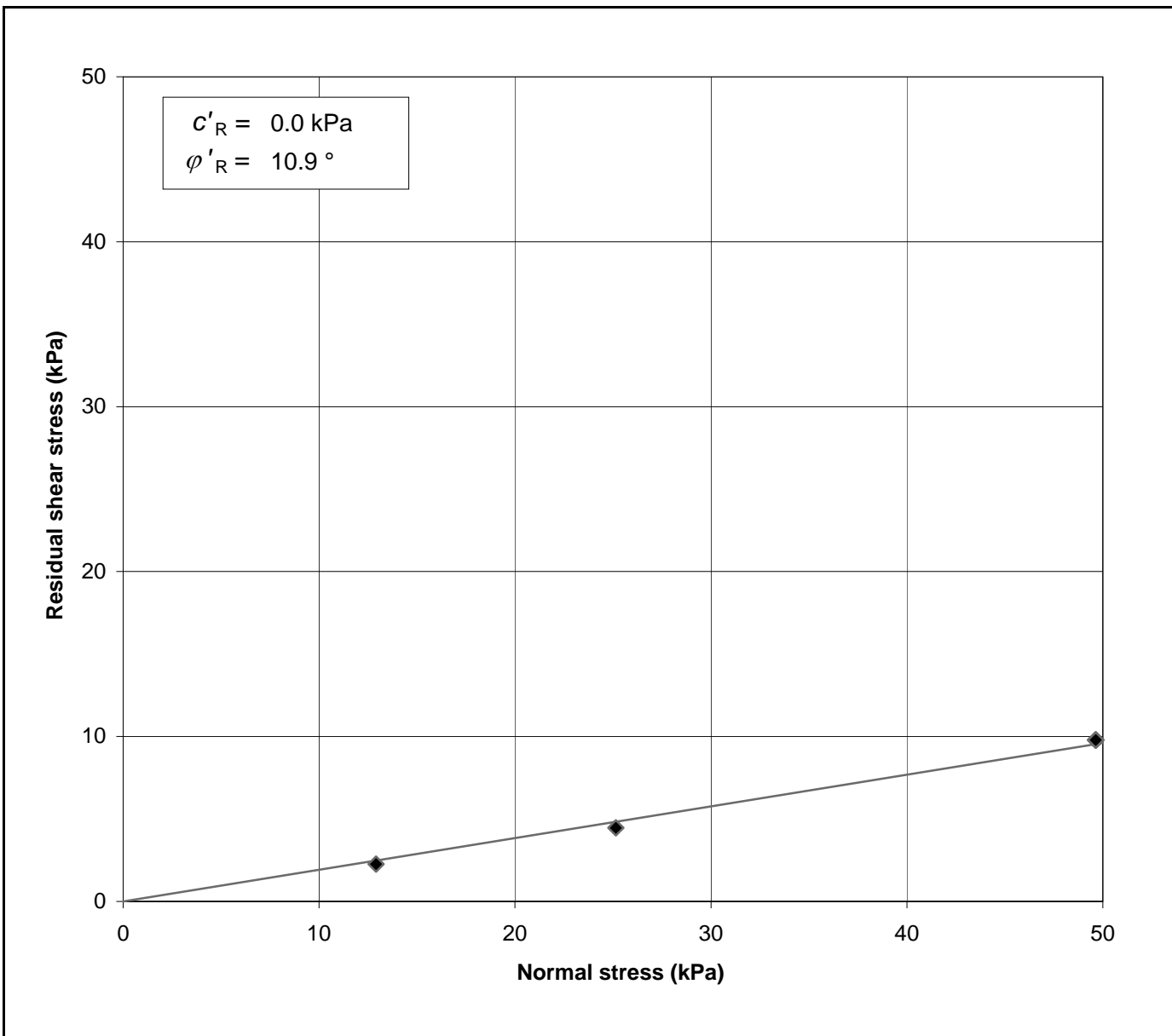


DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST REPORT - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2		



Tested Date	Farinelli 21/10/2010	Checked Date	Sfalanga 21/10/2010	Approved Date	Carmignani 25/11/2010
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DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2		

STAGE 1 **Normal stress (kPa)** **13**

Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	0.329	0.2	0.000
0.08	0.340	0.3	0.011
0.13	0.341	0.4	0.012
0.20	0.343	0.5	0.014
0.32	0.362	0.6	0.033
0.51	0.383	0.7	0.054
0.81	0.387	0.9	0.058
1.29	0.394	1.1	0.065
2.05	0.410	1.4	0.081
3.25	0.425	1.8	0.096
5.17	0.441	2.3	0.112
8.21	0.477	2.9	0.148
13.06	0.507	3.6	0.178
20.76	0.547	4.6	0.218
33.00	0.605	5.7	0.276
52.47	0.664	7.2	0.335
83.43	0.733	9.1	0.404
132.66	0.789	11.5	0.460
210.92	0.824	14.5	0.495
335.37	0.852	18.3	0.523
533.23	0.880	23.1	0.551
847.84	0.883	29.1	0.554
862.90	0.885	29.4	0.556



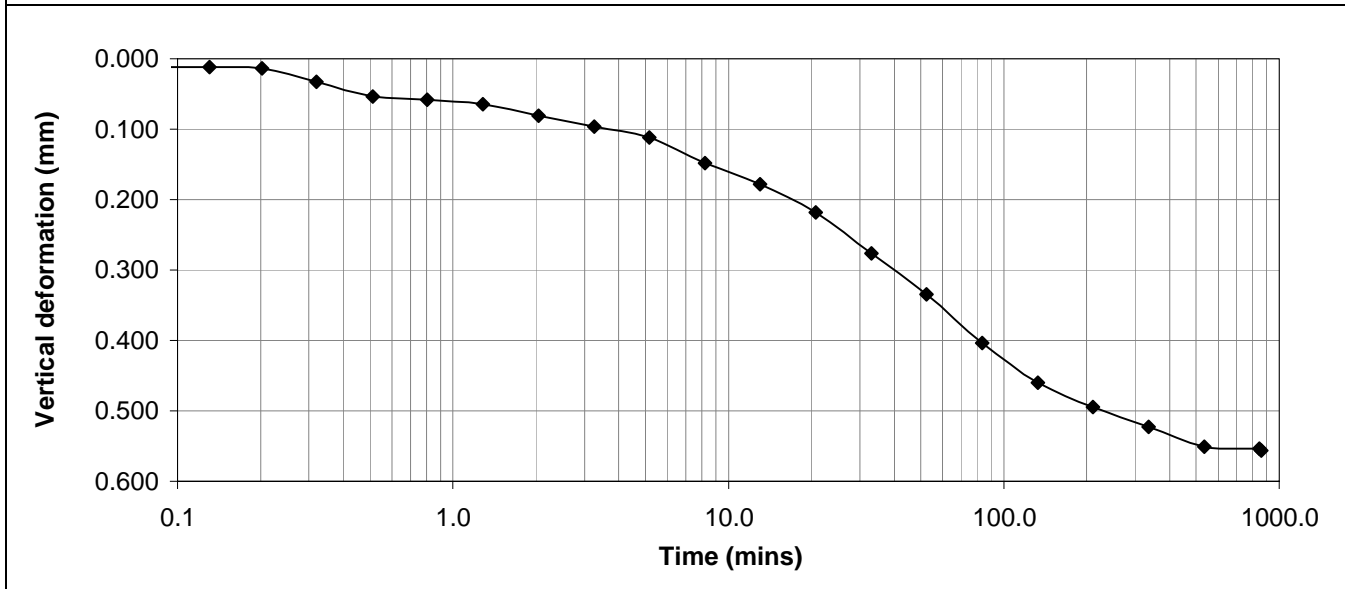
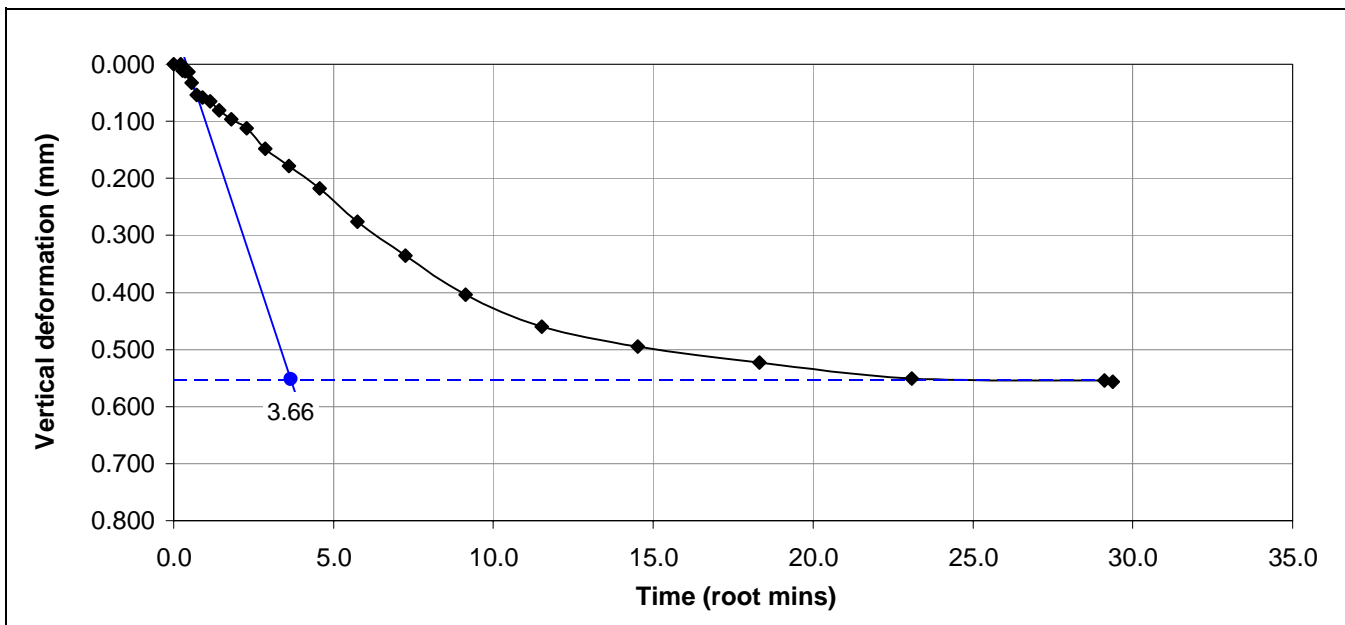
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2		

STAGE 1 **Normal stress (kPa)** **13**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	18/10/2010	Date	21/10/2010	Date	25/10/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2		

STAGE 1 **Normal stress (kPa)** **13**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
0.02	1.157	-0.1	-0.1	0.0	0.00	0.000	0.0	0.0
5.00	1.158	2.0	2.2	0.1	0.09	0.001	2.2	1.0
10.00	1.164	2.6	2.9	0.2	0.18	0.007	2.9	1.3
15.00	1.168	3.0	3.4	0.4	0.27	0.011	3.3	1.5
20.00	1.170	3.3	3.7	0.5	0.36	0.013	3.6	1.6
25.00	1.172	3.5	3.9	0.6	0.45	0.015	3.8	1.7
30.00	1.179	3.6	4.2	0.7	0.54	0.022	4.0	1.8
35.00	1.181	3.8	4.3	0.8	0.63	0.024	4.2	1.9
40.00	1.193	3.5	4.8	1.0	0.72	0.036	4.3	1.9
45.00	1.193	3.9	4.8	1.1	0.81	0.036	4.5	2.0
50.00	1.194	4.1	5.0	1.2	0.90	0.037	4.7	2.1
55.00	1.197	4.1	5.0	1.3	0.99	0.040	4.7	2.1
60.00	1.199	4.2	5.1	1.5	1.08	0.042	4.8	2.1
65.00	1.202	4.2	5.2	1.6	1.17	0.045	4.8	2.2
70.00	1.205	4.2	5.3	1.7	1.26	0.048	4.9	2.2
75.00	1.206	4.2	5.3	1.8	1.35	0.049	4.9	2.2
80.00	1.209	4.1	5.5	1.9	1.44	0.052	4.9	2.2
85.00	1.213	4.1	5.5	2.1	1.53	0.056	4.9	2.2
90.00	1.217	4.1	5.6	2.2	1.62	0.060	5.0	2.2
95.00	1.224	4.0	5.6	2.3	1.71	0.067	4.9	2.2
100.00	1.230	4.1	5.7	2.4	1.80	0.073	5.0	2.2
105.00	1.236	4.0	5.7	2.5	1.89	0.079	5.0	2.2
110.00	1.242	4.0	5.8	2.7	1.98	0.085	5.0	2.2
115.00	1.247	4.0	5.8	2.8	2.07	0.090	5.0	2.2
120.00	1.250	3.9	5.9	2.9	2.16	0.093	5.0	2.2
125.00	1.253	3.9	5.9	3.0	2.25	0.096	5.0	2.2
125.34	1.254	4.0	5.9	3.0	2.26	0.097	5.1	2.3



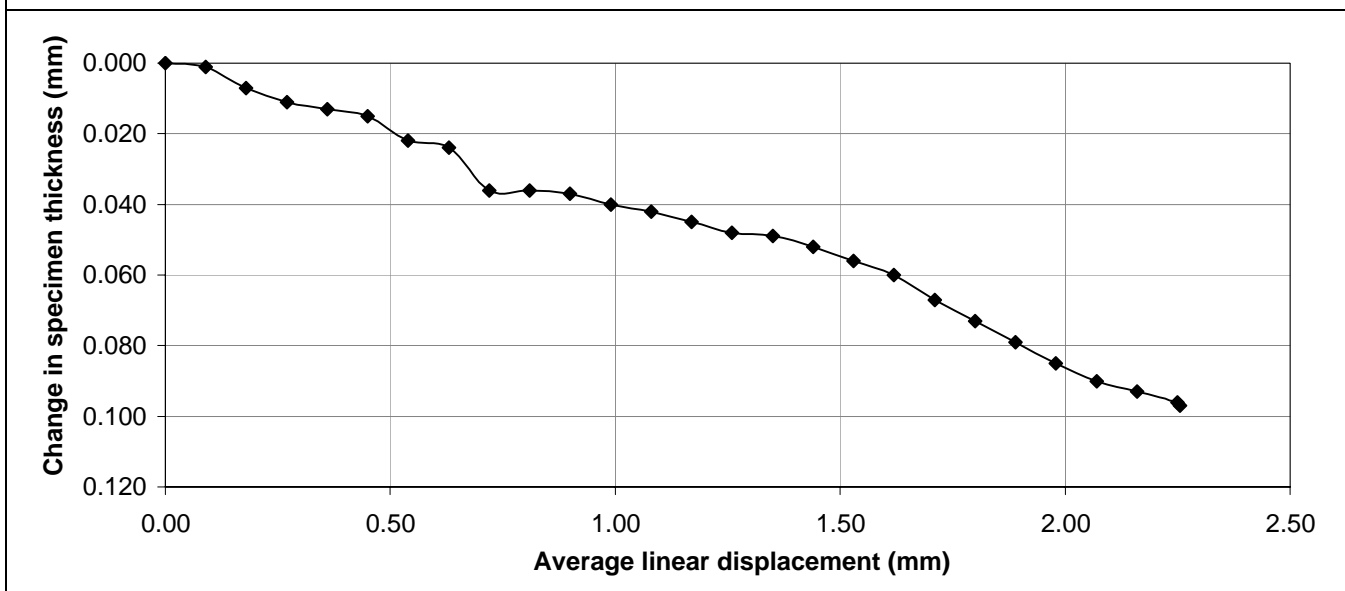
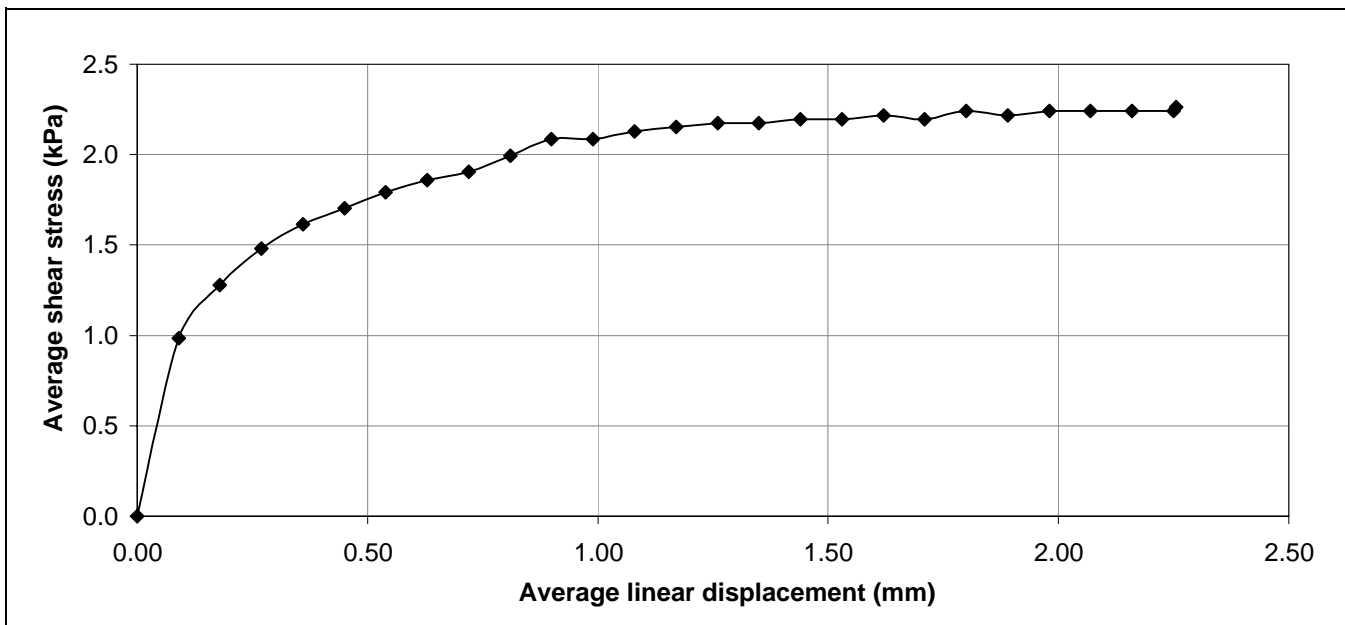
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2		

STAGE 1 **Normal stress (kPa)** **13**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	19/10/2010	Date	21/10/2010	Date	25/10/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2		

STAGE 2 **Normal stress (kPa)** **25**

Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	1.370	0.2	0.000
0.08	1.410	0.3	0.040
0.13	1.432	0.4	0.062
0.20	1.461	0.5	0.091
0.35	1.489	0.6	0.119
0.51	1.500	0.7	0.130
0.81	1.507	0.9	0.137
1.29	1.512	1.1	0.142
2.05	1.519	1.4	0.149
3.25	1.527	1.8	0.157
5.17	1.537	2.3	0.167
8.21	1.555	2.9	0.185
13.06	1.571	3.6	0.201
20.76	1.599	4.6	0.229
33.00	1.623	5.7	0.253
52.48	1.653	7.2	0.283
83.43	1.688	9.1	0.318
132.66	1.726	11.5	0.356
210.92	1.751	14.5	0.381
335.36	1.755	18.3	0.385
427.52	1.756	20.7	0.386



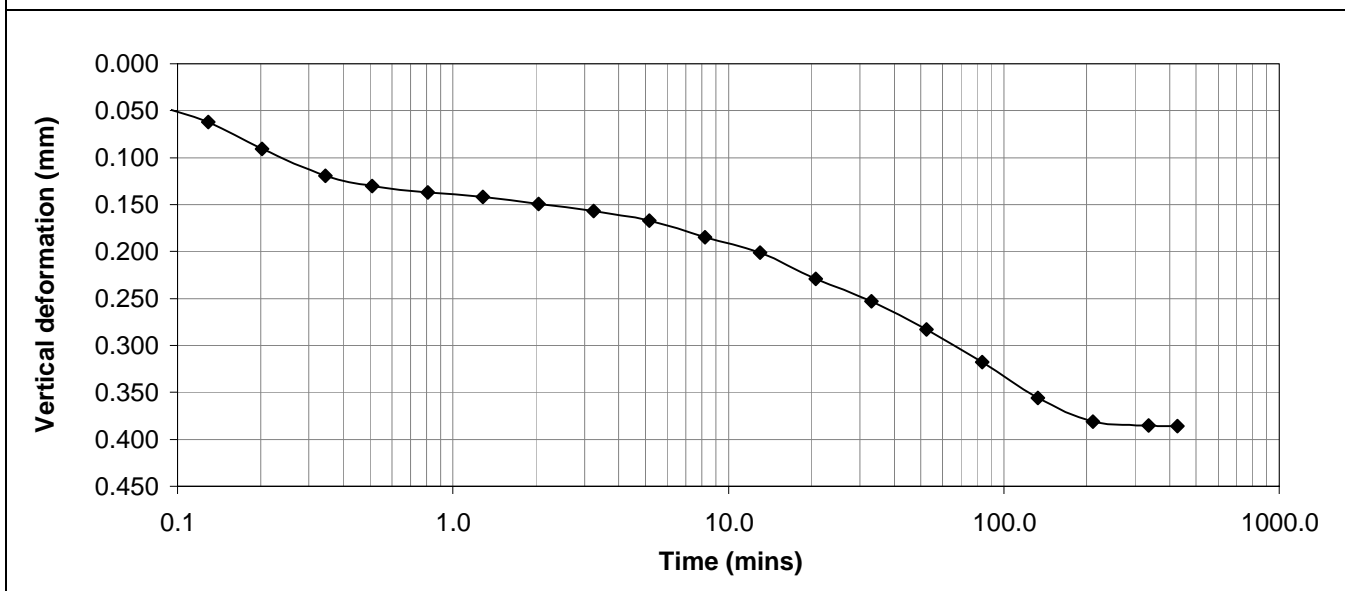
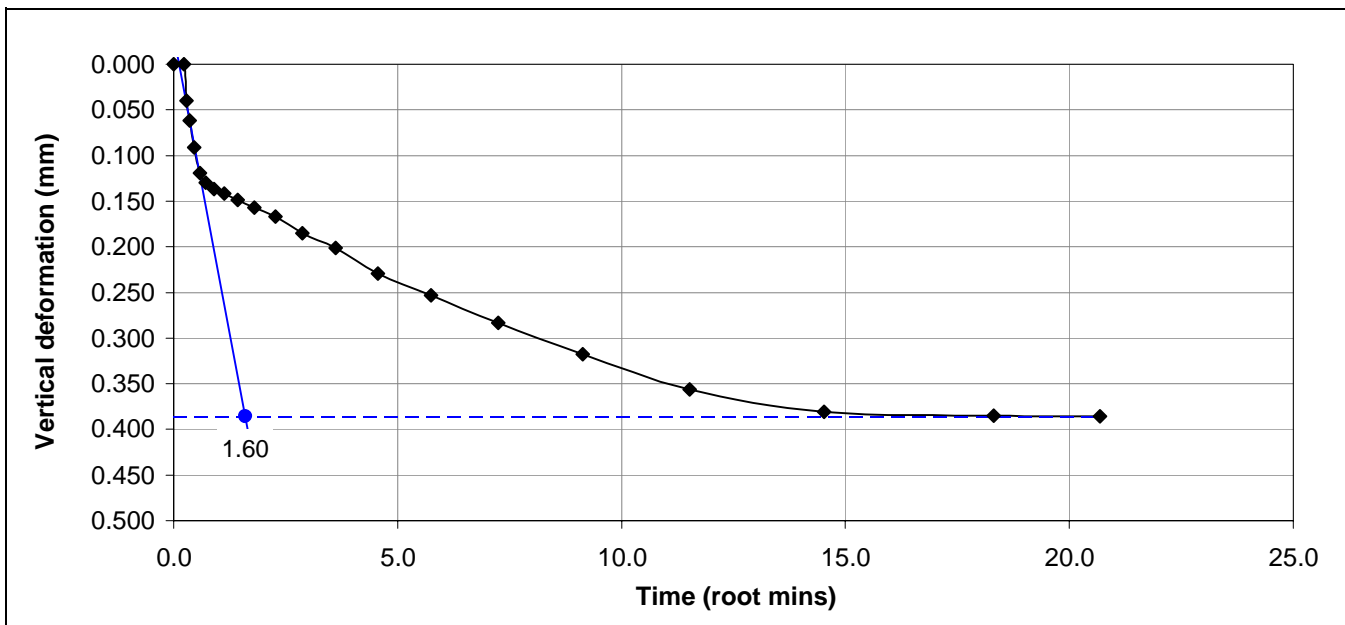
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2		

STAGE 2	Normal stress (kPa)	25
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Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	19/10/2010	Date	21/10/2010	Date	25/11/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2		

STAGE 2 **Normal stress (kPa)** **25**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
0.01	1.824	-0.1	-0.3	0.0	0.00	0.000	0.0	0.0
5.00	1.830	2.8	2.7	0.1	0.09	0.006	3.0	1.3
10.01	1.836	4.2	4.2	0.2	0.18	0.012	4.4	2.0
15.00	1.842	5.1	5.3	0.4	0.27	0.018	5.4	2.4
20.00	1.848	5.6	6.8	0.5	0.36	0.024	6.4	2.9
25.00	1.853	5.6	7.6	0.6	0.45	0.029	6.8	3.0
30.00	1.857	6.0	7.8	0.7	0.54	0.033	7.1	3.2
35.01	1.863	6.2	8.0	0.8	0.63	0.039	7.3	3.3
40.00	1.870	6.3	8.3	1.0	0.72	0.046	7.5	3.4
45.00	1.874	6.7	8.4	1.1	0.81	0.050	7.8	3.5
50.00	1.880	7.0	8.6	1.2	0.90	0.056	8.0	3.6
55.00	1.886	7.4	8.8	1.3	0.99	0.062	8.3	3.7
60.00	1.889	7.7	9.4	1.5	1.08	0.065	8.8	3.9
65.00	1.892	8.0	9.6	1.6	1.17	0.068	9.0	4.0
70.00	1.895	8.1	9.7	1.7	1.26	0.071	9.1	4.1
75.00	1.899	8.3	9.8	1.8	1.35	0.075	9.3	4.1
80.00	1.903	8.6	9.9	1.9	1.44	0.079	9.5	4.2
85.00	1.906	8.9	10.0	2.1	1.53	0.082	9.7	4.3
90.00	1.909	9.1	10.0	2.2	1.62	0.085	9.8	4.4
95.00	1.912	9.2	10.1	2.3	1.71	0.088	9.9	4.4
100.00	1.916	9.4	10.5	2.4	1.80	0.092	10.2	4.5
105.00	1.918	9.3	10.5	2.5	1.89	0.094	10.1	4.5
110.00	1.921	9.2	10.7	2.7	1.98	0.097	10.2	4.5
115.00	1.923	9.0	10.8	2.8	2.07	0.099	10.1	4.5
120.00	1.926	8.9	10.8	2.9	2.16	0.102	10.1	4.5
125.00	1.929	9.3	10.2	3.0	2.25	0.105	10.0	4.5
130.00	1.931	9.2	10.4	3.2	2.34	0.107	10.0	4.5
135.00	1.935	9.0	10.6	3.3	2.43	0.111	10.0	4.5
135.61	1.935	9.0	10.5	3.3	2.44	0.111	10.0	4.5



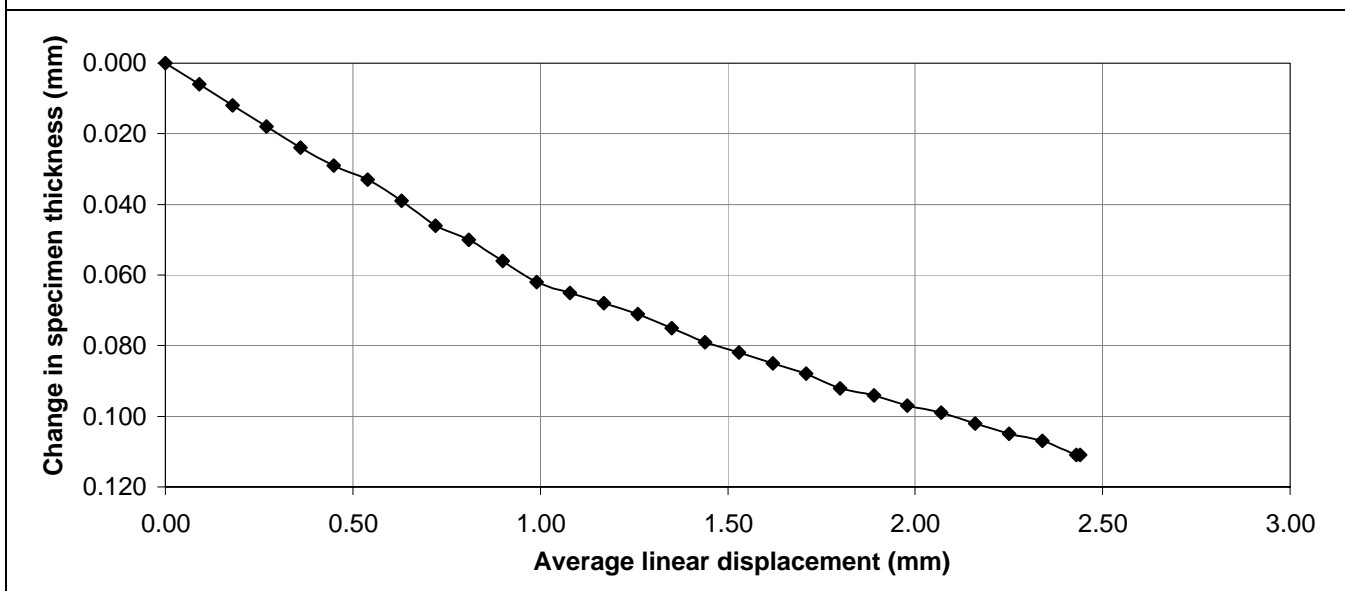
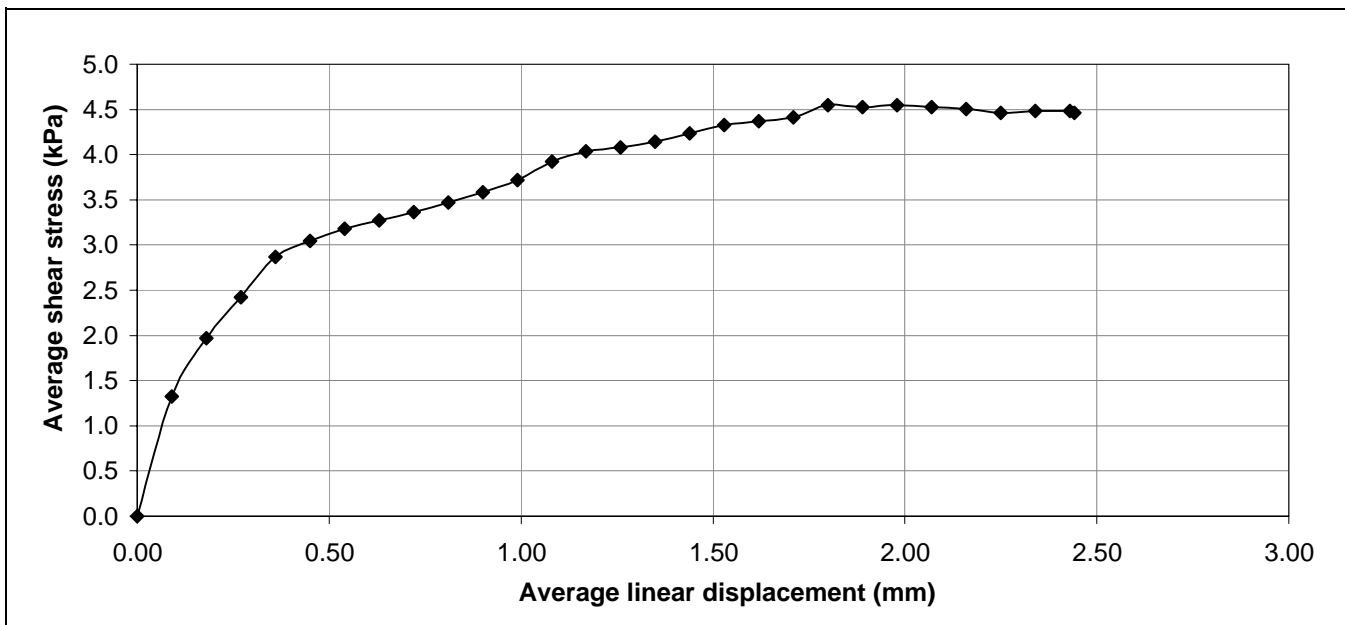
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2		

STAGE 2 **Normal stress (kPa)** **25**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	19/10/2010	Date	21/10/2010	Date	25/11/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2		

STAGE 3 **Normal stress (kPa)** **50**

Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	1.974	0.2	0.000
0.08	1.978	0.3	0.004
0.13	1.980	0.4	0.006
0.21	1.988	0.5	0.014
0.32	1.990	0.6	0.016
0.51	1.994	0.7	0.020
0.81	1.996	0.9	0.022
1.29	1.998	1.1	0.024
2.05	2.000	1.4	0.026
3.25	2.003	1.8	0.029
5.17	2.009	2.3	0.035
8.21	2.025	2.9	0.051
13.06	2.043	3.6	0.069
20.76	2.064	4.6	0.090
33.01	2.076	5.7	0.102
52.47	2.092	7.2	0.118
83.44	2.116	9.1	0.142
132.66	2.129	11.5	0.155
210.92	2.129	14.5	0.155
335.37	2.128	18.3	0.154
533.23	2.128	23.1	0.154
780.70	2.128	27.9	0.154



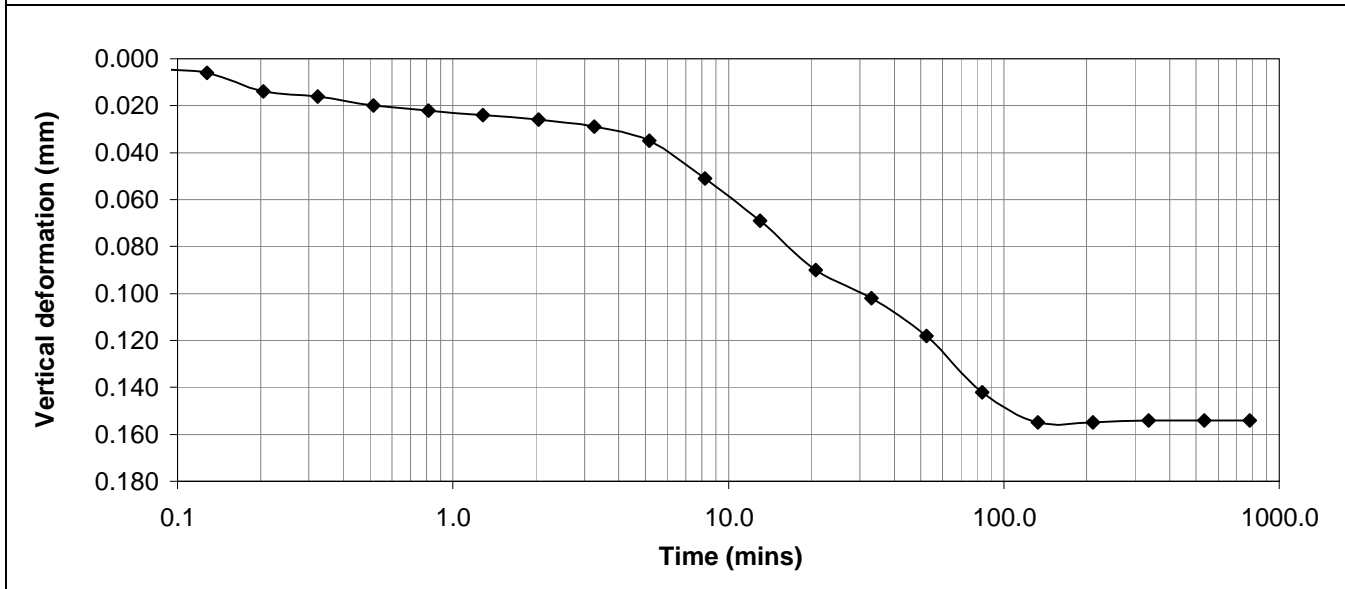
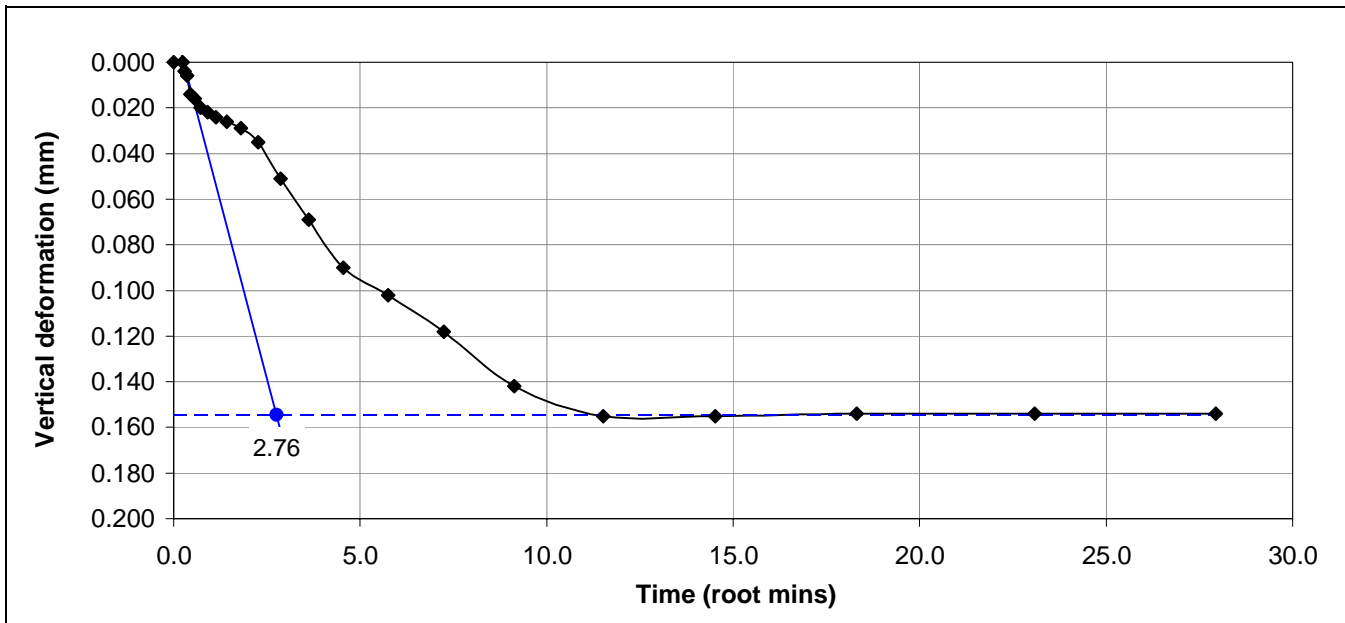
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2		

STAGE 3 **Normal stress (kPa)** **50**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	19/10/2010	Date	21/10/2010	Date	25/11/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2		

STAGE 3 **Normal stress (kPa)** **50**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
0.02	2.138	0.0	-0.1	0.0	0.00	0.000	0.0	0.0
5.00	2.140	8.4	9.8	0.1	0.09	0.002	9.2	4.1
10.00	2.143	11.6	13.5	0.2	0.18	0.005	12.6	5.6
15.00	2.147	13.6	15.5	0.4	0.27	0.009	14.6	6.5
20.00	2.151	14.9	17.3	0.5	0.36	0.013	16.2	7.2
25.00	2.156	15.5	18.1	0.6	0.45	0.018	16.9	7.6
30.00	2.162	15.6	18.1	0.7	0.54	0.024	16.9	7.6
35.00	2.170	16.2	18.8	0.8	0.63	0.032	17.6	7.9
40.00	2.178	16.2	18.9	1.0	0.72	0.040	17.6	7.9
45.00	2.185	16.8	19.7	1.1	0.81	0.047	18.3	8.2
50.00	2.189	17.0	20.1	1.2	0.90	0.051	18.6	8.3
55.00	2.194	17.6	21.0	1.3	0.99	0.056	19.4	8.7
60.00	2.198	17.5	21.0	1.5	1.08	0.060	19.3	8.6
65.00	2.202	17.9	21.6	1.6	1.17	0.064	19.8	8.9
70.00	2.209	17.9	21.8	1.7	1.26	0.071	19.9	8.9
75.00	2.215	18.0	22.1	1.8	1.35	0.077	20.1	9.0
80.00	2.219	18.0	22.3	1.9	1.44	0.081	20.2	9.1
85.00	2.222	18.4	23.0	2.1	1.53	0.084	20.8	9.3
90.00	2.226	18.4	23.2	2.2	1.62	0.088	20.9	9.3
95.00	2.230	18.6	23.5	2.3	1.71	0.092	21.1	9.5
100.00	2.236	18.8	23.7	2.4	1.80	0.098	21.3	9.5
105.00	2.241	19.2	24.2	2.5	1.89	0.103	21.8	9.7
110.00	2.244	19.4	24.6	2.7	1.98	0.106	22.1	9.9
115.00	2.246	19.7	24.9	2.8	2.07	0.108	22.4	10.0
120.00	2.248	19.7	25.0	2.9	2.16	0.110	22.4	10.0
125.00	2.251	19.4	25.1	3.0	2.25	0.113	22.3	10.0
130.00	2.252	18.8	24.8	3.2	2.34	0.114	21.9	9.8



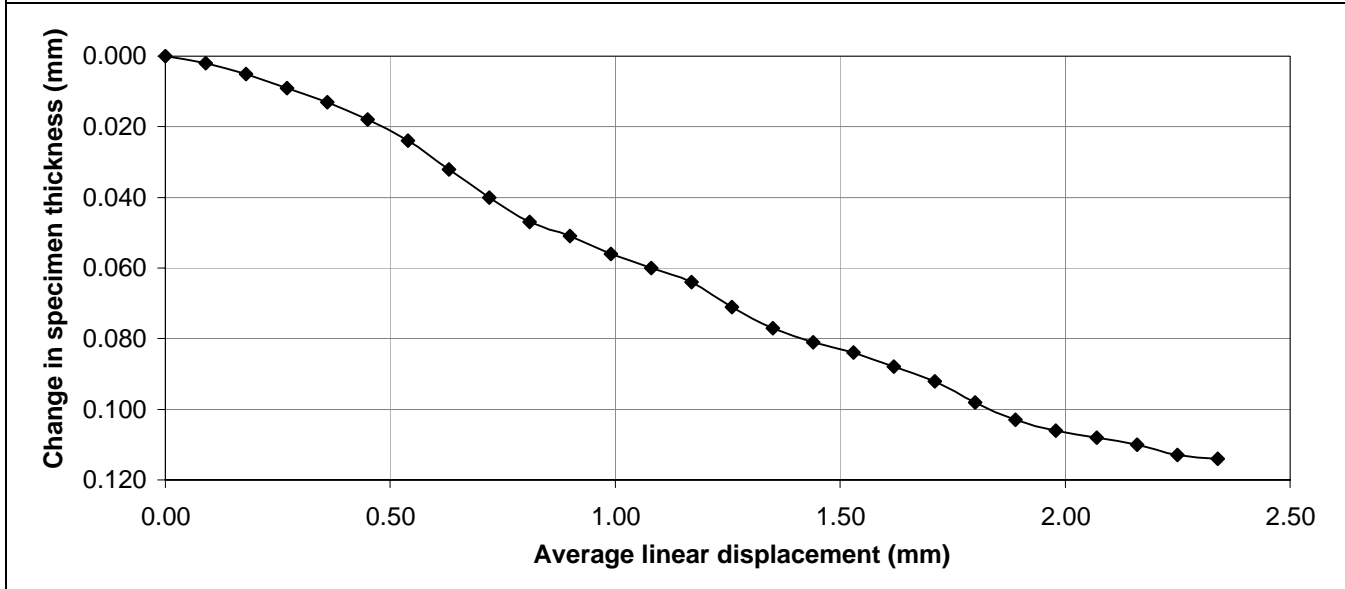
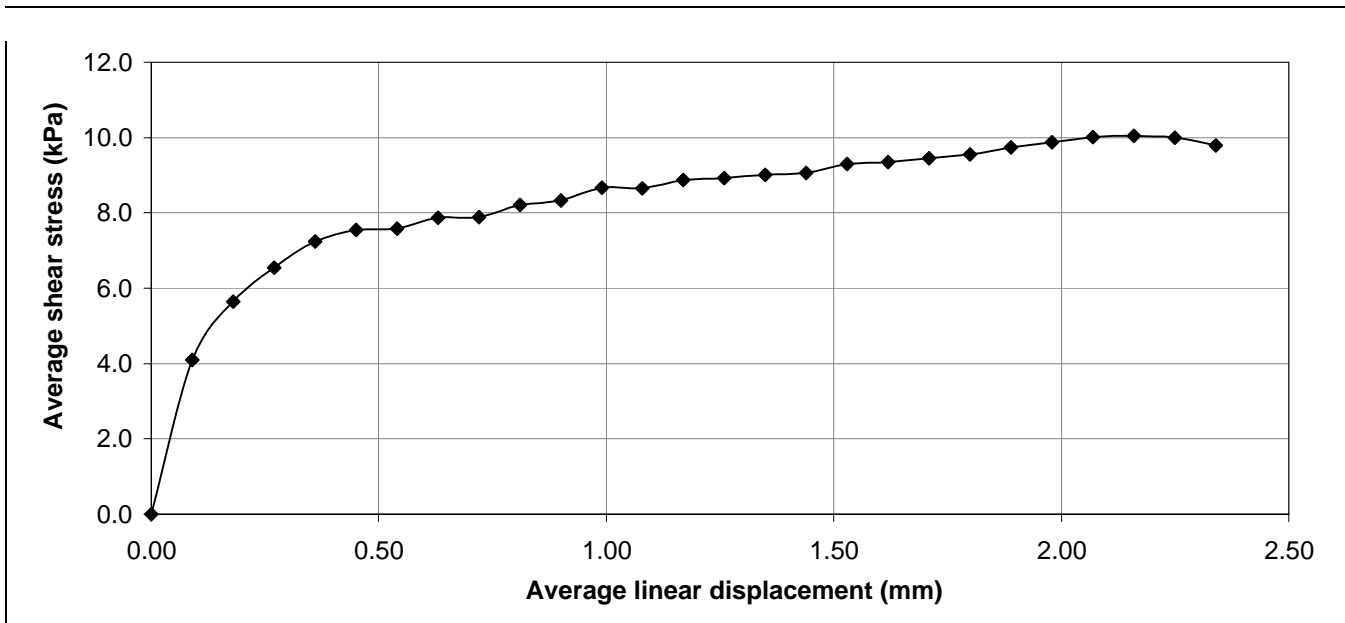
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	9.50/9.90
Borehole number	17	Sample type	Remoulded
Sample number	2		

STAGE 3 **Normal stress (kPa)** **50**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	20/10/2010	Date	21/10/2010	Date	No. 2541/2010

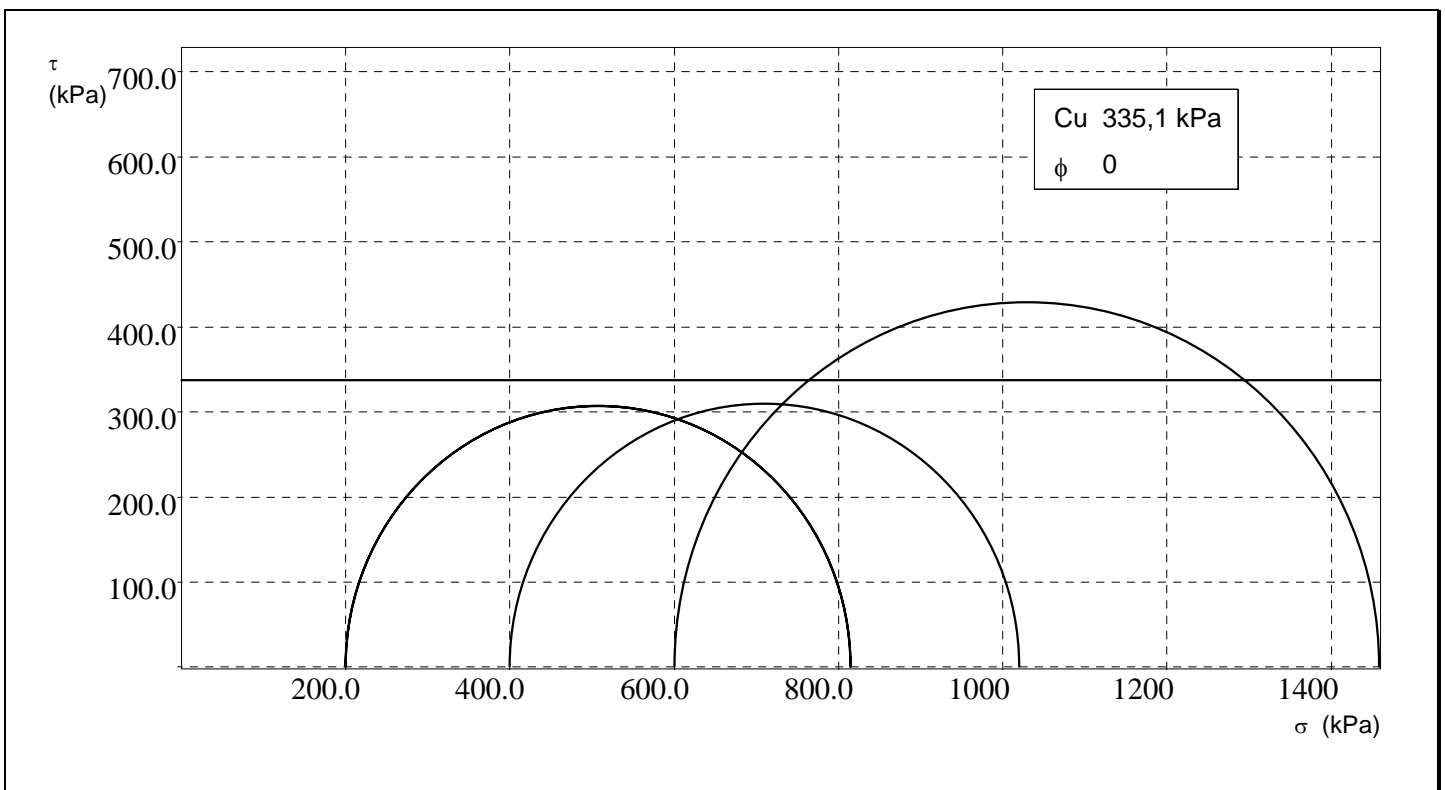
PROVA TRIASSIALE UU (ASTM D2850)

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Poggio Tre Vescovi
Sondaggio	17
Campione	2
Profondità	9.50-9.90

Risultati di prova

Provino	Ho mm	Ao cm ²	γ_n g/cm ³	γ_d g/cm ³	Wo %	So %	σ kPa	ϵ %	$\sigma_1 - \sigma_3$ kPa
10UU903A	76,00	11,39	2,036	1,808	12,61	65,23	200,00	5,71	614,66
10UU903B	76,00	11,39	2,037	1,816	12,20	63,90	400,00	12,38	620,18
10UU903C	76,00	11,39	2,063	1,860	10,93	61,42	600,00	7,73	857,80



Il Direttore del Laboratorio

[Signature]

Lo Sperimentatore

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01	09/02/06	Farinelli A.	Sfalanga A.



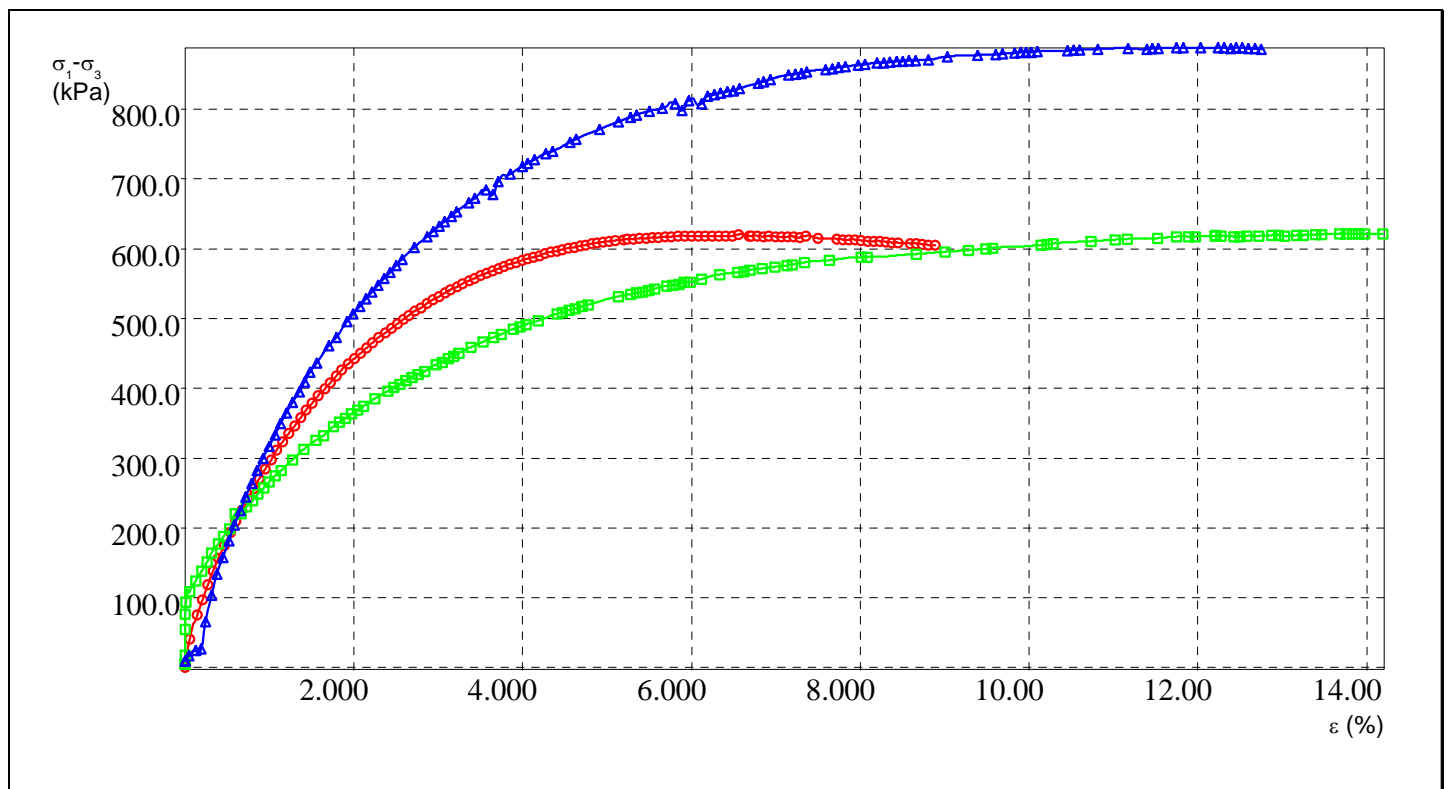
PROVA TRIASSIALE UU (ASTM D2850)

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Poggio Tre Vescovi
Sondaggio	17
Campione	2
Profondità	9.50-9.90

Risultati di prova

Provino	Ho mm	Ao cm ²	γ_n g/cm ³	γ_d g/cm ³	Wo %	So %	σ kPa	ϵ %	$\sigma_1 - \sigma_3$ kPa
10UU903A	76,00	11,39	2,036	1,808	12,61	65,23	200,00	5,71	614,66
10UU903B	76,00	11,39	2,037	1,816	12,20	63,90	400,00	12,38	620,18
10UU903C	76,00	11,39	2,063	1,860	10,93	61,42	600,00	7,73	857,80



Il Direttore del Laboratorio

Lo Sperimentatore

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01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino A

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Poggio Tre Vescovi
Sondaggio	17
Campione	2
Profondità	9.50-9.90

Dati del provino

Data del sondaggio		Densità umida iniziale	2,036 g/cm ³ γ_n
Sezione provino	11,394 cm ²	Densità umida finale	2,220 g/cm ³ γ_f
Altezza iniziale	76,000 mm	Densità secca	1,808 g/cm ³ γ_d
Altezza finale	69,195 mm	Umidità iniziale	12,605 % W_o
No. Tara 1	1	Umidità finale	11,762 % W_f
Peso tara 1	10,000 g	Saturazione iniziale	65,227 % S_o
Tara + peso umido iniziale	186,34 g	Saturazione finale	81,831 % S_f
No. Tara 2	46	Indice dei vuoti iniziale	0,537 e_o
Peso tara 2	31,320 g	Indice dei vuoti finale	0,400 e_f
Tara + peso umido finale	206,340 g	Densità secca finale	1,986 g/cm ³ γ_{df}
Tara + peso secco	187,920 g		
Peso specifico dei grani	2,780 g/cm ³		

Elaborazione dati acquisiti

Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa
0,00	11,39	0,47	1,79	11,60	417,11	3,65	11,83	567,72
0,06	11,40	40,50	1,86	11,61	425,89	3,72	11,83	571,39
0,14	11,41	75,02	1,94	11,62	434,38	3,78	11,84	574,20
0,21	11,42	97,45	2,01	11,63	442,44	3,86	11,85	577,63
0,27	11,42	118,42	2,08	11,64	450,46	3,93	11,86	580,40
0,33	11,43	137,95	2,15	11,64	458,03	4,00	11,87	583,16
0,40	11,44	156,75	2,23	11,65	465,54	4,06	11,88	585,49
0,47	11,45	175,27	2,30	11,66	472,84	4,13	11,89	587,80
0,54	11,46	192,83	2,37	11,67	479,42	4,20	11,89	589,86
0,60	11,46	209,43	2,44	11,68	486,01	4,27	11,90	592,65
0,67	11,47	225,05	2,52	11,69	492,35	4,34	11,91	594,69
0,75	11,48	240,89	2,59	11,70	498,69	4,41	11,92	596,54
0,81	11,49	256,00	2,66	11,71	504,56	4,48	11,93	598,60
0,88	11,50	270,63	2,73	11,71	510,41	4,54	11,94	600,45
0,95	11,50	284,52	2,80	11,72	515,56	4,62	11,95	602,00
1,02	11,51	297,68	2,87	11,73	521,18	4,68	11,95	603,40
1,09	11,52	311,08	2,94	11,74	526,55	4,75	11,96	604,99
1,16	11,53	323,51	3,01	11,75	531,45	4,82	11,97	606,81
1,23	11,54	335,21	3,08	11,76	536,36	4,89	11,98	607,97
1,30	11,54	346,20	3,15	11,76	541,04	4,96	11,99	609,31
1,37	11,55	357,65	3,22	11,77	545,66	5,03	12,00	610,24
1,44	11,56	369,08	3,29	11,78	549,64	5,10	12,01	611,10
1,51	11,57	378,86	3,37	11,79	553,55	5,20	12,02	612,27
1,58	11,58	389,33	3,44	11,80	557,28	5,24	12,02	613,32
1,66	11,59	399,27	3,51	11,81	561,44	5,32	12,03	613,97
1,72	11,59	408,31	3,58	11,82	565,15	5,39	12,04	614,85

Il Direttore del Laboratorio

Lo Sperimentatore

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01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino A

Epsilon %	A cm2	s1-s3 kPa
5,47	12,05	615,24
5,54	12,06	615,92
5,61	12,07	616,09
5,69	12,08	617,16
5,77	12,09	617,10
5,84	12,10	617,72
5,92	12,11	617,86
6,00	12,12	617,99
6,08	12,13	617,93
6,16	12,14	618,04
6,24	12,15	618,41
6,33	12,16	618,31
6,41	12,17	618,22
6,49	12,18	618,14
6,56	12,19	620,67
6,68	12,21	618,17
6,71	12,21	617,56
6,78	12,22	617,97
6,85	12,23	617,27
6,92	12,24	617,47
7,00	12,25	617,19
7,07	12,26	616,49
7,14	12,27	616,47
7,21	12,28	616,41
7,28	12,29	616,18
7,35	12,30	617,95
7,50	12,32	614,94
7,72	12,35	613,23
7,79	12,36	612,78
7,86	12,37	612,52
7,94	12,38	612,02
8,01	12,39	611,09
8,09	12,40	610,83
8,16	12,41	610,12
8,24	12,42	610,06
8,31	12,43	609,78
8,38	12,44	608,44
8,45	12,45	608,23
8,59	12,47	607,24
8,66	12,47	606,80
8,74	12,48	605,86
8,81	12,49	605,17
8,88	12,51	604,66
8,95	12,51	603,33

Restituzione fotografica dopo la prova



Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

PROVA TRIASSIALE UU (ASTM D2850)

Provino A

Dati del Cliente

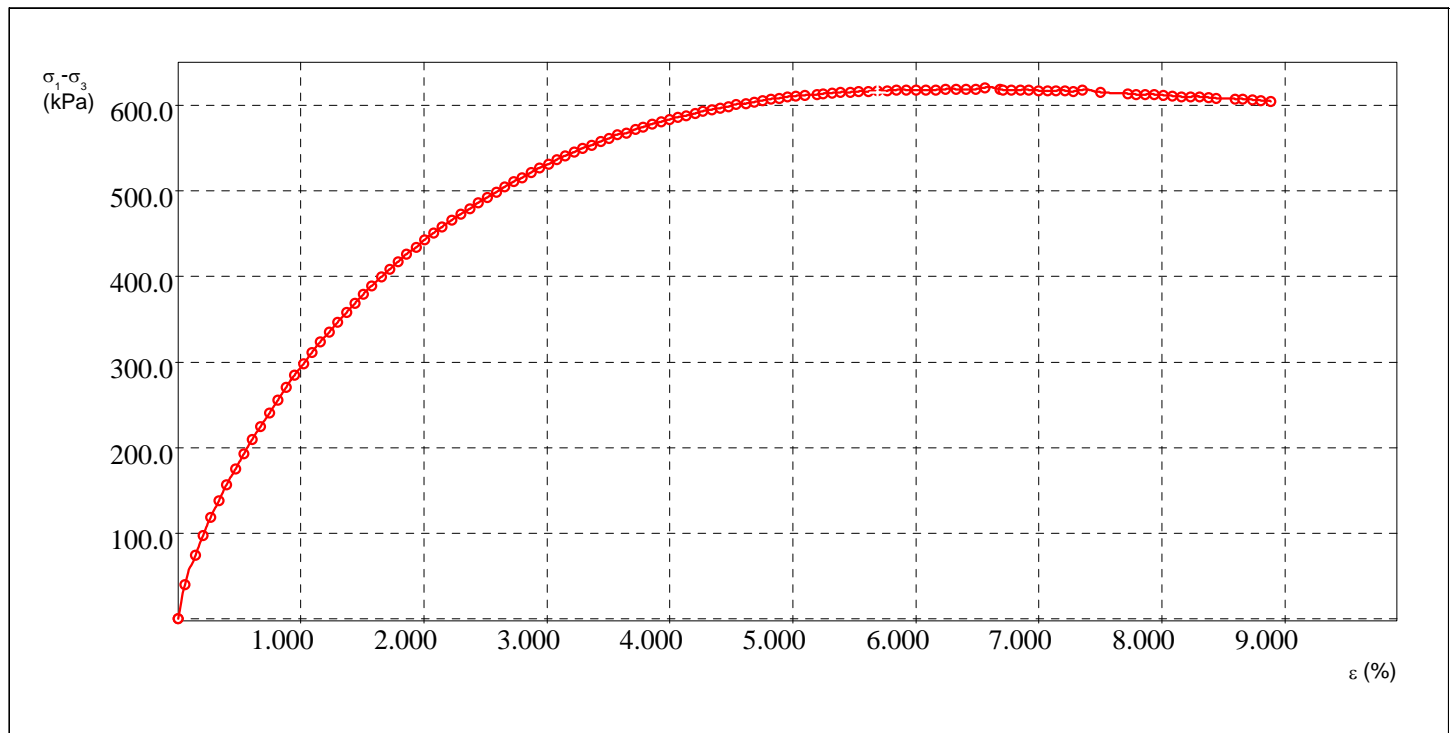
Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Poggio Tre Vescovi
Sondaggio	17
Campione	2
Profondità	9.50-9.90

Dati acquisiti

dH mm	dN N
0,00	0,54
0,05	46,18
0,11	85,60
0,16	111,26
0,20	135,29
0,25	157,71
0,30	179,31
0,36	200,64
0,41	220,90
0,46	240,07
0,51	258,16
0,57	276,53
0,62	294,08
0,67	311,09
0,72	327,30
0,78	342,69

dH mm	dN N
0,83	358,35
0,88	372,93
0,94	386,71
0,99	399,67
1,04	413,17
1,09	426,67
1,15	438,28
1,20	450,71
1,26	462,59
1,31	473,39
1,36	483,92
1,41	494,45
1,47	504,72
1,52	514,44
1,58	524,16
1,63	533,34

dH mm	dN N
1,69	542,52
1,75	551,43
1,80	559,54
1,86	567,64
1,91	575,47
1,97	583,30
2,02	590,59
2,07	597,88
2,13	604,36
2,18	611,38
2,24	618,14
2,29	624,35
2,34	630,56
2,39	636,50
2,45	642,44
2,50	647,57



Il Direttore del Laboratorio

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Lo Sperimentatore

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rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino A

dH mm	dN N
2,56	652,70
2,61	657,56
2,67	662,96
2,72	667,82
2,77	671,33
2,83	676,20
2,88	679,98
2,93	684,57
2,99	688,35
3,04	692,13
3,09	695,37
3,14	698,61
3,20	701,58
3,24	705,36
3,30	708,33
3,35	711,03
3,40	714,00
3,45	716,70
3,51	719,13
3,56	721,29
3,61	723,72
3,66	726,42
3,71	728,31
3,77	730,47
3,82	732,10
3,88	733,72
3,95	735,88
3,99	737,50
4,04	738,85
4,10	740,47
4,16	741,55
4,21	742,90
4,27	743,71
4,32	745,60
4,38	746,14
4,44	747,49
4,50	748,30
4,56	749,11
4,62	749,65
4,69	750,46
4,74	751,54

dH mm	dN N
4,93	753,16
4,99	756,86
5,08	754,78
5,10	754,24
5,15	755,32
5,21	755,05
5,26	755,86
5,32	756,13
5,37	755,86
5,43	756,40
5,48	756,94
5,53	757,21
5,59	759,98
5,70	757,48
5,87	757,21
5,92	757,21
5,98	757,48
6,03	757,48
6,09	756,94
6,15	757,21
6,20	756,94
6,26	757,48
6,32	757,75
6,37	756,67
6,42	756,94
6,53	756,94
6,58	756,94
6,64	756,40
6,69	756,13
6,75	756,13
6,81	755,05

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino B

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Poggio Tre Vescovi
Sondaggio	17
Campione	2
Profondità	9.50-9.90

Dati del provino

Data del sondaggio		Densità umida iniziale	2,037 g/cm ³	γ_n
Sezione provino	11,394 cm ²	Densità umida finale	2,365 g/cm ³	γ_f
Altezza iniziale	76,000 mm	Densità secca	1,816 g/cm ³	γ_d
Altezza finale	65,167 mm	Umidità iniziale	12,204 %	W_0
No. Tara 1	1	Umidità finale	11,664 %	W_f
Peso tara 1	10,000 g	Saturazione iniziale	63,896 %	S_0
Tara + peso umido iniziale	186,43 g	Saturazione finale	103,674	S_f
No. Tara 2	1	Indice dei vuoti iniziale	0,531	e_0
Peso tara 2	28,470 g	Indice dei vuoti finale	0,313	e_f
Tara + peso umido finale	204,050 g	Densità secca finale	2,118 g/cm ³	γ_{df}
Tara + peso secco	185,710 g			
Peso specifico dei grani	2,780 g/cm ³			

Elaborazione dati acquisiti

Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa
0,00	11,39	4,98	1,76	11,60	344,85	4,18	11,89	496,66
0,00	11,39	18,14	1,83	11,61	351,34	4,41	11,92	505,92
0,00	11,39	54,99	1,90	11,61	357,36	4,48	11,93	508,72
0,00	11,39	76,08	1,97	11,62	363,59	4,55	11,94	511,47
0,01	11,40	93,61	2,04	11,63	368,92	4,63	11,95	514,25
0,06	11,40	109,20	2,12	11,64	374,67	4,70	11,96	516,78
0,13	11,41	124,04	2,26	11,66	385,25	4,78	11,97	518,86
0,20	11,42	138,14	2,40	11,67	396,01	5,14	12,01	530,84
0,26	11,42	151,52	2,48	11,68	400,80	5,28	12,03	534,52
0,32	11,43	164,19	2,55	11,69	405,81	5,35	12,04	536,58
0,39	11,44	176,58	2,62	11,70	410,59	5,42	12,05	537,97
0,46	11,45	188,26	2,69	11,71	415,35	5,49	12,06	540,49
0,53	11,45	199,21	2,76	11,72	419,89	5,57	12,07	542,07
0,60	11,46	220,53	2,84	11,73	424,39	5,71	12,08	546,17
0,66	11,47	220,13	2,98	11,74	433,67	5,78	12,09	547,35
0,73	11,48	229,87	3,05	11,75	437,50	5,85	12,10	549,16
0,80	11,49	239,35	3,12	11,76	442,01	5,92	12,11	551,43
0,87	11,49	248,35	3,18	11,77	446,07	5,99	12,12	552,37
0,93	11,50	257,33	3,25	11,78	450,36	6,12	12,14	556,02
1,00	11,51	265,61	3,39	11,79	458,40	6,34	12,16	562,30
1,07	11,52	274,34	3,53	11,81	465,95	6,55	12,19	566,12
1,14	11,53	281,64	3,66	11,83	473,35	6,62	12,20	567,24
1,27	11,54	297,17	3,75	11,84	477,47	6,69	12,21	568,78
1,41	11,56	312,18	3,89	11,86	484,50	6,84	12,23	571,00
1,55	11,57	325,26	3,97	11,86	487,52	6,99	12,25	573,62
1,65	11,58	331,94	4,04	11,87	490,79	7,13	12,27	575,57

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino B

Epsilon %	A cm2	s1-s3 kPa
7,20	12,28	576,92
7,34	12,30	579,55
7,64	12,34	583,39
8,01	12,39	587,38
8,08	12,40	587,99
8,66	12,47	592,30
9,01	12,52	595,23
9,28	12,56	597,73
9,49	12,59	599,60
9,56	12,60	600,15
10,14	12,68	605,49
10,21	12,69	605,64
10,29	12,70	607,05
10,73	12,76	610,19
11,02	12,80	612,45
11,17	12,83	613,10
11,52	12,88	615,04
11,75	12,91	616,41
11,89	12,93	616,86
11,97	12,94	616,73
12,20	12,98	617,63
12,28	12,99	618,13
12,21	12,98	619,00
12,42	13,01	617,31
12,50	13,02	617,39
12,58	13,03	617,85
12,72	13,05	618,51
12,87	13,08	618,88
12,95	13,09	618,52
13,02	13,10	618,41
13,17	13,12	619,03
13,25	13,13	619,10
13,39	13,16	620,11
13,46	13,17	620,21
13,68	13,20	621,12
13,76	13,21	620,77
13,83	13,22	621,26
13,90	13,23	621,54
13,97	13,24	621,05
14,19	13,28	620,94
14,25	13,29	621,05

Restituzione fotografica dopo la prova



Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

PROVA TRIASSIALE UU (ASTM D2850)

Provino B

Dati del Cliente

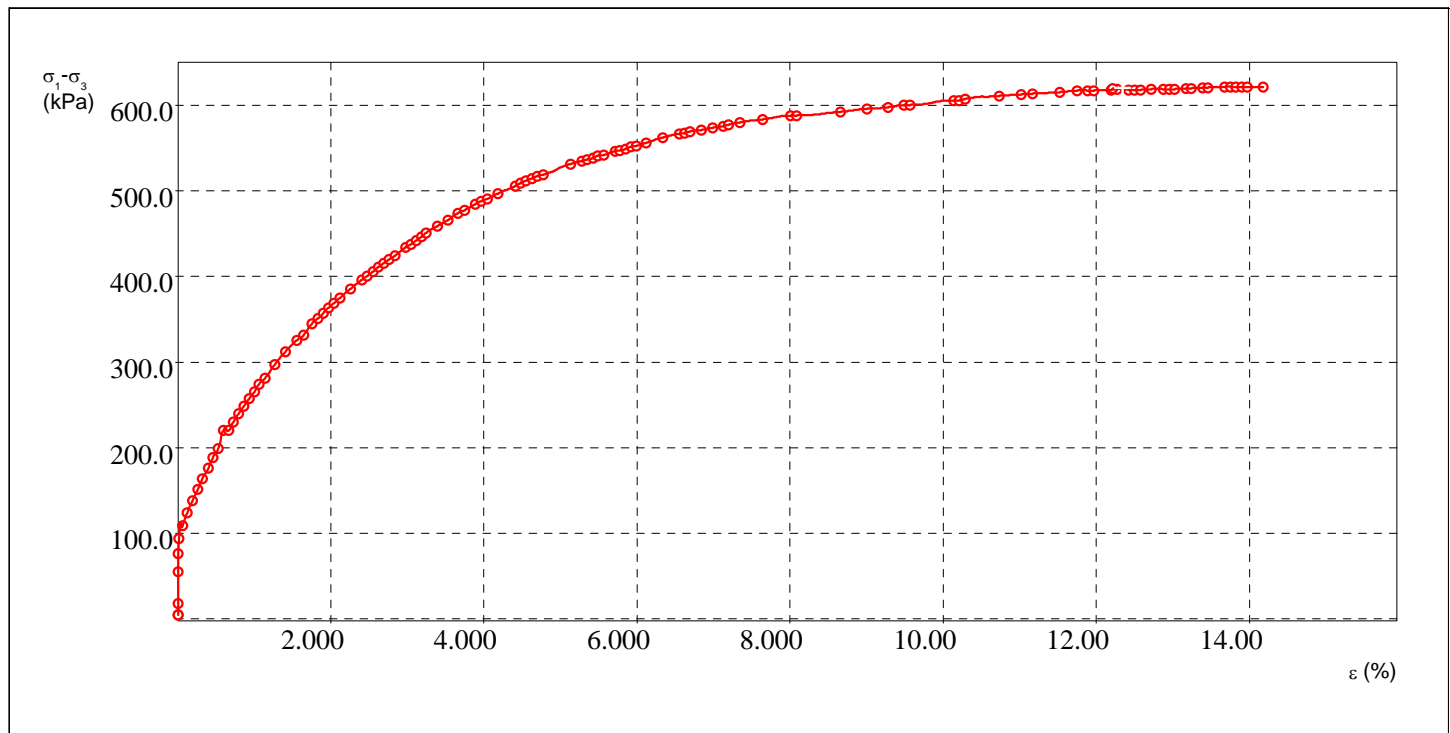
Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Poggio Tre Vescovi
Sondaggio	17
Campione	2
Profondità	9.50-9.90

Dati acquisiti

dH mm	dN N
0,00	5,67
0,00	20,67
0,00	62,65
0,00	86,68
0,01	106,67
0,05	124,49
0,10	141,50
0,15	157,71
0,20	173,10
0,24	187,68
0,30	201,99
0,35	215,50
0,40	228,19
0,45	252,78
0,50	252,49
0,55	263,84

dH mm	dN N
0,61	274,91
0,66	285,44
0,71	295,97
0,76	305,69
0,81	315,95
0,86	324,60
0,97	342,96
1,07	360,78
1,18	376,44
1,25	384,55
1,33	399,94
1,39	407,77
1,44	415,06
1,50	422,62
1,55	429,10
1,61	436,12

dH mm	dN N
1,71	449,09
1,83	462,32
1,88	468,26
1,94	474,47
1,99	480,41
2,05	486,35
2,10	492,02
2,16	497,70
2,27	509,31
2,32	514,17
2,37	519,84
2,42	524,97
2,47	530,37
2,58	540,63
2,69	550,35
2,78	559,81



Il Direttore del Laboratorio



Lo Sperimentatore



rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino B

dH mm	dN N
2,85	565,21
2,96	574,39
3,02	578,44
3,07	582,76
3,18	590,59
3,35	603,01
3,40	606,79
3,46	610,57
3,52	614,36
3,57	617,87
3,63	620,84
3,90	637,58
4,01	642,98
4,07	645,95
4,12	648,11
4,17	651,62
4,23	654,05
4,34	659,99
4,39	661,88
4,44	664,58
4,50	667,82
4,55	669,44
4,65	674,85
4,82	684,03
4,98	690,24
5,03	692,13
5,09	694,56
5,20	698,34
5,31	702,66
5,42	706,17
5,47	708,33
5,58	712,65
5,80	719,67
6,08	727,50
6,14	728,85
6,58	738,85
6,84	745,33
7,05	750,73
7,21	754,78
7,27	756,13
7,71	767,74

dH mm	dN N
8,15	778,81
8,37	784,21
8,49	786,37
8,76	792,05
8,93	795,83
9,04	797,72
9,10	798,26
9,27	801,50
9,33	802,85
9,28	803,39
9,44	803,12
9,50	803,93
9,56	805,28
9,67	807,44
9,78	809,33
9,84	809,60
9,90	810,14
10,01	812,30
10,07	813,11
10,18	815,81
10,23	816,62
10,40	819,86
10,46	820,13
10,51	821,48
10,57	822,56
10,62	822,56
10,78	824,45
10,83	825,26

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino C

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Poggio Tre Vescovi
Sondaggio	17
Campione	2
Profondità	9.50-9.90

Dati del provino

Data del sondaggio		Densità umida iniziale	2,063 g/cm ³ γ_n
Sezione provino	11,394 cm ²	Densità umida finale	2,357 g/cm ³ γ_f
Altezza iniziale	76,000 mm	Densità secca	1,860 g/cm ³ γ_d
Altezza finale	66,261 mm	Umidità iniziale	10,927 % W_0
No. Tara 1	1	Umidità finale	10,461 % W_f
Peso tara 1	10,000 g	Saturazione iniziale	61,419 % S_0
Tara + peso umido iniziale	188,67 g	Saturazione finale	95,963 % S_f
No. Tara 2	9	Indice dei vuoti iniziale	0,495 e_0
Peso tara 2	28,850 g	Indice dei vuoti finale	0,303 e_f
Tara + peso umido finale	206,770 g	Densità secca finale	2,133 g/cm ³ γ_{df}
Tara + peso secco	189,920 g		
Peso specifico dei grani	2,780 g/cm ³		

Elaborazione dati acquisiti

Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa
0,00	11,39	9,01	1,92	11,62	495,60	4,28	11,90	736,41
0,05	11,40	16,35	1,99	11,63	506,62	4,35	11,91	739,70
0,13	11,41	23,91	2,07	11,63	517,59	4,56	11,94	752,59
0,19	11,42	26,02	2,14	11,64	528,10	4,63	11,95	756,98
0,25	11,42	65,25	2,21	11,65	537,93	4,91	11,98	771,22
0,32	11,43	103,95	2,29	11,66	547,47	5,13	12,01	781,79
0,38	11,44	133,40	2,36	11,67	557,71	5,28	12,03	787,96
0,45	11,45	158,08	2,43	11,68	566,34	5,35	12,04	790,77
0,52	11,45	181,55	2,50	11,69	576,06	5,50	12,06	796,21
0,58	11,46	203,81	2,58	11,70	584,63	5,65	12,08	801,41
0,65	11,47	224,39	2,72	11,71	601,30	5,81	12,10	807,00
0,72	11,48	244,00	2,87	11,73	616,48	5,89	12,11	798,18
0,79	11,48	263,82	2,94	11,74	624,32	5,97	12,12	811,47
0,85	11,49	281,98	3,01	11,75	631,91	6,12	12,14	807,57
0,93	11,50	299,62	3,08	11,76	638,82	6,19	12,15	818,38
1,00	11,51	317,01	3,15	11,77	645,91	6,27	12,16	820,17
1,07	11,52	333,43	3,22	11,77	653,04	6,35	12,17	822,39
1,13	11,52	349,37	3,36	11,79	666,04	6,42	12,18	824,81
1,20	11,53	364,82	3,43	11,80	672,42	6,50	12,19	825,94
1,27	11,54	379,54	3,57	11,82	684,04	6,57	12,20	828,82
1,36	11,55	395,34	3,65	11,83	677,49	6,79	12,22	836,84
1,42	11,56	409,13	3,71	11,83	696,49	6,86	12,23	838,87
1,48	11,57	423,32	3,86	11,85	707,08	6,93	12,24	842,17
1,56	11,57	436,29	4,00	11,87	717,41	7,15	12,27	848,30
1,70	11,59	461,29	4,06	11,88	722,37	7,23	12,28	849,60
1,79	11,60	472,51	4,14	11,89	727,03	7,30	12,29	851,13

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino C

Epsilon %	A cm2	s1-s3 kPa
7,37	12,30	852,73
7,59	12,33	856,55
7,67	12,34	856,98
7,74	12,35	859,33
7,82	12,36	860,34
7,98	12,38	862,36
8,05	12,39	863,42
8,20	12,41	865,74
8,28	12,42	865,87
8,35	12,43	867,12
8,43	12,44	867,86
8,50	12,45	868,71
8,58	12,46	869,11
8,66	12,47	869,64
8,81	12,49	870,55
9,03	12,52	874,29
9,39	12,57	877,04
9,60	12,60	878,19
9,68	12,62	878,71
9,82	12,64	879,90
9,90	12,65	880,69
9,96	12,65	880,89
10,03	12,66	881,31
10,10	12,67	882,12
10,46	12,72	883,71
10,53	12,73	884,49
10,60	12,75	884,19
10,81	12,78	885,89
11,17	12,83	886,30
11,40	12,86	885,95
11,46	12,87	886,16
11,53	12,88	886,31
11,75	12,91	887,90
11,82	12,92	887,78
12,03	12,95	887,34
12,24	12,98	887,73
12,31	12,99	887,61
12,39	13,01	886,24
12,45	13,01	887,25
12,52	13,03	887,16
12,60	13,04	887,00
12,68	13,05	887,05
12,74	13,06	885,53
12,81	13,07	885,84

Restituzione fotografica dopo la prova



Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

PROVA TRIASSIALE UU (ASTM D2850)

Provino C

Dati del Cliente

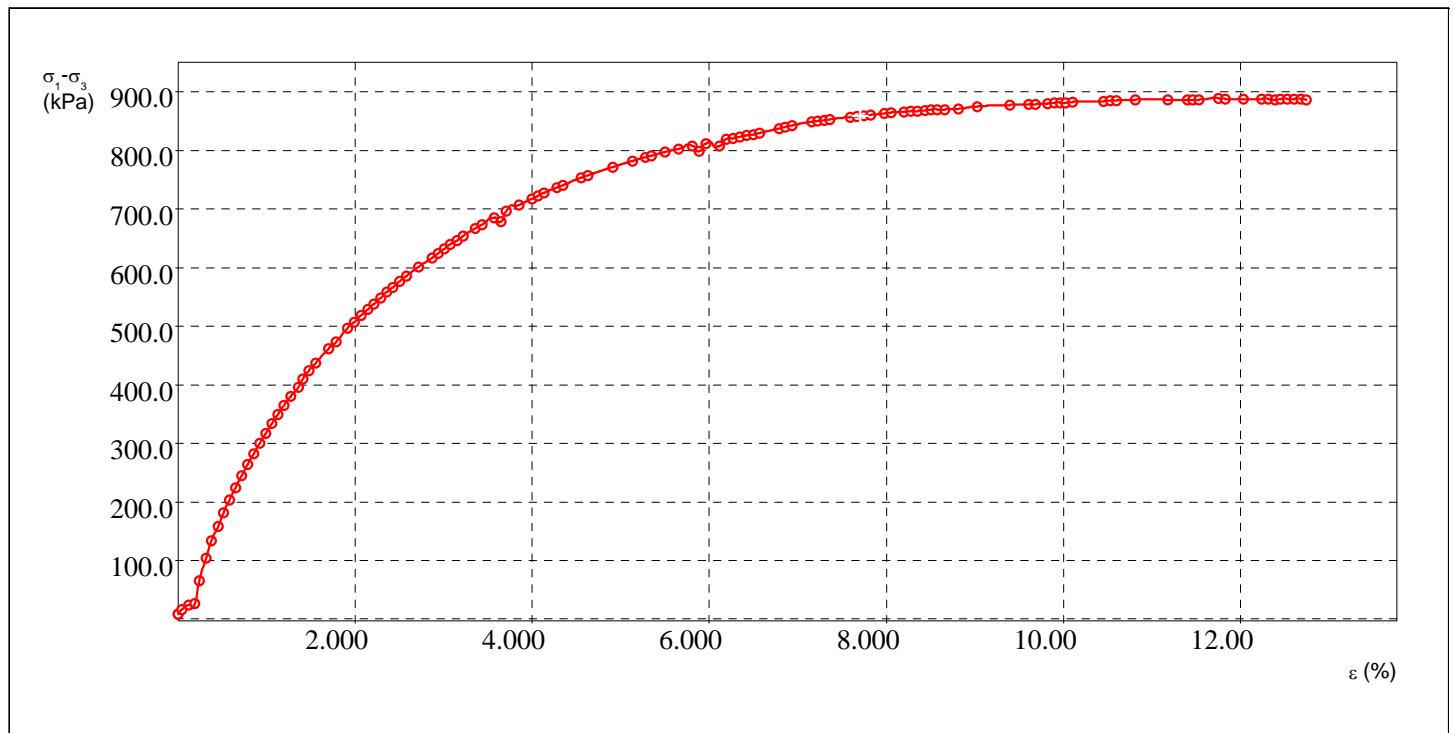
Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Poggio Tre Vescovi
Sondaggio	17
Campione	2
Profondità	9.50-9.90

Dati acquisiti

dH mm	dN N
0,00	10,26
0,03	18,63
0,10	27,27
0,14	29,71
0,19	74,53
0,24	118,82
0,29	152,58
0,34	180,93
0,39	207,94
0,44	233,59
0,50	257,35
0,55	280,04
0,60	302,99
0,65	324,06
0,70	344,58
0,76	364,83

dH mm	dN N
0,81	384,01
0,86	402,64
0,91	420,73
0,97	438,01
1,03	456,65
1,08	472,85
1,13	489,59
1,18	504,99
1,29	534,69
1,36	548,19
1,46	575,74
1,51	588,97
1,57	602,20
1,63	614,90
1,68	626,78
1,74	638,39

dH mm	dN N
1,79	650,81
1,84	661,34
1,90	673,23
1,96	683,76
2,07	704,28
2,18	723,18
2,24	732,91
2,29	742,36
2,34	751,00
2,40	759,91
2,45	768,82
2,56	785,29
2,61	793,40
2,71	808,25
2,77	801,15
2,82	824,18



Il Direttore del Laboratorio



Lo Sperimentatore



rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino C

dH mm	dN N
2,93	837,95
3,04	851,46
3,09	857,94
3,15	864,15
3,25	876,57
3,31	881,16
3,46	898,44
3,52	904,38
3,73	924,10
3,90	938,95
4,01	947,86
4,06	951,91
4,18	960,01
4,30	967,85
4,42	976,22
4,47	966,33
4,53	983,24
4,65	980,10
4,71	994,04
4,76	997,01
4,82	1000,52
4,88	1004,30
4,94	1006,46
4,99	1010,78
5,16	1022,93
5,21	1026,18
5,27	1031,04
5,44	1041,03
5,49	1043,46
5,55	1046,16
5,60	1048,86
5,77	1056,15
5,83	1057,50
5,88	1061,28
5,94	1063,44
6,06	1067,76
6,12	1069,92
6,23	1074,51
6,29	1075,59
6,35	1078,02
6,41	1079,91

dH mm	dN N
6,58	1084,78
6,70	1087,75
6,86	1095,04
7,14	1102,87
7,30	1106,92
7,36	1108,54
7,47	1111,78
7,52	1113,67
7,57	1114,75
7,62	1116,10
7,67	1117,99
7,95	1124,47
8,00	1126,36
8,06	1126,90
8,22	1131,76
8,49	1136,89
8,66	1139,32
8,71	1140,40
8,76	1141,48
8,93	1146,35
8,99	1147,16
9,14	1149,32
9,30	1152,56
9,36	1153,37
9,41	1152,56
9,46	1154,72
9,52	1155,53
9,58	1156,34
9,63	1157,42
9,69	1156,34
9,74	1157,69

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

DESCRIZIONE E RIPRESA FOTOGRAFICA DELLA CAROTA ESTRUSA

Committente: GeoItalia srl - Roma

Cantiere/Località: Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

Sondaggio: 26

Campione: 1

Profondità prelievo: 3.00-3.40

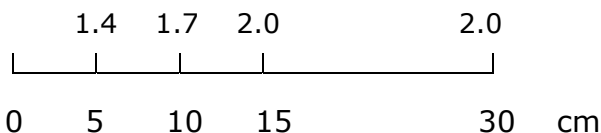
Data prelievo: 20/08/2010

Data apertura: 29/09/2010

Verbale accettazione n° 165

Descrizione: limo con argilla debolmente sabbioso, presenti inclusi di natura argillitica (Raccomandazioni AGI 1977). Argilla limosa (UNI EN ISO 14688-2).
Colore: HUE 5GY VALUE 4 CHROMA 1 (Munsell Soil Color Chart)

Pocket (kg/cm²):



Lunghezza carota: 37 cm
Diametro carota: 88,9 mm



Modalità di prelievo: sondaggio a rotazione

Tipo di fustella: fustella in plastica

Classe di qualità del campione: Q4 (Raccomandazioni AGI 1977)
C2 (Eurocodice 7)

Prove eseguite:

Cont. Acqua W	X	Granulom. Gr	X	T. Residuo TR	X
Peso Volume γ	X	Compress. ELL	-	Triass. TX UU	X
Peso Specifico Gs	X	Edometria Ed	-	Triass. TX CU	-
Limiti Cons. LL	X	T. Diretto TD	X	Triass. TX CD	-



Committente Geotalia srl – Roma **pagina 1 di 2**
Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Norma di riferimento ASTM D5550-00

Data prova	14/10/2010
Data certificato	21/10/2010
Verb. Accettazione	165
N. certificato	2526/2010

AccuPyc II 1340 V1.00 Unit 1 Serial #: 488 Page 1

Sample: VA165_S26_1_m 3,00-3,40
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S26_1.SMP

Analysis Gas: Helium	Analysis Start: 14/10/2010 14.49.41
Reported: 14/10/2010 15.10.44	Analysis End: 14/10/2010 15.10.43
Sample Mass: 9.0400 g	Equilib. Rate: 0.005 psig/min
Temperature: 22.35 °C	Expansion Volume: 9.2248 cm ³
Number of Purges: 5	Cell Volume: 11.8000 cm ³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 26, Campione 1, Prof. (m) 3,00-3,40

Combined Report

Cycle#	Volume (cm ³)	Volume Deviation (cm ³)	Tabular 1		Total Pore Volume (cm ³)	Total Pore Volume Deviation (cm ³)
			Density (g/cm ³)	Density Deviation (g/cm ³)		
1	3.2927	-0.0120	2.7455	0.0099	0.1099	0.0013
2	3.3012	-0.0035	2.7384	0.0029	0.1090	0.0004
3	3.3055	0.0009	2.7348	-0.0007	0.1085	-0.0001
4	3.3073	0.0027	2.7333	-0.0022	0.1083	-0.0003
5	3.3076	0.0030	2.7331	-0.0025	0.1083	-0.0003
6	3.3091	0.0044	2.7319	-0.0037	0.1081	-0.0005
7	3.3091	0.0045	2.7319	-0.0037	0.1081	-0.0005

Summary Data	Average	Standard Deviation
Volume:	3.3046 cm ³	0.0055 cm ³
Density:	2.7356 g/cm ³	0.0046 g/cm ³
Total Pore Volume:	0.1086 cm ³	0.0006 cm ³

Note: _____

Il direttore del Laboratorio

Lo sperimentatore



Committente

Geotalia srl – Roma

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Cantiere

Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Data prova 14/10/2010

Data certificato 21/10/2010

Verb. Accettazione 165

N. certificato 2526/2010

Norma di riferimento ASTM D5550-00

AccuPyc II 1340 V1.00

Unit 1

Serial # 488

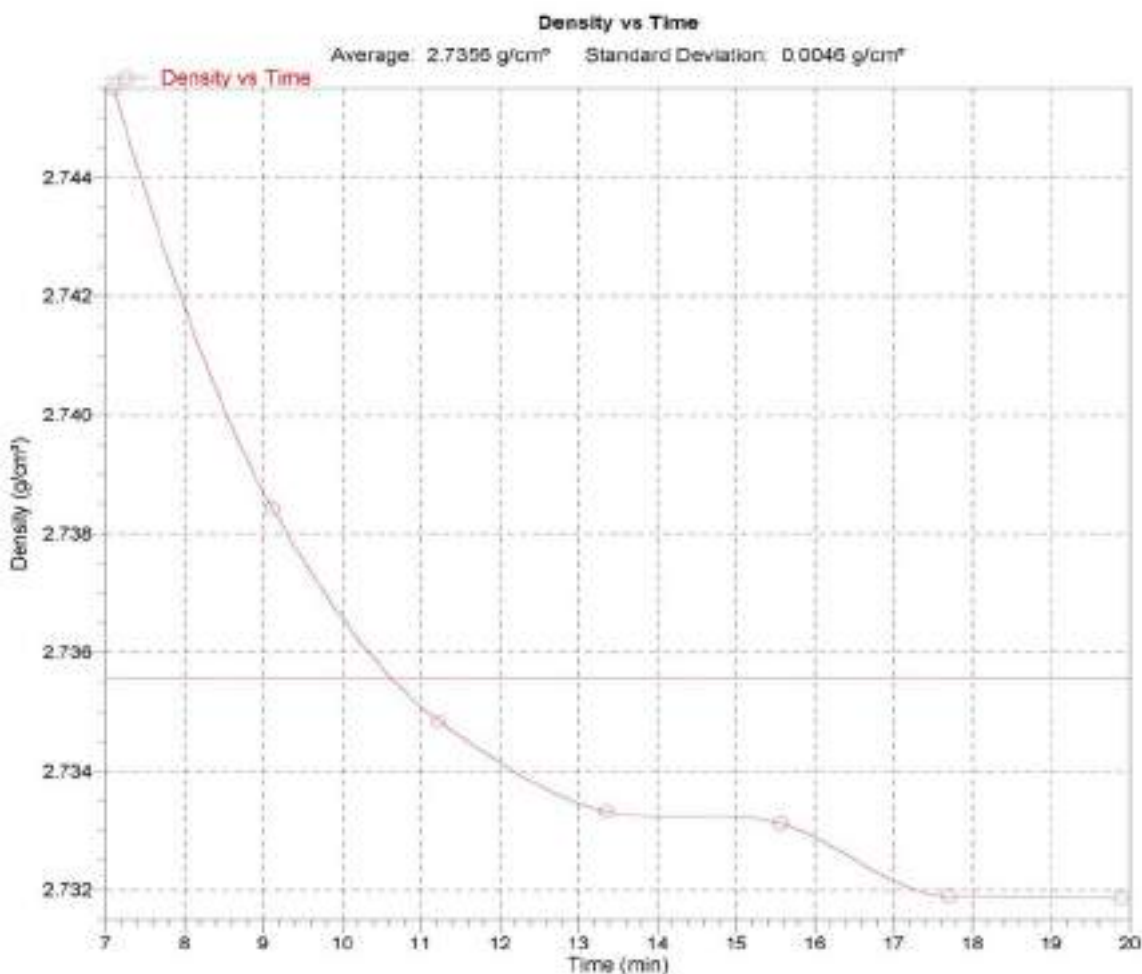
Page 2

Sample: VA165_S26_1_m 3,00-3,40
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S26_1.SMP

Analysis Gas: Helium
 Reported: 14/10/2010 15.10.44
 Sample Mass: 9.0400 g
 Temperature: 22.35 °C
 Number of Purges: 5

Analysis Start: 14/10/2010 14.49.41
 Analysis End: 14/10/2010 15.10.43
 Equib. Rate: 0.005 psig/min
 Expansion Volume: 9.2248 cm³
 Cell Volume: 11.8000 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 26, Campione 1, Prof. (m) 3,00-3,40



Il direttore del Laboratorio

[Signature]

Lo sperimentatore

[Signature]



Committente Geotalia srl – Roma

Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

Data prova 15/10/2010

Data certificato 15/10/2010

Verb. Accettazione 165

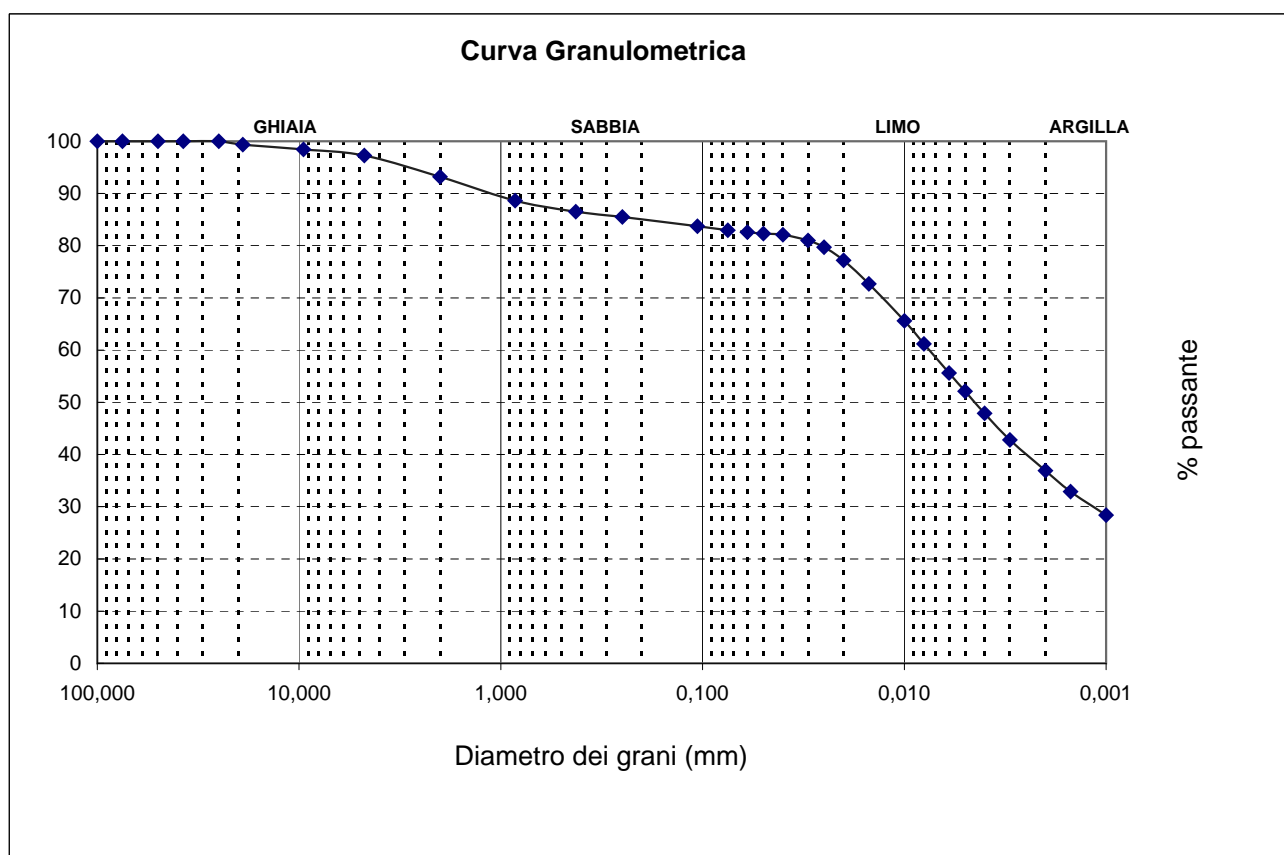
N. Certificato 2501/2010

Pag. 1 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 26 Campione 1 Profondità 3.00-3.40

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)



Riepilogo dei risultati

Ciottoli	(> 60 mm)	0,0
Ghiaia	(60 - 2 mm)	6,8
Sabbia	(2 - 0,060 mm)	10,6
Limo	(0,060 - 0,002 mm)	45,7
Argilla	(< 0,002 mm)	36,9

D10	<0,002
D30	0,0012
D60	0,0076

Classificazione AGI 1994

Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

Data prova 15/10/2010
 Data certificato 15/10/2010
 Verb. Accettazione 165
 N. Certificato 2501/2010

Pag. 2 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 26 Campione 1 Profondità 3.00-3.40

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)

Setacciatura grossa:

Massa materiale (g): 1806.00

Setacciatura fine:

Massa materiale (g): 204.43

Vagli ASTM	Apertura vagli (mm)	Massa Trattenuta (g)	Trattenuto %	Passante %
3"	75,000	0,00	0,0	100,0
2"	50,000	0,00	0,0	100,0
1,5"	37,500	0,00	0,0	100,0
1"	25,000	0,00	0,0	100,0
3/4"	19,000	11,59	0,6	99,4
3/8"	9,500	16,70	1,6	98,4
No.4	4,750	2,43	2,7	97,3
No.10	2,000	8,48	6,8	93,2
No.20	0,850	9,45	11,4	88,6
No.40	0,425	4,37	13,5	86,5
No.60	0,250	2,11	14,5	85,5
No.140	0,106	3,69	16,3	83,7
No.200	0,075	1,59	17,0	83,0

Sedigrafia:

Material Mass (g): 4.601
 Material/Liquid: soil / 0.20% Sodium Metaphosphate (w/w)
 Measurement Principle: X-Ray monitored gravity sedimentation
 Calculation Method: Stokes sedimentation and Beer's law of extinction
 Test Number: 2
 Analyzed: 15/10/2010 11.13.49
 Reported: 15/10/2010 11.30.39
 Liquid Visc: 0.7687 mPa.s
 Analysis Temp: 31.9 °C
 Full Scale Mass: 83.0 %
 Analysis Type: High Speed(Adj)
 Run Time: 0:04 hrs:min
 Sample Density: 2.736 g/cm³
 Liquid Density: 0.9951 g/cm³
 Base/Full Scale: 133 / 93 kCnts/s
 Reynolds Number: 0.82

Diametro (mm)	Trattenuto %	Passante %
0,060	17,4	82,6
0,050	17,7	82,3
0,040	17,9	82,1
0,030	19,0	81,0
0,025	20,3	79,7
0,020	22,8	77,2
0,015	27,3	72,7
0,010	34,4	65,6
0,008	38,8	61,2
0,006	44,4	55,6
0,005	47,9	52,1
0,004	52,1	47,9
0,003	57,2	42,8
0,002	63,1	36,9
0,002	67,1	32,9
0,001	71,6	28,4

Il direttore del Laboratorio

Lo sperimentatore



Committente Geoltalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

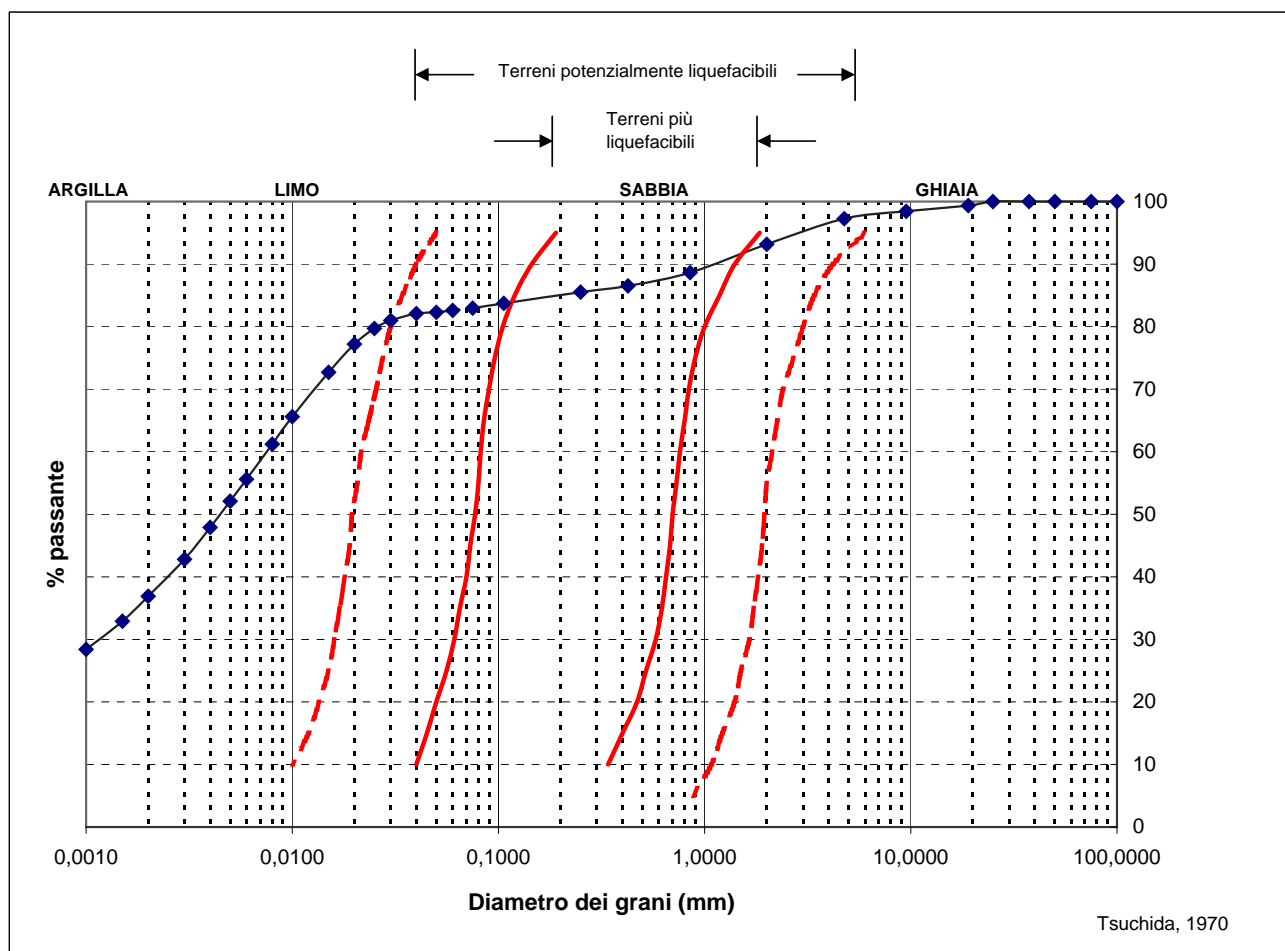
Data prova 15/10/2010
 Data certificato 15/10/2010
 Verb.Accettazione 165
 N. Certificato 2501/2010

Pag. 3 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 26 Campione 1 Profondità 3.00-3.40

POTENZIALE DI LIQUEFACIBILITA'



Il direttore del Laboratorio
[Signature]

Lo sperimentatore
[Signature]



Committente Geotalia srl – Roma Pag. 1 di 1
 Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda

LIMITI DI CONSISTENZA

Norma di riferimento ASTM D4318

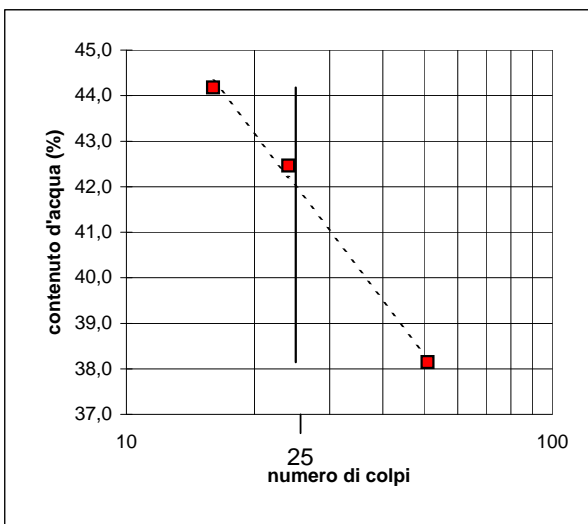
Data prova 20/10/10
 Data certificato 21/10/10
 Verb. Accettazione 165
 N. Certificato 2527/2010

Sondaggio 26 Campione 1 Profondità 3.00-3.40

Limite Liquido				42,0
Numero tara	A9	B18	A6	
Numero dei colpi	51	24	16	
P. umido + tara	g	74,98	68,61	78,85
P. secco + tara	g	59,32	53,43	60,12
Peso tara	g	18,27	17,68	17,72
Peso umido	g	56,71	50,93	61,13
Peso secco	g	41,05	35,75	42,40
Contenuto d'acqua	%	38,15	42,46	44,17

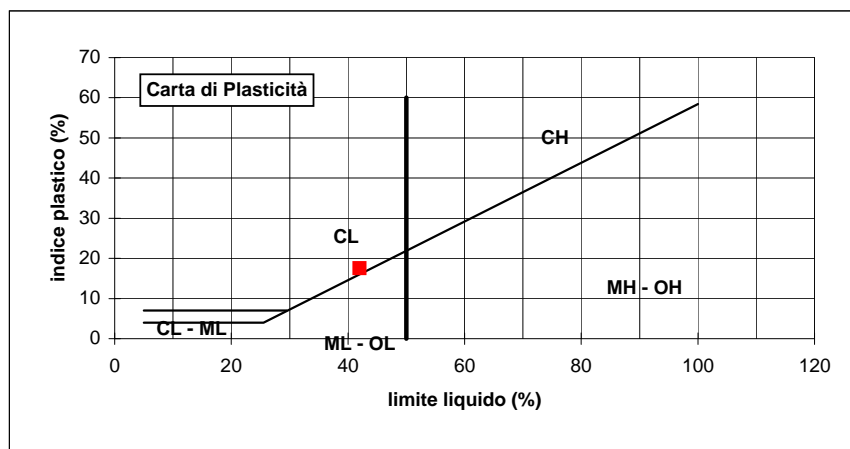
Limite Plastico				24,5
Numero tara	B13	A11		
P. umido + tara	g	27,94	31,63	
P. secco + tara	g	25,92	28,99	
Peso tara	g	17,66	18,22	
Peso umido	g	10,28	13,41	
Peso secco	g	8,26	10,77	
Contenuto d'acqua	%	24,46	24,51	

Umidità Naturale				18,9
Numero tara	A4			
P. umido + tara	g	50,41		
P. secco + tara	g	45,19		
Peso tara	g	17,54		
Peso umido	g	32,87		
Peso secco	g	27,65		
Contenuto d'acqua	%			18,9



Limite Liquido LL	42,0
Limite Plastico LP	24,5
Indice di Plasticità Ip	17,5
Umidità Naturale Wn	18,9
Indice di Consistenza Ic	1,3

$$I_p = LL - LP \quad I_c = \frac{LL - W_n}{I_p}$$



- ML** Limi inorganici di bassa plasticità
- MH** Limi inorganici di alta plasticità
- CL** Argille inorganiche di bassa plasticità
- CH** Argille inorganiche di alta plasticità
- OL** Argille organiche di bassa plasticità
- OH** Argille organiche di alta plasticità

Il direttore del Laboratorio

Lo sperimentatore



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST REPORT - SUMMARY

Project location	<i>GEOITALIA - Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>3.00/3.40</i>
Borehole number	<i>26</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>
Sample description	<i>Argilla limosa con inclusi argillitici. Campione rimaneggiato</i>		
Particle density (Mg/m ³)	<i>2.74 (Measured)</i>		Specimens tested

INITIAL CONDITIONS	SPECIMEN 1	SPECIMEN 2	SPECIMEN 3
Specimen depth (m)	<i>3.00/3.40</i>	<i>3.00/3.40</i>	<i>3.00/3.40</i>
Height (mm)	<i>20.0</i>	<i>20.0</i>	<i>20.0</i>
-			
Diameter (mm)	<i>60.0</i>	<i>60.0</i>	<i>60.0</i>
Area (mm ²)	<i>2827.4</i>	<i>2827.4</i>	<i>2827.4</i>
Moisture content (measured) (%)	<i>16</i>	<i>20</i>	<i>17</i>
Moisture content (trimmings) (%)	<i>20</i>	<i>18</i>	<i>18</i>
Bulk density (Mg/m ³)	<i>2.08</i>	<i>1.98</i>	<i>2.13</i>
Dry density (Mg/m ³)	<i>1.80</i>	<i>1.66</i>	<i>1.83</i>
Voids ratio	<i>0.526</i>	<i>0.655</i>	<i>0.501</i>
Degree of saturation (%)	<i>82</i>	<i>83</i>	<i>91</i>

Voids ratio at the end of consolidation	<i>0.502</i>	<i>0.622</i>	<i>0.461</i>
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SHEARING	SPECIMEN 1	SPECIMEN 2	SPECIMEN 3
Rate of displacement (mm/min)	<i>0.010000</i>	<i>0.010000</i>	<i>0.010000</i>
Conditions at peak shear stress			
Normal stress (kPa)	<i>100</i>	<i>200</i>	<i>400</i>
Shear stress (kPa)	<i>69</i>	<i>120</i>	<i>247</i>
Horizontal displacement (mm)	<i>4.30</i>	<i>5.36</i>	<i>4.69</i>
Vertical deformation (mm)	<i>0.246</i>	<i>0.913</i>	<i>0.791</i>

Apparent cohesion (kPa)	<i>14.0</i>
Angle of shearing resistance (°)	<i>30.2</i>

Comments / variations from procedures:
Verbale di accettazione N.
Il presente certificato è costituito da n. 18 pagine.

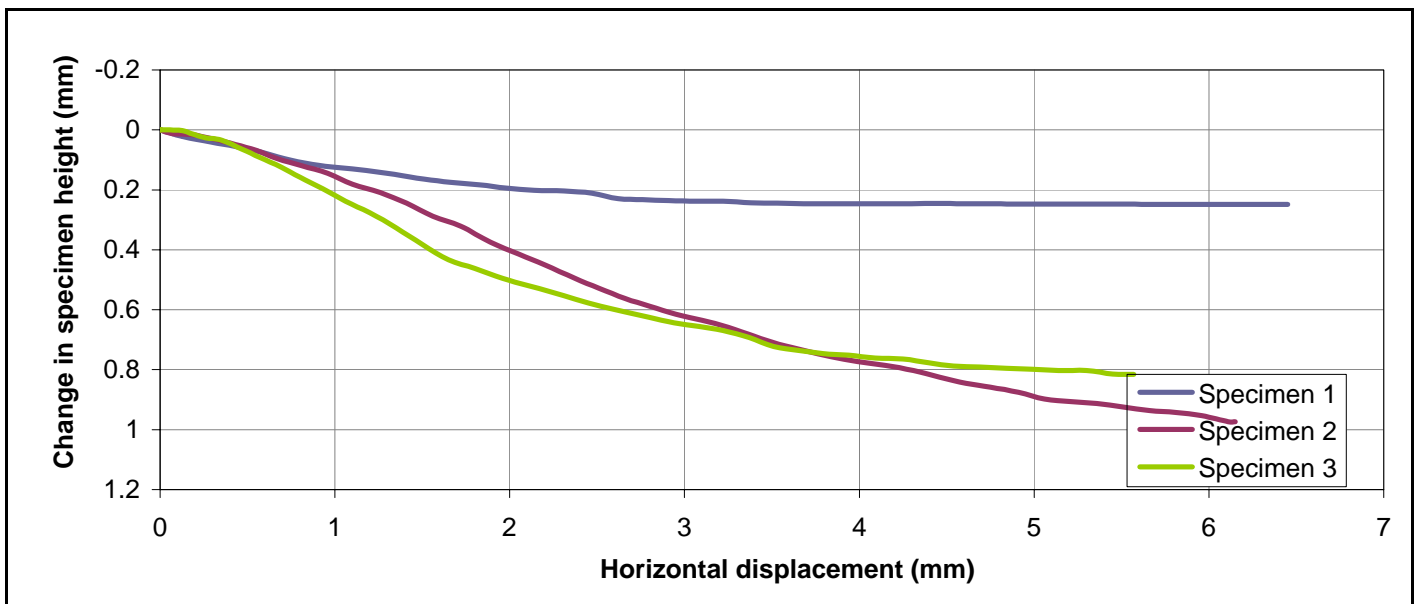
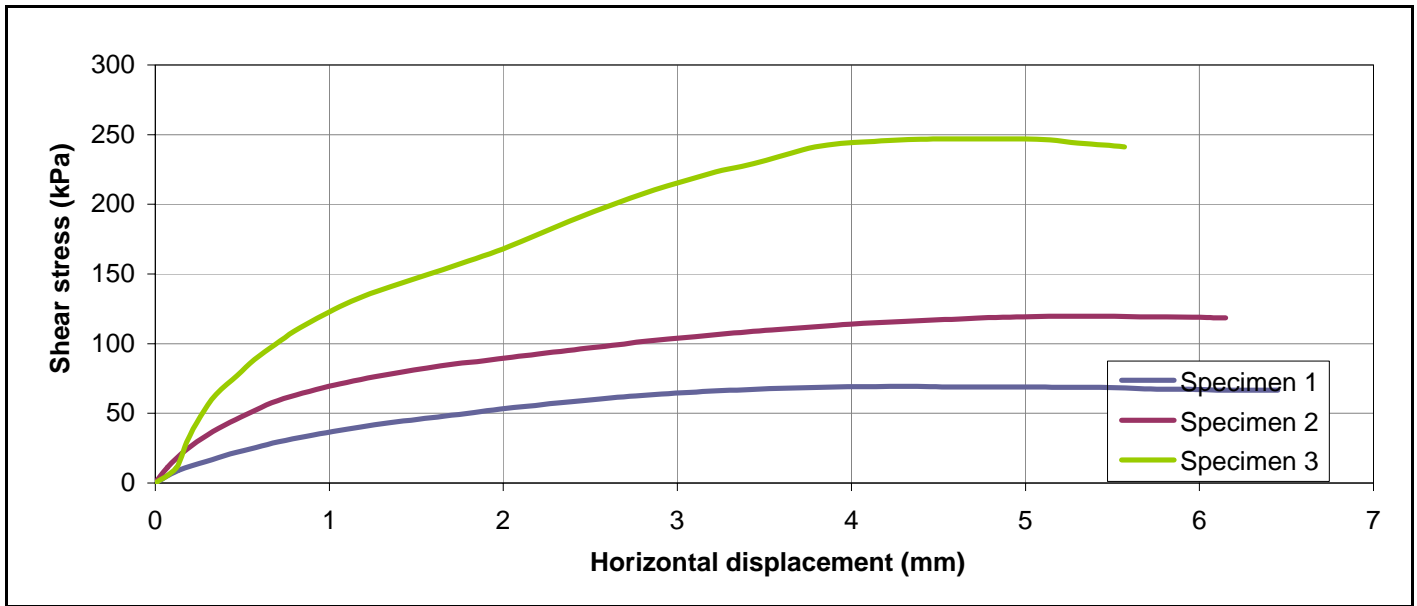
Tested	<i>Farinelli</i>	Checked	<i>Sfalanga</i>	Approved	<i>Carmignani</i>
Date	<i>13/10/2010</i>	Date	<i>15/10/2010</i>	Date	<i>No. 2536/2010</i>



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST REPORT - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth	3.00/3.40
Borehole number	26	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical



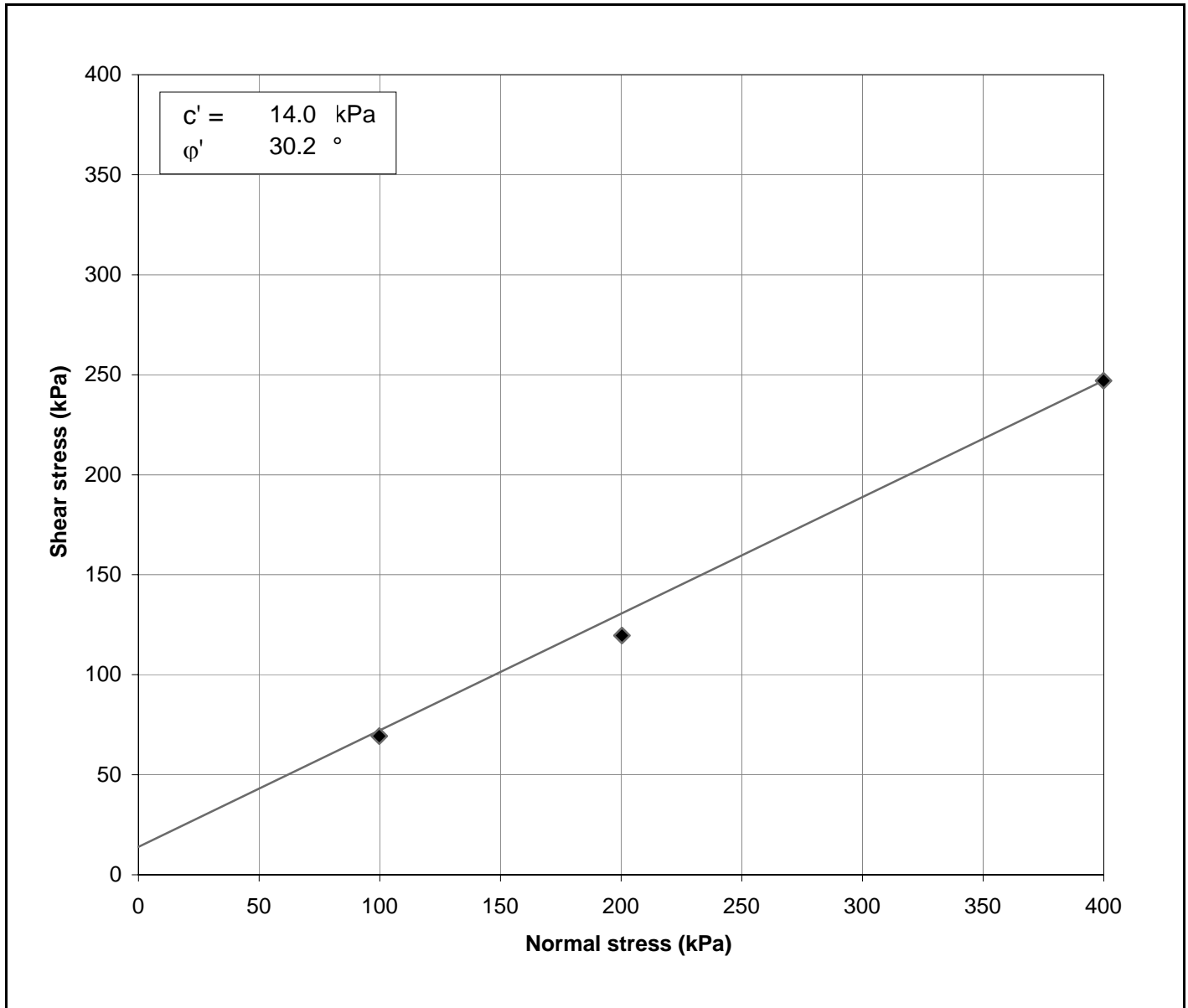
Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	13/10/2010	Date	15/10/2010	Date	No. 2536/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST REPORT - SHEARING

Project location	<i>GEOITALIA - Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>3.00/3.40</i>
Borehole number	<i>26</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>



Tested	<i>Farinelli</i>	Checked	<i>Sfalanga</i>	Approved	<i>Carmignani</i>
Date	<i>13/10/2010</i>	Date	<i>15/10/2010</i>	Date	<i>No. 2536/2010</i>



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	<i>GEOITALIA - Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>3.00/3.40</i>
Borehole number	<i>26</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 1	Normal stress (kPa)	100
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Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.06	0.350	0.2	0.000
0.08	0.362	0.3	0.012
0.13	0.377	0.4	0.027
0.20	0.379	0.4	0.029
0.32	0.401	0.6	0.051
0.51	0.415	0.7	0.065
0.81	0.435	0.9	0.085
1.29	0.470	1.1	0.120
2.04	0.512	1.4	0.162
3.25	0.527	1.8	0.177
5.17	0.533	2.3	0.183
8.21	0.544	2.9	0.194
13.06	0.569	3.6	0.219
20.76	0.596	4.6	0.246
33.00	0.615	5.7	0.265
52.47	0.628	7.2	0.278
83.43	0.636	9.1	0.286
132.65	0.644	11.5	0.294
210.92	0.652	14.5	0.302
335.37	0.656	18.3	0.306
533.23	0.661	23.1	0.311
847.83	0.663	29.1	0.313
936.80	0.665	30.6	0.315

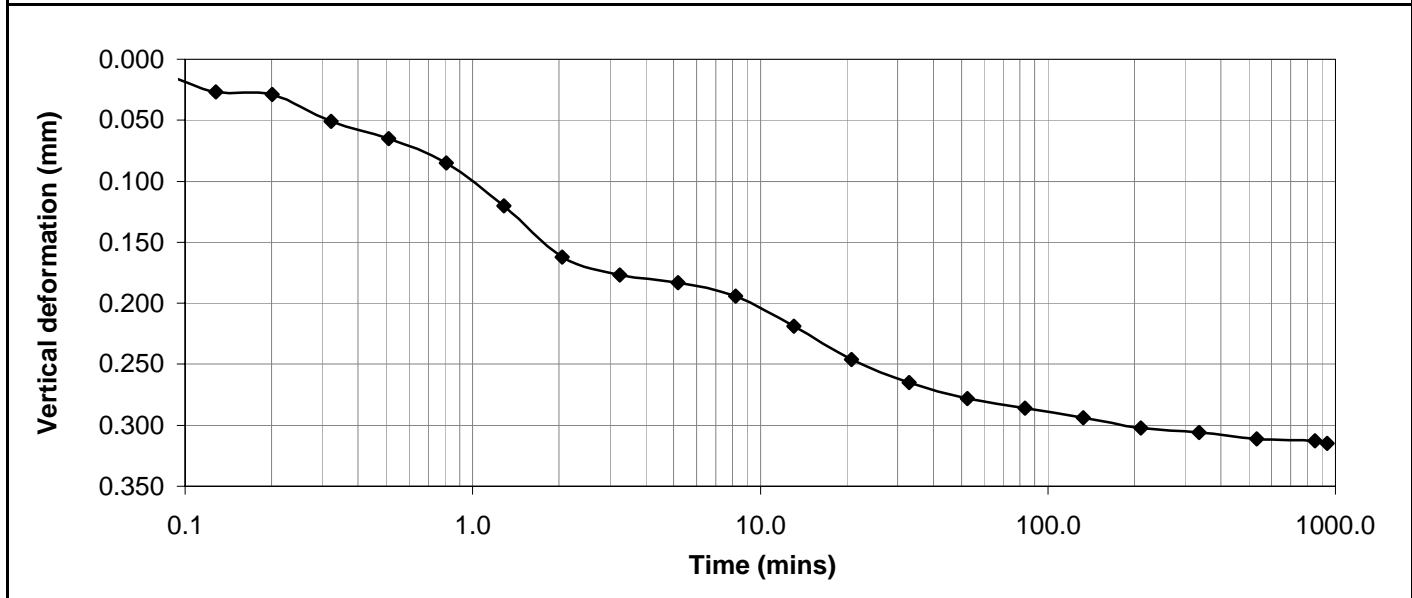
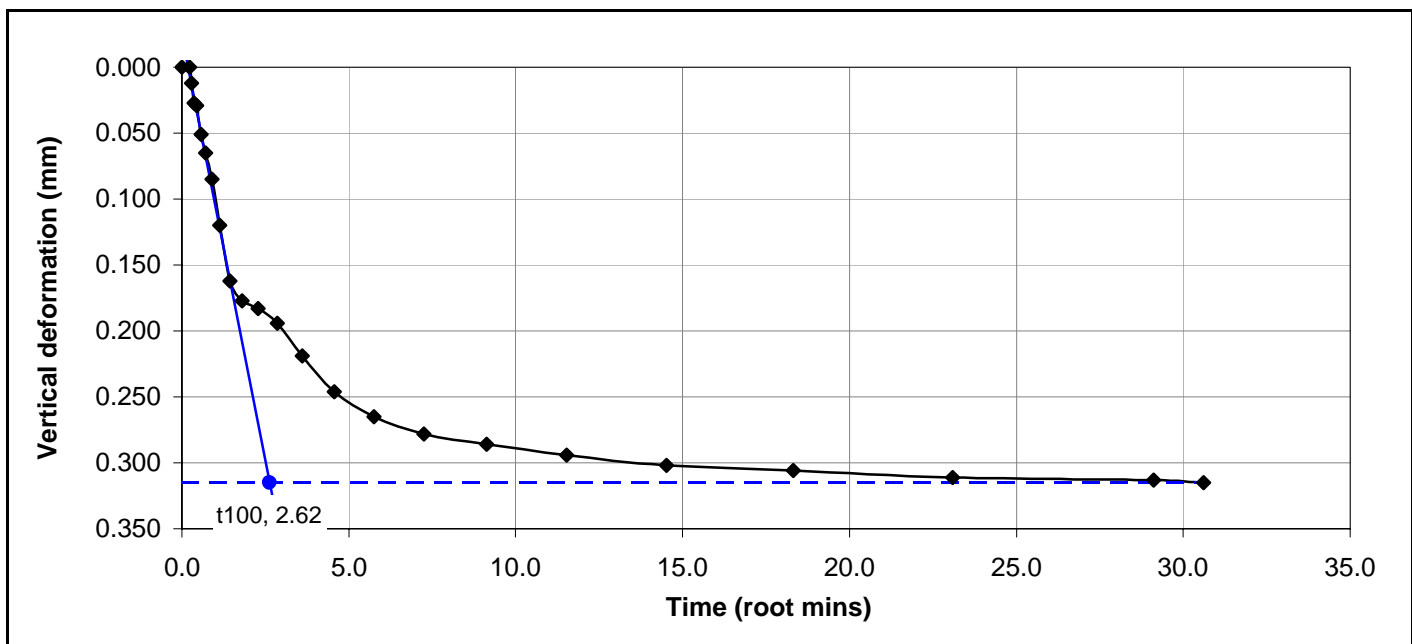


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth	3.00/3.40
Borehole number	26	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 1 **Normal stress (kPa)** 100



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	05/10/2010	Date	15/10/2010	Date	No. 2536/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth	3.00/3.40
Borehole number	26	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 1 **Normal stress (kPa) 100**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
0.02	0.017	0.07	15.2	0.000	0.00	0.0	0.0
10.00	0.039	0.20	40.4	0.022	0.13	25.2	8.9
20.00	0.057	0.36	58.5	0.040	0.29	43.3	15.3
30.00	0.072	0.50	74.4	0.055	0.43	59.3	21.0
40.00	0.091	0.65	87.4	0.074	0.58	72.2	25.5
50.00	0.113	0.78	98.9	0.096	0.71	83.8	29.6
60.00	0.132	0.94	109.9	0.115	0.87	94.8	33.5
70.01	0.143	1.09	119.9	0.126	1.02	104.7	37.0
80.00	0.152	1.25	128.7	0.135	1.18	113.5	40.1
90.00	0.165	1.41	137.1	0.148	1.34	121.9	43.1
100.00	0.181	1.58	144.3	0.164	1.51	129.1	45.7
110.00	0.192	1.73	151.1	0.175	1.66	135.9	48.1
120.00	0.200	1.90	158.3	0.183	1.83	143.1	50.6
130.00	0.211	2.05	165.0	0.194	1.98	149.8	53.0
140.00	0.218	2.21	171.3	0.201	2.14	156.2	55.2
150.00	0.221	2.38	177.3	0.204	2.31	162.1	57.3
160.00	0.228	2.54	182.9	0.211	2.47	167.7	59.3
170.00	0.246	2.69	188.0	0.229	2.62	172.8	61.1
180.00	0.249	2.83	192.1	0.232	2.76	177.0	62.6
190.00	0.253	2.98	196.0	0.236	2.91	180.9	64.0
200.00	0.255	3.14	199.0	0.238	3.07	183.8	65.0
210.00	0.255	3.29	202.0	0.238	3.22	186.8	66.1
220.00	0.260	3.45	204.4	0.243	3.38	189.2	66.9
230.00	0.261	3.60	206.5	0.244	3.53	191.3	67.7
240.00	0.263	3.75	208.0	0.246	3.68	192.8	68.2
250.01	0.263	3.90	209.2	0.246	3.83	194.0	68.6
260.00	0.263	4.05	210.5	0.246	3.98	195.3	69.1
270.00	0.263	4.21	211.0	0.246	4.14	195.8	69.3
280.00	0.263	4.37	211.1	0.246	4.30	196.0	69.3
290.00	0.262	4.52	211.0	0.245	4.45	195.8	69.3
300.00	0.263	4.66	210.2	0.246	4.59	195.0	69.0
310.00	0.263	4.81	210.3	0.246	4.74	195.1	69.0
320.00	0.264	4.95	210.0	0.247	4.88	194.8	68.9
330.00	0.264	5.11	210.0	0.247	5.04	194.8	68.9



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA - Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>3.00/3.40</i>
Borehole number	<i>26</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 1	Normal stress (kPa)	100
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Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
340.00	0.264	5.26	209.5	0.247	5.19	194.4	68.7
350.00	0.264	5.42	209.2	0.247	5.35	194.0	68.6
360.00	0.264	5.57	208.5	0.247	5.50	193.3	68.4
370.00	0.265	5.72	206.6	0.248	5.65	191.4	67.7
380.00	0.265	5.86	205.4	0.248	5.79	190.2	67.3
390.00	0.265	6.01	205.3	0.248	5.94	190.1	67.2
400.00	0.265	6.17	203.6	0.248	6.10	188.5	66.7
410.01	0.266	6.32	203.3	0.249	6.25	188.2	66.5
420.00	0.265	6.47	203.5	0.248	6.40	188.3	66.6
423.47	0.265	6.52	203.5	0.248	6.45	188.3	66.6



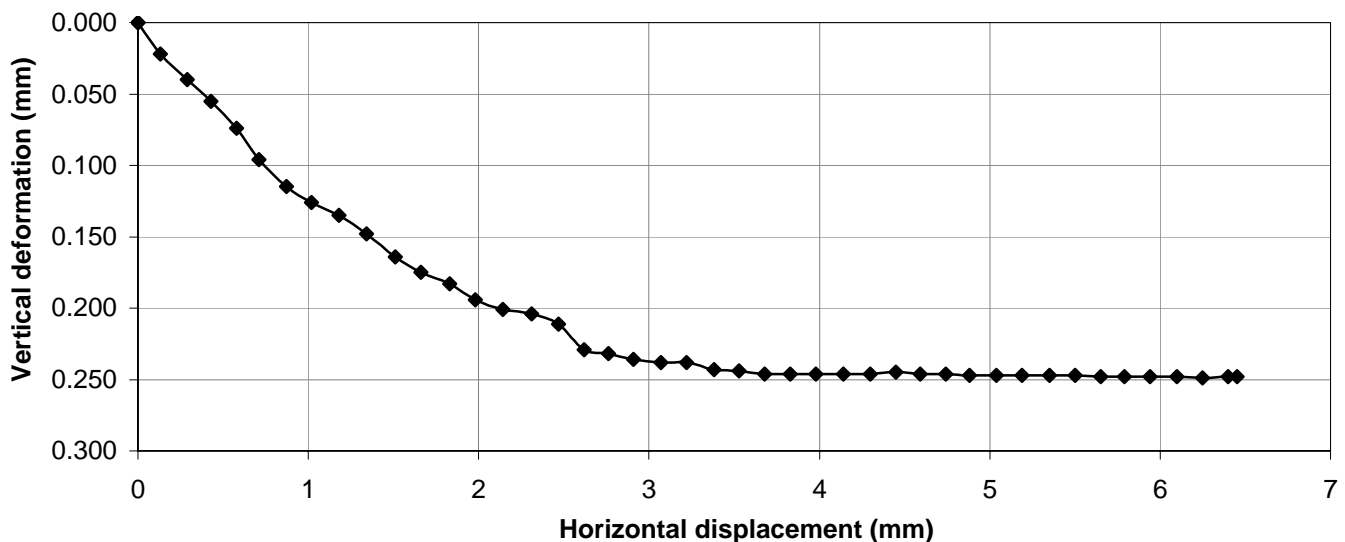
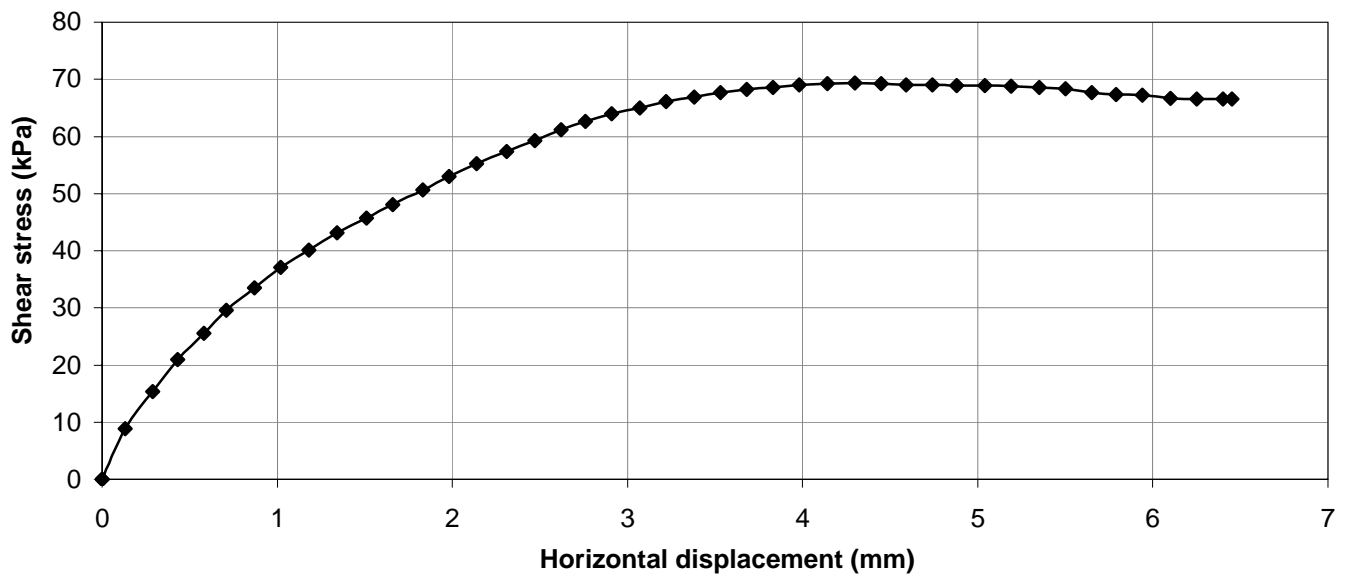
DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth	3.00/3.40
Borehole number	26	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 1

Normal stress (kPa) 100



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	06/10/2010	Date	15/10/2010	Date	No. 2536/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	<i>GEOITALIA - Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>3.00/3.40</i>
Borehole number	<i>26</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 2 **Normal stress (kPa) 200**

Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	1.335	0.2	0.000
0.08	1.363	0.3	0.028
0.13	1.394	0.4	0.059
0.20	1.420	0.5	0.085
0.32	1.450	0.6	0.115
0.51	1.475	0.7	0.140
0.81	1.503	0.9	0.168
1.29	1.535	1.1	0.200
2.05	1.563	1.4	0.228
3.25	1.591	1.8	0.256
5.17	1.610	2.3	0.275
8.21	1.634	2.9	0.299
13.06	1.646	3.6	0.311
20.76	1.665	4.6	0.330
33.01	1.676	5.7	0.341
52.48	1.695	7.2	0.360
83.43	1.702	9.1	0.367
132.66	1.707	11.5	0.372
210.92	1.713	14.5	0.378
335.37	1.721	18.3	0.386
533.23	1.726	23.1	0.391
847.83	1.731	29.1	0.396
974.33	1.734	31.2	0.399



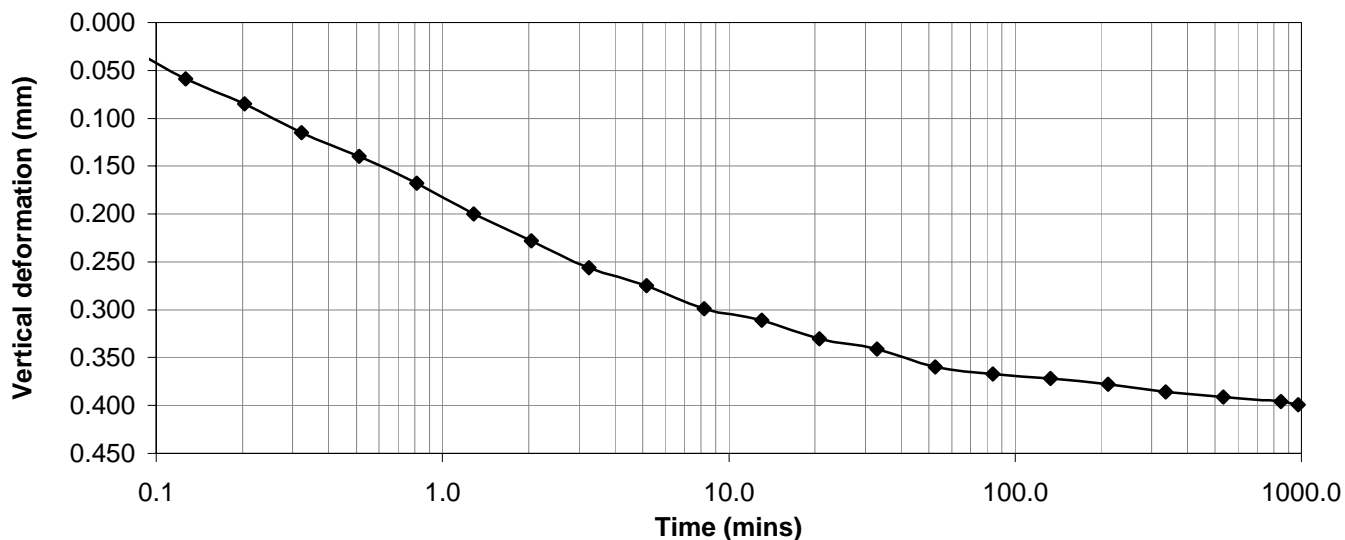
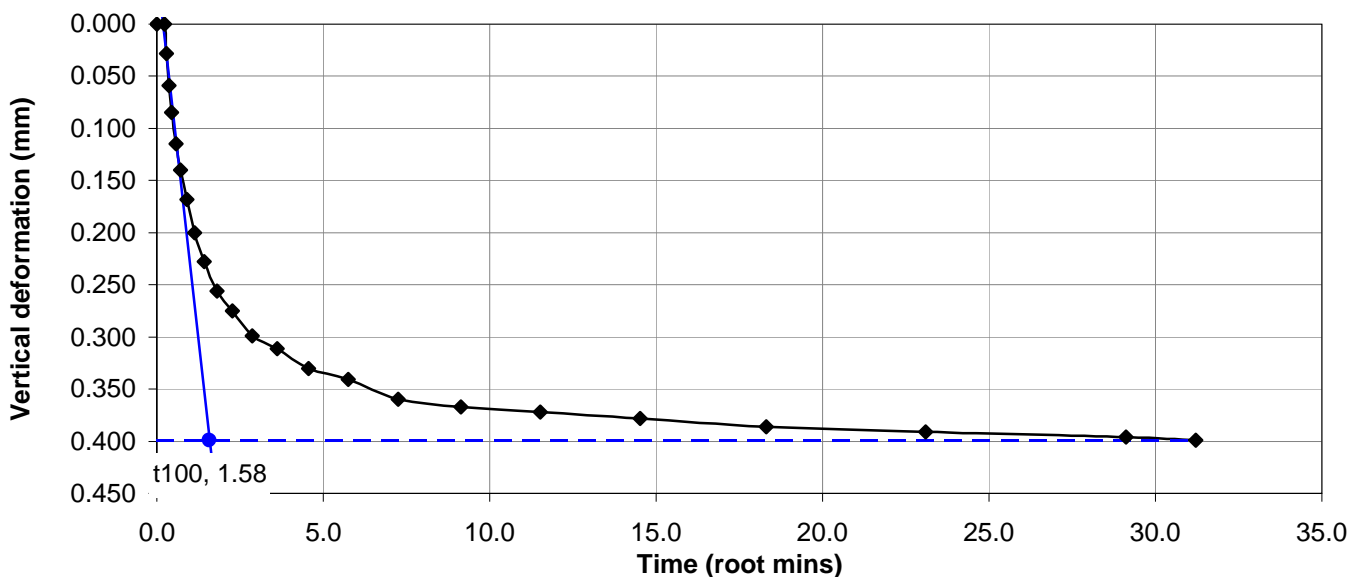
DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth	3.00/3.40
Borehole number	26	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 2

Normal stress (kPa) 200



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	06/10/2010	Date	15/10/2010	Date	No. 2536/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth	3.00/3.40
Borehole number	26	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 2 **Normal stress (kPa) 200**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
0.02	0.003	0.00	11.8	0.000	0.00	0.0	0.0
10.00	0.015	0.07	43.7	0.012	0.07	31.9	11.3
20.00	0.019	0.18	80.1	0.016	0.18	68.3	24.1
30.00	0.033	0.30	109.4	0.030	0.30	97.5	34.5
40.00	0.052	0.43	135.2	0.049	0.43	123.4	43.6
50.00	0.071	0.55	155.7	0.068	0.55	143.8	50.9
60.00	0.099	0.67	174.8	0.096	0.67	163.0	57.6
70.00	0.122	0.81	190.5	0.119	0.81	178.7	63.2
80.00	0.148	0.96	204.5	0.145	0.96	192.7	68.1
90.00	0.184	1.10	216.1	0.181	1.10	204.2	72.2
100.00	0.212	1.26	227.2	0.209	1.26	215.3	76.2
110.00	0.247	1.41	236.6	0.244	1.41	224.7	79.5
120.00	0.291	1.56	245.3	0.288	1.56	233.4	82.6
130.00	0.324	1.72	253.1	0.321	1.72	241.3	85.3
140.01	0.378	1.89	259.6	0.375	1.89	247.8	87.6
150.00	0.417	2.05	267.0	0.414	2.05	255.1	90.2
160.00	0.453	2.20	273.7	0.450	2.20	261.9	92.6
170.00	0.497	2.37	280.5	0.494	2.37	268.7	95.0
180.00	0.531	2.51	286.7	0.528	2.51	274.9	97.2
190.00	0.565	2.66	292.6	0.562	2.66	280.7	99.3
200.00	0.591	2.80	298.7	0.588	2.80	286.8	101.4
210.00	0.618	2.95	303.9	0.615	2.95	292.0	103.3
220.00	0.638	3.10	308.8	0.635	3.10	296.9	105.0
230.00	0.662	3.25	313.7	0.659	3.25	301.9	106.8
240.00	0.692	3.40	318.1	0.689	3.40	306.3	108.3
250.00	0.718	3.54	322.1	0.715	3.54	310.2	109.7
260.00	0.740	3.69	325.9	0.737	3.69	314.0	111.1
270.00	0.760	3.84	330.0	0.757	3.84	318.1	112.5
280.00	0.776	3.99	333.9	0.773	3.99	322.0	113.9
290.00	0.789	4.15	337.1	0.786	4.15	325.3	115.0
300.00	0.806	4.31	340.0	0.803	4.31	328.2	116.1
310.00	0.828	4.46	342.5	0.825	4.46	330.6	116.9
320.00	0.848	4.61	344.6	0.845	4.61	332.8	117.7
330.00	0.861	4.75	346.9	0.858	4.75	335.0	118.5



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA - Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>3.00/3.40</i>
Borehole number	<i>26</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 2	Normal stress (kPa)	200
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Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
340.00	0.878	4.91	348.2	0.875	4.91	336.4	119.0
350.00	0.901	5.06	349.3	0.898	5.06	337.5	119.4
360.00	0.909	5.21	350.0	0.906	5.21	338.1	119.6
370.00	0.916	5.36	350.0	0.913	5.36	338.2	119.6
380.00	0.928	5.51	349.9	0.925	5.51	338.1	119.6
390.00	0.939	5.66	348.9	0.936	5.66	337.1	119.2
400.00	0.946	5.81	348.6	0.943	5.81	336.8	119.1
410.00	0.956	5.96	348.2	0.953	5.96	336.3	119.0
420.00	0.977	6.11	347.1	0.974	6.11	335.2	118.6
422.48	0.977	6.15	347.1	0.974	6.15	335.2	118.6



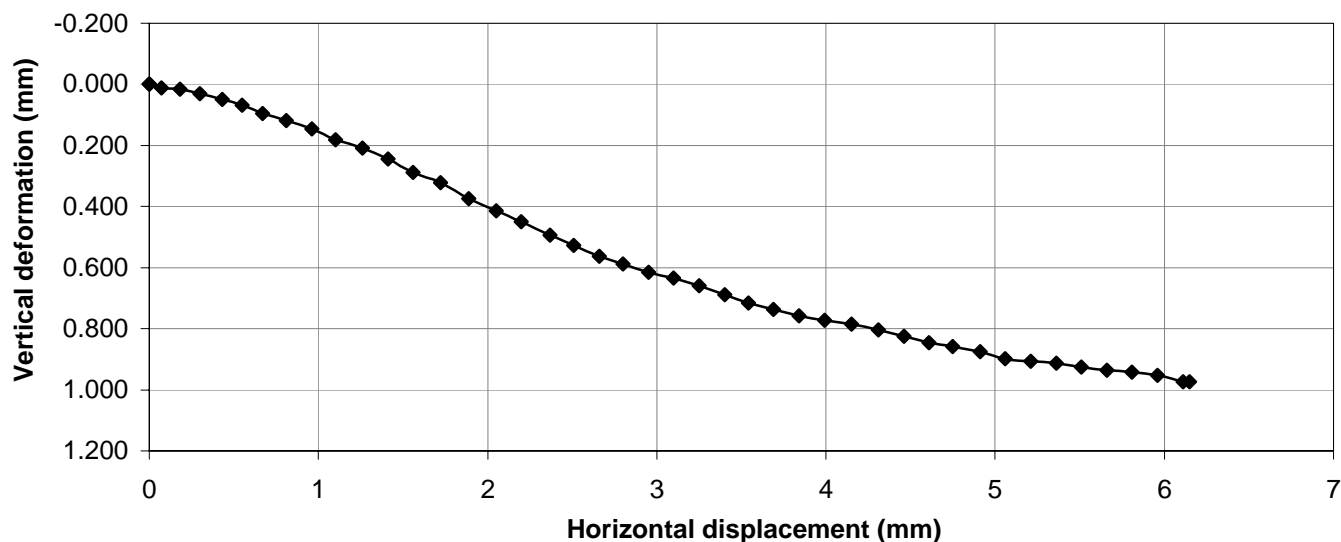
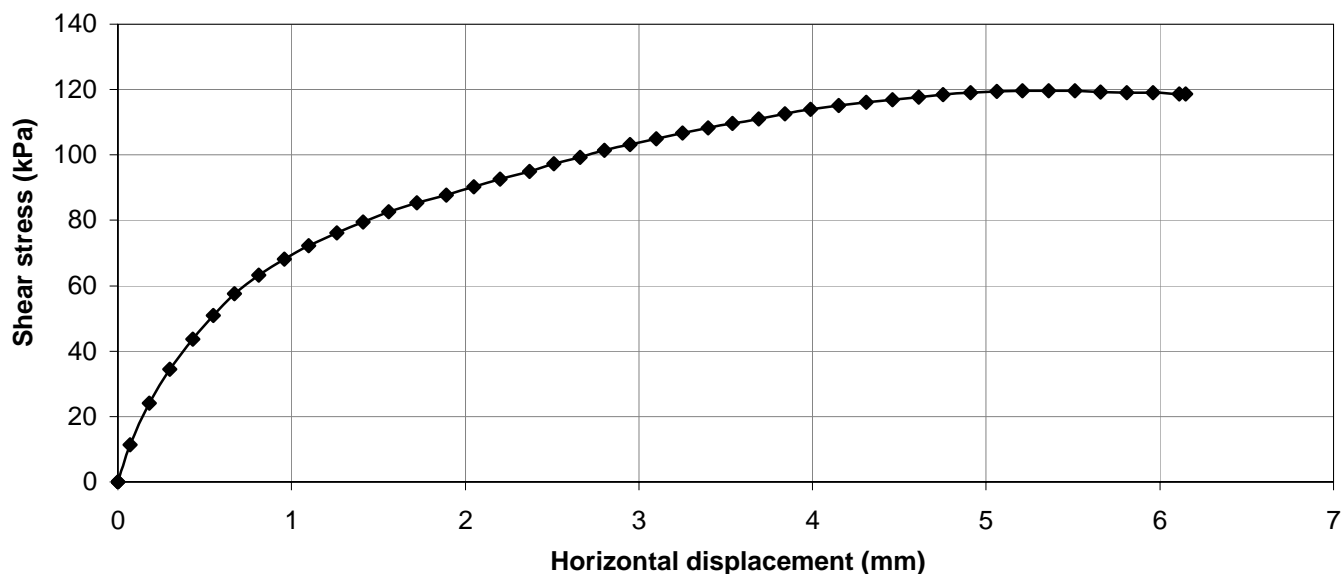
DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA - Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>3.00/3.40</i>
Borehole number	<i>26</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 2

Normal stress (kPa) 200



Tested	<i>Farinelli</i>	Checked	<i>Sfalanga</i>	Approved	<i>Carmignani</i>
Date	<i>07/10/2010</i>	Date	<i>15/10/2010</i>	Date	<i>No. 2536/2010</i>



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	<i>GEOITALIA - Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>3.00/3.40</i>
Borehole number	<i>26</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 3	Normal stress (kPa)	400
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Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	0.829	0.2	0.000
0.08	0.876	0.3	0.047
0.13	0.902	0.4	0.073
0.20	0.925	0.5	0.096
0.32	0.951	0.6	0.122
0.51	0.975	0.7	0.146
0.81	0.995	0.9	0.166
1.29	1.015	1.1	0.186
2.05	1.037	1.4	0.208
3.25	1.092	1.8	0.263
5.16	1.117	2.3	0.288
8.21	1.147	2.9	0.318
13.06	1.168	3.6	0.339
20.76	1.195	4.6	0.366
33.00	1.220	5.7	0.391
52.48	1.238	7.2	0.409
83.43	1.260	9.1	0.431
132.66	1.281	11.5	0.452
210.92	1.304	14.5	0.475
335.37	1.325	18.3	0.496
533.23	1.343	23.1	0.514
847.84	1.360	29.1	0.531
909.49	1.361	30.2	0.532

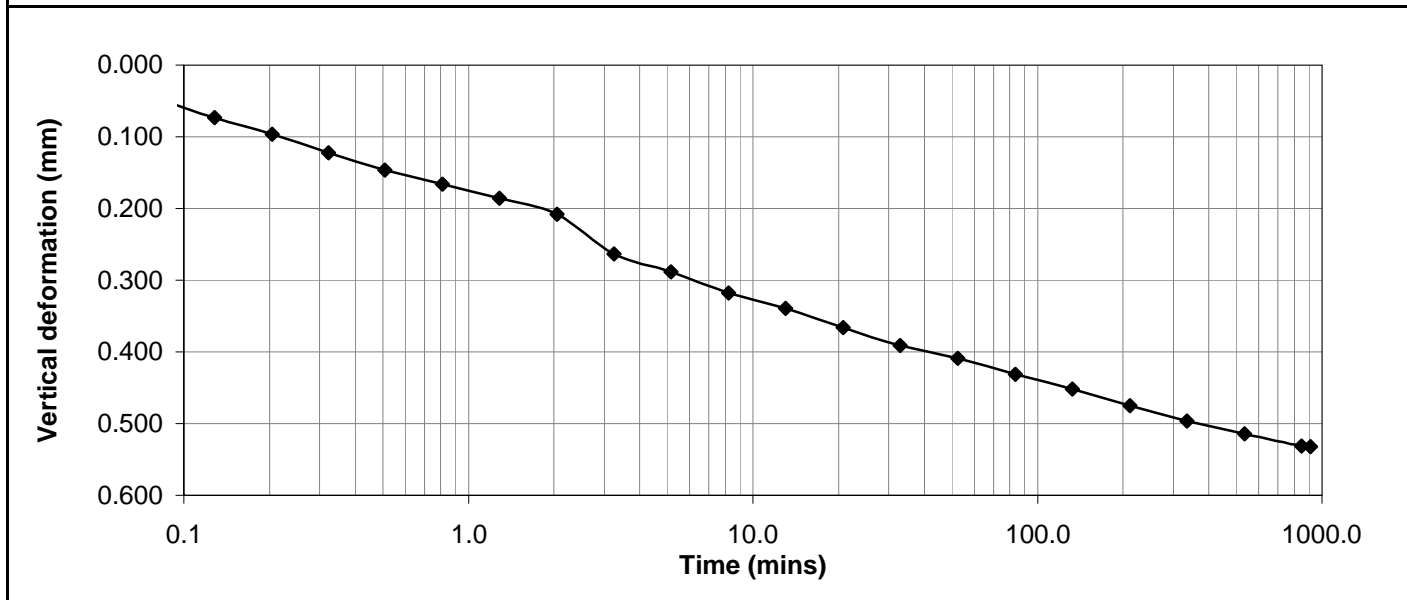
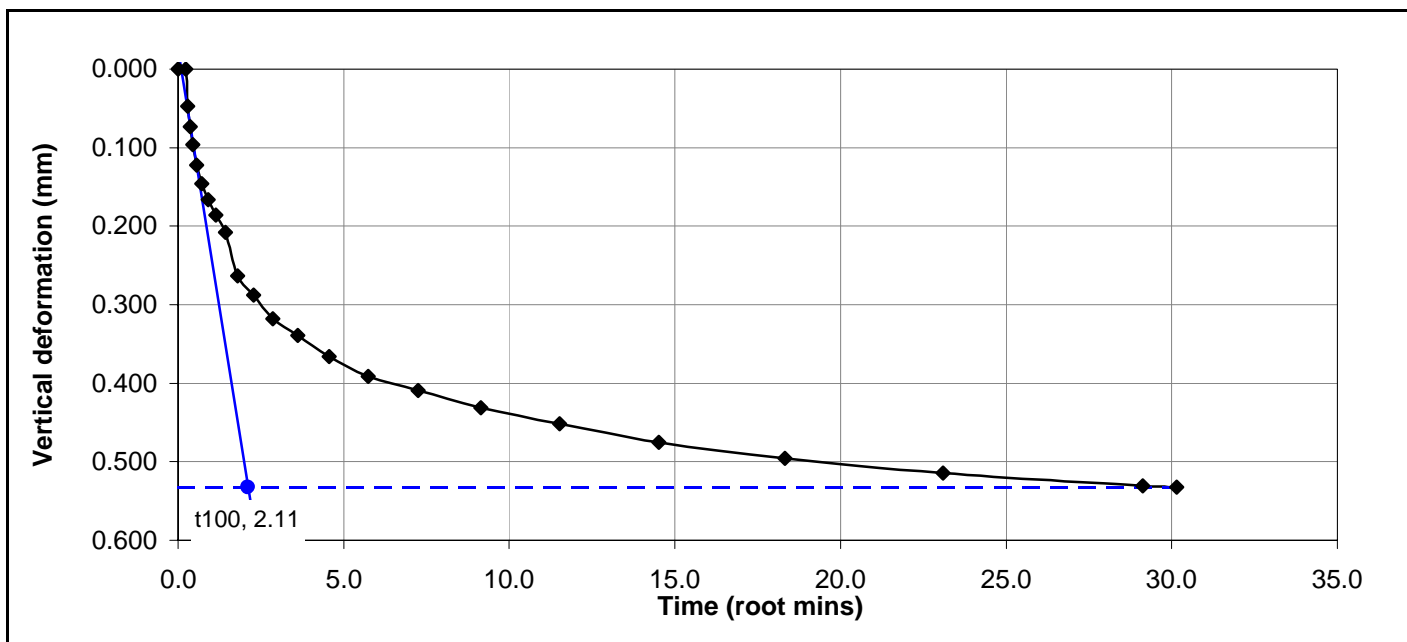


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth	3.00/3.40
Borehole number	26	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 3 **Normal stress (kPa) 400**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	11/10/2010	Date	15/10/2010	Date	No. 2536/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth	3.00/3.40
Borehole number	26	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 3 **Normal stress (kPa) 400**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
0.02	0.000	0.00	17.1	0.000	0.00	0.0	0.0
10.00	0.002	0.12	47.6	0.002	0.12	30.6	10.8
20.00	0.013	0.18	99.9	0.013	0.18	82.8	29.3
30.00	0.026	0.26	151.9	0.026	0.26	134.8	47.7
40.00	0.034	0.35	197.1	0.034	0.35	180.0	63.7
50.00	0.065	0.47	235.1	0.065	0.47	218.0	77.1
60.00	0.091	0.57	268.0	0.091	0.57	250.9	88.8
70.00	0.124	0.69	298.1	0.124	0.69	281.1	99.4
80.00	0.158	0.80	325.8	0.158	0.80	308.7	109.2
90.00	0.196	0.93	351.5	0.196	0.93	334.4	118.3
100.00	0.238	1.06	375.2	0.238	1.06	358.2	126.7
110.00	0.276	1.20	396.1	0.276	1.20	379.1	134.1
120.00	0.326	1.35	415.0	0.326	1.35	397.9	140.7
130.00	0.382	1.50	432.6	0.382	1.50	415.5	147.0
140.00	0.433	1.65	449.8	0.433	1.65	432.7	153.1
150.00	0.462	1.80	468.0	0.462	1.80	450.9	159.5
160.00	0.495	1.96	487.1	0.495	1.96	470.0	166.2
170.00	0.519	2.10	507.0	0.519	2.10	490.0	173.3
180.00	0.541	2.24	527.4	0.541	2.24	510.3	180.5
190.00	0.566	2.38	548.3	0.566	2.38	531.2	187.9
200.00	0.588	2.52	567.9	0.588	2.52	550.9	194.8
210.00	0.607	2.66	586.2	0.607	2.66	569.1	201.3
220.00	0.625	2.80	603.6	0.625	2.80	586.5	207.4
230.00	0.644	2.94	619.8	0.644	2.94	602.8	213.2
240.00	0.655	3.08	634.2	0.655	3.08	617.1	218.3
250.00	0.669	3.22	648.0	0.669	3.22	631.0	223.2
260.00	0.693	3.37	659.3	0.693	3.37	642.2	227.1
270.00	0.723	3.51	672.0	0.723	3.51	654.9	231.6
280.00	0.736	3.65	685.8	0.736	3.65	668.7	236.5
290.00	0.746	3.79	699.2	0.746	3.79	682.2	241.3
300.00	0.751	3.94	706.1	0.751	3.94	689.1	243.7
310.00	0.761	4.09	709.5	0.761	4.09	692.4	244.9
320.00	0.764	4.25	712.5	0.764	4.25	695.5	246.0
330.00	0.777	4.40	714.8	0.777	4.40	697.7	246.8



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA - Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>3.00/3.40</i>
Borehole number	<i>26</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 3	Normal stress (kPa)	400
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Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
340.00	0.788	4.54	715.3	0.788	4.54	698.2	247.0
350.00	0.791	4.69	715.5	0.791	4.69	698.5	247.0
360.00	0.795	4.84	715.5	0.795	4.84	698.5	247.0
370.00	0.799	4.99	715.3	0.799	4.99	698.2	247.0
380.00	0.803	5.14	713.0	0.803	5.14	696.0	246.1
390.00	0.803	5.30	706.6	0.803	5.30	689.5	243.9
400.00	0.815	5.45	702.7	0.815	5.45	685.6	242.5
407.75	0.816	5.57	698.9	0.816	5.57	681.8	241.1

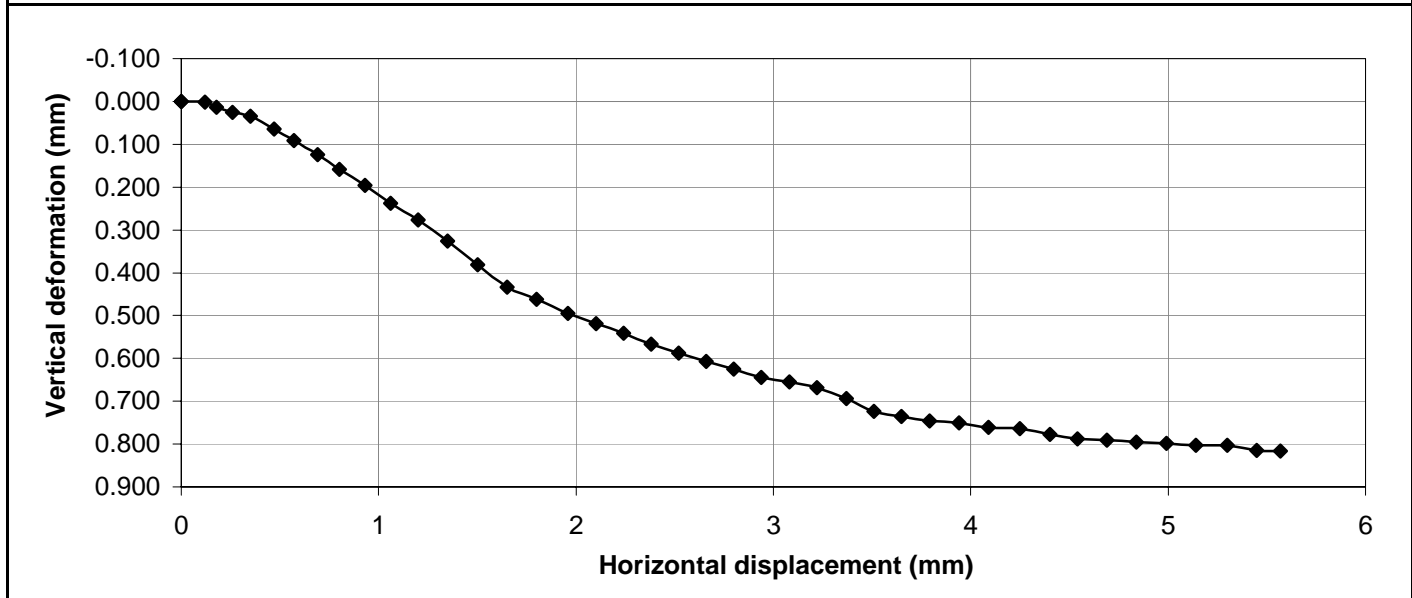
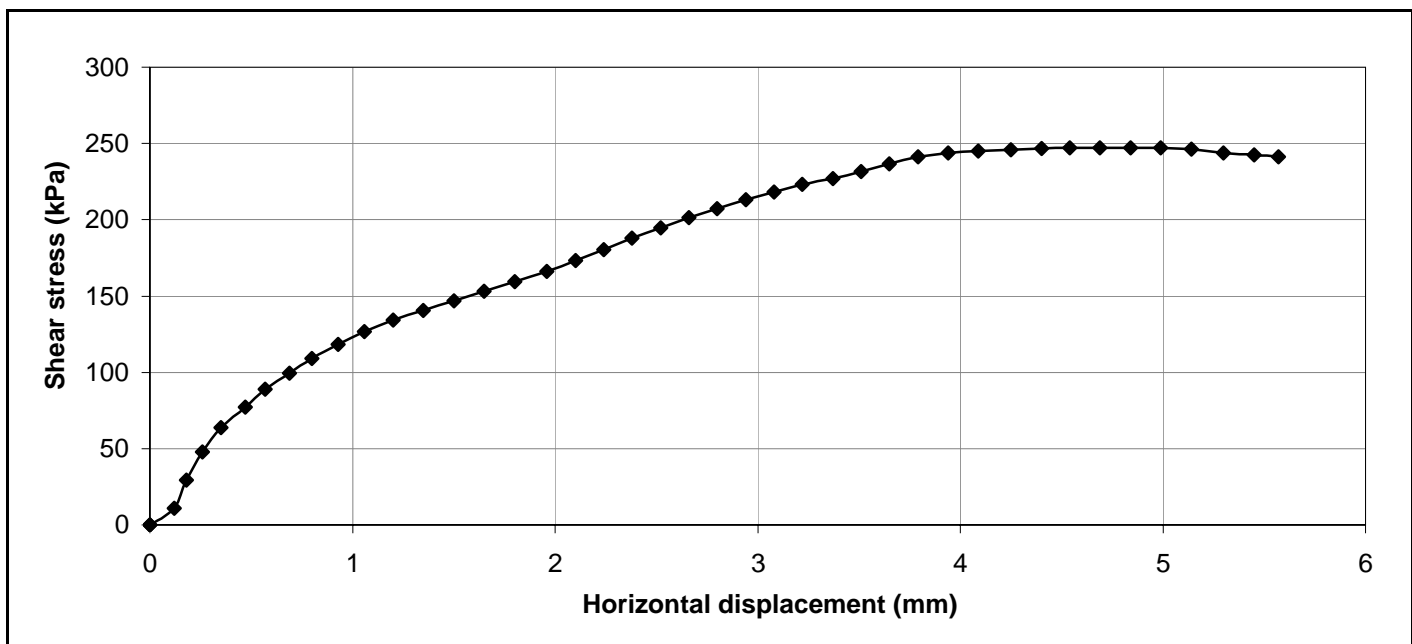


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA - Poggio Tre Vescovi</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>3.00/3.40</i>
Borehole number	<i>26</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 3 **Normal stress (kPa) 400**



Tested	<i>Farinelli</i>	Checked	<i>Sfalanga</i>	Approved	<i>Carmignani</i>
Date	<i>12/10/2010</i>	Date	<i>15/10/2010</i>	Date	<i>No. 2536/2010</i>



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

SETUP DATA

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.00/3.40
Borehole number	26	Sample type	Remoulded
Sample number	1	Test type	<input type="radio"/> Single stage <input checked="" type="radio"/> Multistage
Sample description	Materiale passante a 0.425 mm a contenuto d'acqua compreso tra LL e LP.		
Preparation method	Remoulded at a specified moisture content		

STAGE 1

Machine number	4.00	Specimen depth (m)	3.00/3.40
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Initial measurements

Diameter of internal ring (mm)	70.0	Internal radius (mm)	35.0
Diameter of external ring (mm)	100.0	External radius (mm)	50.0
Specimen thickness (mm)	5.0	Distance between force points (mm)	77.0
Mass of cell (g)	605.1	Specimen volume (cc)	20.0
Mass of cell + wet soil (g)	647.6	Mass of specimen (g)	42.5

Trimmings moisture content

Mass of wet soil + tin (g)	74.98	Final moisture content	
Mass of dry soil + tin (g)	59.32	Mass of wet soil + tin (g)	48.60
Mass of tin (g)	18.27	Mass of dry soil + tin (g)	40.39
		Mass of tin (g)	17.58

Applied stress

Mass directly applied (kg)	0.27	Total mass on specimen (kg)	5.27
Mass indirectly applied (kg)	0.50	Normal stress (kPa)	13
Load arm ratio (**:1)	10.0		

Consolidation stage

Initial vertical displacement reading (mm)*			
t100 (root mins)		2.95	
t100 (mins)		8.70	
Estimated linear displacement at failure (mm)		3.00	
Minimum time to failure (t_f) (mins)		110.48	
Rate of linear displacement (mm/min)	Calculated	0.027	Actual 0.018
Rate of angular displacement (°/min)	Calculated	0.037	Actual 0.024

Shear stage - initial readings

Vertical displacement (mm)*	
Shear force device A (N)*	
Shear force device B (N)*	
Angular rotation (°)*	

* If initial readings are not entered, values will be taken from the test data



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

SETUP DATA

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.00/3.40
Borehole number	26	Sample type	Remoulded
Sample number	1	Test type	<input type="radio"/> Single stage <input checked="" type="radio"/> Multistage
Sample description	Materiale passante a 0.425 mm a contenuto d'acqua compreso tra LL e LP.		
Preparation method	Remoulded at a specified moisture content		

STAGE 2

Applied stress			
Mass directly applied (kg)	0.27	Total mass on specimen (kg)	10.27
Mass indirectly applied (kg)	1.00	Normal stress (kPa)	25
Load arm ratio (**:1)	10.0		

Consolidation stage			
Initial vertical displacement reading (mm)*			
t100 (root mins)		1.84	
t100 (mins)		3.37	
Estimated horizontal displacement at failure (mm)		3.00	
Minimum time to failure (t_f) (mins)		42.79	
Rate of linear displacement (mm/min)	Calculated	0.070	Actual 0.018
Rate of angular displacement (°/min)	Calculated	0.095	Actual 0.024

Shear stage - initial readings			
Vertical displacement (mm)*			
Shear force device A (N)*			
Shear force device B (N)*			
Angular rotation (°)*			

* If initial readings are not entered, values will be taken from the test data



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

SETUP DATA

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.00/3.40
Borehole number	26	Sample type	Remoulded
Sample number	1	Test type	<input type="radio"/> Single stage <input checked="" type="radio"/> Multistage
Sample description	Materiale passante a 0.425 mm a contenuto d'acqua compreso tra LL e LP.		
Preparation method	Remoulded at a specified moisture content		

STAGE 3

Applied stress			
Mass directly applied (kg)	0.27	Total mass on specimen (kg)	20.27
Mass indirectly applied (kg)	2.00	Normal stress (kPa)	50
Load arm ratio (**:1)	10.0		

Consolidation stage			
Initial vertical displacement reading (mm)*			
t100 (root mins)		1.82	
t100 (mins)		3.31	
Estimated horizontal displacement at failure (mm)		3.00	
Minimum time to failure (t_f) (mins)		41.99	
Rate of linear displacement (mm/min)	Calculated	0.071	Actual 0.018
Rate of angular displacement (°/min)	Calculated	0.096	Actual 0.024

Shear stage - initial readings			
Vertical displacement (mm)*			
Shear force device A (N)*			
Shear force device B (N)*			
Angular rotation (°)*			

* If initial readings are not entered, values will be taken from the test data



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST REPORT - SUMMARY

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.00/3.40
Borehole number	26	Sample type	Remoulded
Sample number	1		
Sample description	Materiale passante a 0.425 mm a contenuto d'acqua compreso tra LL e LP.		
Preparation method	Remoulded at a specified moisture content		

INITIAL CONDITIONS	Stage 1	Stage 2	Stage 3
Specimen depth (m)	3.00/3.40	-	-
Specimen thickness (mm)	5.0	-	-
External ring radius (mm)	50.0	-	-
Internal ring radius (mm)	35.0	-	-
Moisture content (trimmings) (%)	38	-	-

SHEARING	Stage 1	Stage 2	Stage 3
Average linear displacement (mm/min)	0.018	0.018	0.018
Rate of angular displacement (°/min)	0.024	0.024	0.024
Conditions at end of shear			
Normal stress (kPa)	13	25	50
Residual shear stress (kPa)	3	6	13
Average linear displacement (mm)	4.05	2.96	5.94
Angular displacement (°)	5.5	4.0	8.0

FINAL MEASUREMENTS	Stage 1	Stage 2	Stage 3
Moisture content (%)	36	-	-

Assumed cohesion (kPa)	0.0
Angle of residual shear resistance (°)	14.9

Comments / variations from procedures:

Il presente rapporto di prova è formato da n. 19 pagine.

Tested Date	Farinelli 25/10/2010	Checked Date	Sfalanga 25/10/2010	Approved Date	Carmignani 2544/2010
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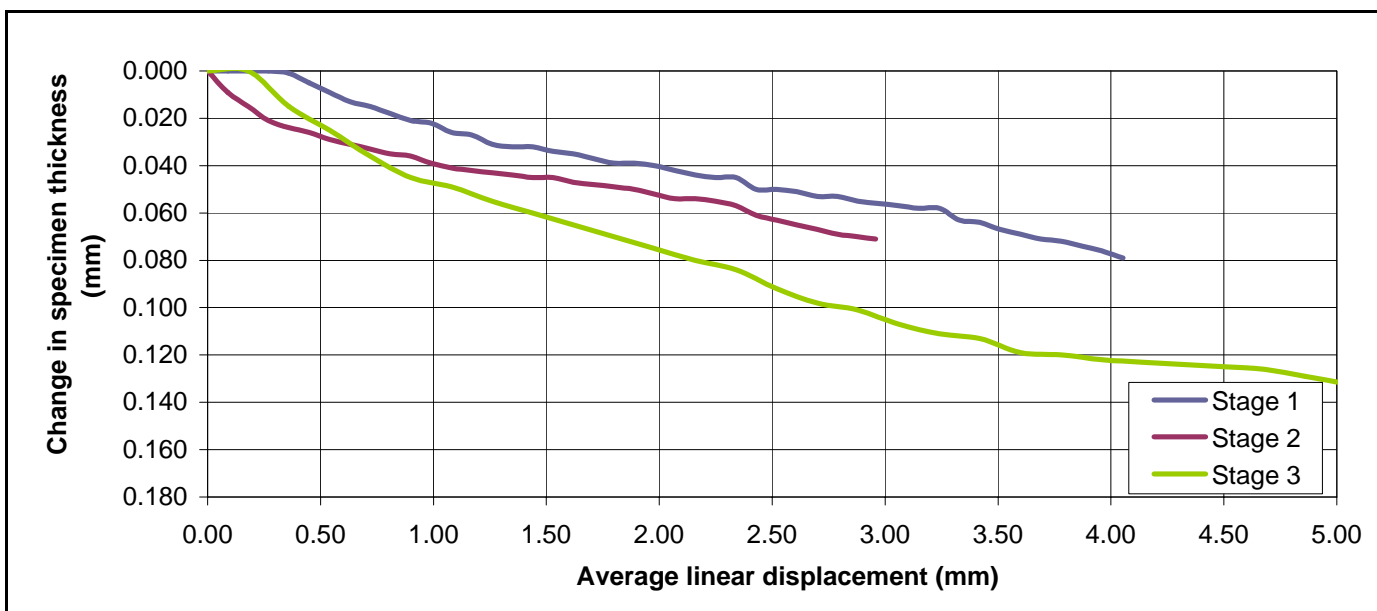
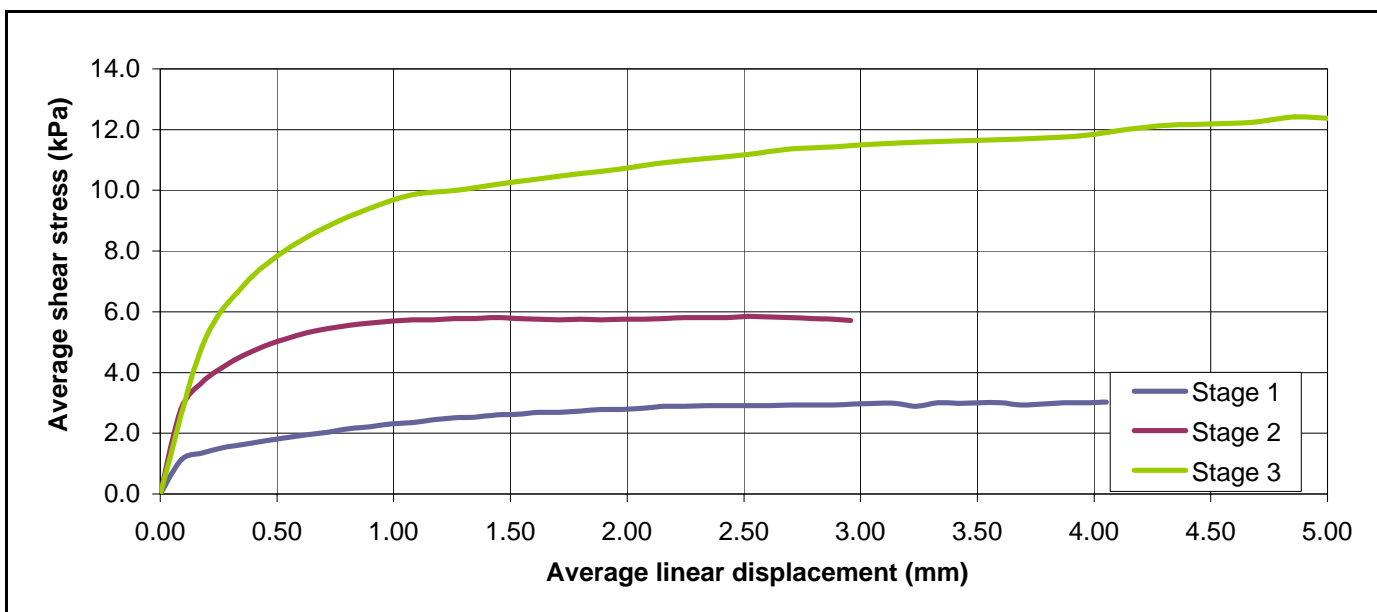


DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST REPORT - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi	Sample depth (m)	3.00/3.40
Project reference	Palazzi Giomarelli srl	Sample type	Remoulded
Borehole number	26		
Sample number	1		



Tested Date	Farinelli 25/10/2010	Checked Date	Sfalanga 25/10/2010	Approved Date	Carmignani 25/10/2010
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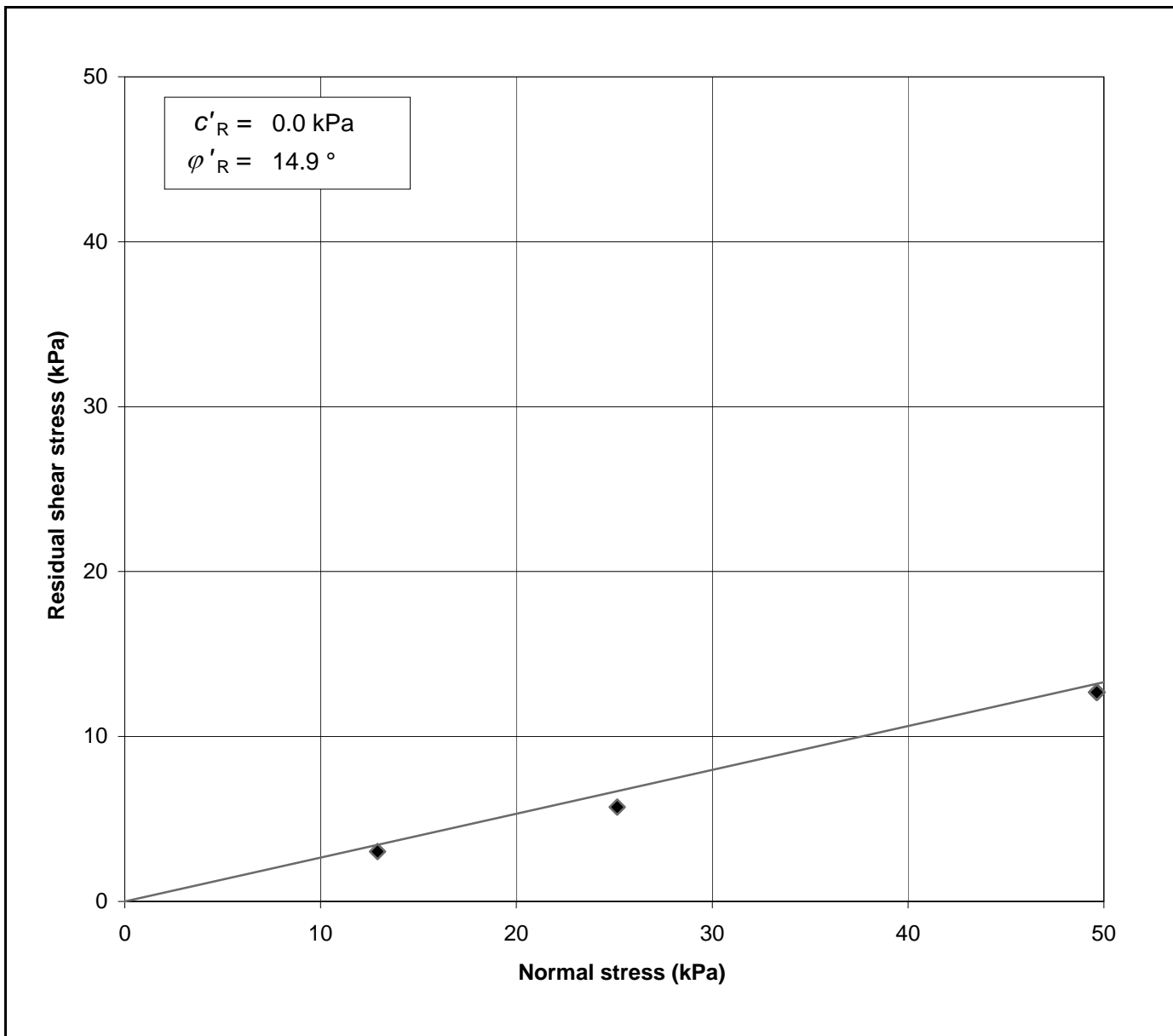


DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST REPORT - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi	Sample depth (m)	3.00/3.40
Project reference	Palazzi Giomarelli srl	Sample type	Remoulded
Borehole number	26		
Sample number	1		



Tested Date	Farinelli 25/10/2010	Checked Date	Sfalanga 25/10/2010	Approved Date	Carmignani 2544/2010
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DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.00/3.40
Borehole number	26	Sample type	Remoulded
Sample number	1		

STAGE 1 **Normal stress (kPa)** **13**

Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	0.172	0.2	0.000
0.09	0.174	0.3	0.002
0.13	0.178	0.4	0.006
0.20	0.184	0.4	0.012
0.32	0.191	0.6	0.019
0.51	0.199	0.7	0.027
0.81	0.210	0.9	0.038
1.29	0.228	1.1	0.056
2.05	0.252	1.4	0.080
3.25	0.269	1.8	0.097
5.17	0.296	2.3	0.124
8.22	0.317	2.9	0.145
13.06	0.328	3.6	0.156
20.76	0.335	4.6	0.163
33.00	0.344	5.7	0.172
52.47	0.353	7.2	0.181
83.43	0.368	9.1	0.196
132.66	0.380	11.5	0.208
210.92	0.379	14.5	0.207
335.37	0.378	18.3	0.206
533.23	0.377	23.1	0.205
847.83	0.376	29.1	0.204
1036.52	0.375	32.2	0.203



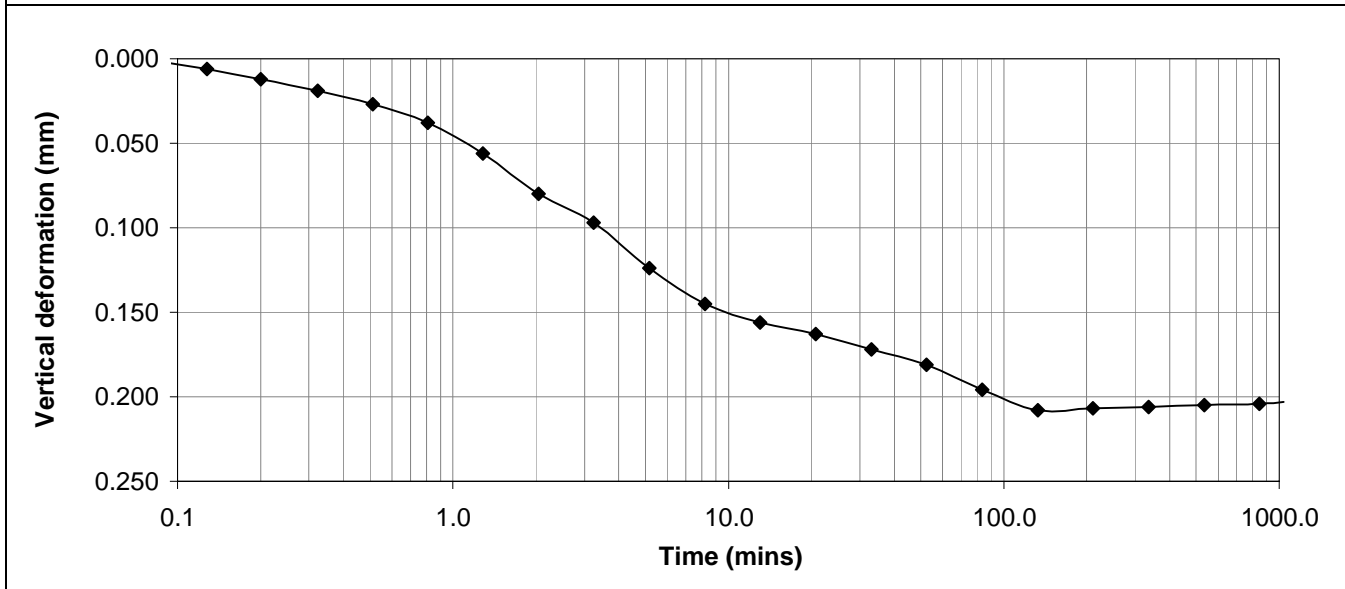
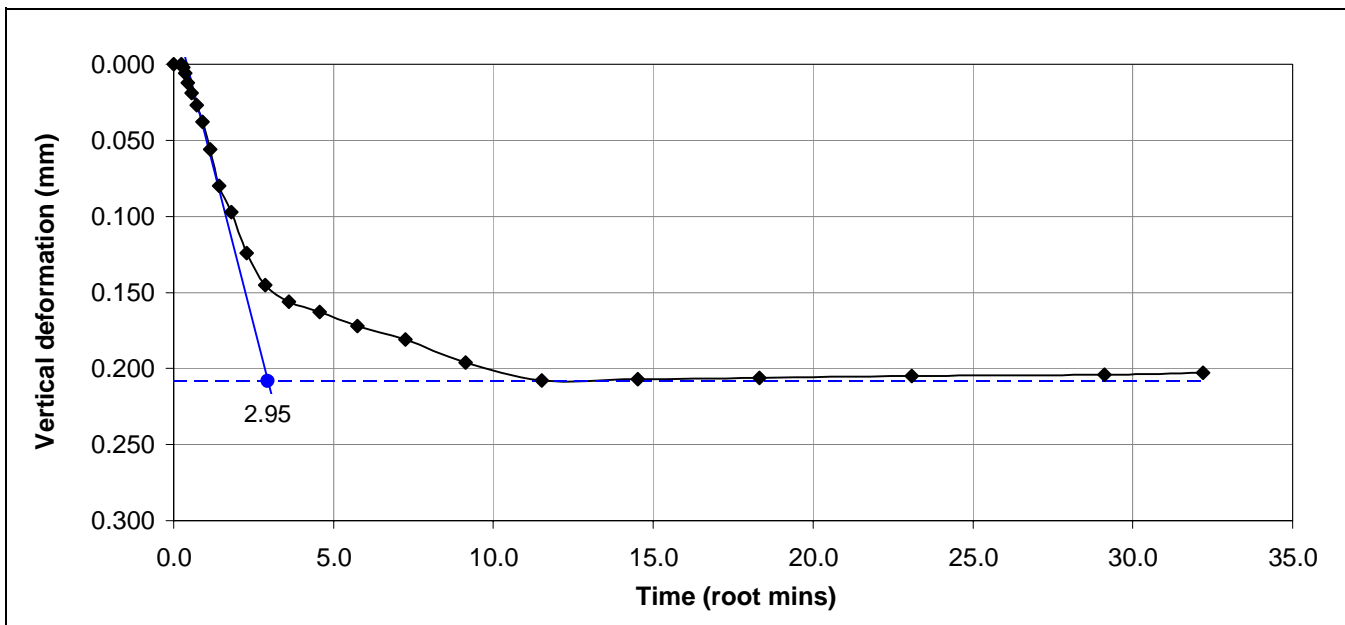
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.00/3.40
Borehole number	26	Sample type	Remoulded
Sample number	1		

STAGE 1 **Normal stress (kPa)** **13**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	20/10/2010	Date	25/10/2010	Date	25/10/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.00/3.40
Borehole number	26	Sample type	Remoulded
Sample number	1		

STAGE 1 **Normal stress (kPa)** **13**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
0.02	0.390	-0.3	-0.2	0.0	0.00	0.000	0.0	0.0
5.00	0.390	2.0	2.5	0.1	0.09	0.000	2.5	1.1
10.00	0.390	2.5	3.0	0.2	0.18	0.000	3.0	1.3
15.00	0.390	2.9	3.4	0.4	0.27	0.000	3.4	1.5
20.00	0.391	3.2	3.6	0.5	0.36	0.001	3.7	1.6
25.00	0.395	3.4	3.9	0.6	0.45	0.005	3.9	1.7
30.00	0.399	3.6	4.2	0.7	0.54	0.009	4.2	1.9
35.01	0.403	3.8	4.4	0.8	0.63	0.013	4.4	1.9
40.00	0.405	4.0	4.6	1.0	0.72	0.015	4.6	2.0
45.00	0.408	4.2	4.9	1.1	0.81	0.018	4.8	2.2
50.00	0.411	4.3	5.1	1.2	0.90	0.021	5.0	2.2
55.00	0.412	4.4	5.4	1.3	0.99	0.022	5.2	2.3
60.00	0.416	4.5	5.5	1.5	1.08	0.026	5.3	2.4
65.00	0.417	4.7	5.7	1.6	1.17	0.027	5.5	2.4
70.00	0.421	4.7	6.0	1.7	1.26	0.031	5.6	2.5
75.00	0.422	4.5	6.3	1.8	1.35	0.032	5.7	2.5
80.00	0.422	4.7	6.4	1.9	1.44	0.032	5.8	2.6
85.00	0.424	4.8	6.4	2.1	1.53	0.034	5.9	2.6
90.00	0.425	4.8	6.7	2.2	1.62	0.035	6.0	2.7
95.00	0.427	4.9	6.6	2.3	1.71	0.037	6.0	2.7
100.00	0.429	4.9	6.8	2.4	1.80	0.039	6.1	2.7
105.00	0.429	4.9	7.0	2.5	1.89	0.039	6.2	2.8
110.00	0.430	4.9	7.0	2.7	1.98	0.040	6.2	2.8
115.00	0.432	4.9	7.2	2.8	2.07	0.042	6.3	2.8
120.00	0.434	5.0	7.4	2.9	2.16	0.044	6.5	2.9
125.00	0.435	5.0	7.4	3.0	2.25	0.045	6.5	2.9
130.00	0.435	5.0	7.5	3.2	2.34	0.045	6.5	2.9
135.00	0.440	5.0	7.5	3.3	2.43	0.050	6.5	2.9
140.00	0.440	4.9	7.6	3.4	2.52	0.050	6.5	2.9
145.00	0.441	4.9	7.6	3.5	2.61	0.051	6.5	2.9
150.00	0.443	4.9	7.7	3.6	2.70	0.053	6.6	2.9
155.00	0.443	4.9	7.7	3.8	2.79	0.053	6.6	2.9
160.00	0.445	4.9	7.7	3.9	2.88	0.055	6.6	2.9
165.00	0.446	4.8	7.9	4.0	2.97	0.056	6.6	3.0



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.00/3.40
Borehole number	26	Sample type	Remoulded
Sample number	1		

STAGE 1 **Normal stress (kPa)** **13**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
170.00	0.447	4.9	7.9	4.1	3.06	0.057	6.7	3.0
175.00	0.448	5.0	7.8	4.2	3.15	0.058	6.7	3.0
180.00	0.448	4.6	7.8	4.4	3.24	0.058	6.5	2.9
185.00	0.453	4.9	8.0	4.5	3.33	0.063	6.7	3.0
190.00	0.454	4.9	7.9	4.6	3.42	0.064	6.7	3.0
195.00	0.457	4.8	8.1	4.7	3.51	0.067	6.7	3.0
200.00	0.459	4.9	8.0	4.9	3.60	0.069	6.7	3.0
205.00	0.461	5.0	7.6	5.0	3.69	0.071	6.6	2.9
210.00	0.462	4.8	7.9	5.1	3.78	0.072	6.6	3.0
215.00	0.464	5.0	7.9	5.2	3.87	0.074	6.7	3.0
220.00	0.466	5.0	7.9	5.3	3.96	0.076	6.7	3.0
225.00	0.469	5.1	7.9	5.5	4.05	0.079	6.8	3.0
225.16	0.469	5.1	7.9	5.5	4.05	0.079	6.8	3.0



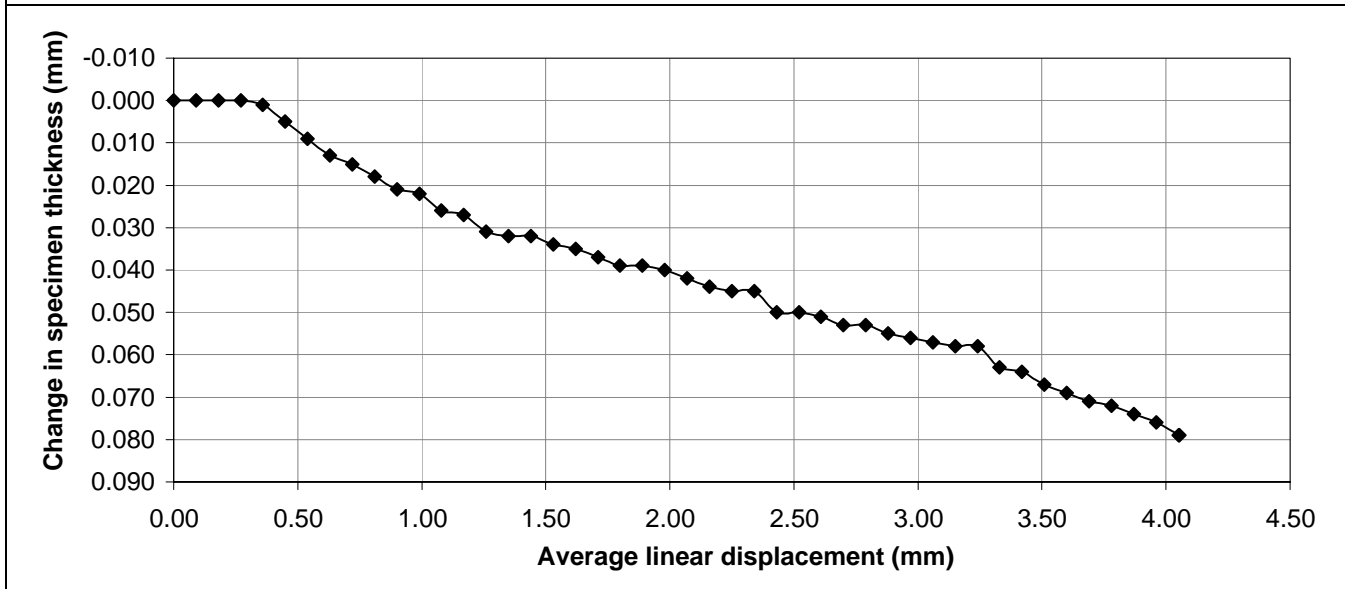
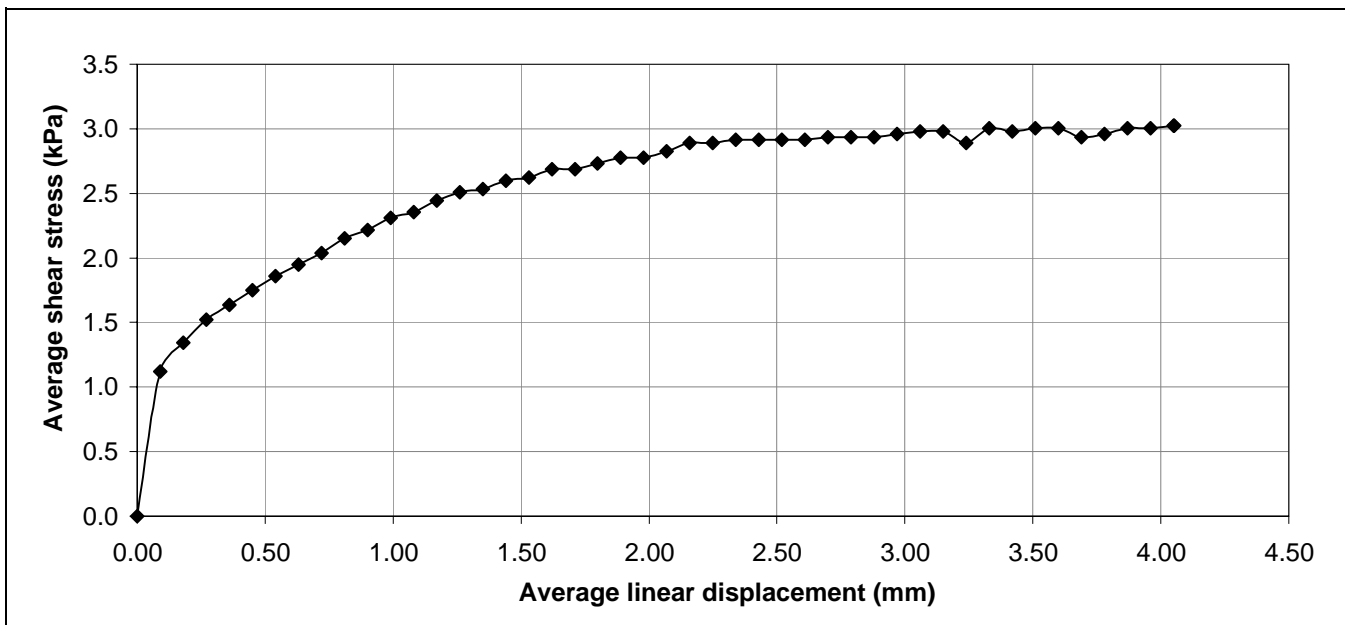
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.00/3.40
Borehole number	26	Sample type	Remoulded
Sample number	1		

STAGE 1 **Normal stress (kPa)** **13**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	21/10/2010	Date	25/10/2010	Date	25/10/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.00/3.40
Borehole number	26	Sample type	Remoulded
Sample number	1		

STAGE 2 **Normal stress (kPa)** **25**

Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	0.561	0.2	0.000
0.08	0.575	0.3	0.014
0.13	0.584	0.4	0.023
0.20	0.591	0.5	0.030
0.32	0.598	0.6	0.037
0.51	0.606	0.7	0.045
0.81	0.615	0.9	0.054
1.29	0.636	1.1	0.075
2.04	0.655	1.4	0.094
3.25	0.672	1.8	0.111
5.17	0.685	2.3	0.124
8.21	0.696	2.9	0.135
13.06	0.707	3.6	0.146
20.76	0.718	4.6	0.157
33.01	0.724	5.7	0.163
52.48	0.733	7.2	0.172
83.43	0.737	9.1	0.176
132.66	0.745	11.5	0.184
210.92	0.750	14.5	0.189
311.93	0.752	17.7	0.191



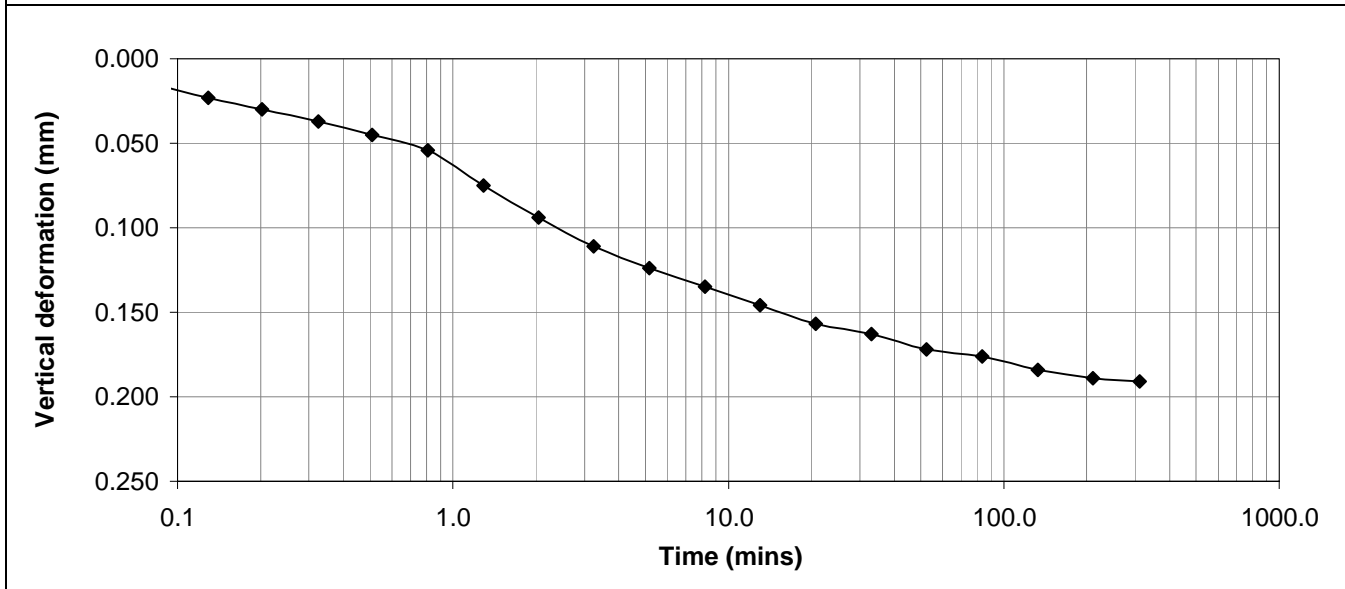
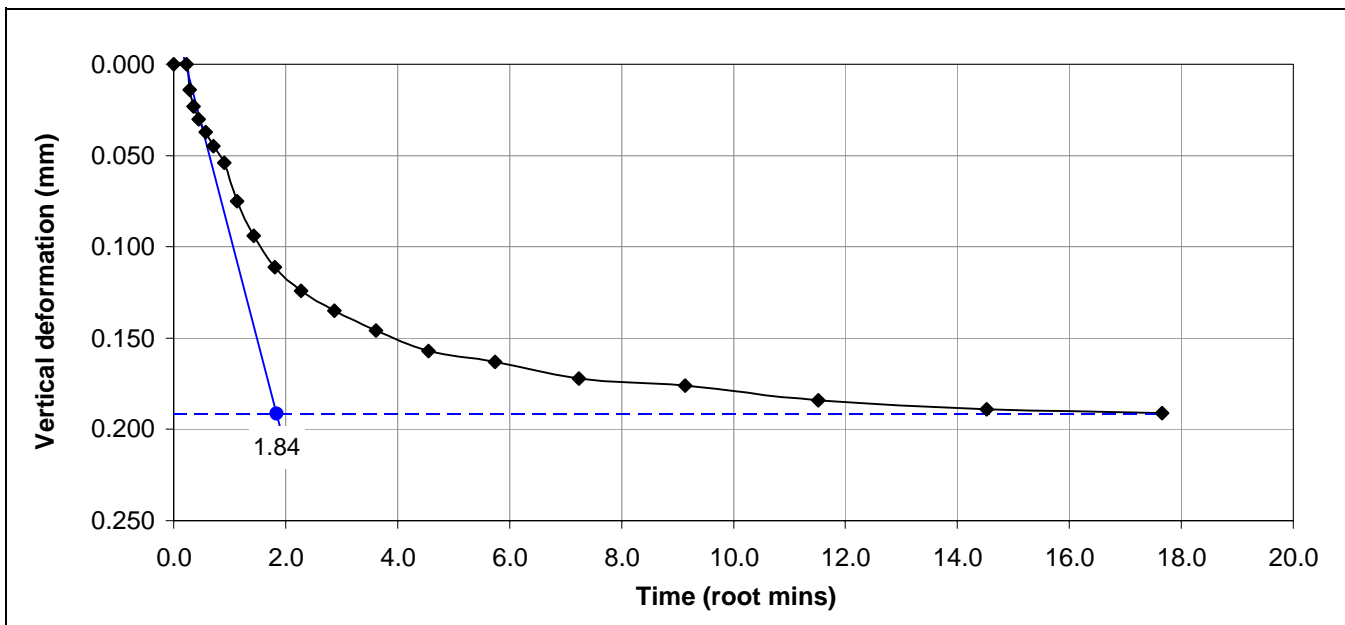
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.00/3.40
Borehole number	26	Sample type	Remoulded
Sample number	1		

STAGE 2 **Normal stress (kPa)** **25**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	21/10/2010	Date	25/10/2010	Date	25/10/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.00/3.40
Borehole number	26	Sample type	Remoulded
Sample number	1		

STAGE 2 **Normal stress (kPa)** **25**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
0.02	0.797	1.3	0.6	0.0	0.00	0.000	0.0	0.0
5.00	0.806	7.1	7.3	0.1	0.09	0.009	6.3	2.8
10.00	0.812	9.4	8.9	0.2	0.18	0.015	8.2	3.7
15.00	0.818	10.4	10.2	0.4	0.27	0.021	9.4	4.2
20.00	0.821	11.1	11.2	0.5	0.36	0.024	10.2	4.6
25.00	0.823	11.7	12.0	0.6	0.45	0.026	10.9	4.9
30.00	0.826	12.1	12.6	0.7	0.54	0.029	11.4	5.1
35.00	0.828	12.5	13.1	0.8	0.63	0.031	11.9	5.3
40.00	0.830	12.8	13.4	1.0	0.72	0.033	12.2	5.4
45.00	0.832	13.0	13.7	1.1	0.81	0.035	12.4	5.6
50.00	0.833	13.1	13.9	1.2	0.90	0.036	12.6	5.6
55.00	0.836	13.2	14.1	1.3	0.99	0.039	12.7	5.7
60.00	0.838	13.2	14.3	1.5	1.08	0.041	12.8	5.7
65.00	0.839	13.2	14.3	1.6	1.17	0.042	12.8	5.7
70.00	0.840	13.2	14.5	1.7	1.26	0.043	12.9	5.8
75.00	0.841	13.2	14.5	1.8	1.35	0.044	12.9	5.8
80.00	0.842	13.2	14.6	1.9	1.44	0.045	13.0	5.8
85.00	0.842	13.1	14.6	2.1	1.53	0.045	12.9	5.8
90.00	0.844	13.0	14.6	2.2	1.62	0.047	12.9	5.8
95.00	0.845	12.9	14.6	2.3	1.71	0.048	12.8	5.7
100.00	0.846	12.9	14.7	2.4	1.80	0.049	12.9	5.8
105.00	0.847	12.9	14.6	2.5	1.89	0.050	12.8	5.7
110.00	0.849	13.0	14.6	2.7	1.98	0.052	12.9	5.8
115.00	0.851	13.0	14.6	2.8	2.07	0.054	12.9	5.8
120.00	0.851	13.1	14.6	2.9	2.16	0.054	12.9	5.8
125.00	0.852	13.2	14.6	3.0	2.25	0.055	13.0	5.8
130.00	0.854	13.2	14.6	3.2	2.34	0.057	13.0	5.8
135.00	0.858	13.2	14.6	3.3	2.43	0.061	13.0	5.8
140.00	0.860	13.2	14.8	3.4	2.52	0.063	13.1	5.8
145.00	0.862	13.1	14.8	3.5	2.61	0.065	13.0	5.8
150.00	0.864	13.1	14.7	3.6	2.70	0.067	13.0	5.8
155.00	0.866	13.0	14.7	3.8	2.79	0.069	12.9	5.8
160.00	0.867	12.9	14.7	3.9	2.88	0.070	12.9	5.8
164.34	0.868	12.8	14.6	4.0	2.96	0.071	12.8	5.7



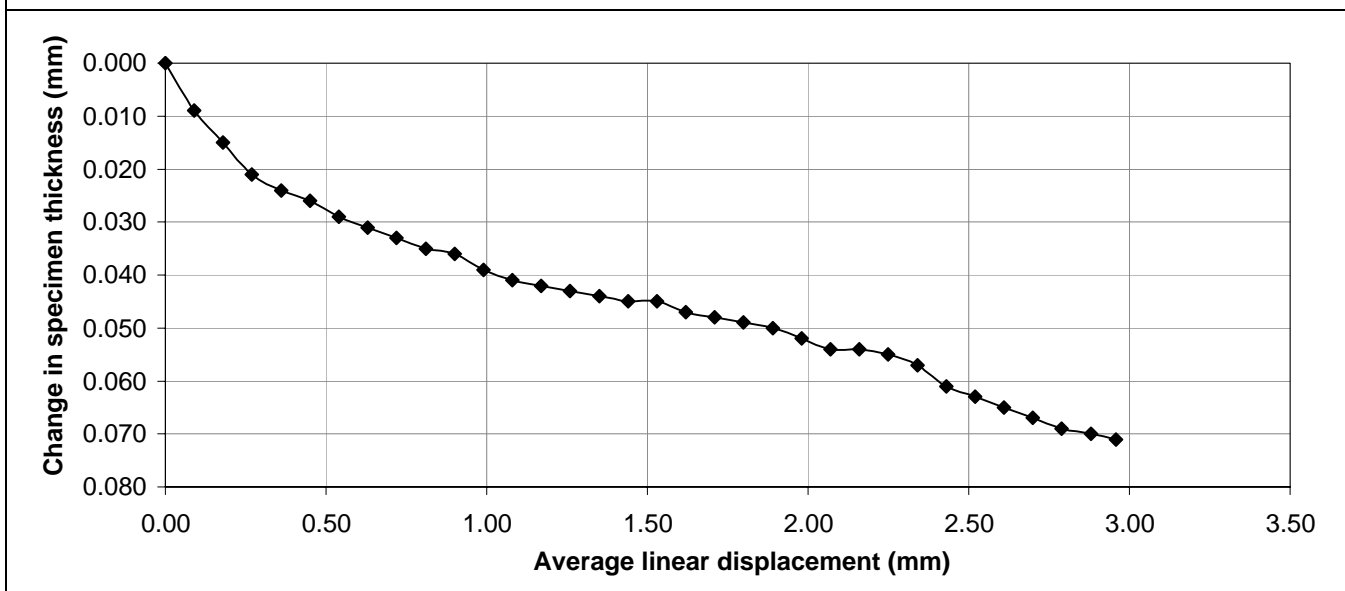
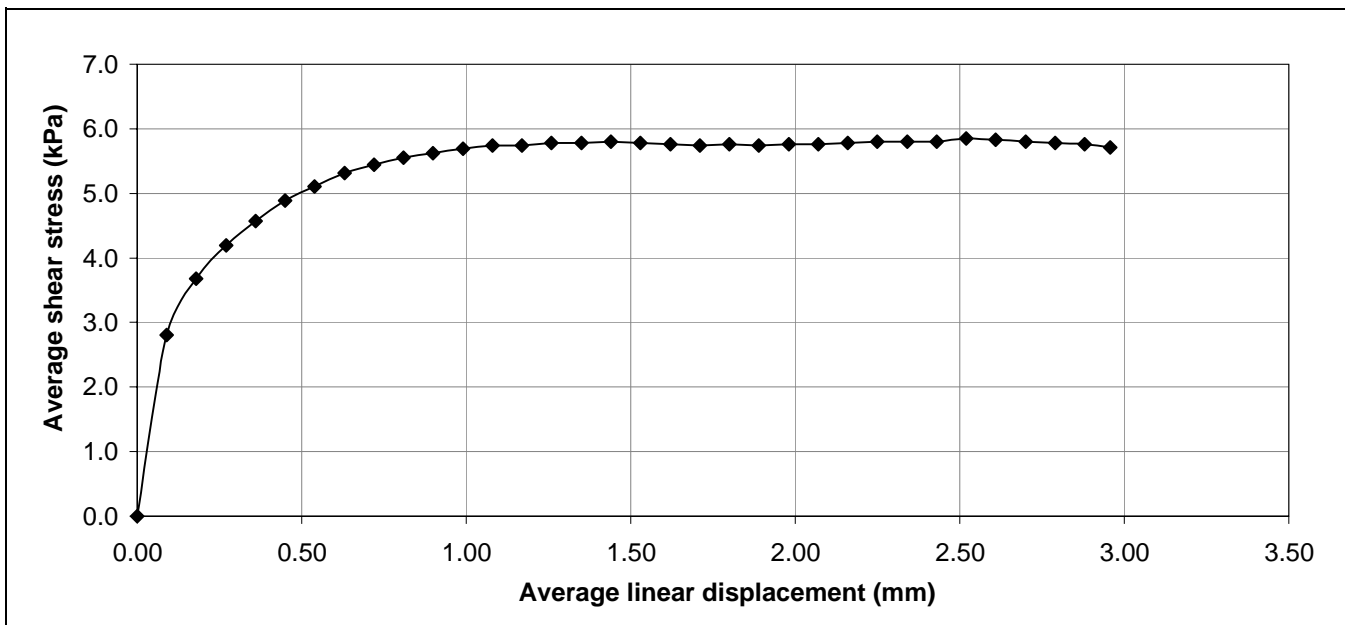
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.00/3.40
Borehole number	26	Sample type	Remoulded
Sample number	1		

STAGE 2 **Normal stress (kPa)** **25**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	22/10/2010	Date	25/10/2010	Date	25/10/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.00/3.40
Borehole number	26	Sample type	Remoulded
Sample number	1		

STAGE 3 **Normal stress (kPa)** **50**

Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.06	0.919	0.2	0.000
0.08	0.923	0.3	0.004
0.13	0.926	0.4	0.007
0.20	0.928	0.4	0.009
0.32	0.938	0.6	0.019
0.51	0.944	0.7	0.025
0.81	0.952	0.9	0.033
1.29	0.966	1.1	0.047
2.05	0.977	1.4	0.058
3.25	0.988	1.8	0.069
5.17	1.003	2.3	0.084
8.21	1.009	2.9	0.090
13.06	1.015	3.6	0.096
20.76	1.015	4.6	0.096
33.00	1.015	5.7	0.096
52.48	1.015	7.2	0.096
83.43	1.014	9.1	0.095
132.66	1.014	11.5	0.095
210.92	1.013	14.5	0.094
335.37	1.013	18.3	0.094
533.23	1.014	23.1	0.095
771.54	1.014	27.8	0.095



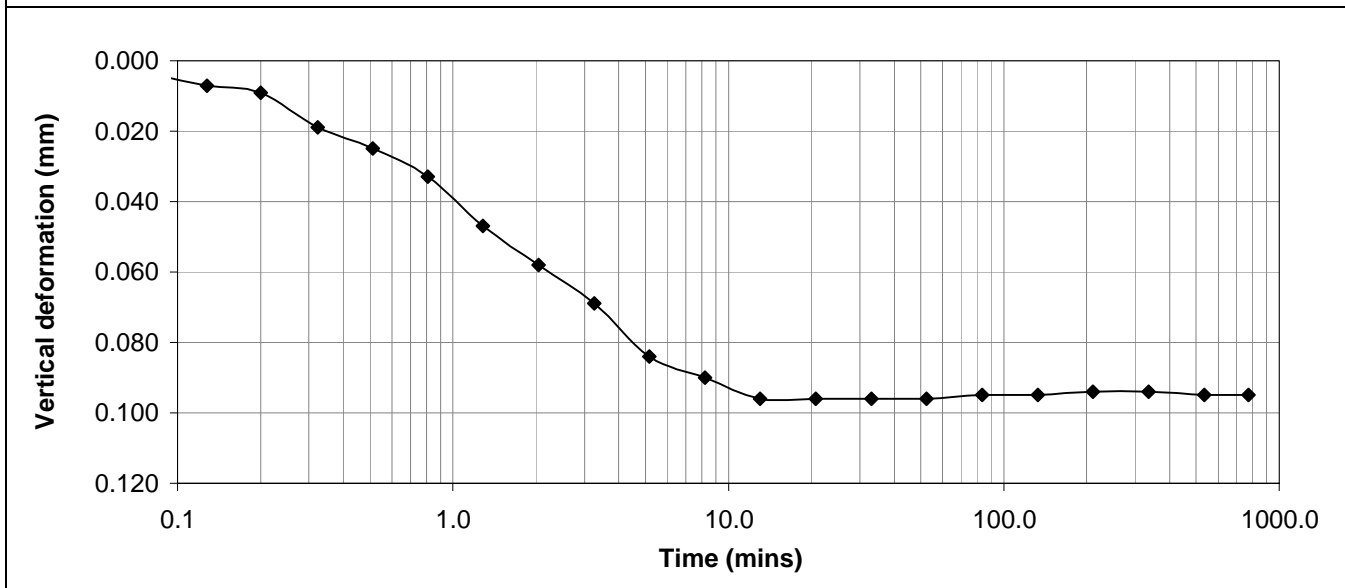
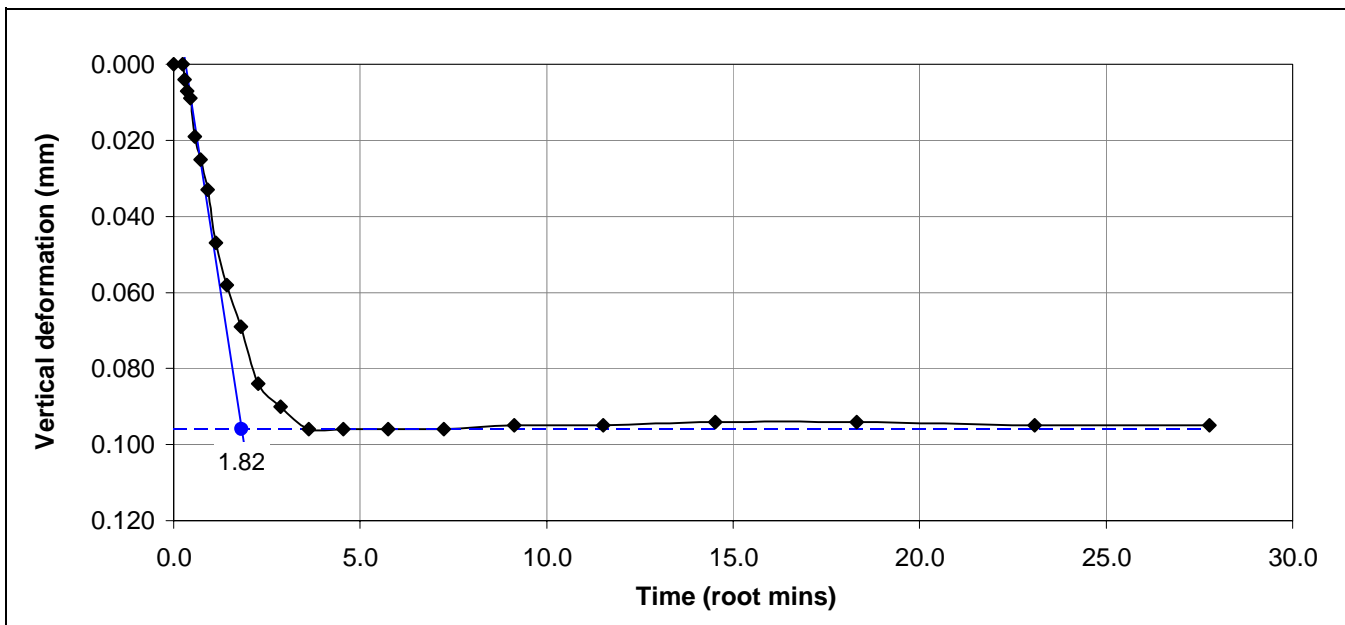
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.00/3.40
Borehole number	26	Sample type	Remoulded
Sample number	1		

STAGE 3 **Normal stress (kPa)** **50**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	22/10/2010	Date	25/10/2010	Date	25/10/2010



DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.00/3.40
Borehole number	26	Sample type	Remoulded
Sample number	1		

STAGE 3 **Normal stress (kPa)** **50**

Recorded data				Calculated data				
Elapsed time (mins)	Vertical disp. (mm)	Shear force A (N)	Shear force B (N)	Angular rotation (°)	Average linear disp. (mm)	Vertical disp. (mm)	Avg. shear force (N)	Avg. shear stress (kPa)
0.02	1.012	-0.4	-0.5	0.0	0.00	0.000	0.0	0.0
10.01	1.012	9.4	11.4	0.2	0.18	0.000	10.9	4.9
20.00	1.027	13.3	16.5	0.5	0.36	0.015	15.4	6.9
30.00	1.037	15.6	19.4	0.7	0.54	0.025	18.0	8.0
40.00	1.048	17.1	21.4	1.0	0.72	0.036	19.7	8.8
50.00	1.057	18.3	22.8	1.2	0.90	0.045	21.0	9.4
60.00	1.061	19.2	23.9	1.5	1.08	0.049	22.0	9.9
70.00	1.067	19.4	24.3	1.7	1.26	0.055	22.3	10.0
80.00	1.072	19.7	24.9	1.9	1.44	0.060	22.8	10.2
90.00	1.077	20.1	25.3	2.2	1.62	0.065	23.2	10.4
100.00	1.082	20.4	25.8	2.4	1.80	0.070	23.6	10.6
110.00	1.087	20.7	26.2	2.7	1.98	0.075	23.9	10.7
120.00	1.092	21.0	26.8	2.9	2.16	0.080	24.4	10.9
130.00	1.096	21.2	27.2	3.2	2.34	0.084	24.7	11.0
140.00	1.104	21.4	27.6	3.4	2.52	0.092	25.0	11.2
150.00	1.110	21.7	28.1	3.6	2.70	0.098	25.4	11.4
160.00	1.113	21.8	28.3	3.9	2.88	0.101	25.5	11.4
170.00	1.119	21.9	28.6	4.1	3.06	0.107	25.7	11.5
180.00	1.123	22.0	28.8	4.4	3.24	0.111	25.9	11.6
190.00	1.125	22.1	28.9	4.6	3.42	0.113	26.0	11.6
200.00	1.131	22.2	29.0	4.9	3.60	0.119	26.1	11.7
210.00	1.132	22.3	29.1	5.1	3.78	0.120	26.2	11.7
220.00	1.134	22.5	29.3	5.3	3.96	0.122	26.4	11.8
230.00	1.135	22.9	29.8	5.6	4.14	0.123	26.8	12.0
240.00	1.136	23.2	30.1	5.8	4.32	0.124	27.1	12.1
250.00	1.137	23.3	30.2	6.1	4.50	0.125	27.2	12.2
260.00	1.138	23.4	30.3	6.3	4.68	0.126	27.3	12.2
270.00	1.141	23.8	30.7	6.6	4.86	0.129	27.7	12.4
280.00	1.144	23.7	30.5	6.8	5.04	0.132	27.6	12.3
290.00	1.146	23.5	30.1	7.0	5.22	0.134	27.3	12.2
300.00	1.148	23.7	30.1	7.3	5.40	0.136	27.4	12.3
310.00	1.153	24.1	30.4	7.5	5.58	0.141	27.7	12.4
320.00	1.160	24.3	30.6	7.8	5.76	0.148	27.9	12.5
330.00	1.170	24.7	31.0	8.0	5.94	0.158	28.3	12.7



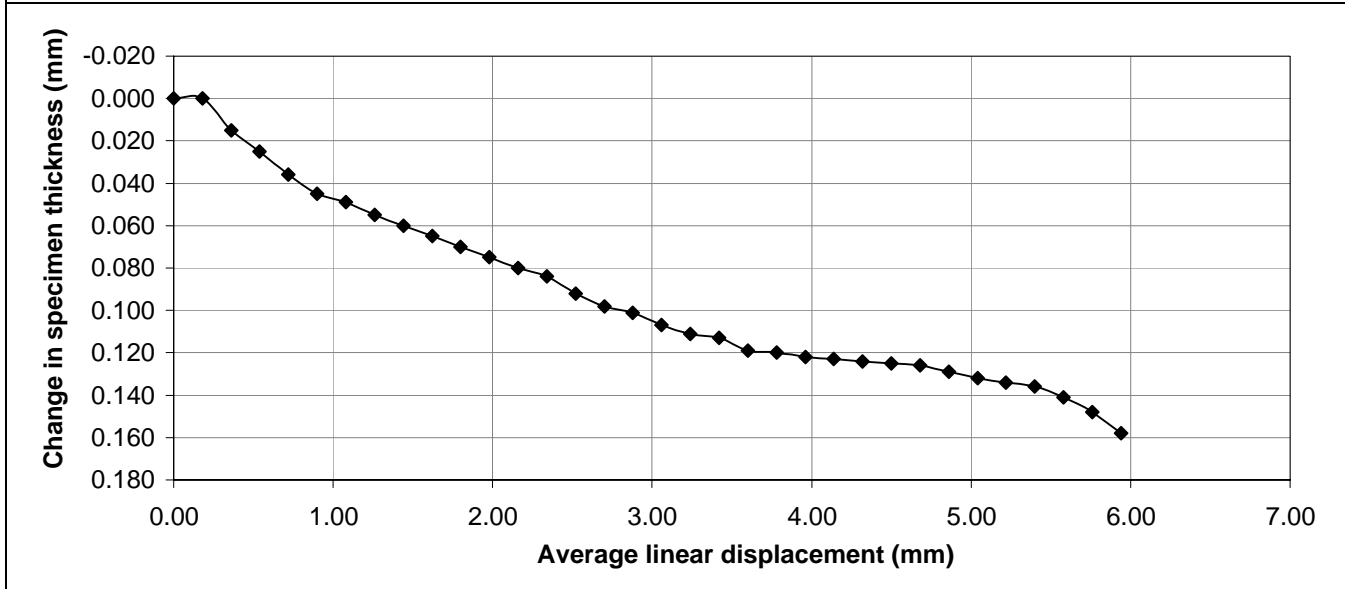
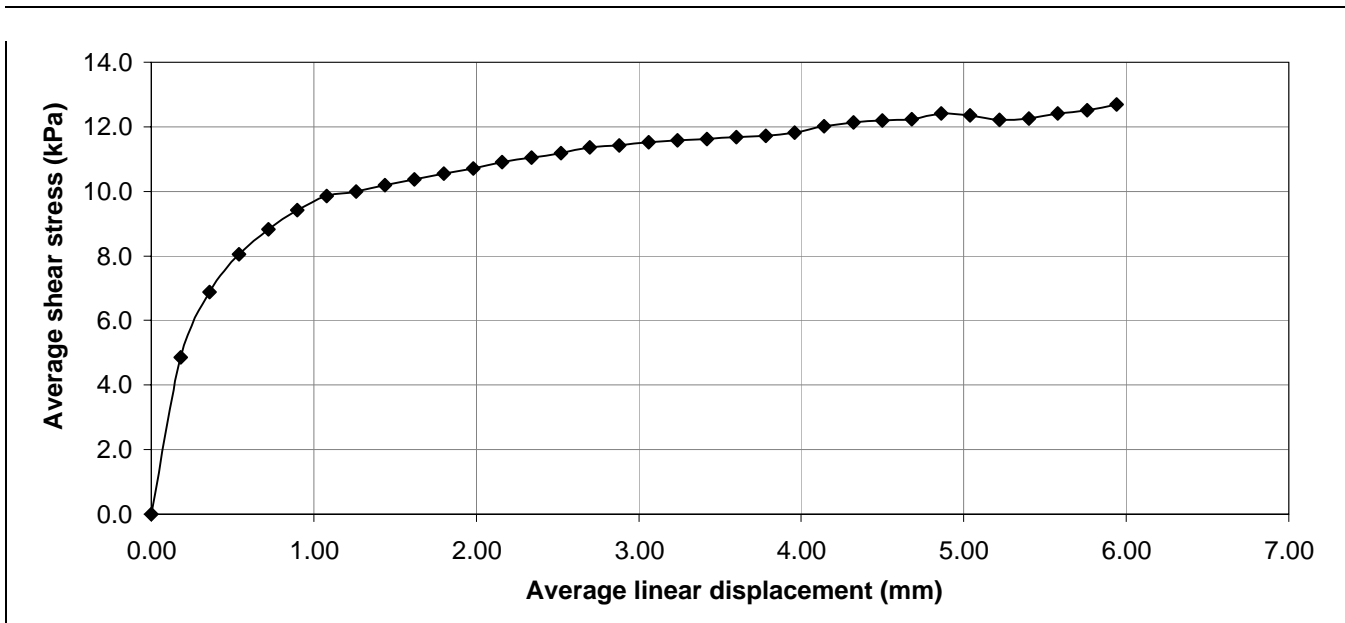
DETERMINATION OF RESIDUAL STRENGTH USING THE SMALL RING SHEAR APPARATUS

Multistage test - tested in accordance with BS 1377:1990:Part 7:Clause 6

TEST DATA - SHEARING

Project location	GEOITALIA - Poggio Tre Vescovi		
Project reference	Palazzi Giomarelli srl	Sample depth (m)	3.00/3.40
Borehole number	26	Sample type	Remoulded
Sample number	1		

STAGE 3 **Normal stress (kPa)** **50**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	23/10/2010	Date	25/10/2010	Date	No. 2544/2010



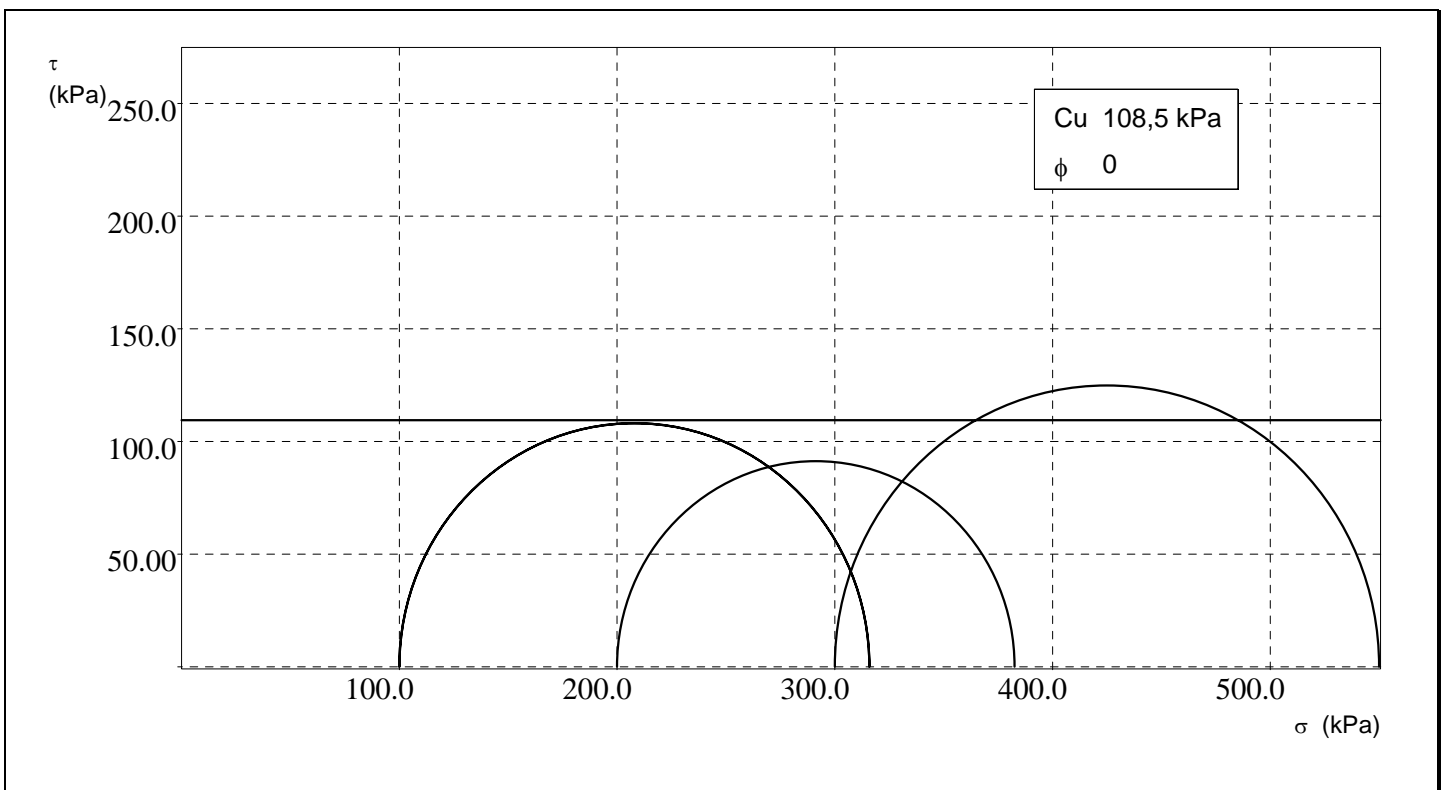
PROVA TRIASSIALE UU (ASTM D2850)

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Poggio Tre Vescovi
Sondaggio	26
Campione	1
Profondità	3.00-3.40

Risultati di prova

Provino	Ho mm	Ao cm ²	γ_n g/cm ³	γ_d g/cm ³	Wo %	So %	σ kPa	ϵ %	$\sigma_1 - \sigma_3$ kPa
10UU899A	76,00	11,39	2,008	1,693	18,56	82,29	100,00	6,99	216,21
10UU899B	76,00	11,39	2,027	1,646	23,16	95,50	200,00	5,92	182,58
10UU899C	76,00	11,39	2,041	1,745	16,97	81,55	300,00	8,45	249,87



Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



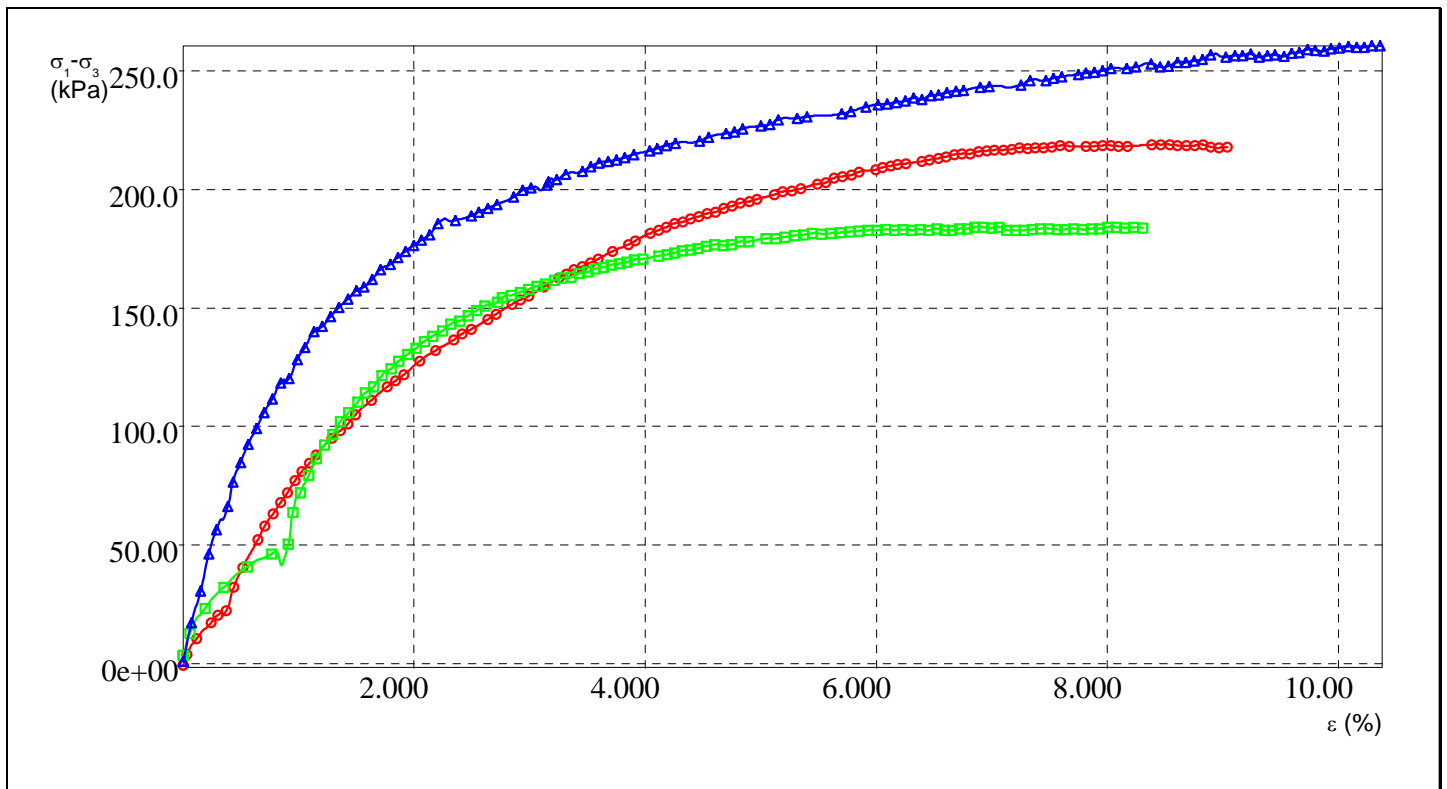
PROVA TRIASSIALE UU (ASTM D2850)

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Poggio Tre Vescovi
Sondaggio	26
Campione	1
Profondità	3.00-3.40

Risultati di prova

Provino	Ho mm	Ao cm ²	γ_n g/cm ³	γ_d g/cm ³	Wo %	So %	σ kPa	ε %	$\sigma_1 - \sigma_3$ kPa
10UU899A	76,00	11,39	2,008	1,693	18,56	82,29	100,00	6,99	216,21
10UU899B	76,00	11,39	2,027	1,646	23,16	95,50	200,00	5,92	182,58
10UU899C	76,00	11,39	2,041	1,745	16,97	81,55	300,00	8,45	249,87



Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino A

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Poggio Tre Vescovi
Sondaggio	26
Campione	1
Profondità	3.00-3.40

Dati del provino

Data del sondaggio			
Sezione provino	11,394 cm ²	Densità umida iniziale	2,008 g/cm ³ γ_n
Altezza iniziale	76,000 mm	Densità umida finale	2,152 g/cm ³ γ_f
Altezza finale	68,912 mm	Densità secca	1,693 g/cm ³ γ_d
No. Tara 1	1	Umidità iniziale	18,564 % W_o
Peso tara 1	10,000 g	Umidità finale	15,249 % W_f
Tara + peso umido iniziale	183,85 g	Saturazione iniziale	82,286 % S_o
No. Tara 2	3	Saturazione finale	89,427 % S_f
Peso tara 2	27,990 g	Indice dei vuoti iniziale	0,618 e_o
Tara + peso umido finale	196,980 g	Indice dei vuoti finale	0,467 e_f
Tara + peso secco	174,620 g	Densità secca finale	1,867 g/cm ³ γ_{df}
Peso specifico dei grani	2,740 g/cm ³		

Elaborazione dati acquisiti

Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa
0,00	11,39	0,95	1,91	11,62	121,82	4,25	11,90	185,63
0,04	11,40	3,71	2,05	11,63	127,45	4,32	11,91	186,17
0,12	11,41	10,42	2,19	11,65	132,14	4,39	11,92	187,62
0,25	11,42	17,21	2,34	11,67	136,33	4,46	11,93	188,62
0,30	11,43	20,20	2,41	11,68	139,00	4,54	11,94	189,60
0,37	11,44	22,20	2,49	11,69	140,97	4,61	11,94	190,36
0,44	11,44	32,09	2,64	11,70	145,14	4,68	11,95	192,02
0,52	11,45	40,32	2,71	11,71	147,35	4,75	11,96	193,02
0,65	11,47	52,28	2,85	11,73	151,51	4,83	11,97	194,22
0,71	11,48	57,89	2,92	11,74	153,24	4,90	11,98	194,74
0,78	11,48	63,02	2,99	11,74	154,97	4,97	11,99	195,72
0,84	11,49	67,92	3,12	11,76	158,89	5,12	12,01	197,67
0,90	11,50	72,11	3,25	11,78	162,57	5,19	12,02	198,87
0,97	11,51	76,98	3,32	11,79	164,06	5,27	12,03	199,38
1,03	11,51	80,93	3,39	11,79	166,01	5,34	12,04	200,34
1,09	11,52	84,39	3,46	11,80	167,49	5,49	12,06	202,27
1,15	11,53	87,85	3,53	11,81	168,97	5,56	12,07	202,78
1,29	11,54	94,98	3,59	11,82	170,68	5,63	12,07	204,64
1,36	11,55	98,19	3,72	11,83	173,89	5,71	12,08	205,37
1,43	11,56	101,16	3,85	11,85	176,61	5,78	12,09	206,11
1,49	11,57	104,83	3,91	11,86	178,31	5,85	12,10	207,30
1,63	11,58	110,98	4,05	11,87	181,48	6,00	12,12	208,31
1,77	11,60	116,64	4,12	11,88	182,71	6,05	12,13	209,30
1,84	11,61	119,35	4,18	11,89	183,94	6,13	12,14	209,80

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino A

Epsilon %	A cm2	s1-s3 kPa
6,19	12,15	210,56
6,26	12,15	210,85
6,39	12,17	211,65
6,46	12,18	212,38
6,54	12,19	213,10
6,60	12,20	213,83
6,67	12,21	214,56
6,74	12,22	214,85
6,81	12,23	214,90
6,88	12,24	215,84
6,96	12,25	216,11
7,03	12,25	216,61
7,10	12,26	216,44
7,17	12,27	216,93
7,24	12,28	217,44
7,31	12,29	217,05
7,38	12,30	217,54
7,45	12,31	217,60
7,52	12,32	217,87
7,59	12,33	218,36
7,67	12,34	218,18
7,81	12,36	218,27
7,89	12,37	218,31
7,96	12,38	218,36
8,03	12,39	218,63
8,10	12,40	218,25
8,18	12,41	218,28
8,39	12,44	218,87
8,46	12,45	218,69
8,54	12,46	218,94
8,61	12,47	218,56
8,68	12,48	218,37
8,76	12,49	218,42
8,83	12,50	218,67
8,89	12,51	217,87
8,97	12,52	217,48
9,04	12,53	217,95
9,18	12,55	217,19

Restituzione fotografica dopo la prova



Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

PROVA TRIASSIALE UU (ASTM D2850)

Provino A

Dati del Cliente

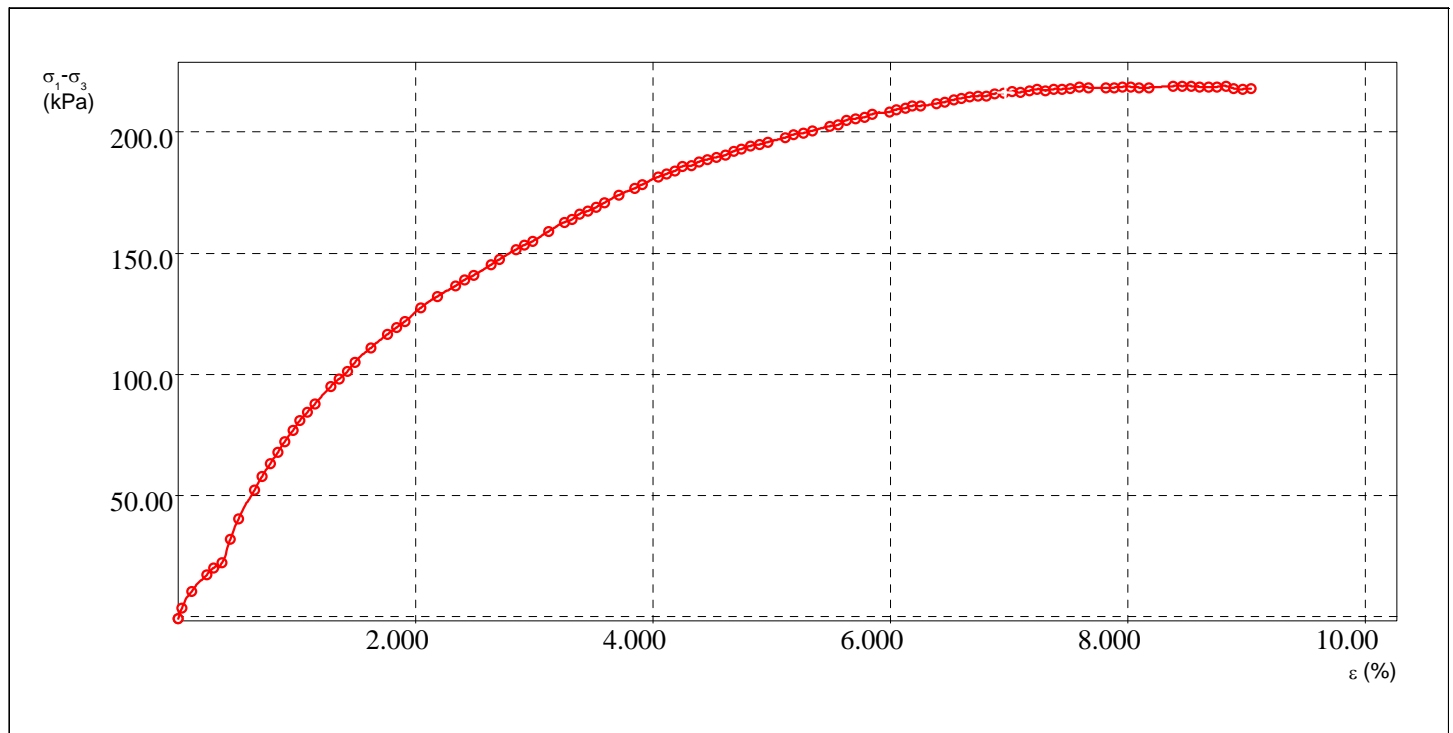
Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Poggio Tre Vescovi
Sondaggio	26
Campione	1
Profondità	3.00-3.40

Dati acquisiti

dH mm	dN N
0,00	1,08
0,03	4,23
0,09	11,88
0,19	19,66
0,23	23,08
0,28	25,38
0,34	36,73
0,39	46,18
0,49	59,95
0,54	66,43
0,59	72,37
0,64	78,04
0,69	82,90
0,74	88,58
0,78	93,17
0,83	97,22

dH mm	dN N
0,88	101,27
0,98	109,64
1,03	113,42
1,08	116,93
1,14	121,25
1,24	128,54
1,34	135,29
1,40	138,53
1,45	141,50
1,56	148,26
1,66	153,93
1,78	159,06
1,84	162,30
1,89	164,73
2,01	169,86
2,06	172,56

dH mm	dN N
2,17	177,69
2,22	179,85
2,27	182,01
2,37	186,87
2,47	191,46
2,52	193,35
2,57	195,78
2,63	197,67
2,68	199,56
2,73	201,72
2,83	205,78
2,93	209,29
2,97	211,45
3,08	215,50
3,13	217,12
3,18	218,74



Il Direttore del Laboratorio

[Signature]

Lo Sperimentatore

[Signature]

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino A

dH mm	dN N
3,23	220,90
3,29	221,71
3,34	223,60
3,39	224,95
3,45	226,30
3,50	227,38
3,56	229,54
3,61	230,89
3,67	232,51
3,72	233,32
3,78	234,67
3,89	237,37
3,94	238,99
4,00	239,80
4,06	241,15
4,17	243,85
4,23	244,66
4,28	247,09
4,34	248,17
4,39	249,25
4,45	250,87
4,56	252,49
4,60	253,84
4,66	254,65
4,70	255,73
4,76	256,27
4,86	257,62
4,91	258,70
4,97	259,78
5,02	260,86
5,07	261,94
5,12	262,48
5,18	262,75
5,23	264,11
5,29	264,65
5,34	265,46
5,39	265,46
5,45	266,27
5,50	267,08
5,55	266,81
5,61	267,62

dH mm	dN N
5,77	269,24
5,83	269,24
5,94	269,78
5,99	270,05
6,05	270,32
6,10	270,86
6,15	270,59
6,21	270,86
6,37	272,21
6,43	272,21
6,49	272,75
6,54	272,48
6,60	272,48
6,65	272,75
6,71	273,29
6,76	272,48
6,82	272,21
6,87	273,02
6,98	272,48

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino B

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Poggio Tre Vescovi
Sondaggio	26
Campione	1
Profondità	3.00-3.40

Dati del provino

Data del sondaggio			
Sezione provino	11,394 cm ²	Densità umida iniziale	2,027 g/cm ³ γ_n
Altezza iniziale	76,000 mm	Densità umida finale	2,143 g/cm ³ γ_f
Altezza finale	69,629 mm	Densità secca	1,646 g/cm ³ γ_d
No. Tara 1	1	Umidità iniziale	23,155 % W_o
Peso tara 1	10,000 g	Umidità finale	19,269 % W_f
Tara + peso umido iniziale	185,57 g	Saturazione iniziale	95,501 % S_o
No. Tara 2	47	Saturazione finale	100,600 % S_f
Peso tara 2	37,370 g	Indice dei vuoti iniziale	0,664 e_o
Tara + peso umido finale	207,400 g	Indice dei vuoti finale	0,525 e_f
Tara + peso secco	179,930 g	Densità secca finale	1,797 g/cm ³ γ_{df}
Peso specifico dei grani	2,740 g/cm ³		

Elaborazione dati acquisiti

Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa
0,00	11,39	3,32	2,16	11,65	137,97	3,91	11,86	170,13
0,06	11,40	12,55	2,24	11,66	140,41	3,98	11,87	170,68
0,19	11,42	23,18	2,32	11,66	143,08	4,12	11,88	171,80
0,36	11,43	31,95	2,39	11,67	144,58	4,19	11,89	172,36
0,55	11,46	40,60	2,47	11,68	146,79	4,25	11,90	173,14
0,76	11,48	46,11	2,54	11,69	148,99	4,32	11,91	174,16
0,91	11,50	50,38	2,61	11,70	150,95	4,39	11,92	174,49
0,95	11,50	63,62	2,72	11,71	152,40	4,46	11,93	175,04
1,02	11,51	72,02	2,76	11,72	154,18	4,53	11,93	176,04
1,09	11,52	79,47	2,84	11,73	155,20	4,60	11,94	176,59
1,15	11,53	86,21	2,92	11,74	156,46	4,67	11,95	176,45
1,22	11,54	92,00	2,99	11,74	157,73	4,75	11,96	176,77
1,30	11,54	96,62	3,07	11,75	158,98	4,82	11,97	177,98
1,36	11,55	101,93	3,14	11,76	160,01	4,90	11,98	178,07
1,43	11,56	105,82	3,21	11,77	161,72	5,05	12,00	179,14
1,51	11,57	110,18	3,28	11,78	162,75	5,13	12,01	179,20
1,58	11,58	114,07	3,36	11,79	162,85	5,21	12,02	179,95
1,65	11,59	116,78	3,43	11,80	164,56	5,29	12,03	180,47
1,72	11,59	121,36	3,50	11,81	165,13	5,37	12,04	180,76
1,80	11,60	124,29	3,57	11,82	166,38	5,45	12,05	181,30
1,87	11,61	127,45	3,64	11,82	167,18	5,53	12,06	181,14
1,94	11,62	130,38	3,71	11,83	168,20	5,61	12,07	181,43
2,02	11,63	132,83	3,78	11,84	168,76	5,69	12,08	181,72
2,09	11,64	135,75	3,84	11,85	169,33	5,77	12,09	182,02

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino B

Epsilon %	A cm2	s1-s3 kPa
5,85	12,10	182,30
5,93	12,11	182,60
6,01	12,12	182,89
6,08	12,13	183,20
6,16	12,14	182,60
6,23	12,15	183,12
6,30	12,16	182,77
6,38	12,17	183,06
6,45	12,18	182,70
6,52	12,19	183,22
6,59	12,20	182,64
6,65	12,21	182,74
6,72	12,22	183,27
6,79	12,22	183,37
6,86	12,23	183,89
6,93	12,24	183,97
7,00	12,25	183,84
7,06	12,26	184,15
7,13	12,27	182,69
7,20	12,28	182,77
7,28	12,29	182,84
7,35	12,30	182,92
7,42	12,31	183,43
7,49	12,32	183,30
7,56	12,33	183,15
7,63	12,34	183,01
7,71	12,35	183,30
7,78	12,36	182,93
7,86	12,37	183,21
7,93	12,38	183,52
8,00	12,38	184,03
8,08	12,40	184,09
8,15	12,40	183,73
8,23	12,42	184,01
8,31	12,43	183,63
8,38	12,44	183,70

Restituzione fotografica dopo la prova



Il Direttore del Laboratorio
[Signature]

Lo Sperimentatore
[Signature]

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

PROVA TRIASSIALE UU (ASTM D2850)

Provino B

Dati del Cliente

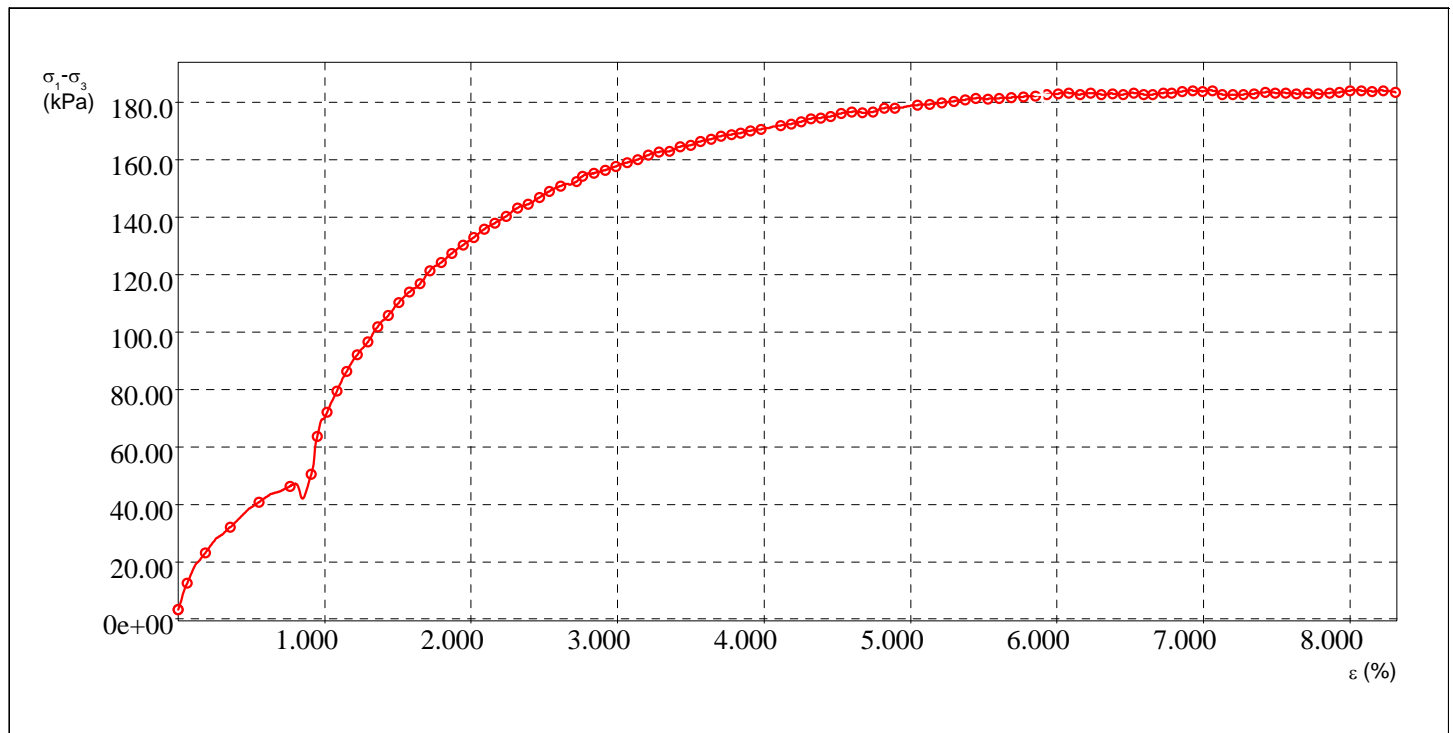
Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Poggio Tre Vescovi
Sondaggio	26
Campione	1
Profondità	3.00-3.40

Dati acquisiti

dH mm	dN N
0,00	3,78
0,05	14,31
0,14	26,46
0,27	36,53
0,42	46,52
0,58	52,94
0,69	57,94
0,72	73,18
0,77	82,90
0,83	91,55
0,88	99,38
0,93	106,13
0,99	111,53
1,04	117,74
1,09	122,33
1,15	127,46

dH mm	dN N
1,20	132,05
1,26	135,29
1,31	140,69
1,37	144,20
1,42	147,99
1,48	151,50
1,53	154,47
1,59	157,98
1,64	160,68
1,70	163,65
1,76	166,89
1,82	168,78
1,88	171,48
1,93	174,18
1,99	176,61
2,07	178,50

dH mm	dN N
2,10	180,66
2,16	182,01
2,22	183,63
2,27	185,25
2,33	186,87
2,38	188,22
2,44	190,38
2,50	191,73
2,55	192,00
2,61	194,16
2,66	194,97
2,71	196,59
2,77	197,67
2,82	199,02
2,87	199,83
2,92	200,64



Il Direttore del Laboratorio

[Signature]

Lo Sperimentatore

[Signature]

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino B

dH mm	dN N
2,97	201,72
3,02	202,53
3,13	204,15
3,18	204,97
3,23	206,05
3,28	207,40
3,34	207,94
3,39	208,75
3,44	210,10
3,50	210,91
3,55	210,91
3,61	211,45
3,67	213,07
3,72	213,34
3,84	214,96
3,90	215,23
3,96	216,31
4,02	217,12
4,08	217,66
4,14	218,47
4,20	218,47
4,26	219,01
4,32	219,55
4,39	220,09
4,45	220,63
4,51	221,17
4,57	221,71
4,62	222,25
4,68	221,71
4,74	222,52
4,79	222,25
4,85	222,79
4,90	222,52
4,96	223,33
5,01	222,79
5,06	223,06
5,11	223,87
5,16	224,14
5,21	224,95
5,27	225,22
5,32	225,22

dH mm	dN N
5,47	224,41
5,53	224,68
5,58	224,95
5,64	225,76
5,69	225,76
5,75	225,76
5,80	225,76
5,86	226,30
5,92	226,03
5,98	226,57
6,03	227,11
6,08	227,92
6,14	228,19
6,19	227,92
6,25	228,46
6,31	228,19
6,37	228,46

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino C

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Poggio Tre Vescovi
Sondaggio	26
Campione	1
Profondità	3.00-3.40

Dati del provino

Data del sondaggio			
Sezione provino	11,394 cm ²	Densità umida iniziale	2,041 g/cm ³ γ_n
Altezza iniziale	76,000 mm	Densità umida finale	2,203 g/cm ³ γ_f
Altezza finale	68,070 mm	Densità secca	1,745 g/cm ³ γ_d
No. Tara 1	1	Umidità iniziale	16,967 % W_o
Peso tara 1	10,000 g	Umidità finale	13,076 % W_f
Tara + peso umido iniziale	186,76 g	Saturazione iniziale	81,549 % S_o
No. Tara 2	10	Saturazione finale	88,192 % S_f
Peso tara 2	28,810 g	Indice dei vuoti iniziale	0,570 e_o
Tara + peso umido finale	199,690 g	Indice dei vuoti finale	0,406 e_f
Tara + peso secco	179,930 g	Densità secca finale	1,948 g/cm ³ γ_{df}
Peso specifico dei grani	2,740 g/cm ³		

Elaborazione dati acquisiti

Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa
0,00	11,39	0,95	1,86	11,61	171,20	4,11	11,88	217,27
0,07	11,40	17,00	1,92	11,62	173,87	4,18	11,89	218,46
0,15	11,41	30,53	2,00	11,63	176,29	4,26	11,90	219,43
0,22	11,42	46,11	2,06	11,63	178,50	4,47	11,93	220,53
0,29	11,43	56,48	2,14	11,64	180,69	4,55	11,94	221,92
0,39	11,44	66,11	2,21	11,65	185,65	4,70	11,96	223,62
0,43	11,44	76,46	2,36	11,67	186,99	4,77	11,97	224,11
0,50	11,45	84,66	2,49	11,69	188,81	4,84	11,97	225,53
0,56	11,46	92,38	2,56	11,69	190,52	5,00	11,99	226,73
0,64	11,47	99,15	2,64	11,70	191,99	5,08	12,00	227,45
0,70	11,47	105,90	2,72	11,71	193,45	5,15	12,01	229,44
0,77	11,48	111,71	2,86	11,73	196,84	5,32	12,03	230,02
0,85	11,49	118,21	2,94	11,74	199,67	5,40	12,04	230,49
0,91	11,50	120,15	3,01	11,75	200,45	5,70	12,08	231,99
0,99	11,51	128,21	3,15	11,76	202,00	5,78	12,09	232,69
1,06	11,52	133,20	3,16	11,77	203,12	5,91	12,11	234,81
1,13	11,52	140,08	3,23	11,77	204,11	6,02	12,12	235,66
1,20	11,53	142,13	3,32	11,78	206,23	6,09	12,13	236,14
1,28	11,54	146,23	3,46	11,80	207,77	6,17	12,14	236,61
1,35	11,55	150,10	3,53	11,81	209,44	6,25	12,15	237,30
1,43	11,56	153,73	3,60	11,82	211,11	6,33	12,16	238,44
1,50	11,57	157,12	3,68	11,83	211,63	6,39	12,17	237,83
1,56	11,58	158,88	3,75	11,84	212,38	6,47	12,18	239,40
1,64	11,58	162,02	3,82	11,85	213,35	6,54	12,19	239,89
1,71	11,59	166,10	3,90	11,86	214,56	6,61	12,20	240,82
1,80	11,60	168,51	4,04	11,87	216,29	6,69	12,21	241,51

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino C

Epsilon %	A cm2	s1-s3 kPa
6,75	12,22	241,78
6,90	12,24	243,17
6,97	12,25	243,41
7,25	12,28	244,00
7,33	12,29	246,00
7,46	12,31	245,85
7,53	12,32	246,99
7,60	12,33	247,46
7,75	12,35	248,38
7,81	12,36	249,08
7,89	12,37	249,53
7,96	12,38	250,22
8,03	12,39	250,89
8,17	12,41	250,95
8,24	12,42	251,61
8,38	12,44	252,98
8,45	12,45	251,69
8,53	12,46	252,13
8,61	12,47	253,64
8,68	12,48	253,67
8,75	12,49	254,12
8,82	12,50	254,79
8,89	12,51	256,68
9,02	12,52	255,94
9,10	12,53	256,37
9,17	12,54	256,61
9,24	12,55	257,05
9,31	12,56	255,78
9,38	12,57	256,54
9,45	12,58	256,88
9,53	12,59	256,13
9,59	12,60	257,33
9,66	12,61	257,79
9,73	12,62	258,87
9,80	12,63	258,68
9,87	12,64	258,25
9,94	12,65	259,35
10,01	12,66	259,78
10,08	12,67	260,21
10,16	12,68	259,99
10,22	12,69	260,02
10,29	12,70	260,67
10,36	12,71	260,67
10,43	12,72	261,95

Restituzione fotografica dopo la prova



Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

PROVA TRIASSIALE UU (ASTM D2850)

Provino C

Dati del Cliente

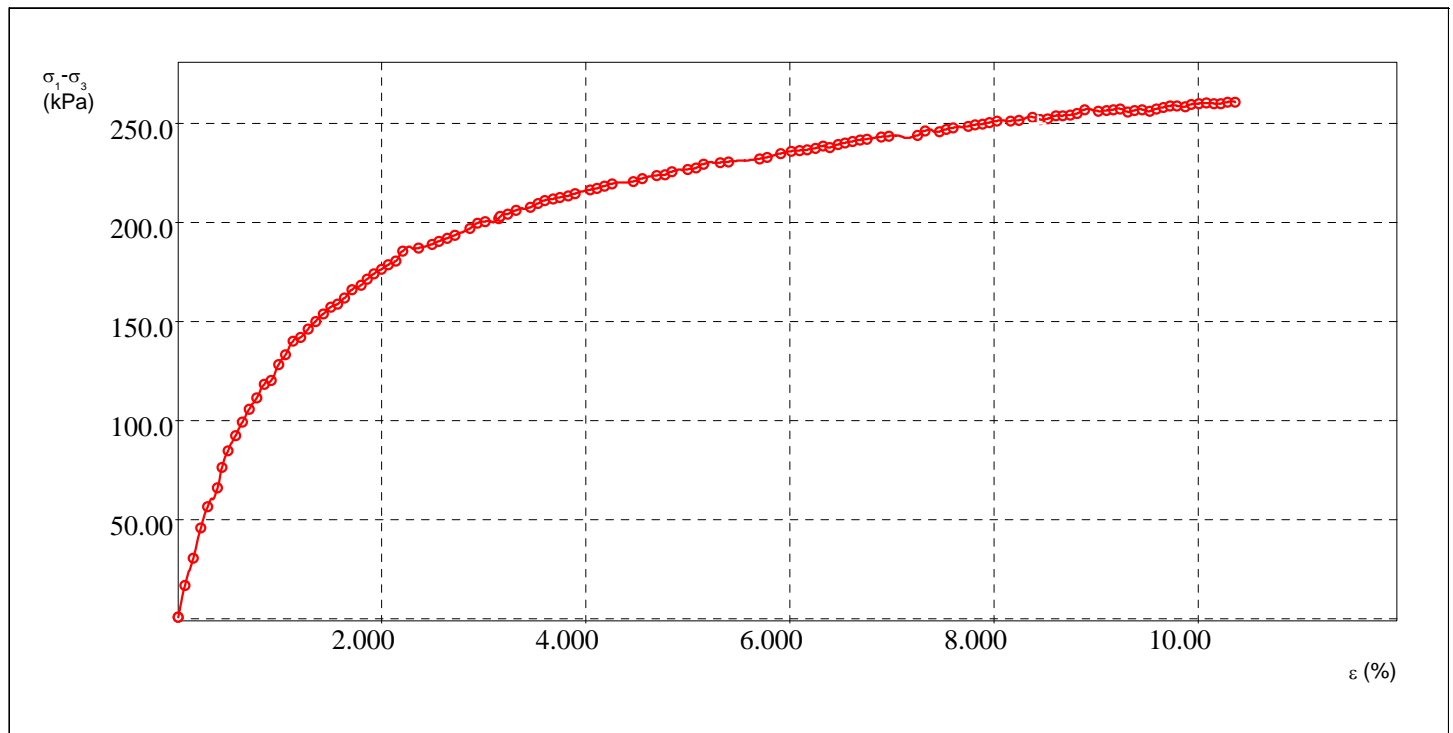
Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Poggio Tre Vescovi
Sondaggio	26
Campione	1
Profondità	3.00-3.40

Dati acquisiti

dH mm	dN N
0,00	1,08
0,05	19,38
0,12	34,84
0,17	52,66
0,22	64,54
0,29	75,61
0,33	87,49
0,38	96,95
0,43	105,86
0,48	113,69
0,53	121,52
0,59	128,27
0,64	135,83
0,69	138,16
0,75	147,54
0,80	153,39

dH mm	dN N
0,86	161,44
0,91	163,92
0,97	168,78
1,03	173,37
1,08	177,69
1,14	181,74
1,19	183,90
1,24	187,68
1,30	192,54
1,36	195,51
1,41	198,75
1,46	201,99
1,52	204,96
1,57	207,67
1,62	210,37
1,68	216,31

dH mm	dN N
1,79	218,20
1,89	220,63
1,95	222,79
2,01	224,68
2,06	226,57
2,18	230,89
2,23	234,40
2,29	235,48
2,39	237,64
2,40	238,99
2,46	240,34
2,52	243,04
2,63	245,20
2,68	247,36
2,74	249,52
2,79	250,33



Il Direttore del Laboratorio



Lo Sperimentatore



rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino C

dH mm	dN N
2,85	251,41
2,91	252,76
2,96	254,38
3,07	256,81
3,12	258,16
3,18	259,78
3,24	261,13
3,40	263,02
3,46	264,92
3,57	267,35
3,63	268,16
3,68	270,05
3,80	271,94
3,86	273,02
3,92	275,64
4,04	276,80
4,10	277,61
4,33	280,31
4,39	281,39
4,49	284,36
4,57	285,71
4,63	286,52
4,69	287,33
4,75	288,41
4,81	290,03
4,86	289,49
4,92	291,65
4,97	292,46
5,02	293,81
5,08	294,89
5,13	295,43
5,24	297,59
5,30	298,13
5,51	299,75
5,57	302,45
5,67	302,72
5,73	304,34
5,78	305,15
5,89	306,77
5,94	307,85
5,99	308,66

dH mm	dN N
6,21	311,36
6,27	312,44
6,37	314,80
6,42	313,25
6,48	314,06
6,54	316,22
6,59	316,49
6,65	317,30
6,70	318,38
6,76	321,00
6,86	320,54
6,92	321,35
6,97	321,90
7,02	322,71
7,08	321,35
7,13	322,57
7,18	323,25
7,24	322,57
7,29	324,33
7,34	325,14
7,39	326,76
7,45	326,76
7,50	326,49
7,55	328,11
7,61	328,92
7,66	329,73
7,72	329,73
7,77	330,00
7,82	331,08
7,88	331,35
7,93	333,24

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



DESCRIZIONE E RIPRESA FOTOGRAFICA DELLA CAROTA ESTRUSA

Committente: GeoItalia srl - Roma

Cantiere/Località: Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

Sondaggio: 27

Campione: 1

Profondità prelievo: 4.00-4.30

Data prelievo: 20/08/2010

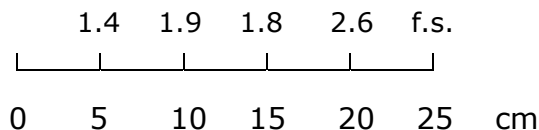
Data apertura: 29/09/2010

Verbale accettazione n° 165

Descrizione: sabbia con limo debolmente argillosa da disfacimento di inclusi di natura argillitica (Raccomandazioni AGI 1977). Sabbia limosa (UNI EN ISO 14688-2).

Colore: HUE 5Y VALUE 5 CHROMA 3 (Munsell Soil Color Chart)

Pocket (kg/cm²):



Lunghezza carota: 28 cm
Diametro carota: 88,9 mm



Modalità di prelievo: sondaggio a rotazione

Tipo di fustella: Shelby

Classe di qualità del campione: Q5 (Raccomandazioni AGI 1977)
C1 (Eurocodice 7)

Prove eseguite:

Cont. Acqua W	X	Granulom. Gr	X	T. Residuo TR	-
Peso Volume γ	X	Compress. ELL	-	Triass. TX UU	-
Peso Specifico Gs	X	Edometria Ed	-	Triass. TX CU	-
Limiti Cons. LL	X	T. Diretto TD	-	Triass. TX CD	-



Committente Geotalia srl – Roma **pagina 1 di 2**
Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Norma di riferimento ASTM D5550-00

Data prova	04/10/2010
Data certificato	21/10/2010
Verb. Accettazione	165
N. certificato	2528/2010

AccuPyc II 1340 V1.00 Unit 1 Serial #: 488 Page 1

Sample: VA165_S27_1_m 4,00-4,30
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S27_1.SMP

Analysis Gas: Helium	Analysis Start: 04/10/2010 16.33.22
Reported: 04/10/2010 16.55.07	Analysis End: 04/10/2010 16.55.07
Sample Mass: 7.8000 g	Equilib. Rate: 0.005 psig/min
Temperature: 24.81 °C	Expansion Volume: 9.2248 cm ³
Number of Purges: 5	Cell Volume: 11.8000 cm ³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 27, Campione 1, Prof. (m) 4,00-4,30

Combined Report

Tabular 1

Cycle#	Volume (cm ³)	Volume Deviation (cm ³)	Density (g/cm ³)	Density Deviation (g/cm ³)	Total Pore Volume (cm ³)	Total Pore Volume Deviation (cm ³)
1	2.8973	-0.0122	2.6921	0.0113	0.1857	0.0016
2	2.9064	-0.0032	2.6837	0.0029	0.1845	0.0004
3	2.9107	0.0012	2.6797	-0.0011	0.1839	-0.0001
4	2.9124	0.0029	2.6782	-0.0027	0.1837	-0.0004
5	2.9131	0.0035	2.6776	-0.0032	0.1836	-0.0005
6	2.9132	0.0037	2.6774	-0.0034	0.1836	-0.0005
7	2.9138	0.0042	2.6770	-0.0039	0.1835	-0.0005

Summary Data


Average

Standard Deviation

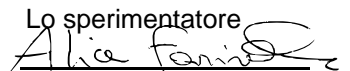
Volume:	2.9096 cm ³	0.0055 cm ³
Density:	2.6808 g/cm ³	0.0051 g/cm ³
Total Pore Volume:	0.1841 cm ³	0.0007 cm ³

Note: _____

Il direttore del Laboratorio



Lo sperimentatore





Committente

Geotalia srl – Roma

pagina 2 di 2

Cantiere

Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Data prova 04/10/2010

Data certificato 21/10/2010

Verb. Accettazione 165

N. certificato 2528/2010

Norma di riferimento

ASTM D5550-00

AccuPyc II 1340 V1.00

Unit 1

Serial # 488

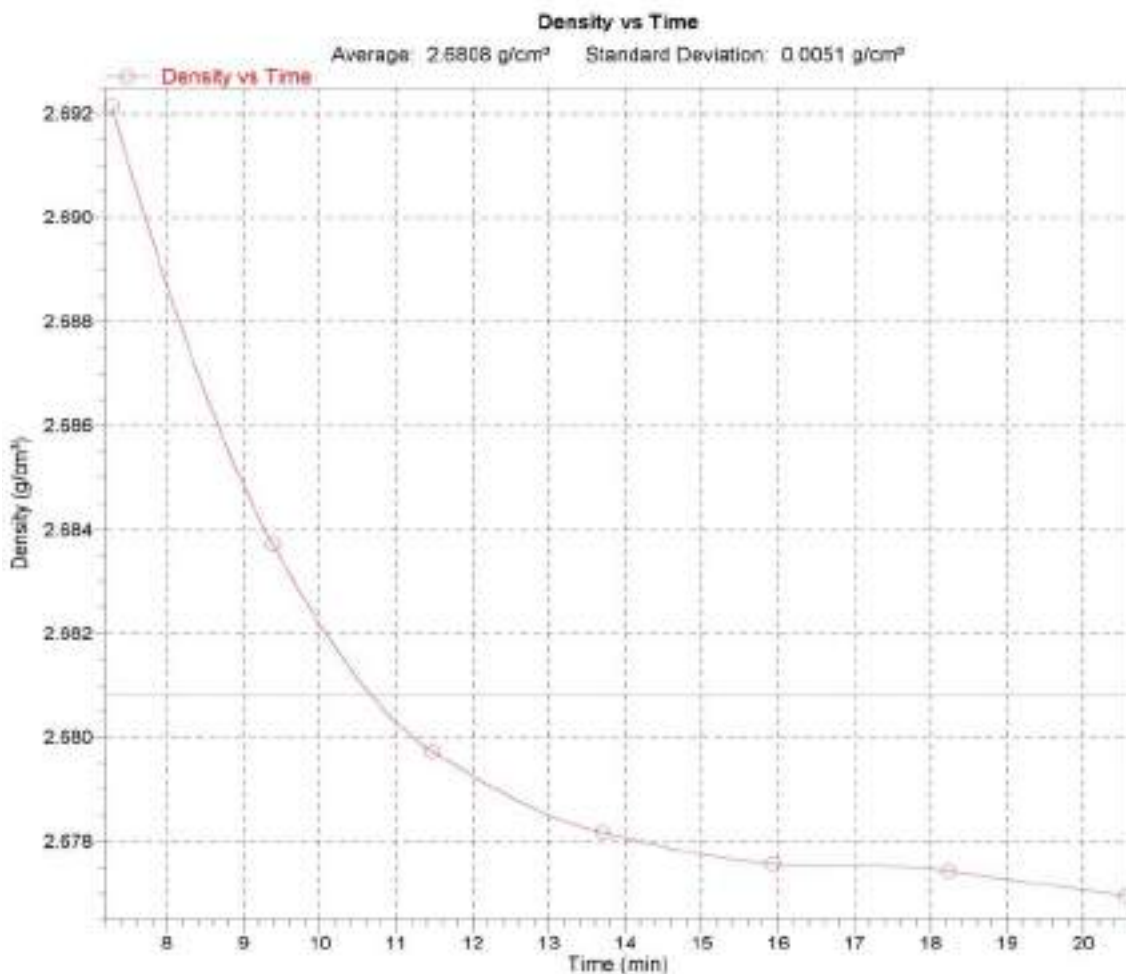
Page 2

Sample: VA165_S27_1_m 4,00-4,30
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S27_1.SMP

Analysis Gas: Helium
 Reported: 04/10/2010 16.55.07
 Sample Mass: 7.8000 g
 Temperature: 24.81 °C
 Number of Purges: 5

Analysis Start: 04/10/2010 16.33.22
 Analysis End: 04/10/2010 16.55.07
 Equib. Rate: 0.005 psig/min
 Expansion Volume: 9.2248 cm³
 Cell Volume: 11.8000 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 27, Campione 1, Prof. (m) 4,00-4,30



Il direttore del Laboratorio

[Signature]

Lo sperimentatore

[Signature]



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

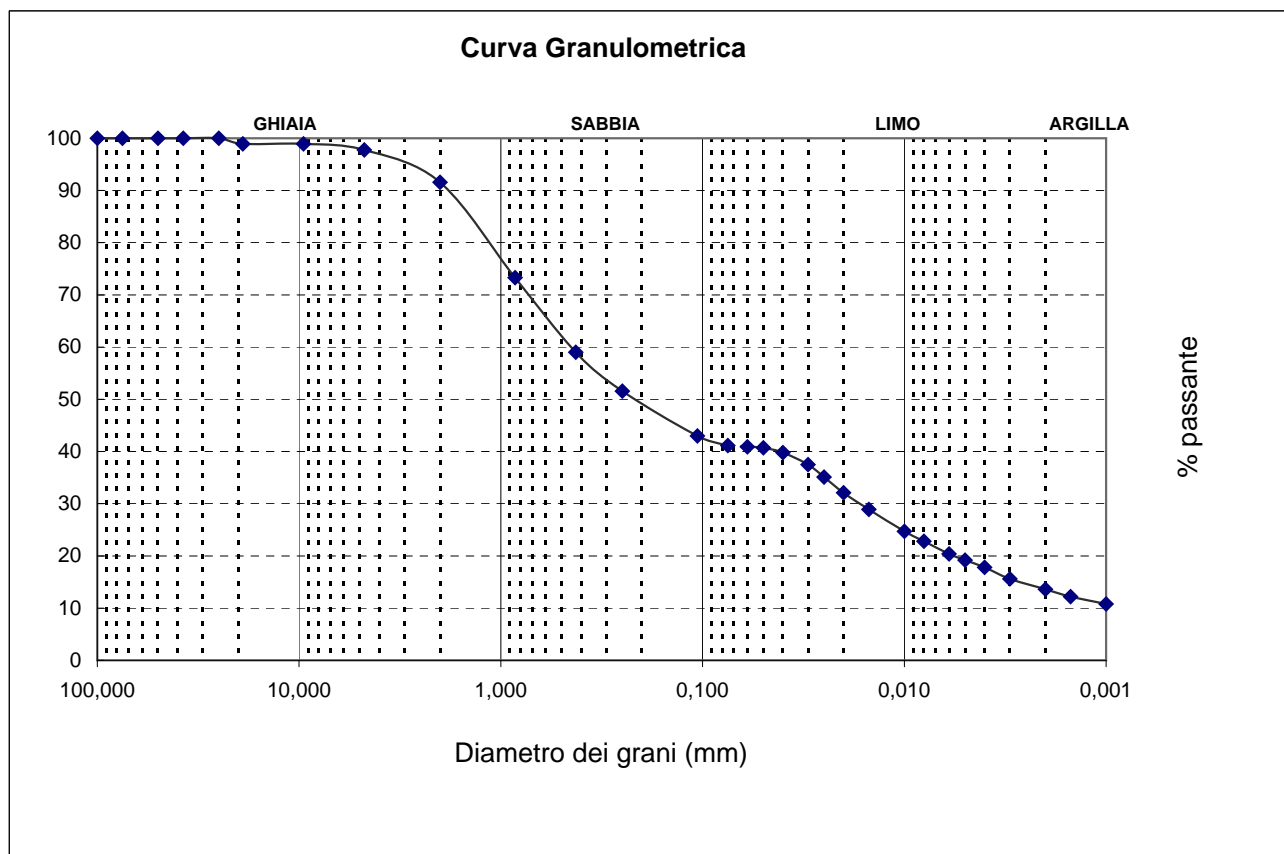
Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2482/2010

Pag. 1 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 27 Campione 1 Profondità 4.00-4.30

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)



Riepilogo dei risultati

Ciottoli	(> 60 mm)	0,0
Ghiaia	(60 - 2 mm)	8,4
Sabbia	(2 - 0,060 mm)	50,7
Limo	(0,060 - 0,002 mm)	27,3
Argilla	(< 0,002 mm)	13,6

D10	<0,002
D30	0,0167
D60	0,4540

Classificazione AGI 1994

Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2482/2010

Pag. 2 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 27 Campione 1 Profondità 4.00-4.30

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)

Setacciatura grossa:

Massa materiale (g): 1171.13

Setacciatura fine:

Massa materiale (g): 195.63

Vagli ASTM	Apertura vagli (mm)	Massa Trattenuta (g)	Trattenuto %	Passante %
3"	75,000	0,00	0,0	100,0
2"	50,000	0,00	0,0	100,0
1,5"	37,500	0,00	0,0	100,0
1"	25,000	0,00	0,0	100,0
3/4"	19,000	12,53	1,1	98,9
3/8"	9,500	0,00	1,1	98,9
No.4	4,750	2,30	2,2	97,8
No.10	2,000	12,28	8,4	91,6
No.20	0,850	36,11	26,7	73,3
No.40	0,425	28,22	41,0	59,0
No.60	0,250	14,73	48,4	51,6
No.140	0,106	16,97	57,0	43,0
No.200	0,075	3,66	58,9	41,1

Sedigrafia:

Material Mass (g): 4.597
 Material/Liquid: soil / 0.20% Sodium Metaphosphate (w/w)
 Measurement Principle: X-Ray monitored gravity sedimentation
 Calculation Method: Stokes sedimentation and Beer's law of extinction
 Test Number: 2
 Analyzed: 05/10/2010 15.40.37
 Reported: 06/10/2010 10.01.14
 Liquid Visc: 0.7683 mPa.s
 Analysis Temp: 32.0 °C
 Full Scale Mass: 41.1 %
 Analysis Type: High Speed(Adj)
 Run Time: 0:04 hrs:min
 Sample Density: 2.681 g/cm³
 Liquid Density: 0.9951 g/cm³
 Base/Full Scale: 134 / 93 kCnts/s
 Reynolds Number: 0.79

Diametro (mm)	Trattenuto %	Passante %
0,060	59,1	40,9
0,050	59,3	40,7
0,040	60,2	39,8
0,030	62,5	37,5
0,025	64,9	35,1
0,020	67,9	32,1
0,015	71,1	28,9
0,010	75,3	24,7
0,008	77,2	22,8
0,006	79,6	20,4
0,005	80,8	19,2
0,004	82,2	17,8
0,003	84,4	15,6
0,002	86,4	13,6
0,002	87,8	12,2
0,001	89,2	10,8

Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

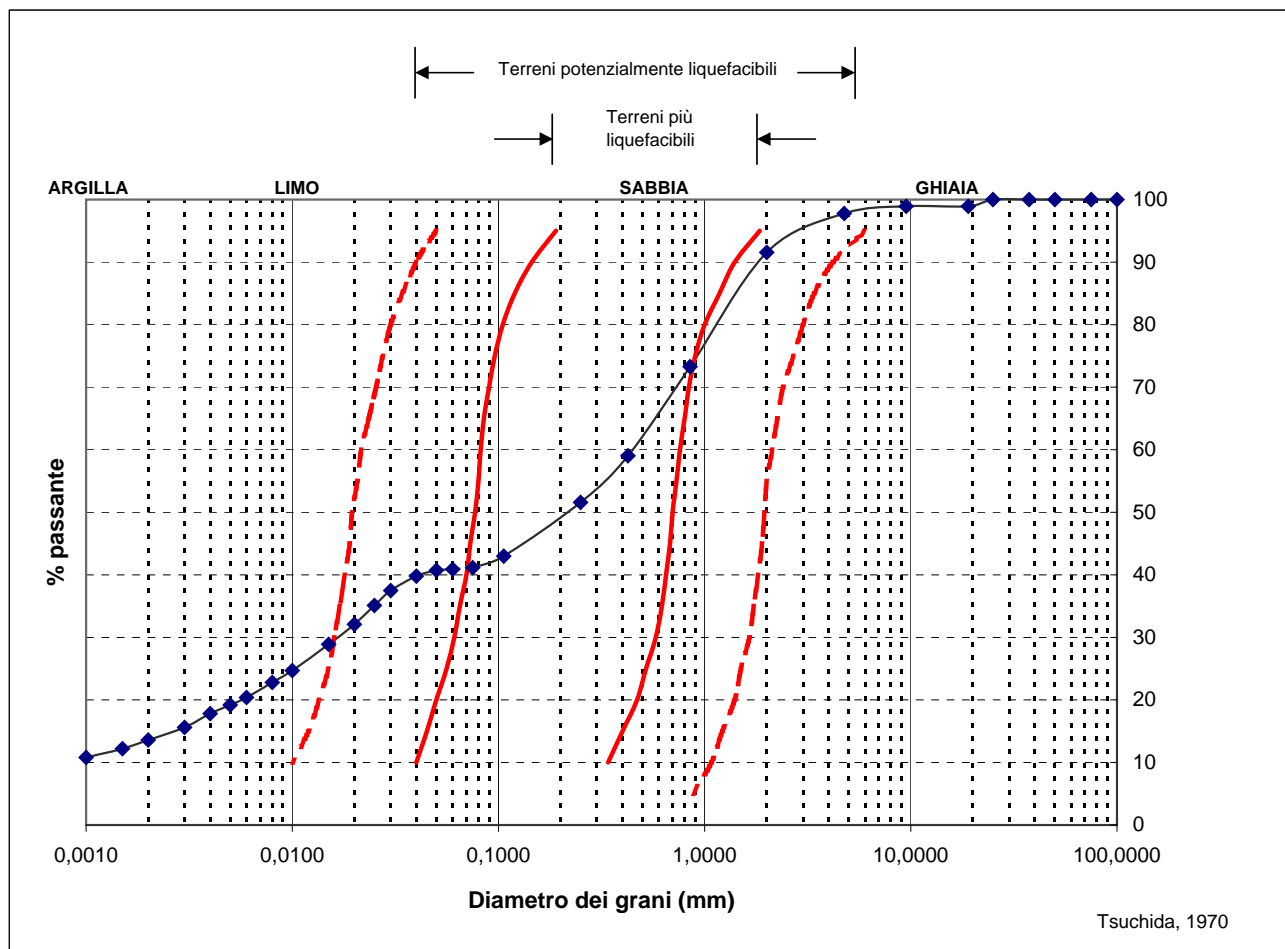
Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2482/2010

Pag. 3 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 27 Campione 1 Profondità 4.00-4.30

POTENZIALE DI LIQUEFACIBILITA'



Il direttore del Laboratorio

[Signature]

Lo sperimentatore

[Signature]



Committente Geotalia srl – Roma Pag. 1 di 1
 Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda

LIMITI DI CONSISTENZA

Norma di riferimento ASTM D4318

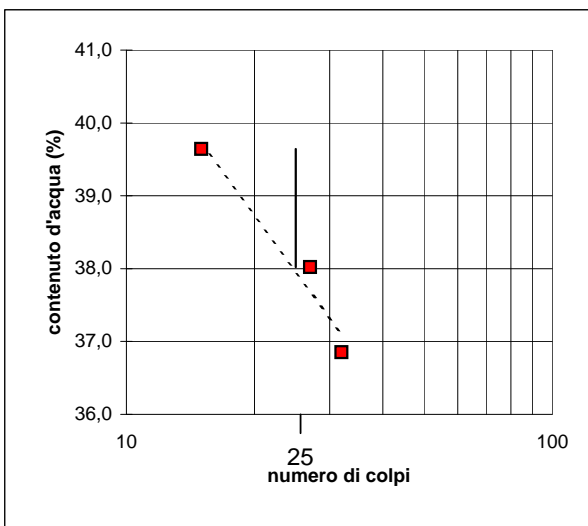
Data prova 05/10/10
 Data certificato 06/10/10
 Verb. Accettazione 165
 N. Certificato 2475/2010

Sondaggio 27 Campione 1 Profondità 4.00-4.30

Limite Liquido			
			38,0
Numero tara	A12	B13	B33
Numero dei colpi	15	32	27
P. umido + tara	g 106,86	106,04	97,79
P. secco + tara	g 81,70	82,24	75,86
Peso tara	g 18,23	17,66	18,18
Peso umido	g 88,63	88,38	79,61
Peso secco	g 63,47	64,58	57,68
Contenuto d'acqua	% 39,64	36,85	38,02

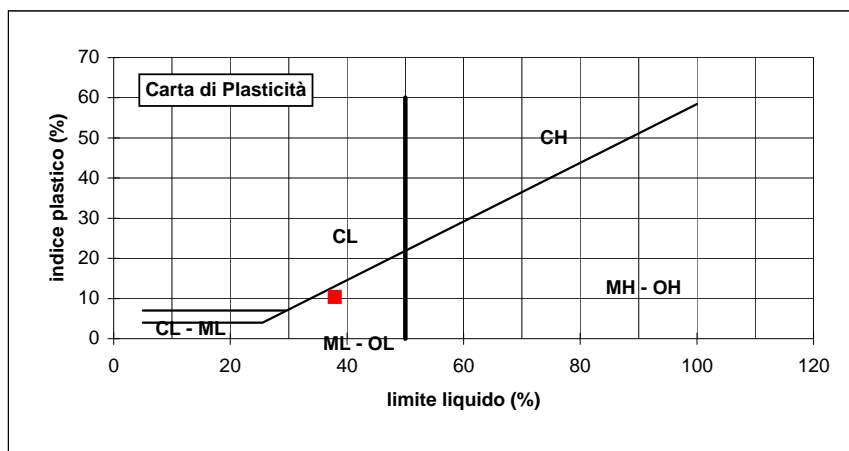
Limite Plastico		
		27,6
Numero tara	B20	B24
P. umido + tara	g 30,58	28,53
P. secco + tara	g 27,72	26,19
Peso tara	g 17,49	17,59
Peso umido	g 13,09	10,94
Peso secco	g 10,23	8,60
Contenuto d'acqua	% 27,96	27,21

Umidità Naturale	
Numero tara	B43
P. umido + tara	g 134,14
P. secco + tara	g 112,96
Peso tara	g 32,74
Peso umido	g 101,40
Peso secco	g 80,22
Contenuto d'acqua	% 26,4



Limite Liquido LL	38,0
Limite Plastico LP	27,6
Indice di Plasticità Ip	10,4
Umidità Naturale Wn	26,4
Indice di Consistenza Ic	1,1

$$I_p = LL - LP \quad I_c = \frac{LL - W_n}{I_p}$$



- ML** Limi inorganici di bassa plasticità
- MH** Limi inorganici di alta plasticità
- CL** Argille inorganiche di bassa plasticità
- CH** Argille inorganiche di alta plasticità
- OL** Argille organiche di bassa plasticità
- OH** Argille organiche di alta plasticità

Il direttore del Laboratorio

Lo sperimentatore

DESCRIZIONE E RIPRESA FOTOGRAFICA DELLA CAROTA ESTRUSA

Committente: GeoItalia srl - Roma

Cantiere/Località: Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

Sondaggio: 27

Campione: 2

Profondità prelievo: 8.45-8.75

Data prelievo: 20/08/2010

Data apertura: 29/09/2010

Verbale accettazione n° 165

Descrizione: limo con sabbia e argilla da disfacimento di inclusi di natura argillitica (Raccomandazioni AGI 1977). Limo sabbio-argilloso (UNI EN ISO 14688-2).

Colore: HUE 5Y VALUE 4 CHROMA 2 (Munsell Soil Color Chart)

Pocket (kg/cm²): fuori scala

Lunghezza carota: 33 cm
Diametro carota: 88,9 mm



Modalità di prelievo: sondaggio a rotazione

Tipo di fustella: fustella in plastica

Classe di qualità del campione: Q4 (Raccomandazioni AGI 1977)
C2 (Eurocodice 7)

Prove eseguite:

Cont. Acqua W	X	Granulom. Gr	X	T. Residuo TR	-
Peso Volume γ	X	Compress. ELL	-	Triass. TX UU	-
Peso Specifico Gs	X	Edometria Ed	-	Triass. TX CU	-
Limiti Cons. LL	X	T. Diretto TD	-	Triass. TX CD	-



Committente Geotalia srl – Roma **pagina 1 di 2**
Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Norma di riferimento ASTM D5550-00

Data prova	01/10/2010
Data certificato	21/10/2010
Verb. Accettazione	165
N. certificato	2529/2010

AccuPyc II 1340 V1.00 Unit 1 Serial #. 488 Page 1

Sample: VA165_S27_2_m 8,45-8,75
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S27_2.SMP

Analysis Gas: Helium
 Reported: 01/10/2010 15.43.30
 Sample Mass: 7.9900 g
 Temperature: 24.85 °C
 Number of Purges: 5

Analysis Start: 01/10/2010 15.21.22
 Analysis End: 01/10/2010 15.43.30
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2265 cm³
 Cell Volume: 11.8010 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 27, Campione 2, Prof. (m) 8,45-8,75

Combined Report

Cycle#	Volume (cm ³)	Volume Deviation (cm ³)	Tabular 1		Total Pore Volume (cm ³)	Total Pore Volume Deviation (cm ³)
			Density (g/cm ³)	Density Deviation (g/cm ³)		
1	2.9652	-0.0134	2.6946	0.0121	0.2543	0.0017
2	2.9753	-0.0033	2.6855	0.0030	0.2530	0.0004
3	2.9798	0.0012	2.6814	-0.0011	0.2524	-0.0002
4	2.9815	0.0029	2.6799	-0.0026	0.2522	-0.0004
5	2.9826	0.0040	2.6789	-0.0036	0.2521	-0.0005
6	2.9824	0.0038	2.6790	-0.0034	0.2521	-0.0005
7	2.9834	0.0048	2.6782	-0.0043	0.2520	-0.0006

Summary Data	Average	Standard Deviation
Volume:	2.9786 cm ³	0.0060 cm ³
Density:	2.6825 g/cm ³	0.0054 g/cm ³
Total Pore Volume:	0.2526 cm ³	0.0008 cm ³

Note: _____

Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma **pagina 2 di 2**
Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Data prova 01/10/2010
 Data certificato 21/10/2010
 Verb. Accettazione 165
 N. certificato 2529/2010

Norma di riferimento ASTM D5550-00

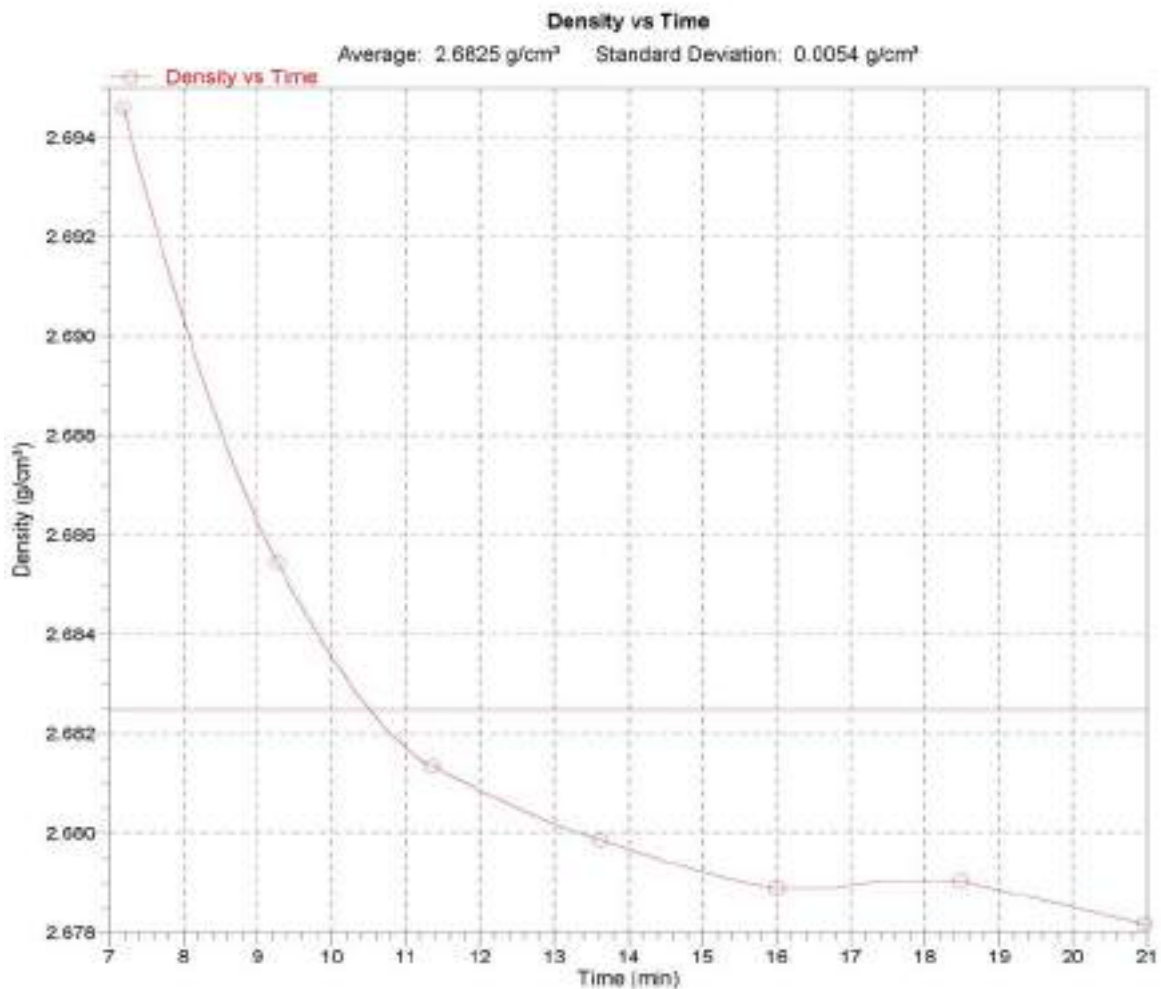
AccuPyc II 1340 V1.00 Unit 1 Serial #: 486 Page 2

Sample: VA165_S27_2_m 8,45-8,75
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S27_2.SMP

Analysis Gas: Helium
 Reported: 01/10/2010 15.43.30
 Sample Mass: 7.9900 g
 Temperature: 24.85 °C
 Number of Purges: 5

Analysis Start: 01/10/2010 15.21.22
 Analysis End: 01/10/2010 15.43.30
 Equib. Rate: 0.005 psig/min
 Expansion Volume: 9.2265 cm³
 Cell Volume: 11.8010 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 27, Campione 2, Prof. (m) 8,45-8,75



Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2483/2010

Pag. 2 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 27 Campione 2 Profondità 8.45-8.75

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)

Setacciatura:

Massa materiale (g): 200.79

Vagli ASTM	Apertura vagli (mm)	Massa Trattenuta (g)	Trattenuto %	Passante %
3"	75,000	0,00	0,0	100,0
2"	50,000	0,00	0,0	100,0
1,5"	37,500	0,00	0,0	100,0
1"	25,000	0,00	0,0	100,0
3/4"	19,000	0,00	0,0	100,0
3/8"	9,500	0,00	0,0	100,0
No.4	4,750	1,05	0,5	99,5
No.10	2,000	9,63	5,3	94,7
No.20	0,850	17,10	13,8	86,2
No.40	0,425	11,44	19,5	80,5
No.60	0,250	8,11	23,6	76,4
No.140	0,106	15,60	31,3	68,7
No.200	0,075	3,16	32,9	67,1

Sedigrafia:

Material Mass (g): 4.700
 Material/Liquid: soil / 0.20% Sodium Metaphosphate (w/w)
 Measurement Principle: X-Ray monitored gravity sedimentation
 Calculation Method: Stokes sedimentation and Beer's law of extinction
 Test Number: 2
 Analyzed: 05/10/2010 16.10.43
 Reported: 06/10/2010 10.01.13
 Liquid Visc: 0.7682 mPa.s
 Analysis Temp: 32.0 °C
 Full Scale Mass: 67.1 %
 Analysis Type: High Speed(Adj)
 Run Time: 0:04 hrs:min
 Sample Density: 2.683 g/cm³
 Liquid Density: 0.9951 g/cm³
 Base/Full Scale: 134 / 91 kCnts/s
 Reynolds Number: 0.79

Diametro (mm)	Trattenuto %	Passante %
0,060	33,6	66,4
0,050	33,5	66,5
0,040	34,1	65,9
0,030	37,2	62,8
0,025	40,2	59,8
0,020	44,3	55,7
0,015	49,5	50,5
0,010	56,1	43,9
0,008	59,5	40,5
0,006	63,7	36,3
0,005	65,9	34,1
0,004	68,5	31,5
0,003	71,4	28,6
0,002	74,8	25,2
0,002	77,3	22,7
0,001	80,3	19,7

Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

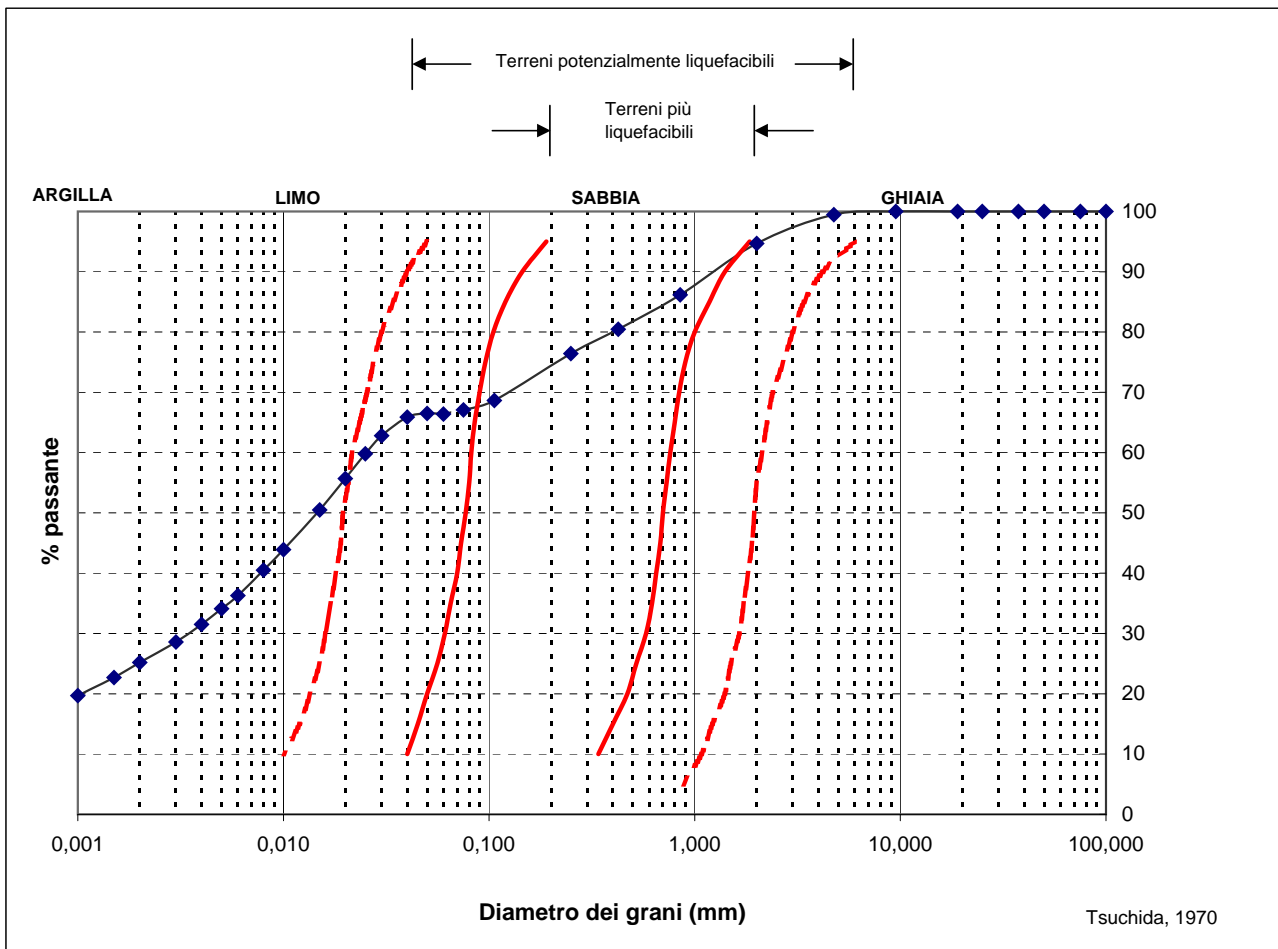
Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2483/2010

Pag. 3 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 27 Campione 2 Profondità 8.45-8.75

POTENZIALE DI LIQUEFACIBILITA'



Il direttore del Laboratorio
[Signature]

Lo sperimentatore
[Signature]



Committente Geotalia srl – Roma Pag. 1 di 1
 Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda

LIMITI DI CONSISTENZA

Norma di riferimento ASTM D4318

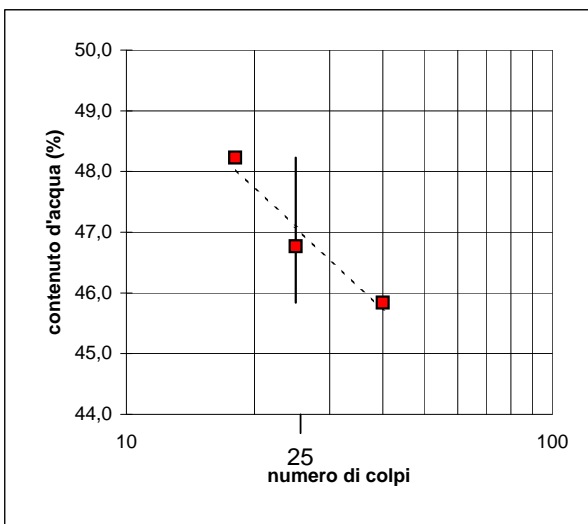
Data prova 05/10/10
 Data certificato 06/10/10
 Verb. Accettazione 165
 N. Certificato 2476/2010

Sondaggio 27 Campione 2 Profondità 8.45-8.75

Limite Liquido			
			47,1
Numero tara	B28	B14	B23
Numero dei colpi	40	25	18
P. umido + tara	g 68,93	68,59	72,69
P. secco + tara	g 52,79	52,37	54,58
Peso tara	g 17,58	17,69	17,03
Peso umido	g 51,35	50,90	55,66
Peso secco	g 35,21	34,68	37,55
Contenuto d'acqua	% 45,84	46,77	48,23

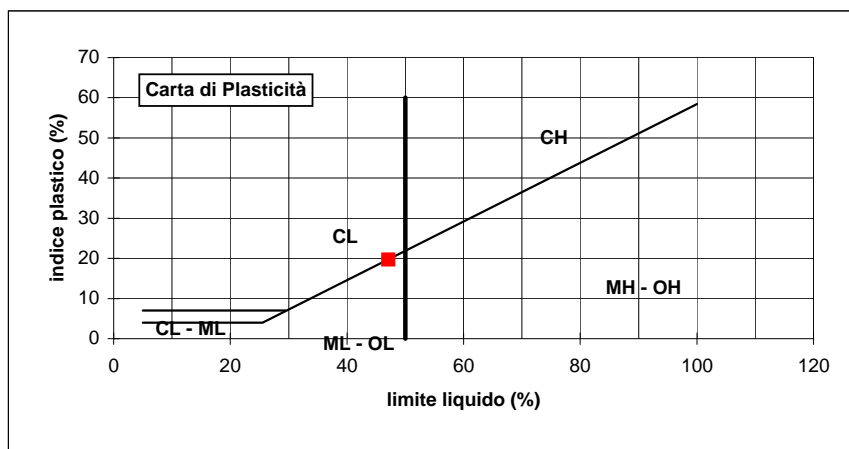
Limite Plastico		
		27,4
Numero tara	A10	B34
P. umido + tara	g 26,14	29,46
P. secco + tara	g 24,35	26,99
Peso tara	g 17,78	18,02
Peso umido	g 8,36	11,44
Peso secco	g 6,57	8,97
Contenuto d'acqua	% 27,25	27,54

Umidità Naturale	
Numero tara	B43
P. umido + tara	g 55,91
P. secco + tara	g 49,50
Peso tara	g 17,72
Peso umido	g 38,19
Peso secco	g 31,78
Contenuto d'acqua	% 20,2



Limite Liquido LL	47,1
Limite Plastico LP	27,4
Indice di Plasticità Ip	19,7
Umidità Naturale Wn	20,2
Indice di Consistenza Ic	1,4

$$I_p = LL - LP \quad I_c = \frac{LL - W_n}{I_p}$$



- ML** Limi inorganici di bassa plasticità
- MH** Limi inorganici di alta plasticità
- CL** Argille inorganiche di bassa plasticità
- CH** Argille inorganiche di alta plasticità
- OL** Argille organiche di bassa plasticità
- OH** Argille organiche di alta plasticità

Il direttore del Laboratorio

Lo sperimentatore

DESCRIZIONE E RIPRESA FOTOGRAFICA DELLA CAROTA ESTRUSA

Committente: GeoItalia srl - Roma

Cantiere/Località: Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

Sondaggio: 34

Campione: 1

Profondità prelievo: 2.60-3.20

Data prelievo: 02/08/2010

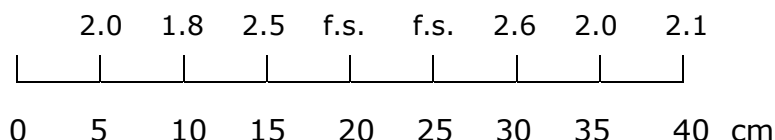
Data apertura: 22/09/2010

Verbale accettazione n° 165

Descrizione: argillite, presenti concrezioni carbonatiche (*Raccomandazioni AGI 1977*). Argillite (*UNI EN ISO 14688-2*).

Colore: HUE 5Y VALUE 4 CHROMA 1 (*Munsell Soil Color Chart*)

Pocket (kg/cm²):



Lunghezza carota: 46 cm
Diametro carota: 88,9 mm



Modalità di prelievo: sondaggio a rotazione

Tipo di fustella: Shelby

Classe di qualità del campione: Q4 (*Raccomandazioni AGI 1977*)
C2 (*Eurocodice 7*)

Prove eseguite:

Cont. Acqua W	X	Granulom. Gr	X	T. Residuo TR	-
Peso Volume γ	X	Compress. ELL	-	Triass. TX UU	-
Peso Specifico Gs	X	Edometria Ed	-	Triass. TX CU	-
Limiti Cons. LL	X	T. Diretto TD	X	Triass. TX CD	-



Committente Geotalia srl – Roma **pagina 1 di 2**
Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Norma di riferimento ASTM D5550-00

Data prova	29/09/2010
Data certificato	21/10/2010
Verb. Accettazione	165
N. certificato	2530/2010

AccuPyc II 1340 V1.00 Unit 1 Serial #: 488 Page 1

Sample: VA165_S34_1_m 2,60-3,20
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S34_1.SMP

Analysis Gas: Helium
 Reported: 29/09/2010 15.30.27
 Sample Mass: 8.4200 g
 Temperature: 23.80 °C
 Number of Purges: 5

Analysis Start: 29/09/2010 15.06.41
 Analysis End: 29/09/2010 15.27.51
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2265 cm³
 Cell Volume: 11.8010 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 34, Campione 1, Prof. (m) 2,60-3,20

Combined Report

Cycle#	Volume (cm ³)	Volume Deviation (cm ³)	Tabular 1		Total Pore Volume (cm ³)	Total Pore Volume Deviation (cm ³)
			Density (g/cm ³)	Density Deviation (g/cm ³)		
1	3.0932	-0.0106	2.7221	0.0093	0.1876	0.0013
2	3.1010	-0.0029	2.7153	0.0025	0.1867	0.0003
3	3.1047	0.0008	2.7120	-0.0007	0.1862	-0.0001
4	3.1065	0.0026	2.7105	-0.0023	0.1860	-0.0003
5	3.1067	0.0028	2.7103	-0.0025	0.1860	-0.0003
6	3.1070	0.0031	2.7101	-0.0027	0.1859	-0.0004
7	3.1079	0.0041	2.7092	-0.0036	0.1858	-0.0005

Summary Data	Average	Standard Deviation
Volume:	3.1038 cm ³	0.0048 cm ³
Density:	2.7128 g/cm ³	0.0042 g/cm ³
Total Pore Volume:	0.1863 cm ³	0.0006 cm ³

Note: _____

Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma **pagina 2 di 2**
Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Data prova 29/09/2010
 Data certificato 21/10/2010
 Verb. Accettazione 165
 N. certificato 2530/2010

Norma di riferimento ASTM D5550-00

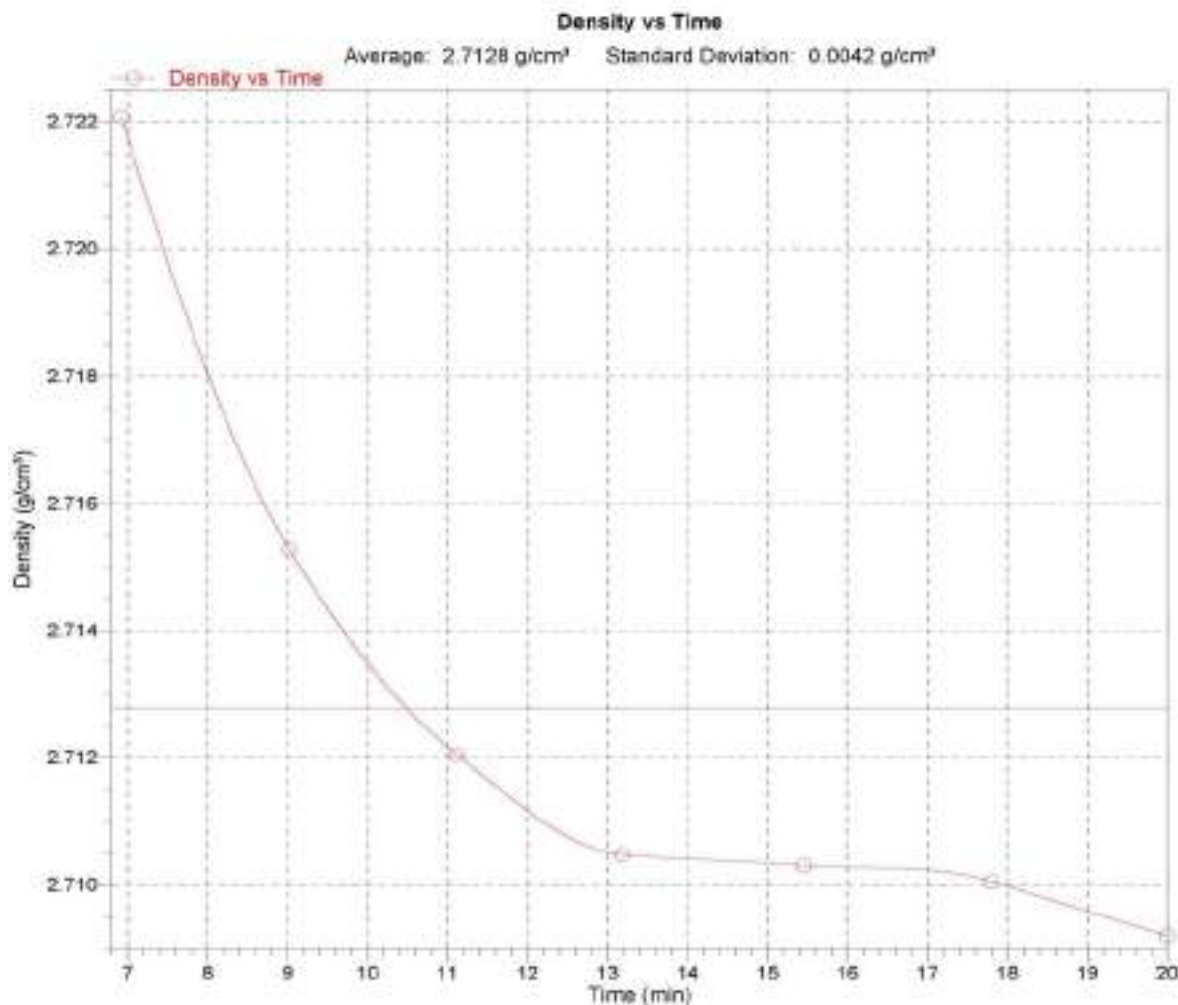
AccuPyc II 1340 V1.00 Unit 1 Serial #: 488 Page 2

Sample: VA165_534_1_m 2.60-3.20
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S34_1.SMP

Analysis Gas: Helium
 Reported: 29/09/2010 15.30.27
 Sample Mass: 8.4200 g
 Temperature: 23.80 °C
 Number of Purges: 5

Analysis Start: 29/09/2010 15.06.41
 Analysis End: 29/09/2010 15.27.51
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2265 cm³
 Cell Volume: 11.8010 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 34, Campione 1, Prof. (m) 2.60-3.20



Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

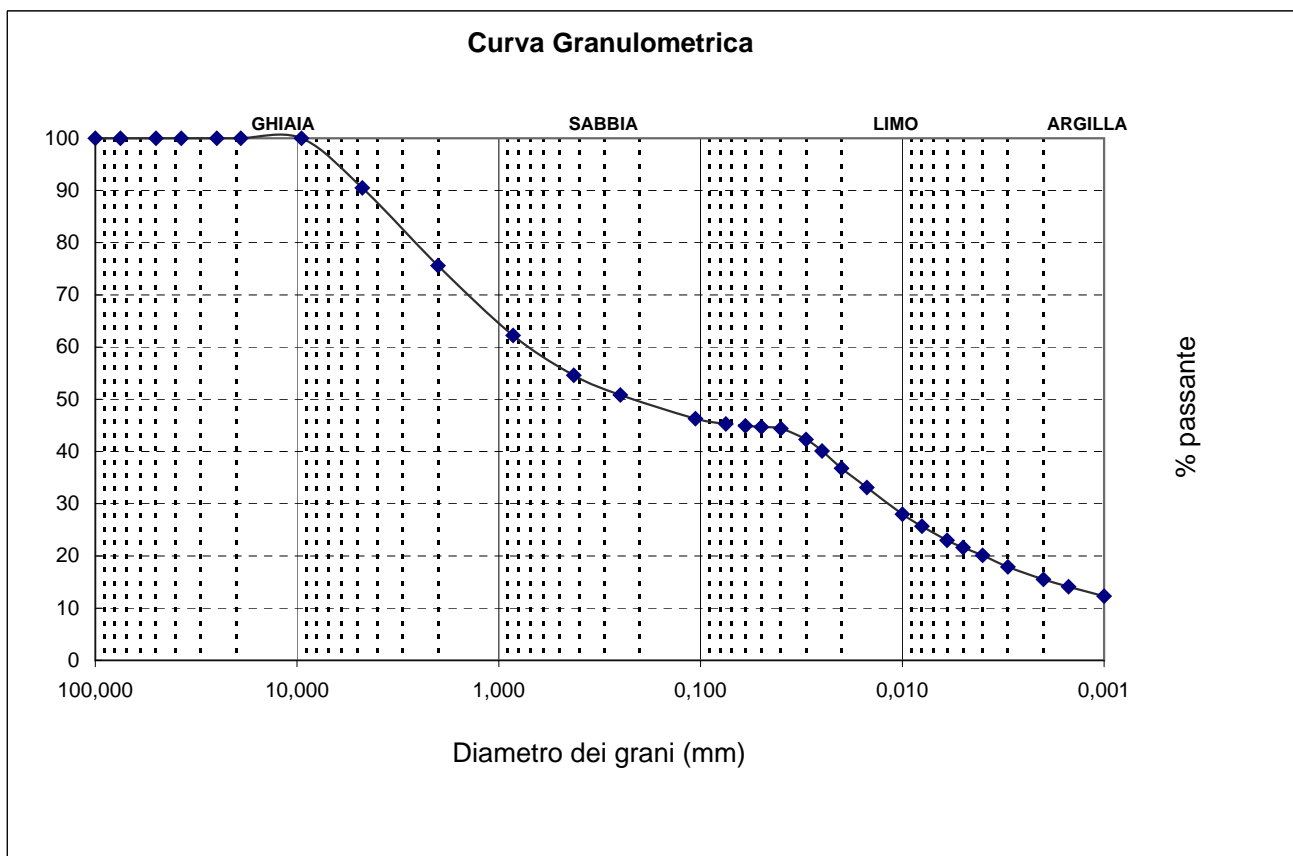
Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2469/2010

Pag. 1 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 34 Campione 1 Profondità 2.60-3.20

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)





Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2469/2010

Pag. 2 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 34 Campione 1 Profondità 2.60-3.20

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)

Setacciatura:


Massa materiale (g): 202.56

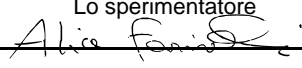
Vagli ASTM	Apertura vagli (mm)	Massa Trattenuta (g)	Trattenuto %	Passante %
3"	75,000	0,00	0,0	100,0
2"	50,000	0,00	0,0	100,0
1,5"	37,500	0,00	0,0	100,0
1"	25,000	0,00	0,0	100,0
3/4"	19,000	0,00	0,0	100,0
3/8"	9,500	0,00	0,0	100,0
No.4	4,750	19,28	9,5	90,5
No.10	2,000	30,13	24,4	75,6
No.20	0,850	27,07	37,8	62,2
No.40	0,425	15,51	45,4	54,6
No.60	0,250	7,62	49,2	50,8
No.140	0,106	9,19	53,7	46,3
No.200	0,075	2,06	54,7	45,3

Sedigrafia:

Material Mass (g): 4.437
 Material/Liquid: soil / 0.20% Sodium Metaphosphate (w/w)
 Measurement Principle: X-Ray monitored gravity sedimentation
 Calculation Method: Stokes sedimentation and Beer's law of extinction
 Test Number: 2
 Analyzed: 05/10/2010 13.40.03
 Reported: 06/10/2010 10.01.16
 Liquid Visc: 0.7683 mPa.s
 Analysis Temp: 32.0 °C
 Full Scale Mass: 45.3 %
 Analysis Type: High Speed(Adj)
 Run Time: 0:05 hrs:min
 Sample Density: 2.713 g/cm³
 Liquid Density: 0.9951 g/cm³
 Base/Full Scale: 134 / 92 kCnts/s
 Reynolds Number: 0.81

Diametro (mm)	Trattenuto %	Passante %
0,060	55,1	44,9
0,050	55,3	44,7
0,040	55,6	44,4
0,030	57,7	42,3
0,025	59,9	40,1
0,020	63,2	36,8
0,015	66,9	33,1
0,010	72,0	28,0
0,008	74,3	25,7
0,006	77,0	23,0
0,005	78,4	21,6
0,004	79,9	20,1
0,003	82,1	17,9
0,002	84,5	15,5
0,002	85,9	14,1
0,001	87,7	12,3

Il direttore del Laboratorio


Lo sperimentatore




Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

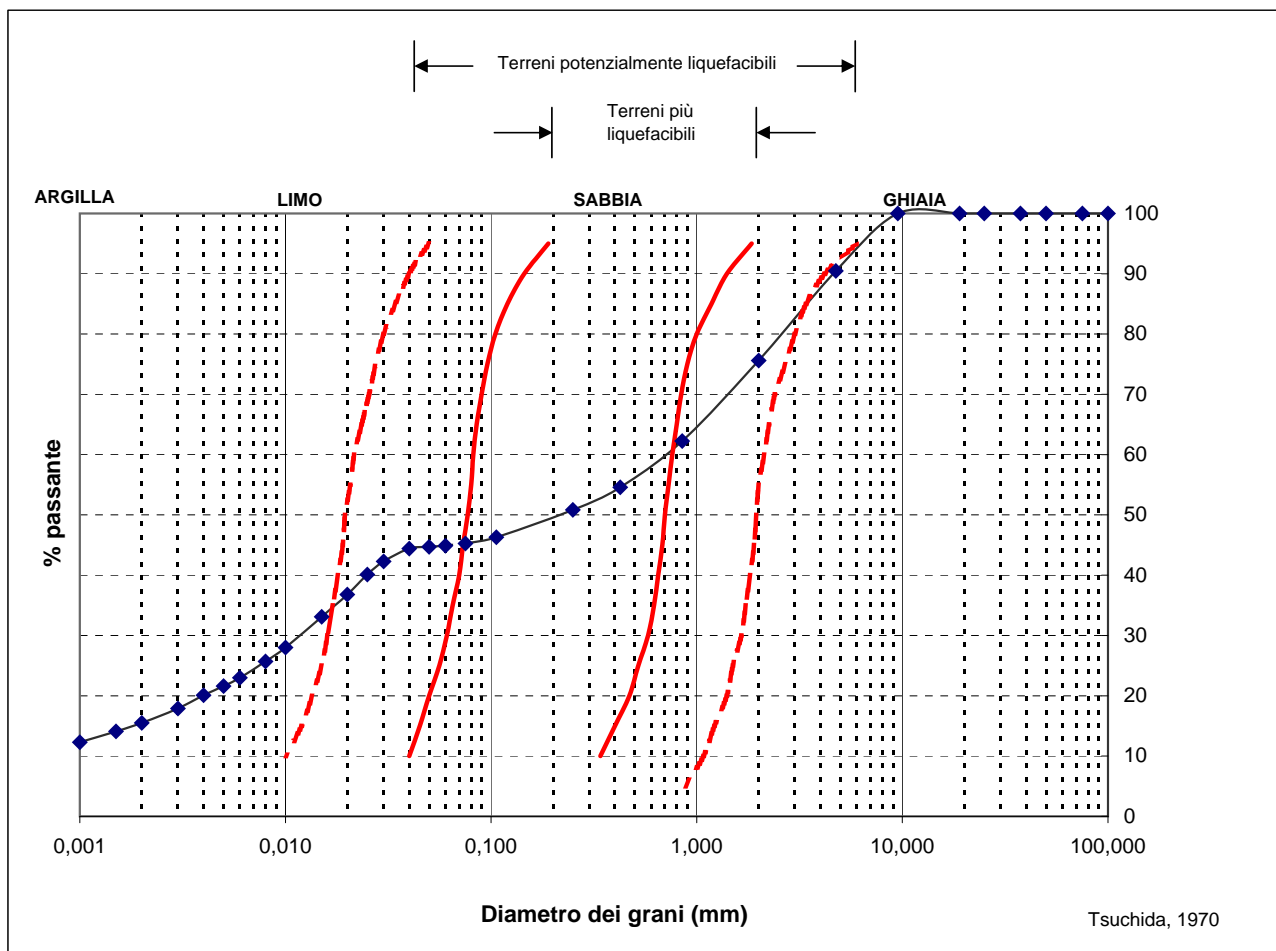
Data prova 05/10/2010
 Data certificato 06/10/2010
 Verb. Accettazione 165
 N. Certificato 2469/2010

Pag. 3 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 34 Campione 1 Profondità 2.60-3.20

POTENZIALE DI LIQUEFACIBILITA'



Il direttore del Laboratorio
[Signature]

Lo sperimentatore
[Signature]



Committente Geotalia srl – Roma Pag. 1 di 1
 Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda

LIMITI DI CONSISTENZA

Norma di riferimento ASTM D4318

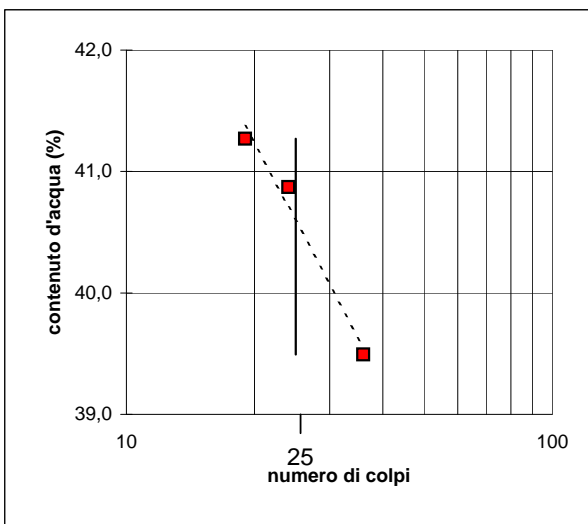
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 Data certificato 06/10/10
 Verb. Accettazione 165
 N. Certificato 2432/2010

Sondaggio 34 Campione 1 Profondità 2.60-3.20

Limite Liquido				40,6
Numero tara		A2	B41	A5
Numero dei colpi		19	24	36
P. umido + tara	g	60,30	66,17	66,50
P. secco + tara	g	47,89	52,29	52,76
Peso tara	g	17,82	18,33	17,97
Peso umido	g	42,48	47,84	48,53
Peso secco	g	30,07	33,96	34,79
Contenuto d'acqua	%	41,27	40,87	39,49

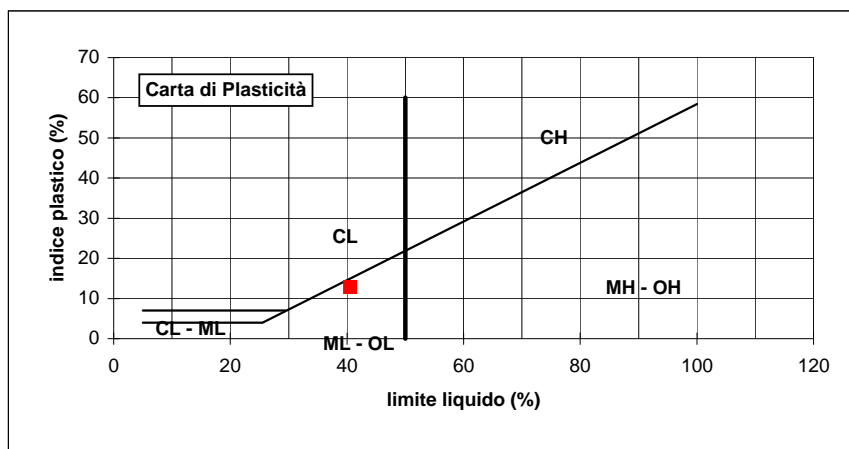
Limite Plastico				27,8
Numero tara		B34	B31	
P. umido + tara	g	31,21	30,40	
P. secco + tara	g	28,36	27,67	
Peso tara	g	18,02	17,90	
Peso umido	g	13,19	12,50	
Peso secco	g	10,34	9,77	
Contenuto d'acqua	%	27,56	27,94	

Umidità Naturale				21,6
Numero tara		B26		
P. umido + tara	g	60,22		
P. secco + tara	g	52,64		
Peso tara	g	17,53		
Peso umido	g	42,69		
Peso secco	g	35,11		
Contenuto d'acqua	%			21,6



Limite Liquido LL	40,6
Limite Plastico LP	27,8
Indice di Plasticità Ip	12,8
Umidità Naturale Wn	21,6
Indice di Consistenza Ic	1,5

$$I_p = LL - LP \quad I_c = \frac{LL - W_n}{I_p}$$



- ML** Limi inorganici di bassa plasticità
- MH** Limi inorganici di alta plasticità
- CL** Argille inorganiche di bassa plasticità
- CH** Argille inorganiche di alta plasticità
- OL** Argille organiche di bassa plasticità
- OH** Argille organiche di alta plasticità

Il direttore del Laboratorio

Lo sperimentatore



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST REPORT - SUMMARY

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	2.60/3.20
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical
Sample description	Argillite con concrezioni di calcite. Provini parzialmente ricostruiti		

Particle density (Mg/m ³)	2.71 (Measured)	Specimens tested
---------------------------------------	-----------------	------------------

INITIAL CONDITIONS	SPECIMEN 1	SPECIMEN 2	SPECIMEN 3
Specimen depth (m)	2.90/3.00	2.90/3.00	2.90/3.00
Height (mm)	20.0	20.0	20.0
-			
Diameter (mm)	60.0	60.0	60.0
Area (mm ²)	2827.4	2827.4	2827.4
Moisture content (measured) (%)	26	25	24
Moisture content (trimmings) (%)	21	22	22
Bulk density (Mg/m ³)	1.83	1.89	1.82
Dry density (Mg/m ³)	1.45	1.52	1.47
Voids ratio	0.865	0.784	0.846
Degree of saturation (%)	82	85	78

Voids ratio at the end of consolidation	0.834	0.754	0.787
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SHEARING	SPECIMEN 1	SPECIMEN 2	SPECIMEN 3
Rate of displacement (mm/min)	0.010000	0.010000	0.010000
Conditions at peak shear stress			
Normal stress (kPa)	100	200	400
Shear stress (kPa)	70	107	202
Horizontal displacement (mm)	6.05	5.67	5.66
Vertical deformation (mm)	0.541	0.639	1.311

Apparent cohesion (kPa)	22.4
Angle of shearing resistance (°)	24.5

Comments / variations from procedures:
 Verbale di accettazione N.
 Il presente certificato è costituito da n. 18 pagine.

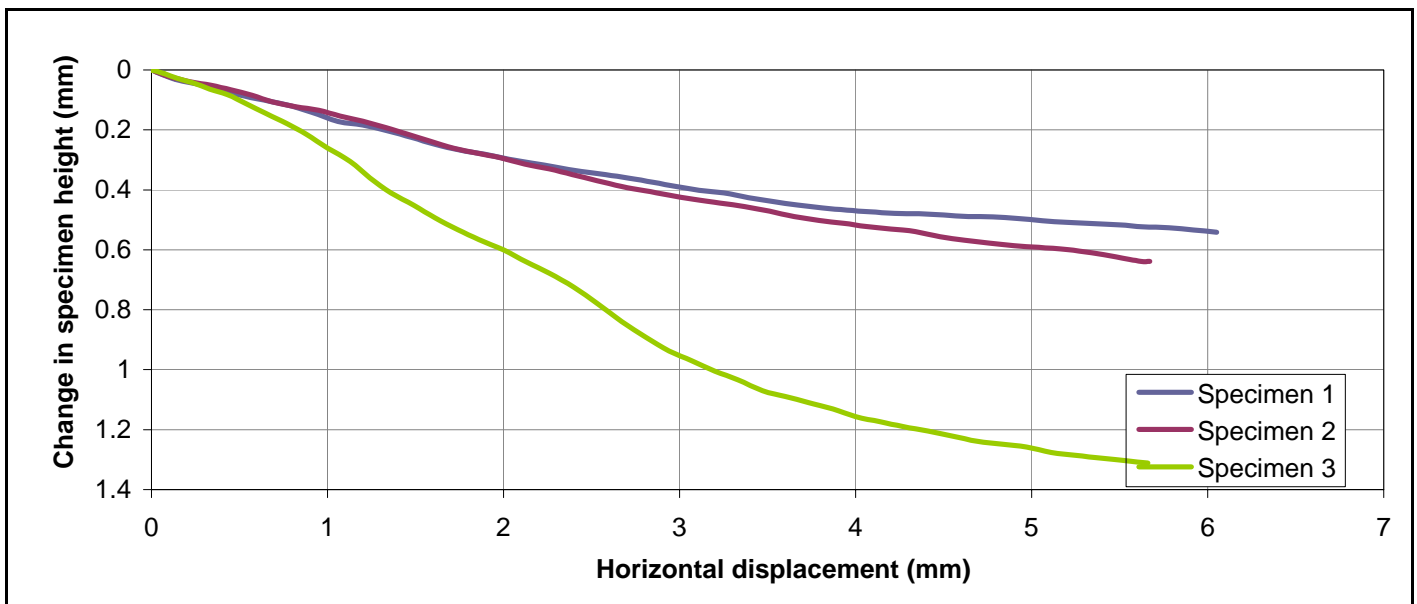
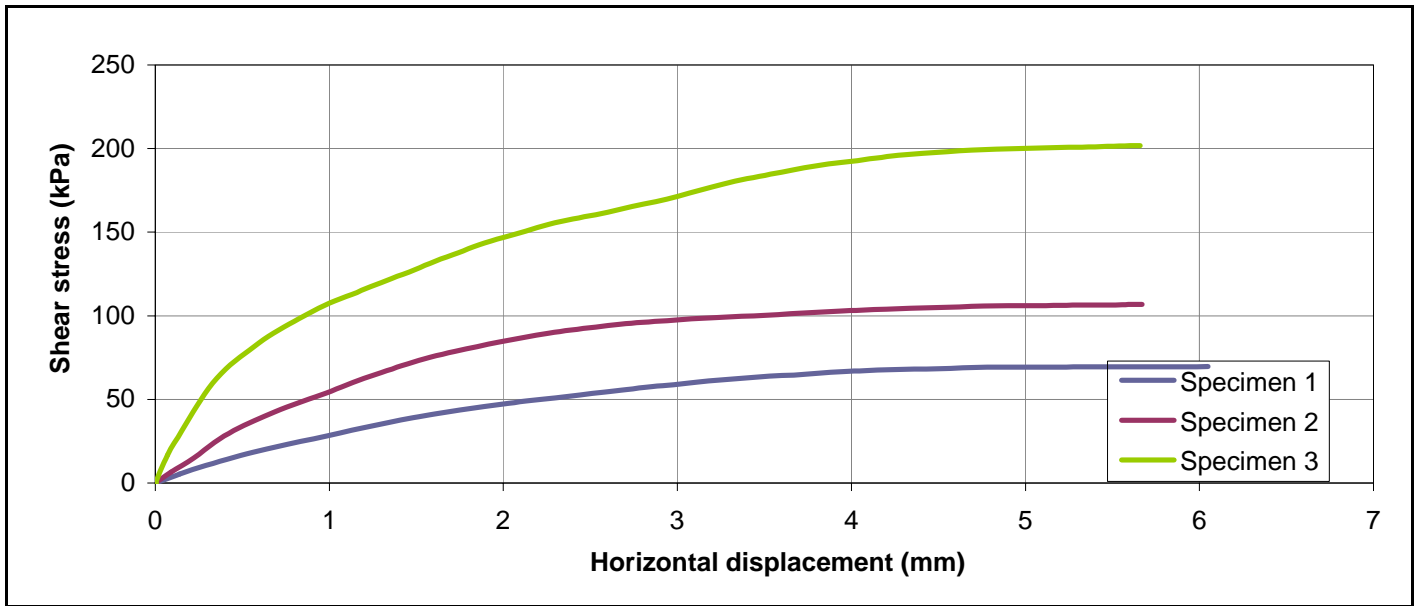
Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	14/10/2010	Date	15/10/2010	Date	No. 2537/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST REPORT - SHEARING

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	2.60/3.20
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical



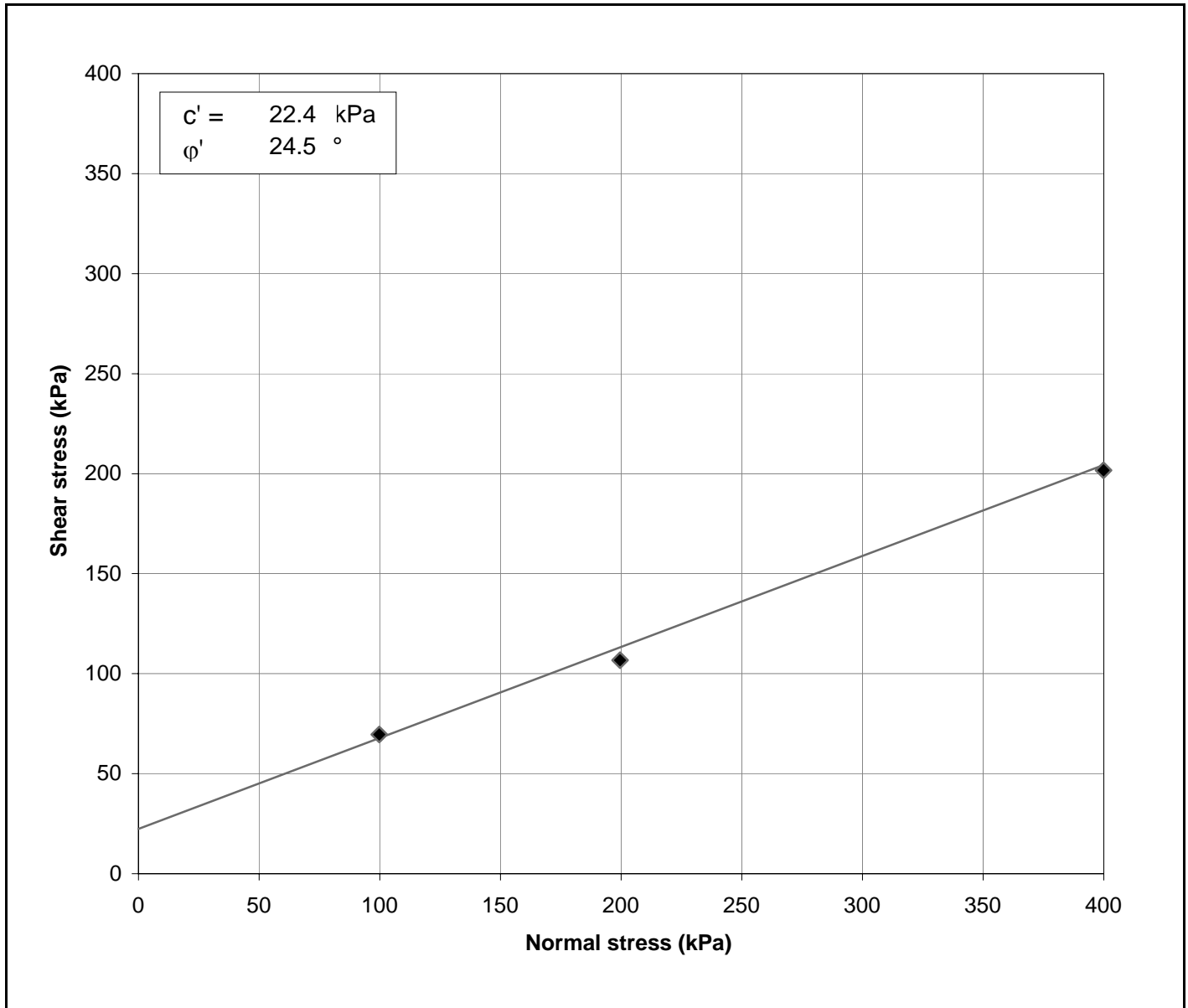
Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	14/10/2010	Date	15/10/2010	Date	No. 2537/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST REPORT - SHEARING

Project location	<i>GEOITALIA - Fresciano</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>2.60/3.20</i>
Borehole number	<i>34</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>



Tested	<i>Farinelli</i>	Checked	<i>Sfalanga</i>	Approved	<i>Carmignani</i>
Date	<i>14/10/2010</i>	Date	<i>15/10/2010</i>	Date	<i>No. 2537/2010</i>



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	<i>GEOITALIA - Fresciano</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>2.60/3.20</i>
Borehole number	<i>34</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 1	Normal stress (kPa)	100
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Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	0.621	0.2	0.000
0.08	0.643	0.3	0.022
0.13	0.656	0.4	0.035
0.21	0.677	0.5	0.056
0.32	0.725	0.6	0.104
0.51	0.745	0.7	0.124
0.81	0.764	0.9	0.143
1.29	0.782	1.1	0.161
2.04	0.792	1.4	0.171
3.25	0.805	1.8	0.184
5.17	0.823	2.3	0.202
8.21	0.841	2.9	0.220
13.05	0.852	3.6	0.231
20.76	0.863	4.6	0.242
33.00	0.875	5.7	0.254
52.48	0.884	7.2	0.263
83.43	0.894	9.1	0.273
132.66	0.903	11.5	0.282
210.92	0.921	14.5	0.300
335.37	0.933	18.3	0.312
533.23	0.942	23.1	0.321
847.83	0.952	29.1	0.331
932.01	0.953	30.5	0.332

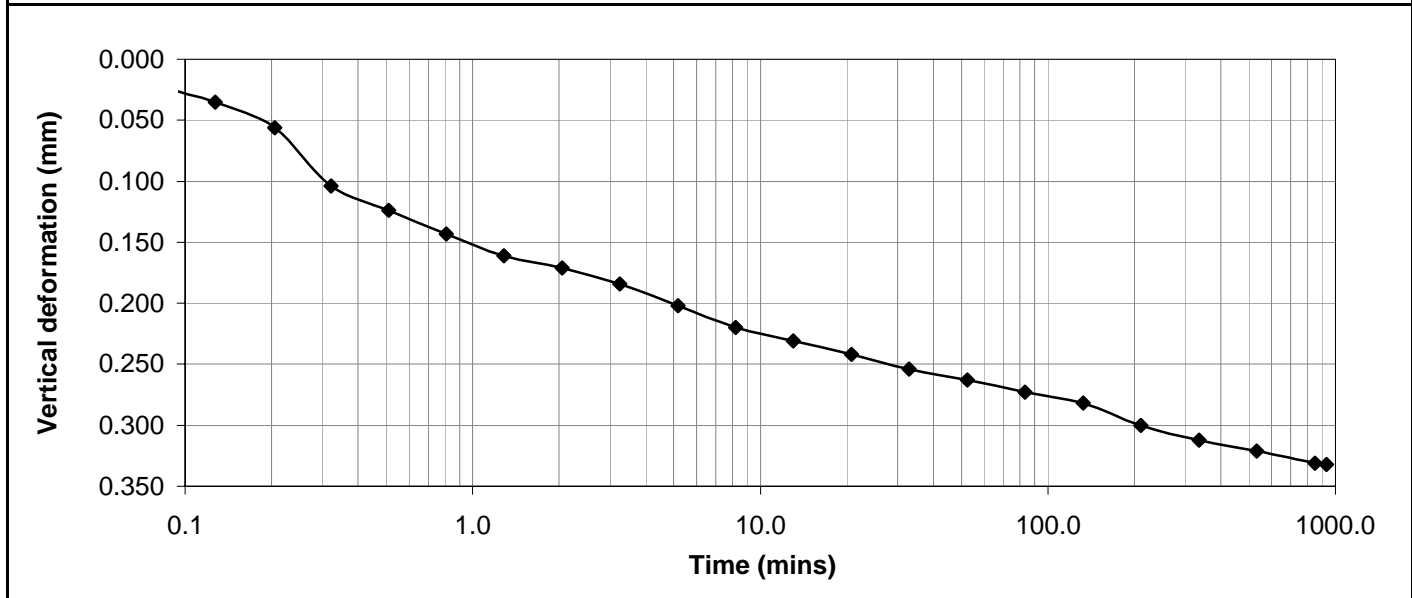
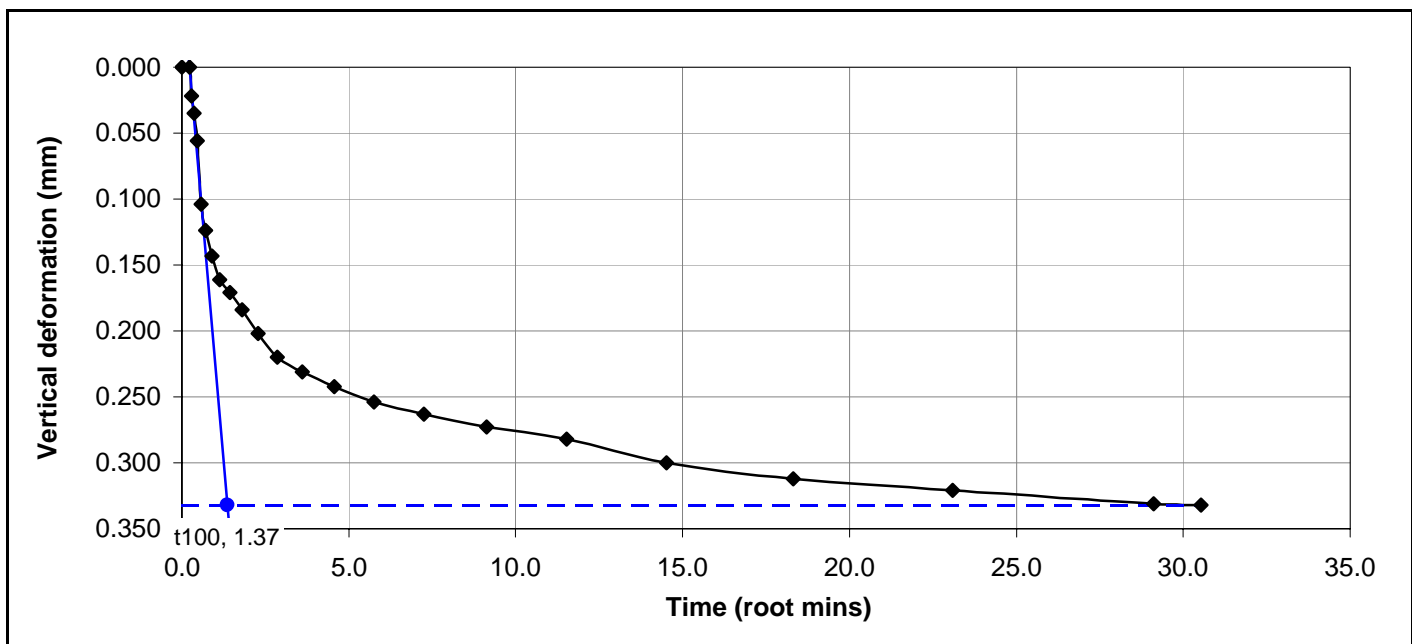


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	2.60/3.20
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 1 **Normal stress (kPa)** 100



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	05/10/2010	Date	15/10/2010	Date	No. 2537/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	2.60/3.20
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 1 **Normal stress (kPa) 100**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
0.00	0.010	0.06	17.7	0.000	0.00	0.0	0.0
10.00	0.042	0.20	32.7	0.032	0.14	15.1	5.3
20.00	0.061	0.35	47.3	0.051	0.29	29.6	10.5
30.00	0.087	0.51	61.0	0.077	0.45	43.3	15.3
40.00	0.106	0.66	72.4	0.096	0.60	54.7	19.4
50.00	0.125	0.82	83.1	0.115	0.76	65.4	23.1
60.00	0.151	0.97	92.6	0.141	0.91	74.9	26.5
70.00	0.182	1.12	102.3	0.172	1.06	84.7	29.9
80.00	0.194	1.26	111.6	0.184	1.20	93.9	33.2
90.00	0.213	1.40	120.2	0.203	1.34	102.5	36.2
100.00	0.235	1.54	127.9	0.225	1.48	110.2	39.0
110.00	0.258	1.67	134.5	0.248	1.61	116.8	41.3
120.00	0.277	1.81	140.9	0.267	1.75	123.2	43.6
130.00	0.291	1.95	146.8	0.281	1.89	129.1	45.7
140.00	0.308	2.09	152.2	0.298	2.03	134.5	47.6
150.00	0.321	2.22	157.2	0.311	2.16	139.5	49.3
160.00	0.335	2.36	161.9	0.325	2.30	144.2	51.0
170.00	0.349	2.50	166.4	0.339	2.44	148.7	52.6
180.00	0.359	2.64	171.2	0.349	2.58	153.5	54.3
190.00	0.371	2.77	175.8	0.361	2.71	158.1	55.9
200.00	0.385	2.91	180.4	0.375	2.85	162.7	57.5
210.00	0.399	3.04	183.9	0.389	2.98	166.2	58.8
220.00	0.411	3.17	187.9	0.401	3.11	170.2	60.2
230.00	0.420	3.31	191.9	0.410	3.25	174.2	61.6
240.00	0.436	3.45	195.4	0.426	3.39	177.7	62.8
250.00	0.449	3.59	198.6	0.439	3.53	180.9	64.0
260.00	0.461	3.73	200.2	0.451	3.67	182.5	64.5
270.00	0.470	3.87	203.2	0.460	3.81	185.5	65.6
280.00	0.478	4.01	206.0	0.468	3.95	188.3	66.6
290.00	0.483	4.14	207.7	0.473	4.08	190.0	67.2
300.00	0.488	4.28	209.4	0.478	4.22	191.7	67.8
310.00	0.490	4.42	210.6	0.480	4.36	193.0	68.2
320.00	0.494	4.56	211.1	0.484	4.50	193.4	68.4
330.00	0.499	4.70	212.3	0.489	4.64	194.7	68.8



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA - Fresciano</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>2.60/3.20</i>
Borehole number	<i>34</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 1	Normal stress (kPa)	100
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Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
340.00	0.500	4.84	213.4	0.490	4.78	195.7	69.2
350.00	0.506	4.98	213.6	0.496	4.92	196.0	69.3
360.00	0.513	5.12	213.7	0.503	5.06	196.0	69.3
370.00	0.518	5.26	213.9	0.508	5.20	196.2	69.4
380.00	0.523	5.41	214.0	0.513	5.35	196.3	69.4
390.00	0.527	5.56	214.2	0.517	5.50	196.6	69.5
400.00	0.533	5.69	214.2	0.523	5.63	196.6	69.5
410.00	0.537	5.84	214.2	0.527	5.78	196.5	69.5
420.00	0.544	5.98	214.3	0.534	5.92	196.6	69.5
429.12	0.551	6.11	214.6	0.541	6.05	196.9	69.6

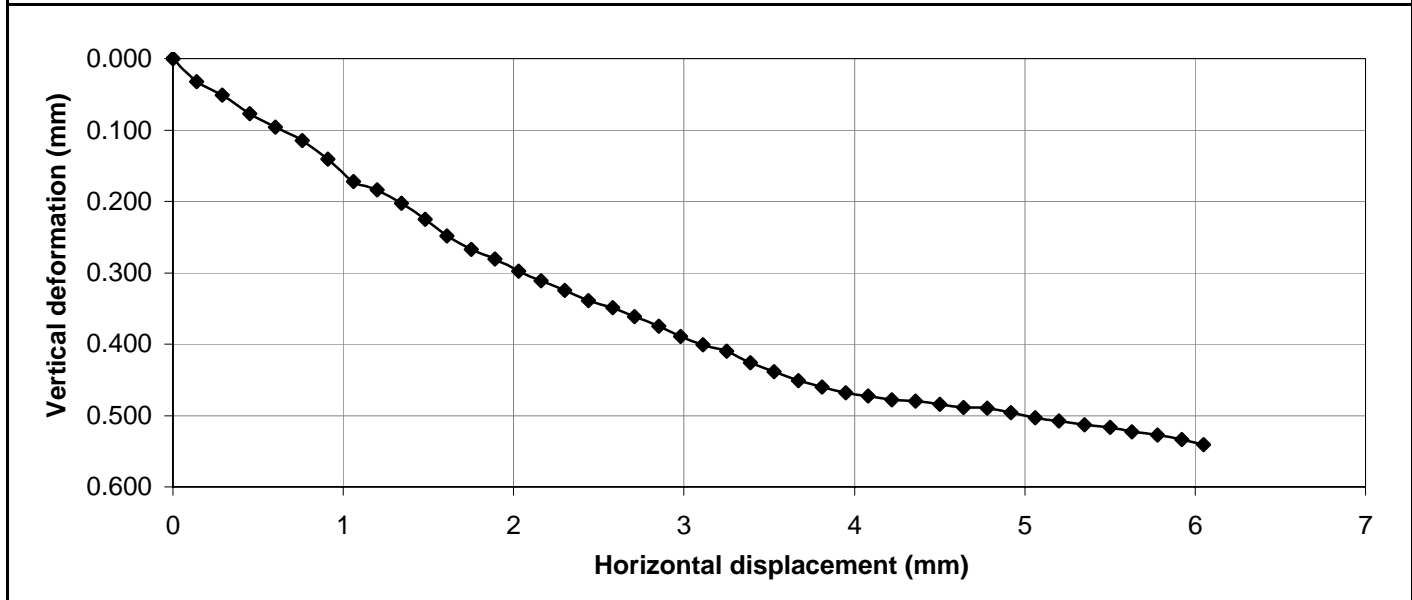
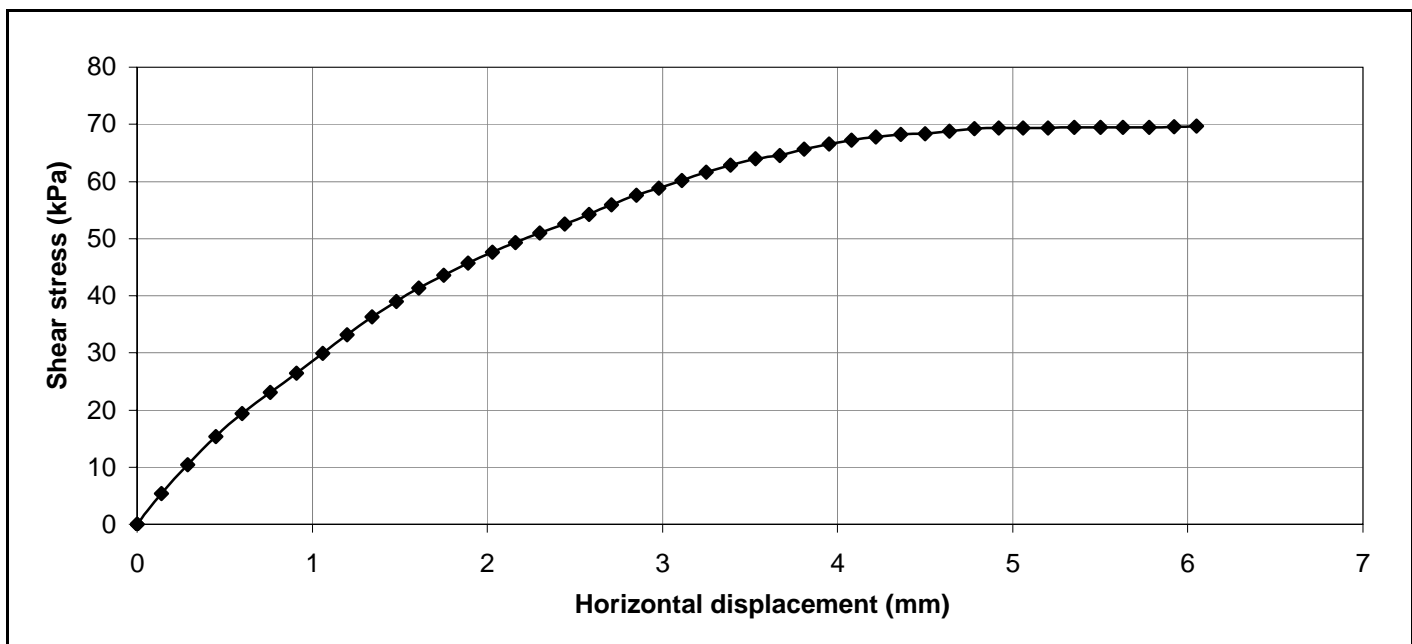


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA - Fresciano</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>2.60/3.20</i>
Borehole number	<i>34</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 1 **Normal stress (kPa)** **100**



Tested	<i>Farinelli</i>	Checked	<i>Sfalanga</i>	Approved	<i>Carmignani</i>
Date	<i>06/10/2010</i>	Date	<i>15/10/2010</i>	Date	<i>No. 2537/2010</i>



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	<i>GEOITALIA - Fresciano</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>2.60/3.20</i>
Borehole number	<i>34</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 2	Normal stress (kPa)	200
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Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	0.899	0.2	0.000
0.08	0.920	0.3	0.021
0.13	0.983	0.4	0.084
0.20	1.012	0.4	0.113
0.32	1.040	0.6	0.141
0.51	1.061	0.7	0.162
0.81	1.072	0.9	0.173
1.29	1.089	1.1	0.190
2.04	1.113	1.4	0.214
3.25	1.123	1.8	0.224
5.17	1.134	2.3	0.235
8.21	1.143	2.9	0.244
13.06	1.155	3.6	0.256
20.76	1.168	4.6	0.269
33.00	1.183	5.7	0.284
52.47	1.189	7.2	0.290
83.43	1.198	9.1	0.299
132.66	1.208	11.5	0.309
210.92	1.214	14.5	0.315
335.37	1.220	18.3	0.321
533.23	1.227	23.1	0.328
847.83	1.237	29.1	0.338
956.62	1.240	30.9	0.341

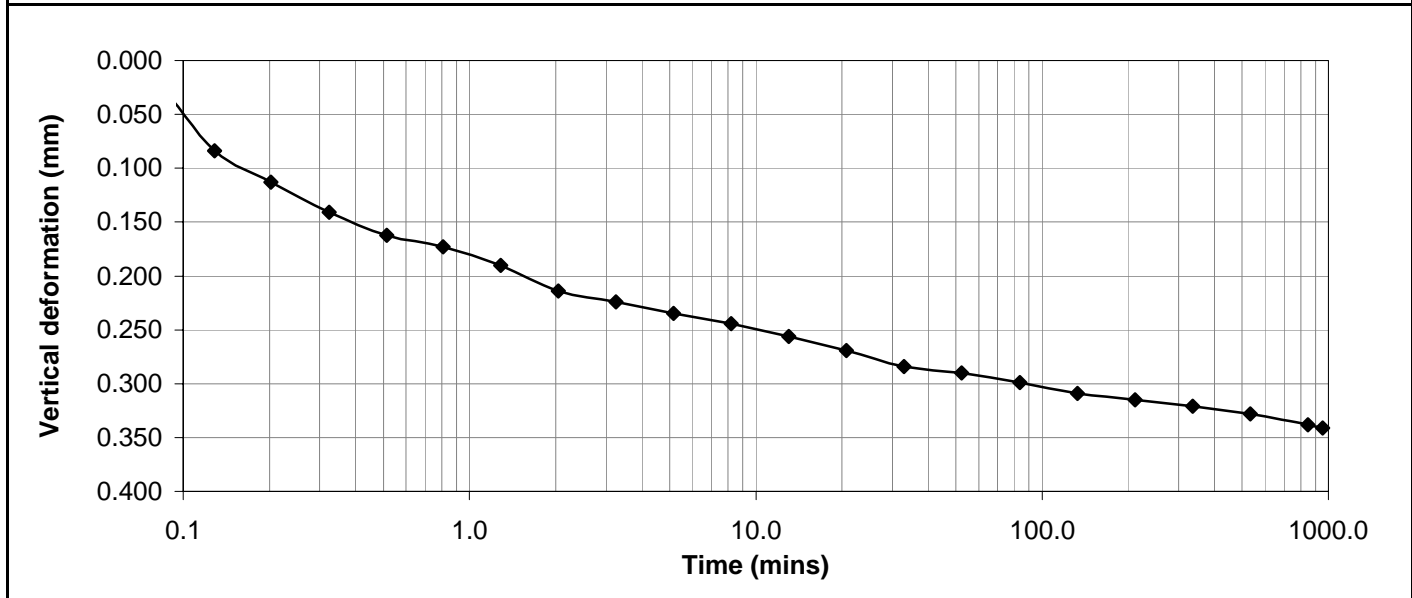
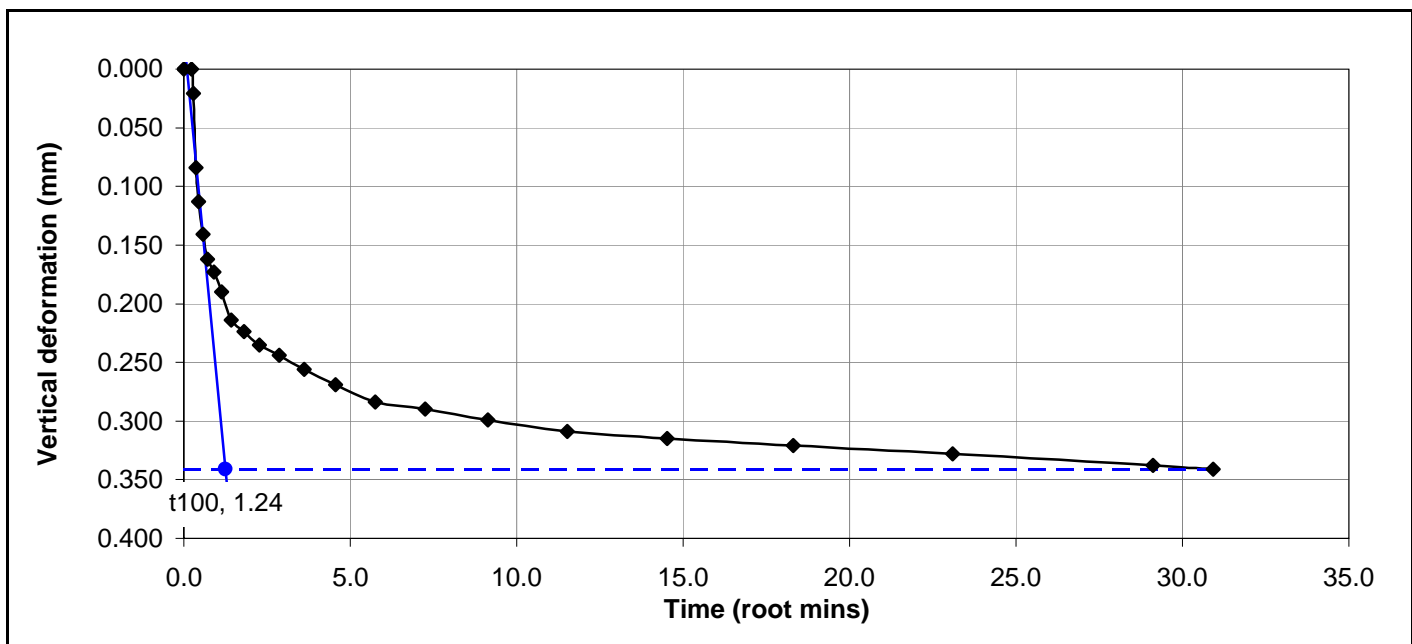


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	2.60/3.20
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 2 **Normal stress (kPa) 200**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	06/10/2010	Date	15/10/2010	Date	No. 2537/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	2.60/3.20
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 2 **Normal stress (kPa) 200**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
0.02	0.004	0.01	16.4	0.000	0.00	0.0	0.0
10.00	0.024	0.10	34.8	0.020	0.09	18.4	6.5
20.00	0.044	0.23	58.9	0.040	0.22	42.5	15.0
30.00	0.055	0.35	85.2	0.051	0.34	68.8	24.3
40.00	0.070	0.46	105.2	0.066	0.45	88.8	31.4
50.00	0.088	0.58	122.1	0.084	0.57	105.7	37.4
60.00	0.111	0.70	137.3	0.107	0.69	120.9	42.8
70.00	0.127	0.83	152.0	0.123	0.82	135.6	47.9
80.00	0.139	0.96	165.3	0.135	0.95	148.9	52.7
90.00	0.158	1.08	178.6	0.154	1.07	162.2	57.4
100.00	0.175	1.21	193.3	0.171	1.20	176.9	62.6
110.00	0.196	1.34	206.3	0.192	1.33	189.9	67.2
120.00	0.218	1.46	217.8	0.214	1.45	201.4	71.2
130.01	0.241	1.59	229.2	0.237	1.58	212.8	75.3
140.00	0.266	1.73	238.6	0.262	1.72	222.2	78.6
150.00	0.282	1.86	246.7	0.278	1.85	230.3	81.5
160.00	0.297	1.99	254.9	0.293	1.98	238.5	84.4
170.00	0.318	2.13	262.6	0.314	2.12	246.2	87.1
180.00	0.334	2.27	269.6	0.330	2.26	253.2	89.6
190.00	0.353	2.40	275.4	0.349	2.39	259.0	91.6
200.00	0.374	2.54	279.8	0.370	2.53	263.4	93.2
210.00	0.393	2.68	284.7	0.389	2.67	268.3	94.9
220.00	0.407	2.81	287.9	0.403	2.80	271.5	96.0
230.00	0.422	2.95	290.9	0.418	2.94	274.5	97.1
240.00	0.435	3.09	293.9	0.431	3.08	277.5	98.2
250.00	0.448	3.24	296.4	0.444	3.23	280.0	99.0
260.00	0.460	3.38	298.2	0.456	3.37	281.8	99.7
270.00	0.475	3.52	300.3	0.471	3.51	283.9	100.4
280.00	0.493	3.66	302.9	0.489	3.65	286.5	101.3
290.00	0.506	3.80	305.0	0.502	3.79	288.6	102.1
300.00	0.515	3.94	306.9	0.511	3.93	290.5	102.8
310.00	0.526	4.07	308.6	0.522	4.06	292.2	103.4
320.00	0.535	4.21	310.3	0.531	4.20	293.9	103.9
330.00	0.543	4.35	311.8	0.539	4.34	295.4	104.5



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA - Fresciano</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>2.60/3.20</i>
Borehole number	<i>34</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 2	Normal stress (kPa)	200
-------------------	----------------------------	------------

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
340.00	0.560	4.49	313.2	0.556	4.48	296.8	105.0
350.00	0.572	4.63	314.3	0.568	4.62	297.9	105.4
360.00	0.582	4.77	315.6	0.578	4.76	299.2	105.8
370.00	0.590	4.91	316.3	0.586	4.90	299.9	106.1
380.00	0.596	5.05	316.5	0.592	5.04	300.1	106.1
390.00	0.603	5.21	316.8	0.599	5.20	300.4	106.2
400.00	0.614	5.35	317.1	0.610	5.34	300.7	106.3
410.00	0.628	5.49	317.6	0.624	5.48	301.2	106.5
420.01	0.643	5.63	318.2	0.639	5.62	301.8	106.7
423.55	0.643	5.68	318.2	0.639	5.67	301.8	106.8

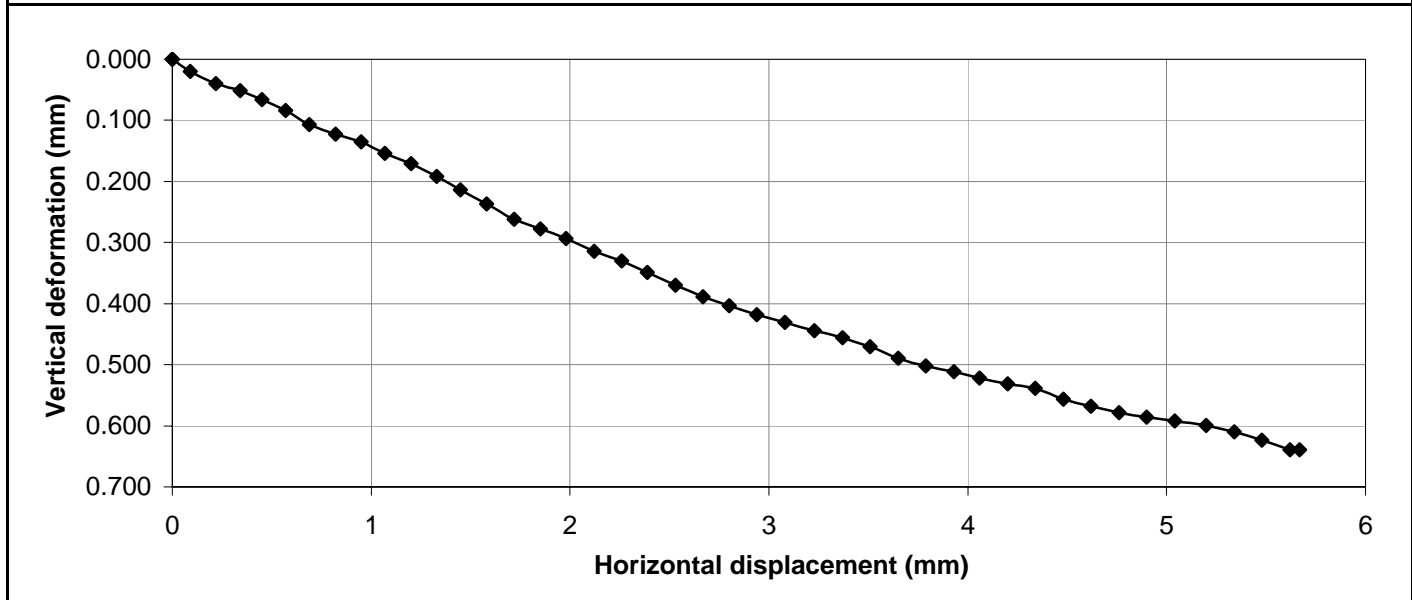
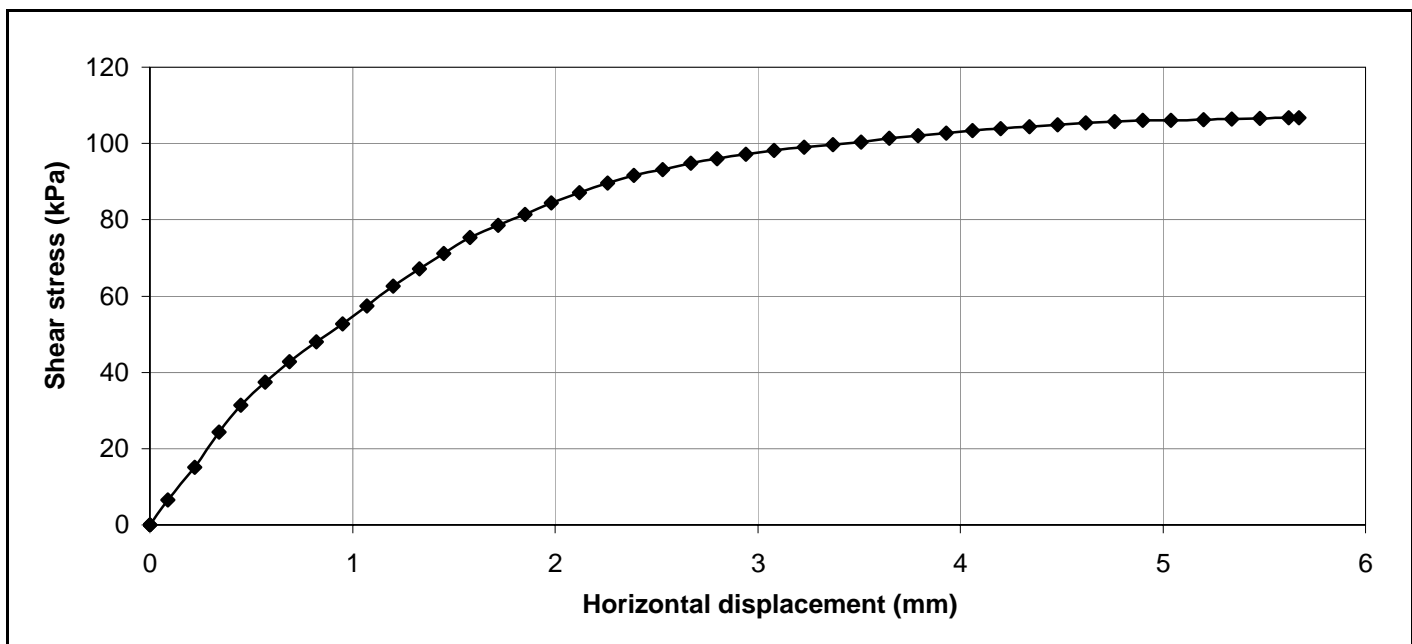


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	2.60/3.20
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 2 **Normal stress (kPa) 200**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	07/10/2010	Date	15/10/2010	Date	No. 2537/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	<i>GEOITALIA - Fresciano</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>2.60/3.20</i>
Borehole number	<i>34</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 3	Normal stress (kPa)	400
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Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	1.495	0.2	0.000
0.08	1.554	0.3	0.059
0.13	1.600	0.4	0.105
0.20	1.664	0.4	0.169
0.32	1.704	0.6	0.209
0.51	1.739	0.7	0.244
0.81	1.773	0.9	0.278
1.29	1.801	1.1	0.306
2.05	1.837	1.4	0.342
3.25	1.872	1.8	0.377
5.17	1.901	2.3	0.406
8.21	1.927	2.9	0.432
13.06	1.950	3.6	0.455
20.76	1.977	4.6	0.482
33.00	2.001	5.7	0.506
52.47	2.025	7.2	0.530
83.43	2.052	9.1	0.557
132.66	2.065	11.5	0.570
210.92	2.079	14.5	0.584
335.37	2.101	18.3	0.606
533.23	2.117	23.1	0.622
847.84	2.135	29.1	0.640
1003.01	2.142	31.7	0.647



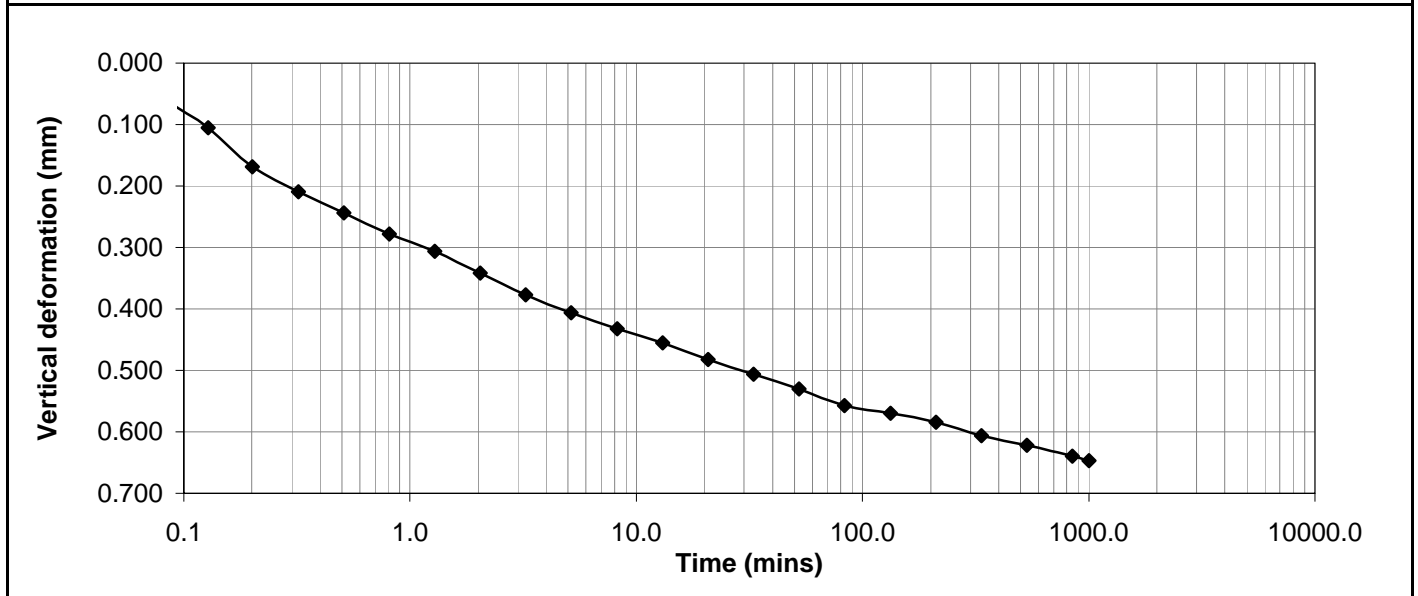
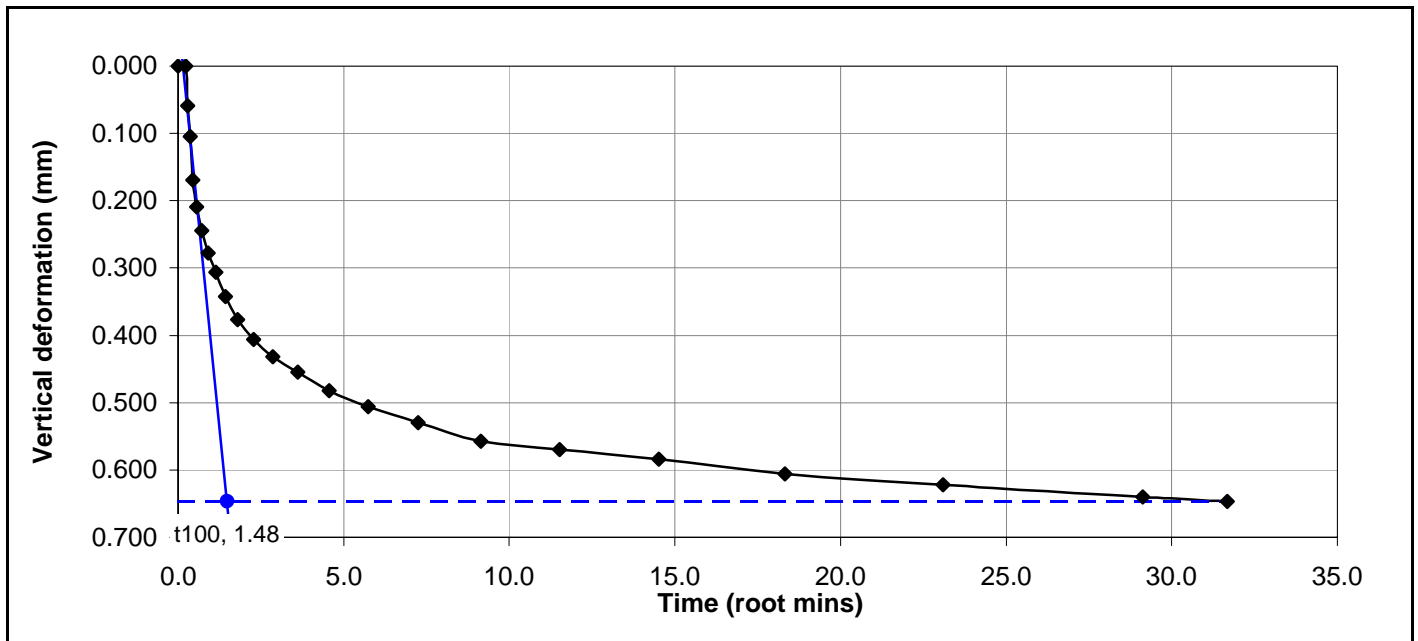
DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	2.60/3.20
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 3

Normal stress (kPa) 400



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	12/10/2010	Date	15/10/2010	Date	No. 2537/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	2.60/3.20
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 3 **Normal stress (kPa) 400**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
0.02	0.002	0.00	16.2	0.000	0.00	0.0	0.0
10.00	0.014	0.07	63.5	0.012	0.07	47.3	16.7
20.00	0.031	0.15	103.9	0.029	0.15	87.7	31.0
30.00	0.046	0.24	146.8	0.044	0.24	130.6	46.2
40.00	0.066	0.33	184.9	0.064	0.33	168.7	59.7
50.00	0.084	0.43	215.9	0.082	0.43	199.8	70.7
60.00	0.115	0.54	240.6	0.113	0.54	224.4	79.4
70.00	0.147	0.65	263.9	0.145	0.65	247.7	87.6
80.00	0.181	0.77	285.2	0.179	0.77	269.0	95.2
90.00	0.217	0.88	302.6	0.215	0.88	286.5	101.3
100.00	0.263	1.00	320.6	0.261	1.00	304.4	107.7
110.00	0.307	1.13	334.9	0.305	1.13	318.7	112.7
120.00	0.362	1.24	348.7	0.360	1.24	332.5	117.6
130.00	0.412	1.36	362.0	0.410	1.36	345.8	122.3
140.00	0.454	1.49	376.8	0.452	1.49	360.6	127.5
150.00	0.495	1.61	391.1	0.493	1.61	374.9	132.6
160.00	0.535	1.74	405.4	0.533	1.74	389.2	137.7
170.00	0.568	1.86	419.1	0.566	1.86	402.9	142.5
180.00	0.602	2.00	431.2	0.600	2.00	415.0	146.8
190.00	0.643	2.13	442.3	0.641	2.13	426.1	150.7
200.00	0.680	2.26	453.3	0.678	2.26	437.1	154.6
210.00	0.727	2.40	462.8	0.725	2.40	446.6	158.0
220.00	0.780	2.53	469.5	0.778	2.53	453.3	160.3
230.00	0.841	2.67	478.9	0.839	2.67	462.7	163.7
240.00	0.895	2.81	488.2	0.893	2.81	472.0	166.9
250.00	0.940	2.94	496.3	0.938	2.94	480.1	169.8
260.00	0.973	3.07	506.3	0.971	3.07	490.1	173.3
270.00	1.007	3.20	516.7	1.005	3.20	500.5	177.0
280.00	1.036	3.33	526.7	1.034	3.33	510.5	180.6
290.00	1.072	3.47	535.0	1.070	3.47	518.8	183.5
300.00	1.091	3.60	541.9	1.089	3.60	525.8	185.9
310.00	1.112	3.73	549.5	1.110	3.73	533.3	188.6
320.00	1.133	3.87	555.7	1.131	3.87	539.5	190.8
330.00	1.159	4.00	560.2	1.157	4.00	544.0	192.4



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA - Fresciano</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>2.60/3.20</i>
Borehole number	<i>34</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>1</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 3	Normal stress (kPa)	400
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Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
340.00	1.176	4.14	565.8	1.174	4.14	549.6	194.4
350.00	1.192	4.27	570.3	1.190	4.27	554.1	196.0
360.00	1.207	4.41	573.5	1.205	4.41	557.3	197.1
370.00	1.224	4.55	576.2	1.222	4.55	560.0	198.0
380.00	1.241	4.69	578.9	1.239	4.69	562.7	199.0
390.00	1.250	4.83	580.4	1.248	4.83	564.3	199.6
400.01	1.260	4.97	581.8	1.258	4.97	565.6	200.0
410.00	1.278	5.11	582.9	1.276	5.11	566.7	200.4
420.00	1.288	5.25	583.9	1.286	5.25	567.7	200.8
430.01	1.297	5.40	584.7	1.295	5.40	568.5	201.1
440.00	1.306	5.54	586.2	1.304	5.54	570.0	201.6
448.33	1.313	5.66	586.5	1.311	5.66	570.3	201.7

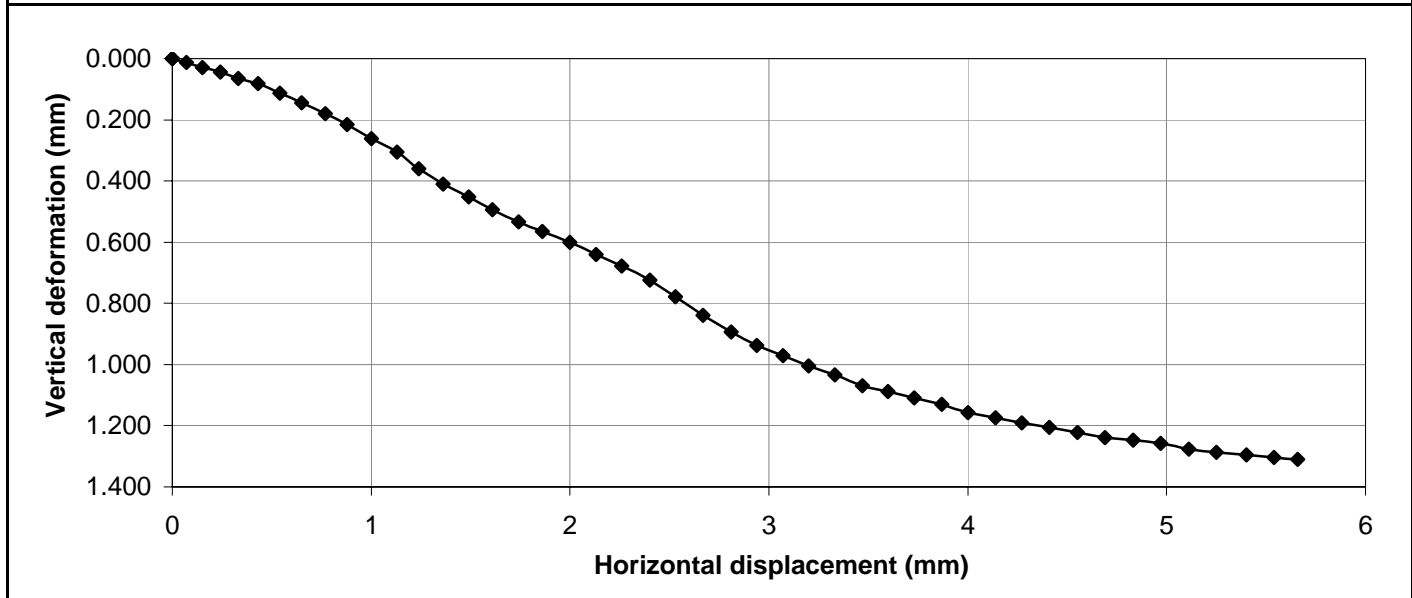
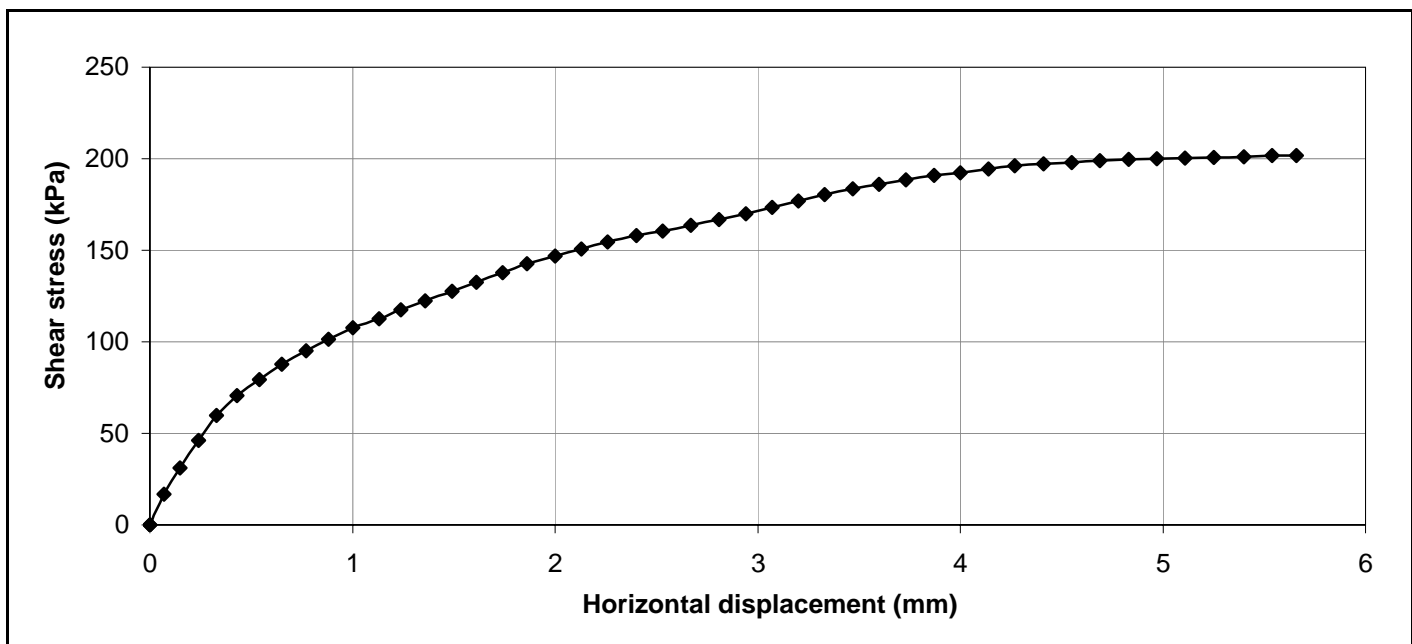


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	2.60/3.20
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	1	Specimen orientation	Vertical

SPECIMEN 3 **Normal stress (kPa) 400**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	13/10/2010	Date	15/10/2010	Date	No. 2537/2010

DESCRIZIONE E RIPRESA FOTOGRAFICA DELLA CAROTA ESTRUSA

Committente: GeoItalia srl - Roma

Cantiere/Località: Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

Sondaggio: 34

Campione: 3

Profondità prelievo: 7.10-7.50

Data prelievo: 02/08/2010

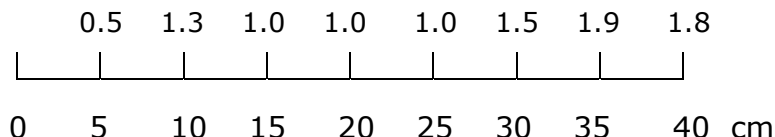
Data apertura: 22/09/2010

Verbale accettazione n° 165

Descrizione: argilla con limo e sabbia, presenti inclusi di natura argillitica e rari fenomeni di ossidazione (Raccomandazioni AGI 1977). Argilla limo-sabbiosa (UNI EN ISO 14688-2).

Colore: HUE 2.5Y VALUE 4 CHROMA 0 (Munsell Soil Color Chart)

Pocket (kg/cm²):



Lunghezza carota: 46 cm
Diametro carota: 88,9 mm



Modalità di prelievo: sondaggio a rotazione

Tipo di fustella: Shelby

Classe di qualità del campione: Q5 (Raccomandazioni AGI 1977)
C1 (Eurocodice 7)

Prove eseguite:

Cont. Acqua W	X	Granulom. Gr	X	T. Residuo TR	-
Peso Volume γ	X	Compress. ELL	-	Triass. TX UU	X
Peso Specifico Gs	X	Edometria Ed	X	Triass. TX CU	-
Limiti Cons. LL	X	T. Diretto TD	X	Triass. TX CD	-



Committente Geotalia srl – Roma **pagina 1 di 2**
Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Data prova 29/09/2010
 Data certificato 21/10/2010
 Verb. Accettazione 165
 N. certificato 2530/2010

Norma di riferimento **ASTM D5550-00**

AccuPyc II 1340 V1.00

Unit 1

Serial #: 488

Page 1

Sample: VA165_S34_1_m 2,60-3,20
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S34_1.SMP

Analysis Gas: Helium
 Reported: 29/09/2010 15.30.27
 Sample Mass: 8.4200 g
 Temperature: 23.80 °C
 Number of Purges: 5

Analysis Start: 29/09/2010 15.06.41
 Analysis End: 29/09/2010 15.27.51
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2265 cm³
 Cell Volume: 11.8010 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 34, Campione 1, Prof. (m) 2,60-3,20

Combined Report

Tabular 1

Cycle#	Volume (cm ³)	Volume Deviation (cm ³)	Density (g/cm ³)	Density Deviation (g/cm ³)	Total Pore Volume (cm ³)	Total Pore Volume Deviation (cm ³)
1	3.0932	-0.0106	2.7221	0.0093	0.1876	0.0013
2	3.1010	-0.0029	2.7153	0.0025	0.1867	0.0003
3	3.1047	0.0008	2.7120	-0.0007	0.1862	-0.0001
4	3.1065	0.0026	2.7105	-0.0023	0.1860	-0.0003
5	3.1067	0.0028	2.7103	-0.0025	0.1860	-0.0003
6	3.1070	0.0031	2.7101	-0.0027	0.1859	-0.0004
7	3.1079	0.0041	2.7092	-0.0036	0.1858	-0.0005

Summary Data

Average

Standard Deviation

Volume: 3.1038 cm³ 0.0048 cm³
 Density: 2.7128 g/cm³ 0.0042 g/cm³
 Total Pore Volume: 0.1863 cm³ 0.0006 cm³

Note: _____

Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma **pagina 2 di 2**
Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda (AR)

PESO SPECIFICO DEI GRANI

Data prova 07/10/2010
 Data certificato 21/10/2010
 Verb. Accettazione 165
 N. certificato 2531/2010

Norma di riferimento **ASTM D5550-00**

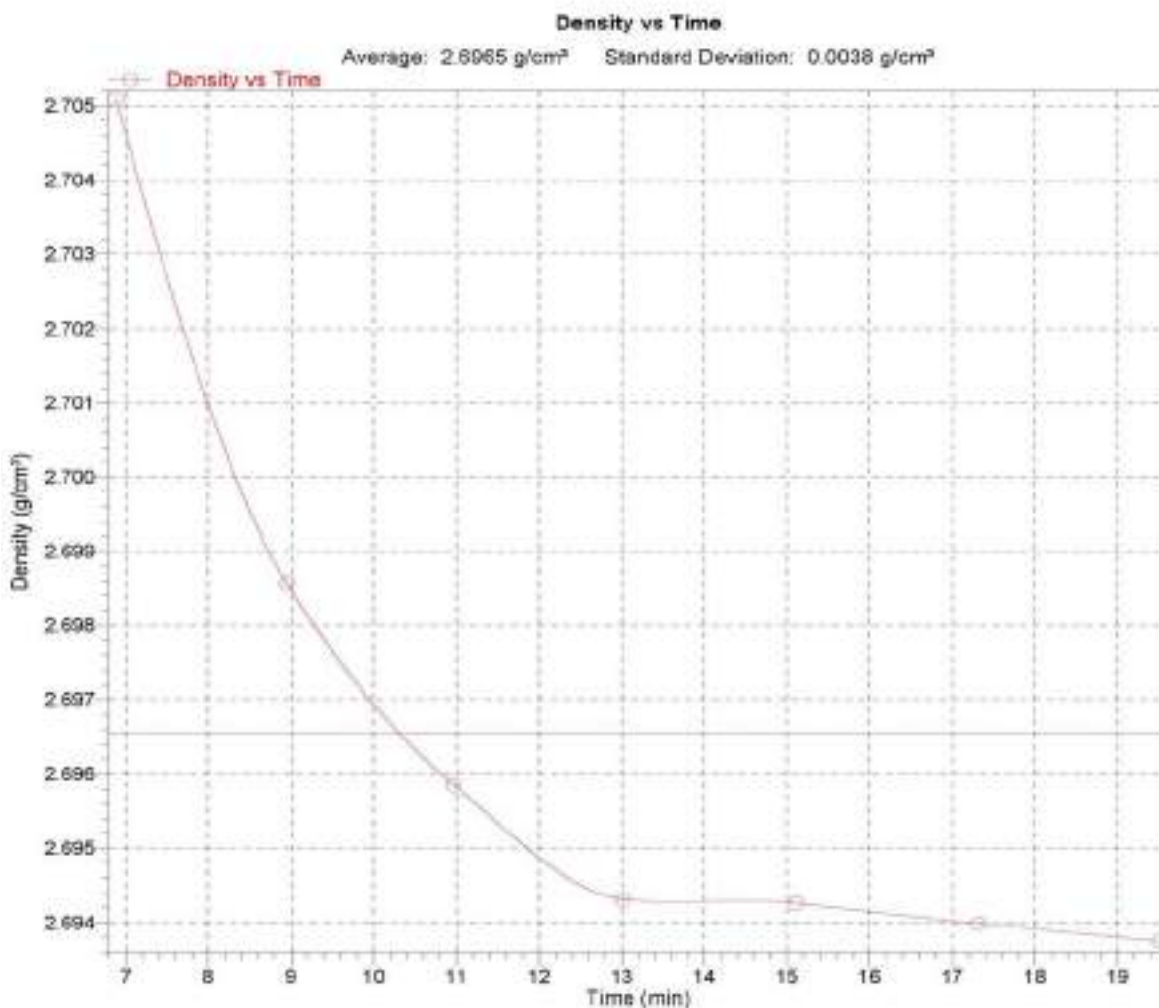
AccuPyc II 1340 V1.00 Unit 1 Serial #: 488 Page 2

Sample: VA165_S34_3_m 7.10-7.50
 Operator: Iannini Marco
 Submitter:
 Bar Code:
 File: C:\1340\DATA\165S34_3.SMP

Analysis Gas: Helium
 Reported: 07/10/2010 16.04.32
 Sample Mass: 8.8700 g
 Temperature: 25.08 °C
 Number of Purges: 5

Analysis Start: 07/10/2010 15.43.50
 Analysis End: 07/10/2010 16.04.32
 Equilib. Rate: 0.005 psig/min
 Expansion Volume: 9.2248 cm³
 Cell Volume: 11.8000 cm³

Comments: VA 165, Geotalia srl, Parco Eolico Badia Tedalda (Ar), Sondaggio 34, Campione 3, Prof. (m) 7.10-7.50



Il direttore del Laboratorio

Lo sperimentatore



Committente Geotalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

Data prova 14/10/2010
 Data certificato 15/10/2010
 Verb. Accettazione 165
 N. Certificato 2499/2010

Pag. 2 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 34 Campione 3 Profondità 7.10-7.50

ANALISI GRANULOMETRICA (ASTM D422 - C958 -E1617)

Setacciatura grossa:

Massa materiale (g): 508.15

Setacciatura fine:

Massa materiale (g): 104.51

Vagli ASTM	Apertura vagli (mm)	Massa Trattenuta (g)	Trattenuto %	Passante %
3"	75,000	0,00	0,0	100,0
2"	50,000	0,00	0,0	100,0
1,5"	37,500	0,00	0,0	100,0
1"	25,000	0,00	0,0	100,0
3/4"	19,000	0,00	0,0	100,0
3/8"	9,500	12,71	2,5	97,5
No.4	4,750	1,42	3,8	96,2
No.10	2,000	1,63	5,3	94,7
No.20	0,850	2,98	8,1	91,9
No.40	0,425	2,94	10,9	89,1
No.60	0,250	2,44	13,1	86,9
No.140	0,106	4,91	17,7	82,3
No.200	0,075	1,84	19,4	80,6

Sedigrafia:

Material Mass (g): 4.462
 Material/Liquid: soil / 0.20% Sodium Metaphosphate (w/w)
 Measurement Principle: X-Ray monitored gravity sedimentation
 Calculation Method: Stokes sedimentation and Beer's law of extinction
 Test Number: 2
 Analyzed: 14/10/2010 13.21.40
 Reported: 15/10/2010 11.12.39
 Liquid Visc: 0.7686 mPa.s
 Analysis Temp: 32.0 °C
 Full Scale Mass: 80.6 %
 Analysis Type: High Speed(Adj)
 Run Time: 0:05 hrs:min
 Sample Density: 2.697 g/cm³
 Liquid Density: 0.9951 g/cm³
 Base/Full Scale: 133 / 95 kCnts/s
 Reynolds Number: 0.80

Diametro (mm)	Trattenuto %	Passante %
0,060	19,7	80,3
0,050	19,9	80,1
0,040	20,3	79,7
0,030	21,0	79,0
0,025	21,7	78,3
0,020	23,5	76,5
0,015	26,0	74,0
0,010	29,4	70,6
0,008	31,4	68,6
0,006	34,1	65,9
0,005	36,4	63,6
0,004	39,4	60,6
0,003	43,5	56,5
0,002	49,3	50,7
0,002	53,0	47,0
0,001	57,3	42,7

Il direttore del Laboratorio

Lo sperimentatore



Committente Geoltalia srl – Roma
 Cantiere Parco Eolico Poggio Tre Vescovi - Casteldelci - Verghereto - Badia Tedalda

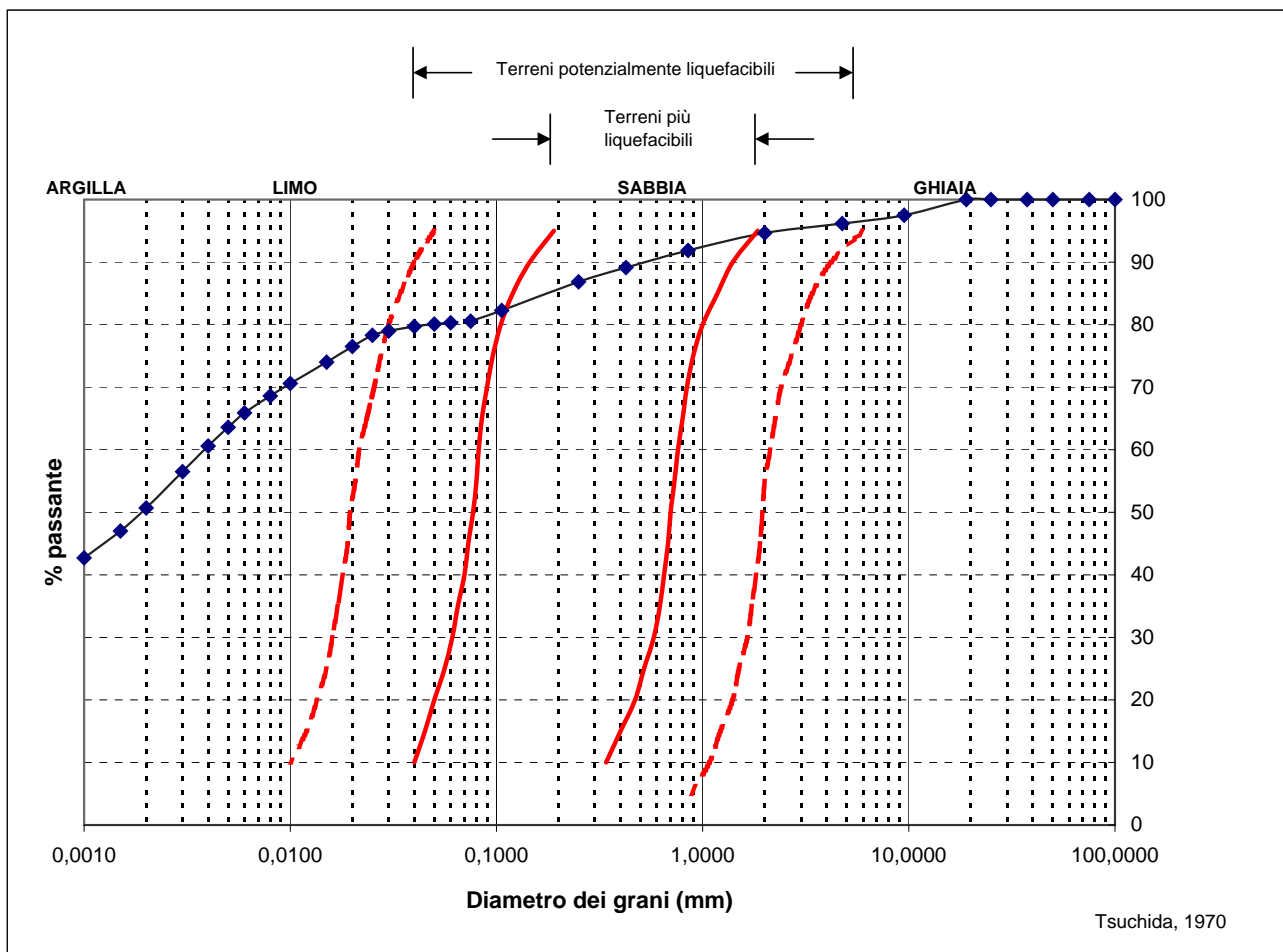
Data prova 14/10/2010
 Data certificato 15/10/2010
 Verb. Accettazione 165
 N. Certificato 2499/2010

Pag. 3 di 3

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

Sondaggio 34 Campione 3 Profondità 7.10-7.50

POTENZIALE DI LIQUEFACIBILITA'



Il direttore del Laboratorio

[Signature]

Lo sperimentatore

[Signature]



Committente Geotalia srl – Roma Pag. 1 di 1
 Cantiere Parco Eolico Poggio Tre Vescovi-Casteldelci-Verghereto-Badia Tedalda

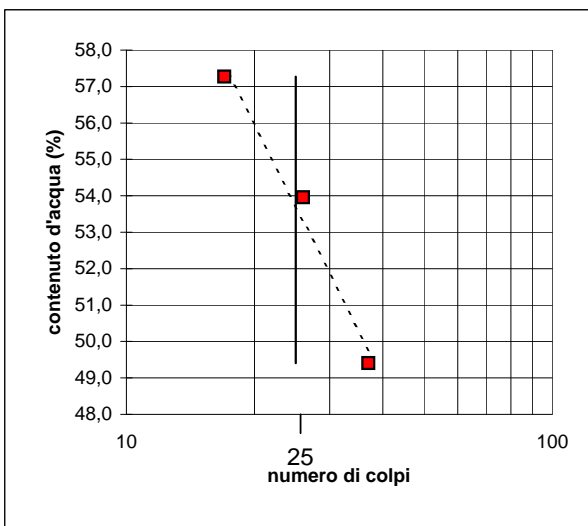
LIMITI DI CONSISTENZA

Norma di riferimento ASTM D4318

Data prova 07/10/10
 Data certificato 14/10/10
 Verb. Accettazione 165
 N. Certificato 2496/2010

Sondaggio 34 Campione 3 Profondità 7.10-7.50

Limite Liquido			
			53,7
Numero tara	C14	C36	C6
Numero dei colpi	37	26	17
P. umido + tara	g 69,64	65,52	58,88
P. secco + tara	g 52,19	46,99	43,56
Peso tara	g 16,87	12,65	16,81
Peso umido	g 52,77	52,87	42,07
Peso secco	g 35,32	34,34	26,75
Contenuto d'acqua	% 49,41	53,96	57,27

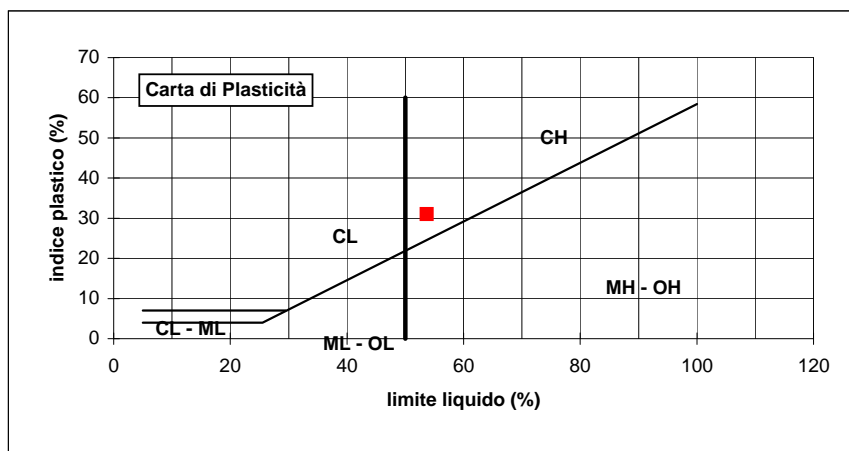


Limite Plastico		
		22,7
Numero tara	B26	B36
P. umido + tara	g 29,34	29,15
P. secco + tara	g 27,13	27,16
Peso tara	g 17,53	18,28
Peso umido	g 11,81	10,87
Peso secco	g 9,60	8,88
Contenuto d'acqua	% 23,02	22,41

Umidità Naturale	
Numero tara	B33
P. umido + tara	g 50,50
P. secco + tara	g 43,42
Peso tara	g 18,18
Peso umido	g 32,32
Peso secco	g 25,24
Contenuto d'acqua	% 28,1

Limite Liquido LL	53,7
Limite Plastico LP	22,7
Indice di Plasticità Ip	31,0
Umidità Naturale Wn	28,1
Indice di Consistenza Ic	0,8

$$I_p = LL - LP \quad I_c = \frac{LL - W_n}{I_p}$$



- ML** Limi inorganici di bassa plasticità
- MH** Limi inorganici di alta plasticità
- CL** Argille inorganiche di bassa plasticità
- CH** Argille inorganiche di alta plasticità
- OL** Argille organiche di bassa plasticità
- OH** Argille organiche di alta plasticità

Il direttore del Laboratorio

Lo sperimentatore



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST REPORT - SUMMARY

Project location	<i>GEOITALIA - Fresciano</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>7.10/7.50</i>
Borehole number	<i>34</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>3</i>	Specimen orientation	<i>Vertical</i>
Sample description	<i>Argilla con presenza di inclusi argillitici. Qualche fenomeno di ossidazione.</i>		

Particle density (Mg/m ³)	<i>2.70 (Measured)</i>	Specimens tested
---------------------------------------	------------------------	------------------

INITIAL CONDITIONS	SPECIMEN 1	SPECIMEN 2	SPECIMEN 3
Specimen depth (m)	<i>7.20/7.30</i>	<i>7.20/7.30</i>	<i>7.20/7.30</i>
Height (mm)	<i>20.0</i>	<i>20.0</i>	<i>20.0</i>
Length (mm)	<i>60.0</i>	<i>60.0</i>	<i>60.0</i>
Width (mm)	<i>60.0</i>	<i>60.0</i>	<i>60.0</i>
Area (mm ²)	<i>3600.0</i>	<i>3600.0</i>	<i>3600.0</i>
Moisture content (measured) (%)	<i>28</i>	<i>29</i>	<i>30</i>
Moisture content (trimmings) (%)	<i>27</i>	<i>27</i>	<i>28</i>
Bulk density (Mg/m ³)	<i>1.95</i>	<i>1.91</i>	<i>1.87</i>
Dry density (Mg/m ³)	<i>1.53</i>	<i>1.48</i>	<i>1.45</i>
Voids ratio	<i>0.766</i>	<i>0.821</i>	<i>0.868</i>
Degree of saturation (%)	<i>97</i>	<i>94</i>	<i>92</i>

Voids ratio at the end of consolidation	<i>0.723</i>	<i>0.732</i>	<i>0.612</i>
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SHEARING	SPECIMEN 1	SPECIMEN 2	SPECIMEN 3
Rate of displacement (mm/min)	<i>0.010000</i>	<i>0.010000</i>	<i>0.010000</i>
Conditions at peak shear stress			
Normal stress (kPa)	<i>100</i>	<i>200</i>	<i>400</i>
Shear stress (kPa)	<i>59</i>	<i>90</i>	<i>161</i>
Horizontal displacement (mm)	<i>1.95</i>	<i>4.48</i>	<i>3.65</i>
Vertical deformation (mm)	<i>0.213</i>	<i>0.525</i>	<i>0.445</i>

Apparent cohesion (kPa)	<i>18.0</i>
Angle of shearing resistance (°)	<i>20.5</i>

Comments / variations from procedures:
Verbale di accettazione
Il presente certificato è costituito da n. 18 pagine.

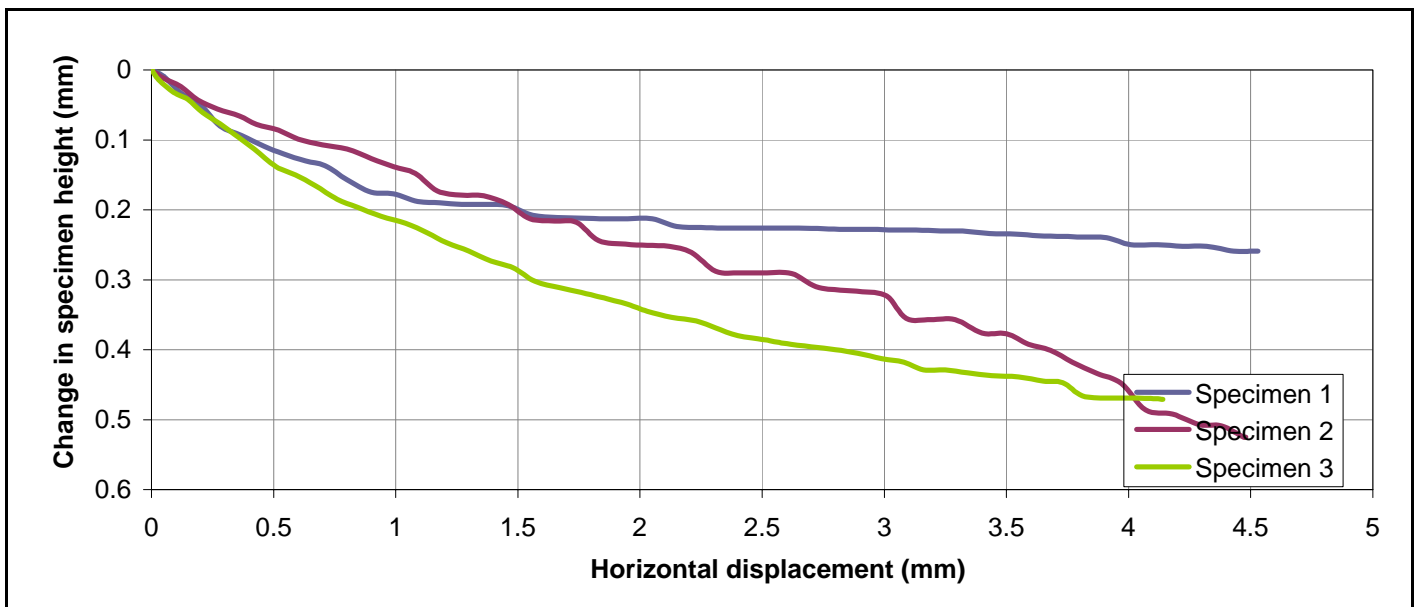
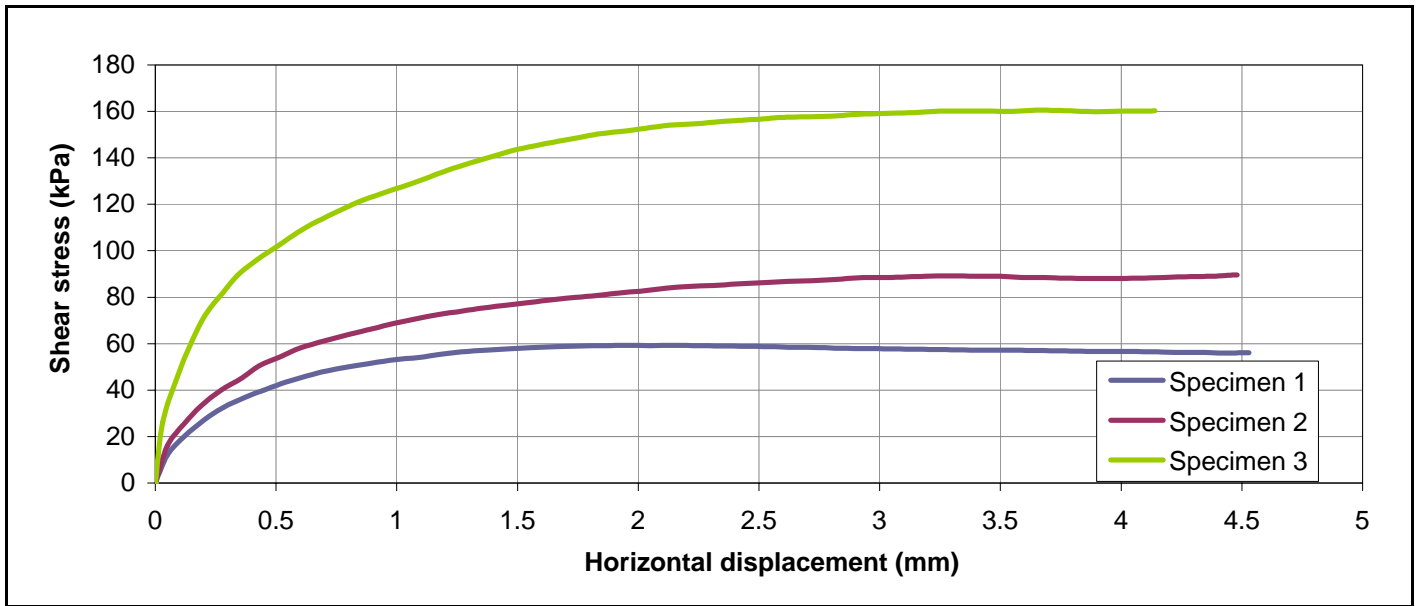
Tested	<i>Farinelli</i>	Checked	<i>Sfalanga</i>	Approved	<i>Carmignani</i>
Date	<i>14/10/2010</i>	Date	<i>15/10/2010</i>	Date	<i>No. 2538/2010</i>



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST REPORT - SHEARING

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	7.10/7.50
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	3	Specimen orientation	Vertical



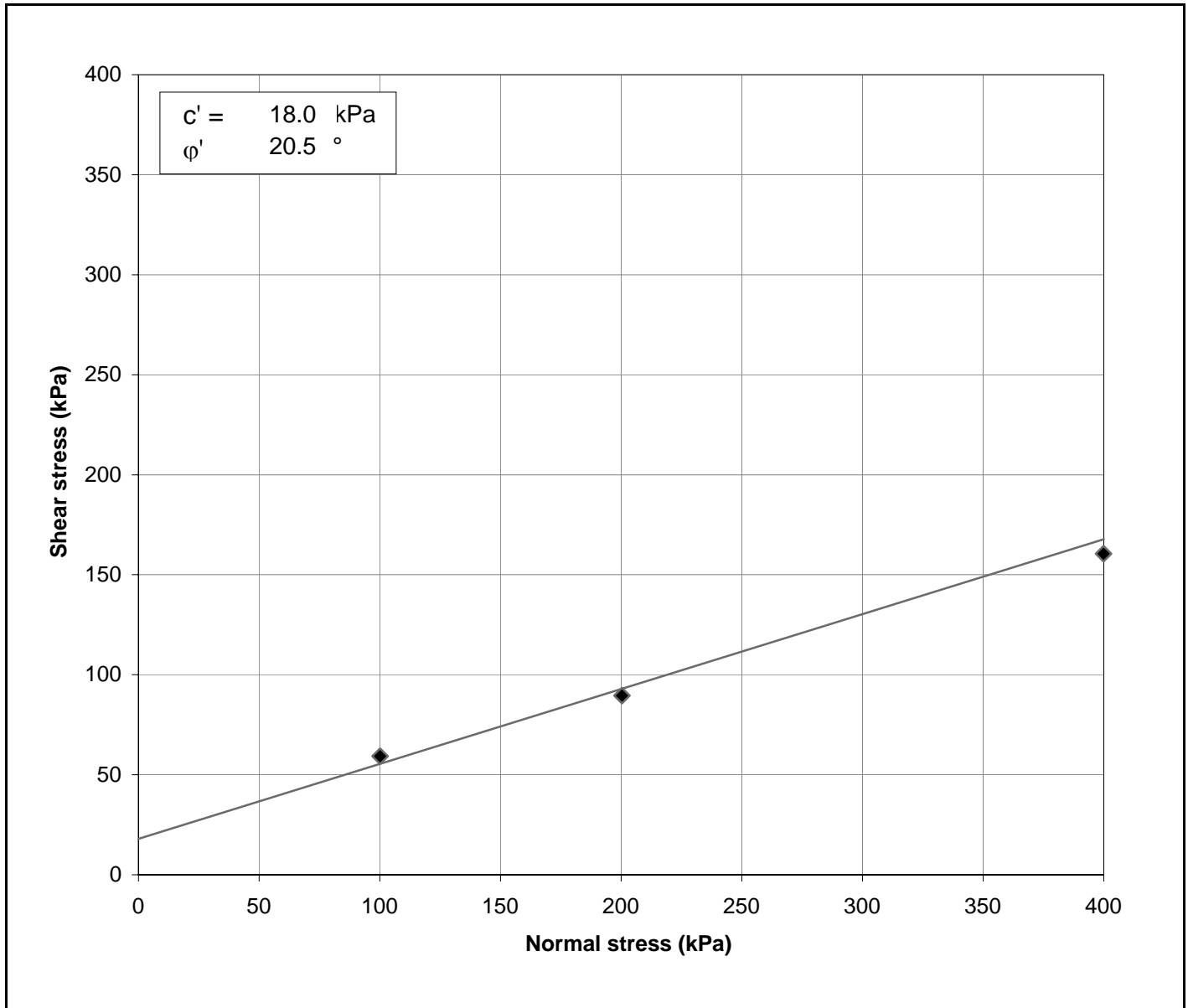
Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	14/10/2010	Date	15/10/2010	Date	No. 2538/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST REPORT - SHEARING

Project location	<i>GEOITALIA - Fresciano</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>7.10/7.50</i>
Borehole number	<i>34</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>3</i>	Specimen orientation	<i>Vertical</i>



Tested	<i>Farinelli</i>	Checked	<i>Sfalanga</i>	Approved	<i>Carmignani</i>
Date	<i>14/10/2010</i>	Date	<i>15/10/2010</i>	Date	<i>No. 2538/2010</i>



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	<i>GEOITALIA - Fresciano</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>7.10/7.50</i>
Borehole number	<i>34</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>3</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 1	Normal stress (kPa)	100
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Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	0.301	0.2	0.000
0.08	0.315	0.3	0.014
0.13	0.331	0.4	0.030
0.21	0.397	0.5	0.096
0.32	0.459	0.6	0.158
0.51	0.465	0.7	0.164
0.81	0.483	0.9	0.182
1.29	0.503	1.1	0.202
2.05	0.520	1.4	0.219
3.25	0.542	1.8	0.241
5.17	0.578	2.3	0.277
8.21	0.615	2.9	0.314
13.05	0.638	3.6	0.337
20.76	0.671	4.6	0.370
33.00	0.707	5.7	0.406
52.48	0.736	7.2	0.435
83.43	0.753	9.1	0.452
132.66	0.760	11.5	0.459
210.92	0.764	14.5	0.463
335.37	0.769	18.3	0.468
533.23	0.773	23.1	0.472
847.83	0.784	29.1	0.483
927.29	0.785	30.5	0.484

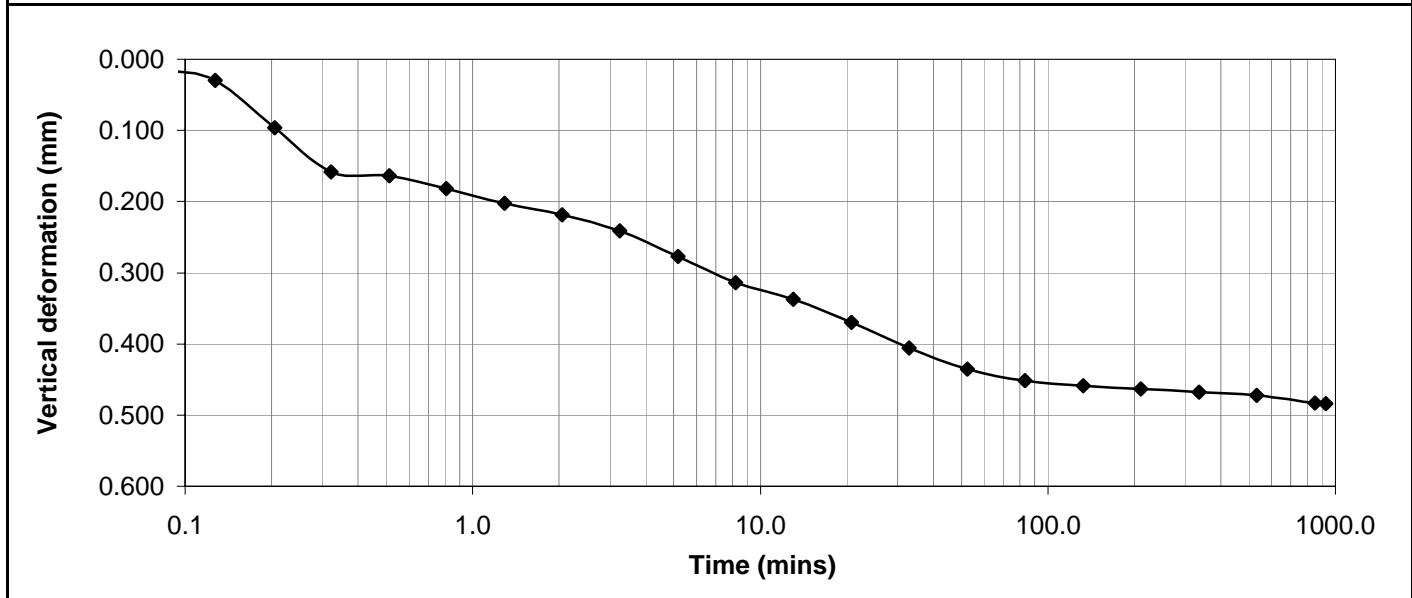
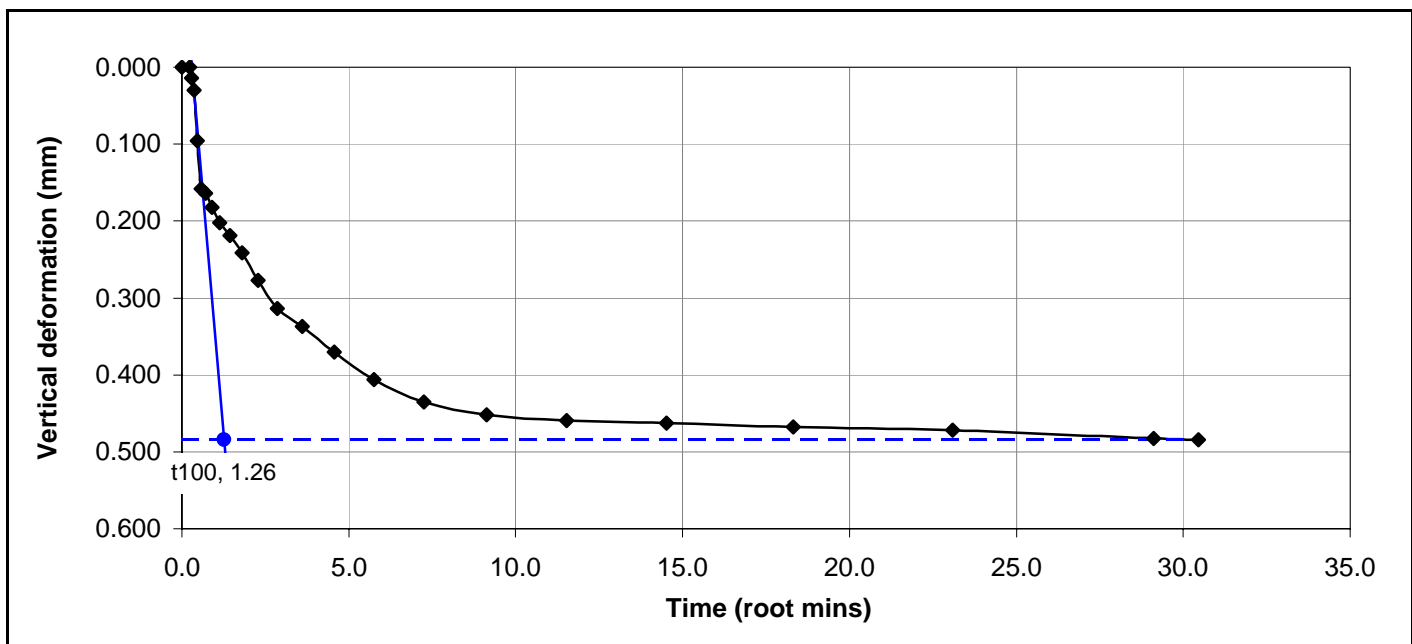


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	7.10/7.50
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	3	Specimen orientation	Vertical

SPECIMEN 1 **Normal stress (kPa)** **100**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	05/10/2010	Date	15/10/2010	Date	No. 2538/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	7.10/7.50
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	3	Specimen orientation	Vertical

SPECIMEN 1 **Normal stress (kPa) 100**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
0.02	0.001	0.01	7.3	0.000	0.00	0.0	0.0
10.00	0.010	0.06	51.0	0.009	0.05	43.7	12.1
20.00	0.034	0.13	79.6	0.033	0.12	72.3	20.1
30.00	0.051	0.21	104.4	0.050	0.20	97.1	27.0
40.00	0.081	0.29	123.7	0.080	0.28	116.4	32.3
50.00	0.095	0.38	139.9	0.094	0.37	132.6	36.8
60.00	0.110	0.47	152.8	0.109	0.46	145.5	40.4
70.00	0.121	0.55	163.8	0.120	0.54	156.5	43.5
80.00	0.131	0.64	173.4	0.130	0.63	166.1	46.1
90.00	0.138	0.72	181.0	0.137	0.71	173.7	48.2
100.00	0.158	0.81	187.5	0.157	0.80	180.2	50.1
110.00	0.176	0.91	193.2	0.175	0.90	185.9	51.6
120.00	0.178	1.00	198.4	0.177	0.99	191.1	53.1
130.00	0.189	1.10	201.9	0.188	1.09	194.6	54.1
140.00	0.191	1.19	206.8	0.190	1.18	199.5	55.4
150.00	0.193	1.28	210.5	0.192	1.27	203.2	56.4
160.00	0.193	1.38	213.3	0.192	1.37	206.0	57.2
170.00	0.195	1.47	215.3	0.194	1.46	208.0	57.8
180.00	0.209	1.57	217.1	0.208	1.56	209.8	58.3
190.00	0.212	1.67	218.8	0.211	1.66	211.5	58.8
200.00	0.213	1.77	219.9	0.212	1.76	212.6	59.1
210.00	0.214	1.87	220.4	0.213	1.86	213.1	59.2
220.00	0.214	1.96	220.7	0.213	1.95	213.4	59.3
230.00	0.214	2.06	220.4	0.213	2.05	213.1	59.2
240.00	0.225	2.16	220.6	0.224	2.15	213.3	59.3
250.00	0.226	2.26	220.1	0.225	2.25	212.8	59.1
260.00	0.227	2.35	219.7	0.226	2.34	212.4	59.0
270.00	0.227	2.46	219.2	0.226	2.45	211.9	58.9
280.00	0.227	2.55	218.5	0.226	2.54	211.2	58.7
290.00	0.227	2.66	217.6	0.226	2.65	210.3	58.4
300.00	0.228	2.76	217.1	0.227	2.75	209.8	58.3
310.00	0.229	2.85	216.4	0.228	2.84	209.1	58.1
320.00	0.229	2.96	215.9	0.228	2.95	208.6	57.9
330.00	0.230	3.05	215.3	0.229	3.04	208.0	57.8



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA - Fresciano</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>7.10/7.50</i>
Borehole number	<i>34</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>3</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 1 **Normal stress (kPa) 100**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
340.00	0.230	3.14	214.7	0.229	3.13	207.4	57.6
350.00	0.231	3.24	214.1	0.230	3.23	206.8	57.4
360.00	0.231	3.33	213.6	0.230	3.32	206.3	57.3
370.00	0.235	3.44	213.4	0.234	3.43	206.1	57.2
380.00	0.236	3.55	213.1	0.235	3.54	205.8	57.2
390.00	0.238	3.64	212.9	0.237	3.63	205.6	57.1
400.01	0.239	3.74	212.4	0.238	3.73	205.1	57.0
410.00	0.240	3.82	211.9	0.239	3.81	204.6	56.8
420.01	0.241	3.92	211.3	0.240	3.91	204.0	56.7
430.00	0.251	4.02	211.2	0.250	4.01	203.9	56.6
440.00	0.251	4.13	210.8	0.250	4.12	203.5	56.5
450.00	0.253	4.23	209.9	0.252	4.22	202.6	56.3
460.00	0.253	4.33	209.9	0.252	4.32	202.6	56.3
470.00	0.260	4.44	208.7	0.259	4.43	201.4	55.9
480.01	0.260	4.52	209.4	0.259	4.51	202.1	56.1
481.02	0.260	4.54	209.3	0.259	4.53	202.0	56.1



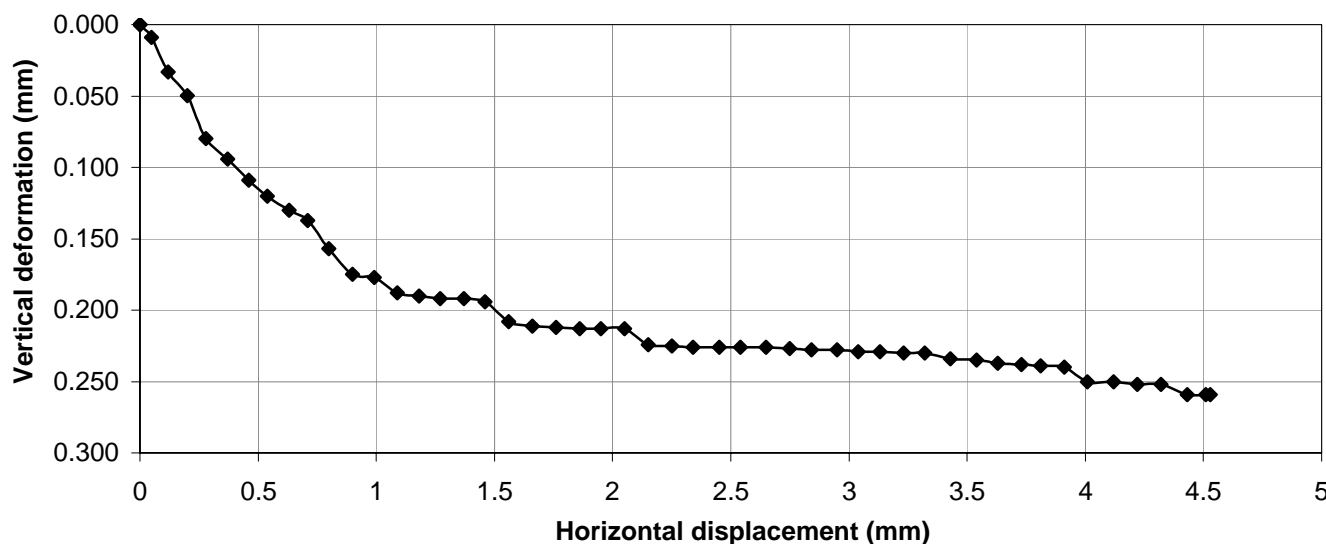
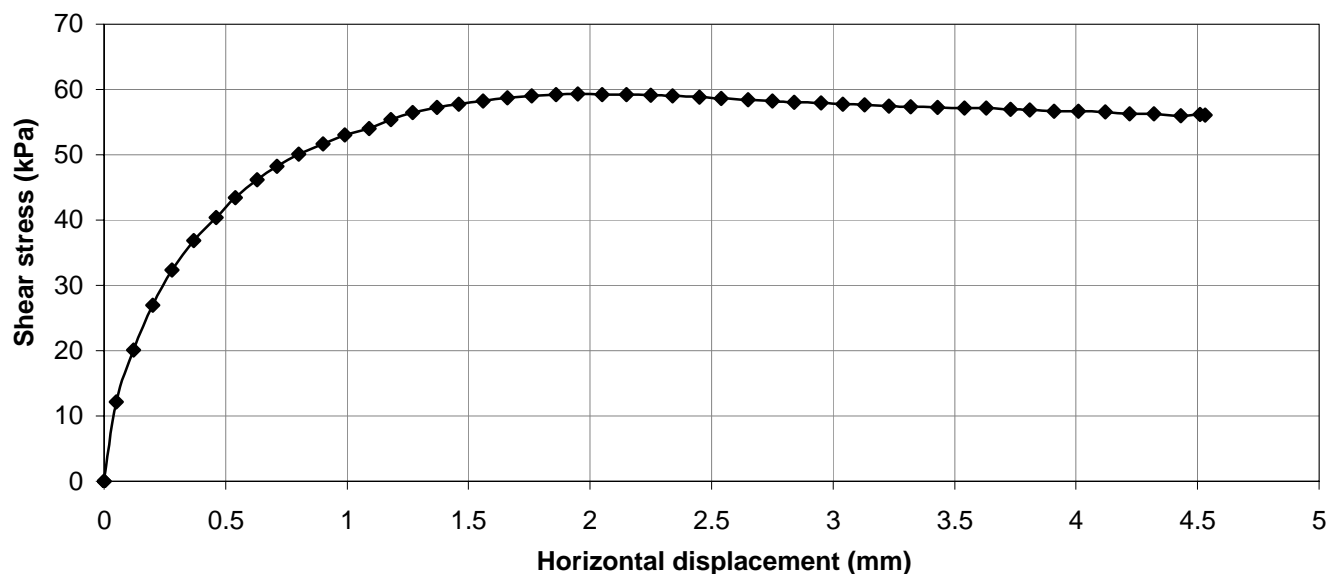
DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	7.10/7.50
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	3	Specimen orientation	Vertical

SPECIMEN 1

Normal stress (kPa) 100



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	06/10/2010	Date	15/10/2010	Date	No. 2538/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	<i>GEOITALIA - Fresciano</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>7.10/7.50</i>
Borehole number	<i>34</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>3</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 2	Normal stress (kPa)	200
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Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.05	1.342	0.2	0.000
0.08	1.467	0.3	0.125
0.13	1.780	0.4	0.438
0.20	1.827	0.5	0.485
0.32	1.854	0.6	0.512
0.51	1.880	0.7	0.538
0.81	1.907	0.9	0.565
1.29	1.930	1.1	0.588
2.04	1.967	1.4	0.625
3.25	2.003	1.8	0.661
5.17	2.049	2.3	0.707
8.21	2.083	2.9	0.741
13.05	2.127	3.6	0.785
20.76	2.184	4.6	0.842
33.00	2.232	5.7	0.890
52.47	2.267	7.2	0.925
83.43	2.291	9.1	0.949
132.66	2.313	11.5	0.971
210.92	2.319	14.5	0.977
335.36	2.318	18.3	0.976
533.23	2.320	23.1	0.978
847.83	2.320	29.1	0.978
916.60	2.323	30.3	0.981

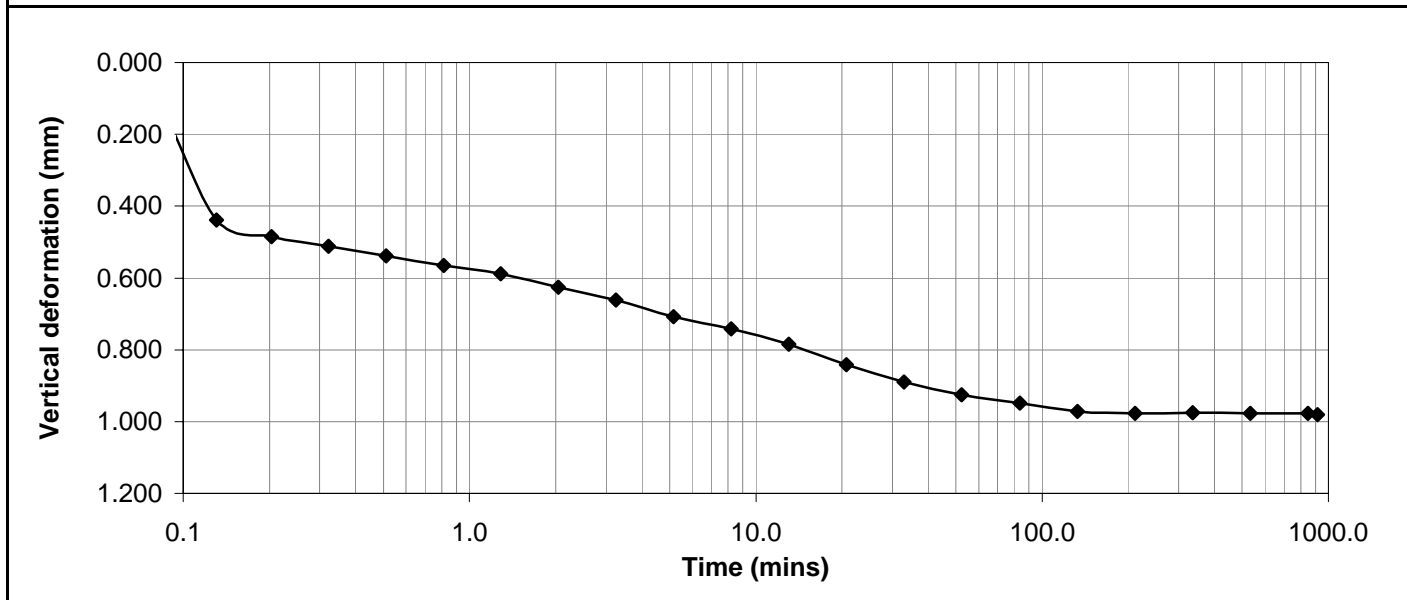
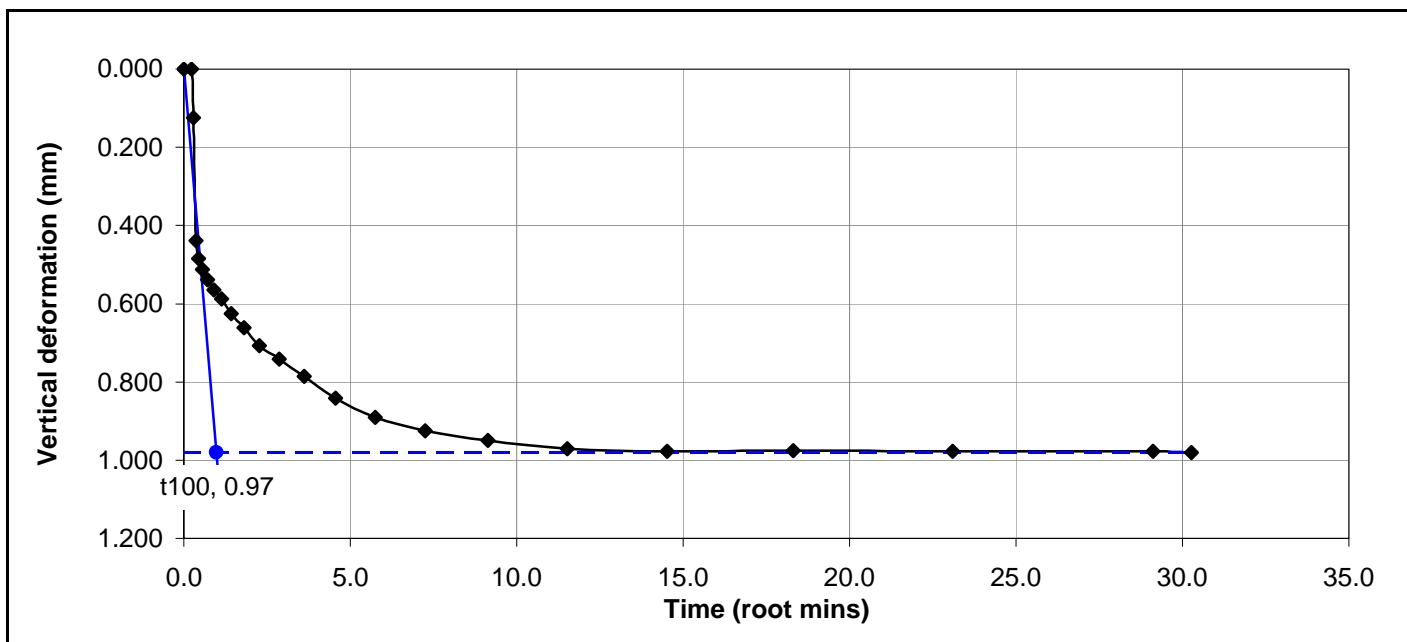


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	7.10/7.50
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	3	Specimen orientation	Vertical

SPECIMEN 2 **Normal stress (kPa) 200**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	06/10/2010	Date	15/10/2010	Date	No. 2538/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	7.10/7.50
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	3	Specimen orientation	Vertical

SPECIMEN 2 **Normal stress (kPa) 200**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
0.02	0.000	0.00	12.7	0.000	0.00	0.0	0.0
10.00	0.012	0.05	70.7	0.012	0.05	58.0	16.1
20.00	0.024	0.12	105.1	0.024	0.12	92.4	25.7
30.00	0.043	0.19	132.4	0.043	0.19	119.7	33.2
40.01	0.056	0.27	156.3	0.056	0.27	143.6	39.9
50.00	0.066	0.36	176.1	0.066	0.36	163.4	45.4
60.00	0.078	0.43	194.1	0.078	0.43	181.4	50.4
70.00	0.086	0.52	208.9	0.086	0.52	196.2	54.5
80.00	0.099	0.60	222.1	0.099	0.60	209.4	58.2
90.00	0.107	0.70	232.9	0.107	0.70	220.2	61.2
100.00	0.113	0.80	242.7	0.113	0.80	230.0	63.9
110.00	0.127	0.90	251.9	0.127	0.90	239.2	66.4
120.00	0.138	0.99	260.3	0.138	0.99	247.6	68.8
130.00	0.148	1.08	267.3	0.148	1.08	254.6	70.7
140.00	0.173	1.17	273.9	0.173	1.17	261.2	72.6
150.00	0.179	1.27	279.3	0.179	1.27	266.6	74.1
160.00	0.180	1.36	284.2	0.180	1.36	271.5	75.4
170.00	0.192	1.46	288.4	0.192	1.46	275.7	76.6
180.00	0.213	1.55	292.4	0.213	1.55	279.7	77.7
190.00	0.216	1.65	297.1	0.216	1.65	284.4	79.0
200.00	0.218	1.74	300.7	0.218	1.74	288.0	80.0
210.00	0.244	1.83	303.7	0.244	1.83	291.0	80.8
220.00	0.249	1.94	307.9	0.249	1.94	295.2	82.0
230.00	0.251	2.03	311.0	0.251	2.03	298.3	82.9
240.00	0.252	2.12	314.8	0.252	2.12	302.1	83.9
250.00	0.261	2.21	317.3	0.261	2.21	304.6	84.6
260.00	0.288	2.31	318.8	0.288	2.31	306.1	85.0
270.00	0.290	2.41	321.1	0.290	2.41	308.4	85.7
280.00	0.290	2.52	323.2	0.290	2.52	310.5	86.3
290.00	0.291	2.62	325.5	0.291	2.62	312.8	86.9
300.00	0.310	2.72	326.3	0.310	2.72	313.6	87.1
310.00	0.315	2.82	328.4	0.315	2.82	315.7	87.7
320.00	0.317	2.91	330.7	0.317	2.91	318.0	88.3
330.00	0.323	3.01	331.4	0.323	3.01	318.7	88.5



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA - Fresciano</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>7.10/7.50</i>
Borehole number	<i>34</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>3</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 2	Normal stress (kPa)	200
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Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
340.00	0.355	3.09	331.9	0.355	3.09	319.2	88.7
350.00	0.357	3.19	333.3	0.357	3.19	320.6	89.1
360.00	0.357	3.29	333.7	0.357	3.29	321.0	89.2
370.00	0.376	3.40	333.1	0.376	3.40	320.4	89.0
380.00	0.377	3.50	333.3	0.377	3.50	320.6	89.1
390.00	0.392	3.59	331.2	0.392	3.59	318.5	88.5
400.00	0.401	3.68	331.2	0.401	3.68	318.5	88.5
410.00	0.418	3.77	330.2	0.418	3.77	317.5	88.2
420.00	0.434	3.87	330.0	0.434	3.87	317.3	88.1
430.00	0.448	3.97	329.8	0.448	3.97	317.1	88.1
440.00	0.486	4.07	330.2	0.486	4.07	317.5	88.2
450.00	0.492	4.18	331.2	0.492	4.18	318.5	88.5
460.00	0.507	4.29	332.6	0.507	4.29	319.9	88.9
470.00	0.509	4.38	333.3	0.509	4.38	320.6	89.1
480.00	0.525	4.47	335.0	0.525	4.47	322.3	89.5
481.14	0.525	4.48	335.2	0.525	4.48	322.5	89.6

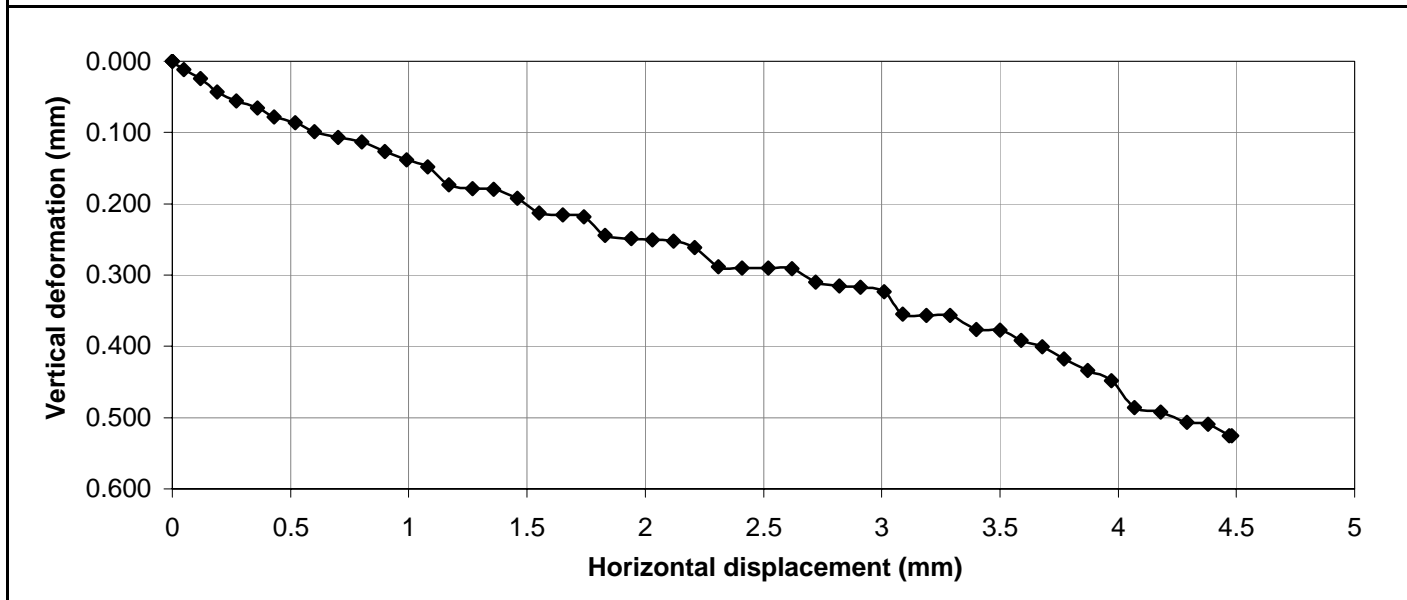
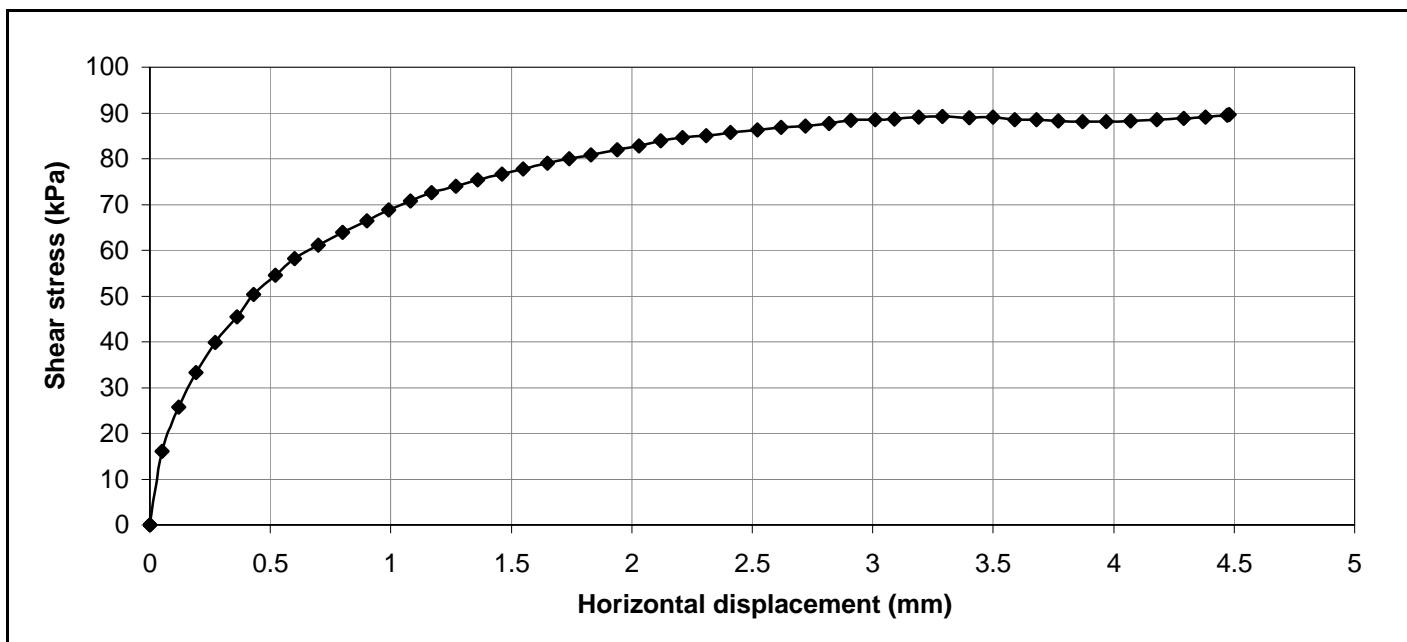


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	7.10/7.50
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	3	Specimen orientation	Vertical

SPECIMEN 2 **Normal stress (kPa) 200**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	07/10/2010	Date	15/10/2010	Date	No. 2538/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	<i>GEOITALIA - Fresciano</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>7.10/7.50</i>
Borehole number	<i>34</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>3</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 3	Normal stress (kPa)	400
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Recorded data		Calculated data	
Time (mins)	Vertical displacement (mm)	Time (root mins)	Vertical deformation of specimen (mm)
0.06	1.587	0.2	0.000
0.08	1.718	0.3	0.131
0.13	2.275	0.4	0.688
0.20	2.467	0.4	0.880
0.32	2.699	0.6	1.112
0.51	2.795	0.7	1.208
0.81	2.882	0.9	1.295
1.29	2.996	1.1	1.409
2.05	3.095	1.4	1.508
3.25	3.227	1.8	1.640
5.17	3.355	2.3	1.768
8.21	3.484	2.9	1.897
13.06	3.652	3.6	2.065
20.76	3.821	4.6	2.234
33.00	3.982	5.7	2.395
52.47	4.138	7.2	2.551
83.43	4.238	9.1	2.651
132.66	4.289	11.5	2.702
210.92	4.311	14.5	2.724
335.37	4.317	18.3	2.730
533.23	4.319	23.1	2.732
847.84	4.325	29.1	2.738
978.76	4.327	31.3	2.740

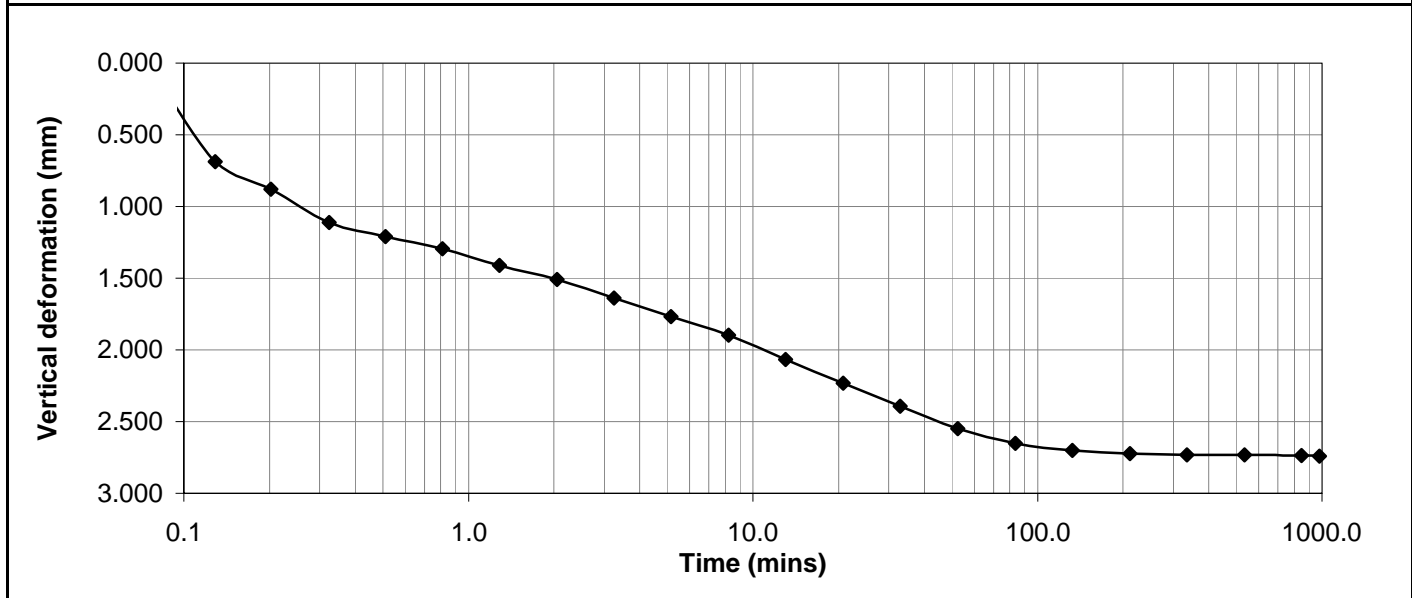
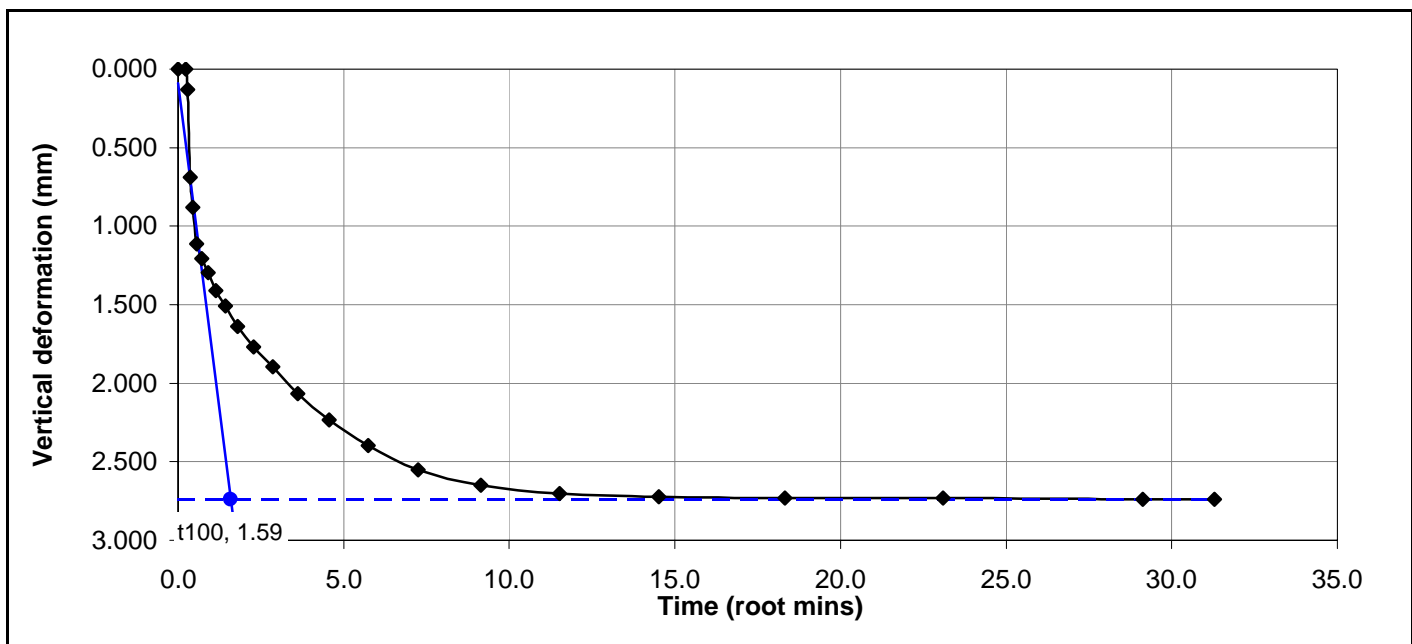


DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - CONSOLIDATION

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	7.10/7.50
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	3	Specimen orientation	Vertical

SPECIMEN 3 **Normal stress (kPa) 400**



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	12/10/2010	Date	15/10/2010	Date	No. 2538/2010



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	7.10/7.50
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	3	Specimen orientation	Vertical

SPECIMEN 3 **Normal stress (kPa) 400**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
0.02	0.000	0.00	16.9	0.000	0.00	0.0	0.0
10.00	0.014	0.03	111.0	0.014	0.03	94.1	26.1
20.00	0.032	0.09	180.0	0.032	0.09	163.1	45.3
30.00	0.042	0.15	235.2	0.042	0.15	218.3	60.6
40.00	0.061	0.21	278.8	0.061	0.21	261.9	72.7
50.00	0.077	0.28	311.5	0.077	0.28	294.6	81.8
60.00	0.092	0.34	338.2	0.092	0.34	321.3	89.3
70.00	0.113	0.42	362.9	0.113	0.42	346.0	96.1
80.00	0.138	0.51	384.9	0.138	0.51	368.0	102.2
90.00	0.150	0.59	405.3	0.150	0.59	388.4	107.9
100.00	0.165	0.67	422.2	0.165	0.67	405.3	112.6
110.00	0.185	0.76	438.5	0.185	0.76	421.6	117.1
120.00	0.196	0.84	452.6	0.196	0.84	435.7	121.0
130.00	0.209	0.94	465.9	0.209	0.94	449.0	124.7
140.00	0.219	1.04	478.4	0.219	1.04	461.5	128.2
150.00	0.233	1.13	490.3	0.233	1.13	473.4	131.5
160.00	0.247	1.21	501.6	0.247	1.21	484.7	134.6
170.00	0.259	1.30	512.4	0.259	1.30	495.5	137.6
180.00	0.273	1.39	522.7	0.273	1.39	505.8	140.5
190.00	0.283	1.48	532.4	0.283	1.48	515.5	143.2
200.00	0.302	1.57	539.6	0.302	1.57	522.7	145.2
210.00	0.311	1.67	546.6	0.311	1.67	529.7	147.1
220.00	0.318	1.76	552.8	0.318	1.76	535.9	148.9
230.00	0.325	1.84	558.1	0.325	1.84	541.2	150.3
240.00	0.335	1.95	562.9	0.335	1.95	546.0	151.7
250.00	0.345	2.03	566.6	0.345	2.03	549.7	152.7
260.00	0.354	2.13	571.5	0.354	2.13	554.6	154.1
270.00	0.359	2.23	573.7	0.359	2.23	556.8	154.7
280.00	0.369	2.31	576.2	0.369	2.31	559.3	155.4
290.00	0.380	2.40	578.4	0.380	2.40	561.5	156.0
300.00	0.386	2.51	581.2	0.386	2.51	564.3	156.8
310.00	0.391	2.59	583.7	0.391	2.59	566.8	157.4
320.00	0.396	2.70	584.4	0.396	2.70	567.5	157.6
330.00	0.400	2.80	585.4	0.400	2.80	568.5	157.9



DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	<i>GEOITALIA - Fresciano</i>		
Project reference	<i>Palazzi Giomarelli srl</i>	Sample depth	<i>7.10/7.50</i>
Borehole number	<i>34</i>	Sample type	<i>Undisturbed cohesive</i>
Sample number	<i>3</i>	Specimen orientation	<i>Vertical</i>

SPECIMEN 3 **Normal stress (kPa) 400**

Recorded data				Calculated data			
Elapsed time (mins)	Vertical disp. (mm)	Horizontal disp. (mm)	Horizontal force (N)	Vertical deformation (mm)	Horizontal disp. (mm)	Horizontal force (N)	Shear stress (kPa)
340.00	0.405	2.89	587.9	0.405	2.89	571.0	158.6
350.00	0.413	2.99	589.6	0.413	2.99	572.7	159.1
360.00	0.418	3.08	590.6	0.418	3.08	573.7	159.4
370.00	0.429	3.16	591.5	0.429	3.16	574.6	159.6
380.00	0.429	3.25	593.4	0.429	3.25	576.5	160.1
390.01	0.433	3.34	593.3	0.433	3.34	576.4	160.1
400.00	0.437	3.44	593.3	0.437	3.44	576.4	160.1
410.00	0.439	3.55	593.1	0.439	3.55	576.2	160.1
420.00	0.445	3.65	594.8	0.445	3.65	577.9	160.5
430.00	0.447	3.73	594.5	0.447	3.73	577.6	160.4
440.05	0.466	3.81	593.3	0.466	3.81	576.4	160.1
450.00	0.469	3.91	592.4	0.469	3.91	575.5	159.9
460.00	0.469	4.01	593.4	0.469	4.01	576.5	160.1
470.00	0.470	4.11	593.3	0.470	4.11	576.4	160.1
473.79	0.471	4.14	593.9	0.471	4.14	577.0	160.3



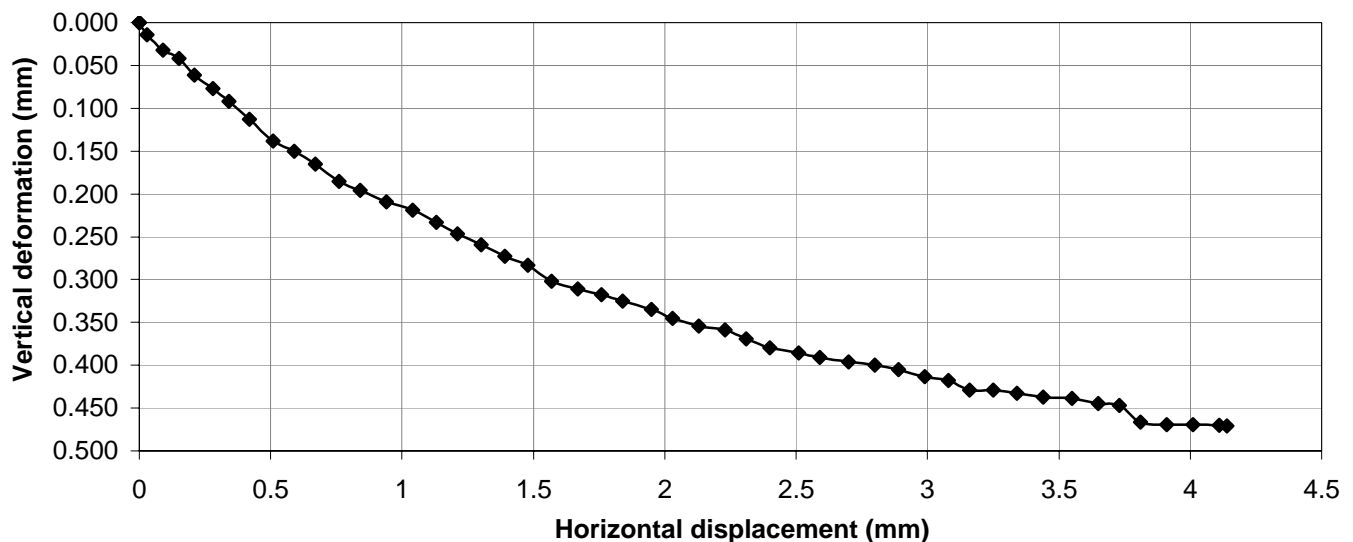
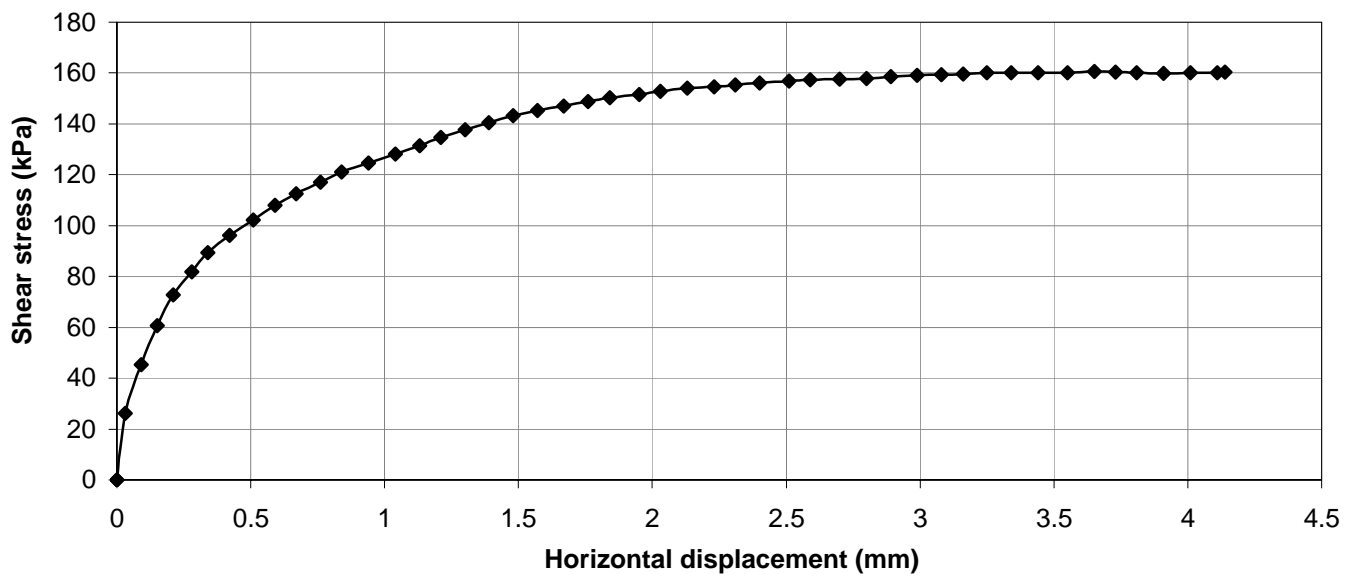
DETERMINATION OF SHEAR STRENGTH BY DIRECT SHEAR (in the small shearbox apparatus)
 Set of single stage tests - tested in accordance with BS 1377:1990:Part 7: Clause 4 (procedure 4.5.4)

TEST DATA - SHEARING

Project location	GEOITALIA - Fresciano		
Project reference	Palazzi Giomarelli srl	Sample depth	7.10/7.50
Borehole number	34	Sample type	Undisturbed cohesive
Sample number	3	Specimen orientation	Vertical

SPECIMEN 3

Normal stress (kPa) 400



Tested	Farinelli	Checked	Sfalanga	Approved	Carmignani
Date	13/10/2010	Date	15/10/2010	Date	No. 2538/2010



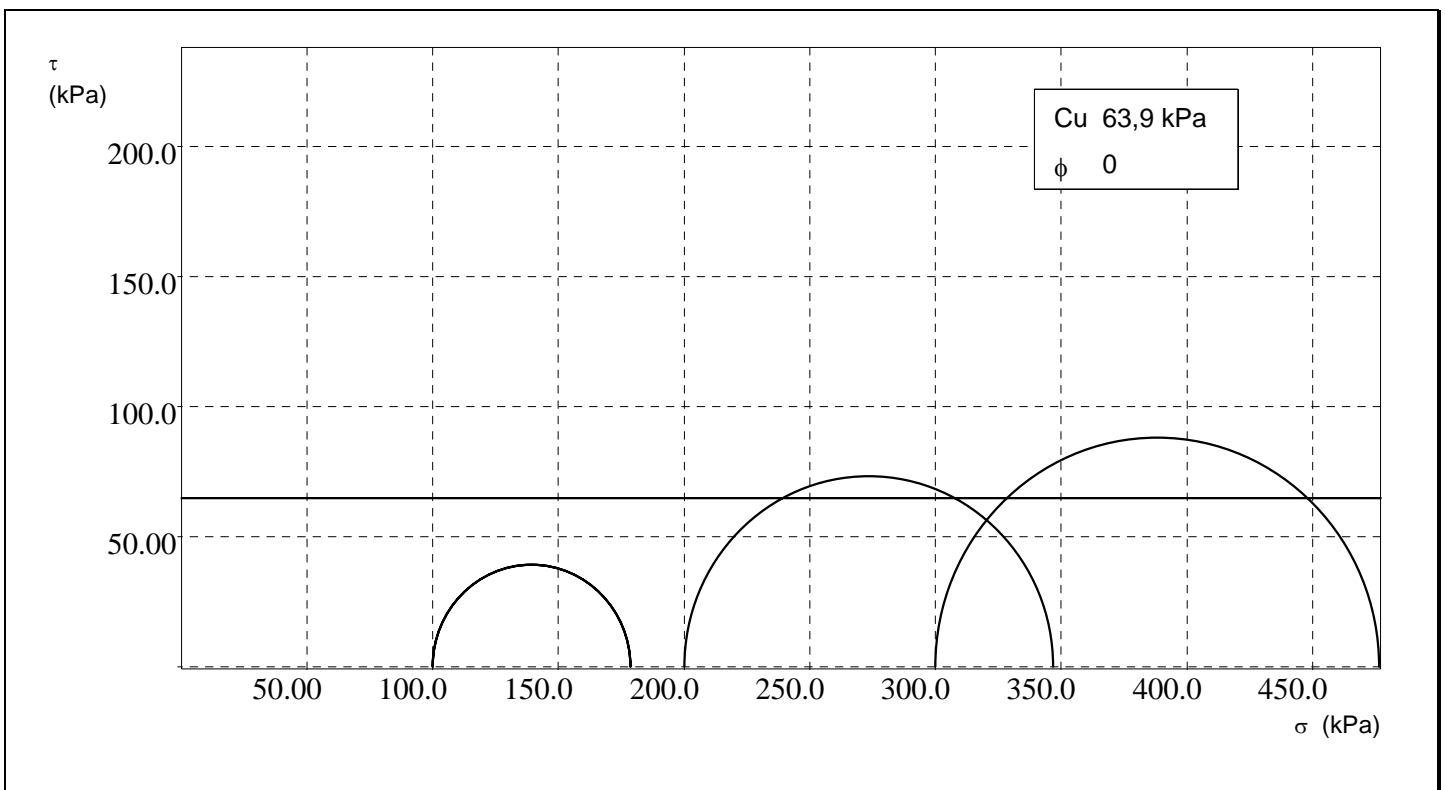
PROVA TRIASSIALE UU (ASTM D2850)

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Fresciano
Sondaggio	34
Campione	3
Profondità	7.10-7.50

Risultati di prova

Provino	Ho mm	Ao cm ²	γ_n g/cm ³	γ_d g/cm ³	Wo %	So %	σ kPa	ϵ %	$\sigma_1 - \sigma_3$ kPa
10UU902A	76,00	11,39	1,945	1,520	27,99	97,33	100,00	6,00	78,73
10UU902B	76,00	11,39	2,049	1,674	22,41	98,71	200,00	9,16	146,92
10UU902C	76,00	11,39	2,033	1,651	23,14	98,38	300,00	13,43	176,32



Il Direttore del Laboratorio

[Signature]

Lo Sperimentatore

[Signature]

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



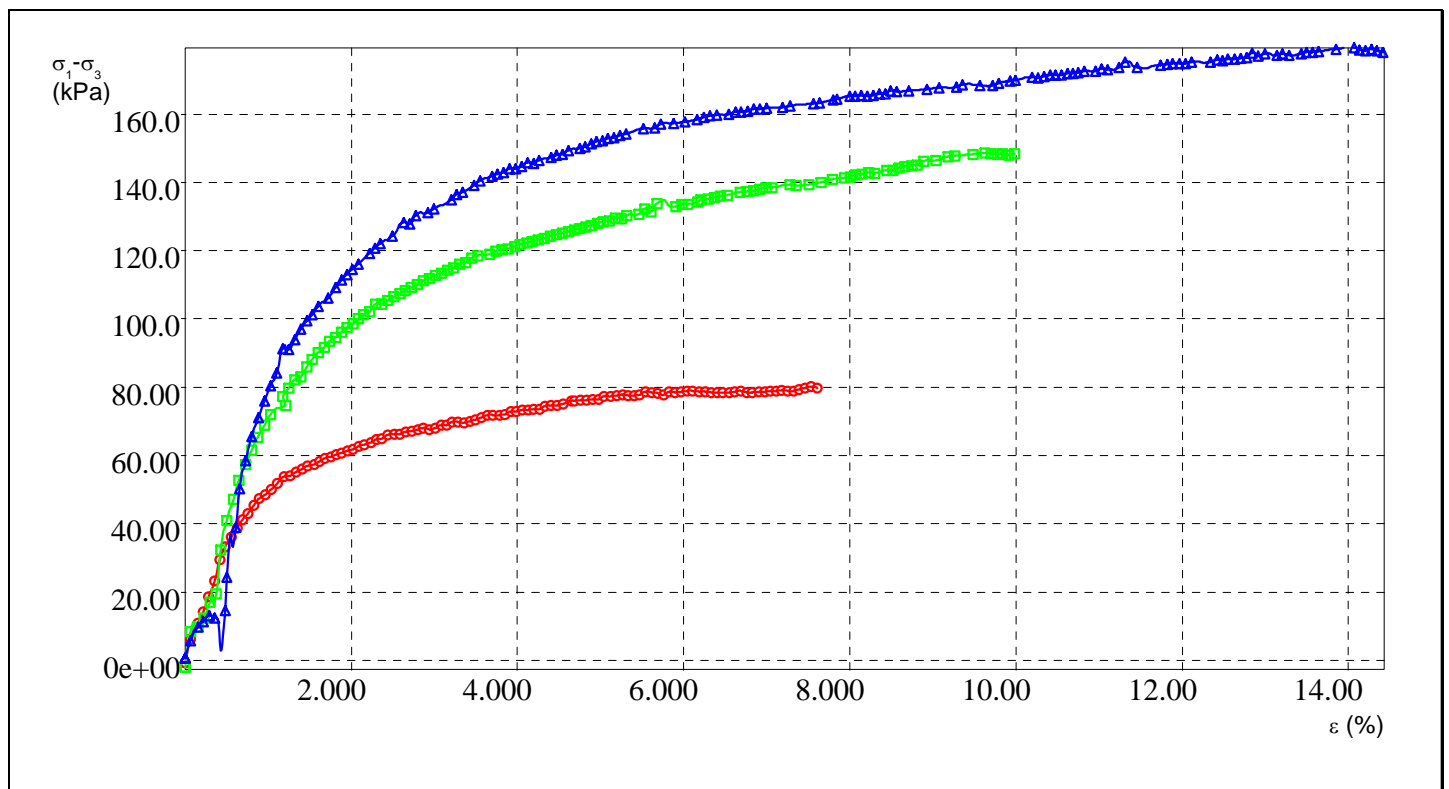
PROVA TRIASSIALE UU (ASTM D2850)

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Fresciano
Sondaggio	34
Campione	3
Profondità	7.10-7.50

Risultati di prova

Provino	Ho mm	Ao cm ²	γ_n g/cm ³	γ_d g/cm ³	Wo %	So %	σ kPa	ϵ %	$\sigma_1 - \sigma_3$ kPa
10UU902A	76,00	11,39	1,945	1,520	27,99	97,33	100,00	6,00	78,73
10UU902B	76,00	11,39	2,049	1,674	22,41	98,71	200,00	9,16	146,92
10UU902C	76,00	11,39	2,033	1,651	23,14	98,38	300,00	13,43	176,32



Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino A

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Fresciano
Sondaggio	34
Campione	3
Profondità	7.10-7.50

Dati del provino

Data del sondaggio			
Sezione provino	11,394 cm ²	Densità umida iniziale	1,945 g/cm ³ γ_n
Altezza iniziale	76,000 mm	Densità umida finale	2,028 g/cm ³ γ_f
Altezza finale	70,162 mm	Densità secca	1,520 g/cm ³ γ_d
No. Tara 1	1	Umidità iniziale	27,992 % W_o
Peso tara 1	10,000 g	Umidità finale	23,182 % W_f
Tara + peso umido iniziale	178,45 g	Saturazione iniziale	97,332 % S_o
No. Tara 2	51	Saturazione finale	97,794 % S_f
Peso tara 2	31,190 g	Indice dei vuoti iniziale	0,776 e_o
Tara + peso umido finale	193,310 g	Indice dei vuoti finale	0,640 e_f
Tara + peso secco	162,800 g	Densità secca finale	1,646 g/cm ³ γ_{df}
Peso specifico dei grani	2,700 g/cm ³		

Elaborazione dati acquisiti

Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa
0,00	11,39	0,71	1,82	11,61	60,27	3,64	11,82	71,71
0,06	11,40	6,16	1,89	11,61	60,69	3,70	11,83	71,67
0,15	11,41	10,89	1,95	11,62	61,35	3,78	11,84	71,83
0,22	11,42	14,19	2,02	11,63	61,77	3,85	11,85	72,01
0,29	11,43	18,64	2,09	11,64	62,65	3,92	11,86	72,95
0,35	11,43	23,14	2,16	11,65	63,07	3,99	11,87	72,82
0,42	11,44	29,50	2,24	11,65	63,72	4,06	11,88	73,22
0,49	11,45	33,26	2,31	11,66	64,60	4,13	11,88	73,39
0,55	11,46	36,06	2,37	11,67	64,79	4,20	11,89	73,57
0,63	11,47	38,63	2,44	11,68	65,90	4,27	11,90	73,51
0,69	11,47	41,19	2,52	11,69	66,31	4,34	11,91	74,37
0,76	11,48	43,04	2,58	11,70	66,27	4,41	11,92	74,54
0,83	11,49	45,36	2,66	11,71	66,91	4,48	11,93	74,71
0,90	11,50	47,45	2,73	11,71	67,09	4,55	11,94	75,10
0,97	11,51	48,59	2,80	11,72	67,50	4,65	11,95	75,93
1,04	11,51	49,96	2,87	11,73	67,91	4,69	11,95	75,90
1,12	11,52	51,79	2,94	11,74	67,63	4,76	11,96	76,07
1,19	11,53	53,87	3,01	11,75	68,04	4,83	11,97	76,24
1,27	11,54	54,06	3,09	11,76	68,91	4,91	11,98	76,40
1,34	11,55	55,18	3,15	11,76	68,86	4,98	11,99	76,35
1,41	11,56	56,08	3,22	11,77	69,73	5,04	12,00	77,19
1,48	11,56	56,98	3,29	11,78	69,68	5,12	12,01	77,35
1,55	11,57	57,40	3,36	11,79	69,63	5,19	12,02	77,52
1,62	11,58	58,29	3,43	11,80	70,04	5,27	12,03	77,69
1,68	11,59	59,02	3,50	11,81	70,44	5,34	12,04	77,40
1,75	11,60	59,61	3,57	11,82	71,18	5,41	12,05	77,57

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino A

Epsilon %	A cm2	s1-s3 kPa
5,47	12,05	77,74
5,54	12,06	78,58
5,62	12,07	78,29
5,69	12,08	78,23
5,76	12,09	77,73
5,83	12,10	78,56
5,90	12,11	78,28
5,97	12,12	78,67
6,05	12,13	78,83
6,11	12,14	78,77
6,19	12,15	78,71
6,26	12,15	78,65
6,34	12,16	78,36
6,40	12,17	78,31
6,47	12,18	78,47
6,55	12,19	78,41
6,62	12,20	78,57
6,69	12,21	78,73
6,76	12,22	78,45
6,83	12,23	78,39
6,90	12,24	78,55
6,98	12,25	78,71
7,04	12,26	78,87
7,11	12,27	78,81
7,18	12,28	78,97
7,25	12,29	78,91
7,33	12,29	78,85
7,39	12,30	79,23
7,46	12,31	79,61
7,54	12,32	80,21
7,61	12,33	79,77
7,68	12,34	79,71

Restituzione fotografica dopo la prova



Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

PROVA TRIASSIALE UU (ASTM D2850)

Provino A

Dati del Cliente

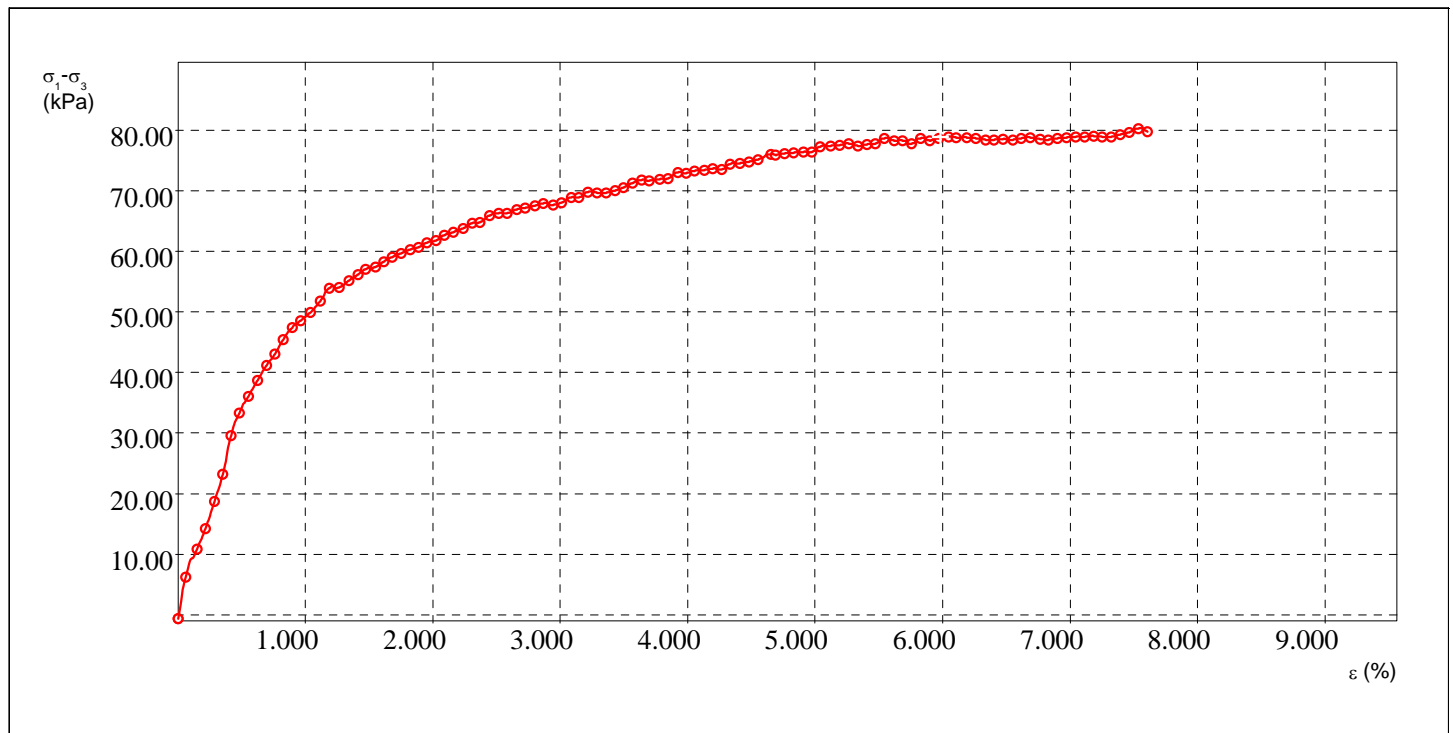
Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Fresciano
Sondaggio	34
Campione	3
Profondità	7.10-7.50

Dati acquisiti

dH mm	dN N
0,00	0,81
0,05	7,02
0,12	12,42
0,17	16,20
0,22	21,30
0,27	26,46
0,32	33,76
0,37	38,08
0,42	41,32
0,48	44,29
0,53	47,26
0,58	49,42
0,63	52,12
0,68	54,55
0,73	55,90
0,79	57,52

dH mm	dN N
0,85	59,68
0,90	62,12
0,96	62,38
1,02	63,73
1,07	64,81
1,12	65,89
1,18	66,43
1,23	67,51
1,28	68,40
1,33	69,13
1,38	69,94
1,44	70,48
1,49	71,29
1,54	71,83
1,59	72,91
1,64	73,45

dH mm	dN N
1,70	74,26
1,75	75,34
1,80	75,61
1,86	76,96
1,91	77,50
1,96	77,50
2,02	78,31
2,07	78,58
2,13	79,12
2,18	79,66
2,24	79,39
2,29	79,93
2,35	81,01
2,39	81,01
2,45	82,09
2,50	82,09



Il Direttore del Laboratorio

[Signature]

Lo Sperimentatore

[Signature]

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino A

dH mm	dN N
2,55	82,09
2,61	82,63
2,66	83,17
2,71	84,11
2,77	84,79
2,81	84,79
2,88	85,06
2,92	85,33
2,98	86,51
3,03	86,41
3,08	86,95
3,14	87,22
3,19	87,49
3,24	87,49
3,29	88,58
3,35	88,85
3,41	89,12
3,46	89,66
3,54	90,74
3,56	90,74
3,62	91,01
3,67	91,28
3,73	91,55
3,78	91,55
3,83	92,63
3,89	92,90
3,95	93,17
4,00	93,44
4,06	93,17
4,11	93,44
4,16	93,71
4,21	94,79
4,27	94,52
4,32	94,52
4,38	93,98
4,43	95,06
4,48	94,79
4,54	95,33
4,59	95,60
4,64	95,60
4,70	95,60

dH mm	dN N
4,87	95,33
4,92	95,60
4,98	95,60
5,03	95,87
5,08	96,14
5,14	95,87
5,19	95,87
5,25	96,14
5,30	96,41
5,35	96,68
5,41	96,68
5,46	96,95
5,51	96,95
5,57	96,95
5,62	97,49
5,67	98,03
5,73	98,84
5,78	98,38
5,84	98,38

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino B

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Fresciano
Sondaggio	34
Campione	3
Profondità	7.10-7.50

Dati del provino

Data del sondaggio			
Sezione provino	11,394 cm ²	Densità umida iniziale	2,049 g/cm ³ γ_n
Altezza iniziale	76,000 mm	Densità umida finale	2,173 g/cm ³ γ_f
Altezza finale	68,354 mm	Densità secca	1,674 g/cm ³ γ_d
No. Tara 1	1	Umidità iniziale	22,406 % W_o
Peso tara 1	10,000 g	Umidità finale	16,756 % W_f
Tara + peso umido iniziale	187,44 g	Saturazione iniziale	98,707 % S_o
No. Tara 2	5	Saturazione finale	100,398 % S_f
Peso tara 2	27,980 g	Indice dei vuoti iniziale	0,613 e_o
Tara + peso umido finale	197,230 g	Indice dei vuoti finale	0,451 e_f
Tara + peso secco	172,940 g	Densità secca finale	1,861 g/cm ³ γ_{df}
Peso specifico dei grani	2,700 g/cm ³		

Elaborazione dati acquisiti

Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa
0,00	11,39	2,13	1,88	11,61	96,04	3,81	11,85	120,14
0,06	11,40	8,29	1,95	11,62	97,37	3,89	11,85	120,50
0,15	11,41	9,70	2,02	11,63	98,46	3,96	11,86	121,09
0,23	11,42	12,30	2,09	11,64	100,02	4,04	11,87	121,91
0,30	11,43	17,01	2,15	11,64	101,11	4,11	11,88	122,27
0,37	11,44	19,36	2,22	11,65	102,20	4,18	11,89	122,64
0,43	11,44	32,33	2,30	11,66	104,39	4,25	11,90	123,23
0,50	11,45	41,03	2,37	11,67	104,36	4,33	11,91	123,58
0,58	11,46	47,13	2,44	11,68	105,44	4,40	11,92	124,17
0,65	11,47	52,75	2,51	11,69	106,52	4,47	11,93	124,76
0,73	11,48	57,41	2,58	11,70	107,36	4,54	11,94	125,11
0,80	11,49	61,60	2,65	11,70	108,21	4,61	11,94	125,47
0,88	11,49	65,31	2,73	11,71	109,28	4,68	11,95	126,05
0,95	11,50	68,78	2,80	11,72	110,12	4,75	11,96	126,42
1,03	11,51	72,01	2,87	11,73	111,19	4,82	11,97	127,00
1,22	11,53	74,69	2,94	11,74	111,80	4,89	11,98	127,36
1,18	11,53	77,29	3,01	11,75	112,64	4,97	11,99	127,93
1,25	11,54	79,81	3,08	11,76	113,47	5,04	12,00	128,52
1,32	11,55	82,09	3,16	11,77	114,30	5,11	12,01	128,65
1,39	11,55	83,10	3,24	11,78	114,90	5,17	12,02	129,45
1,46	11,56	85,94	3,31	11,78	115,96	5,25	12,03	129,35
1,53	11,57	88,21	3,38	11,79	116,56	5,32	12,03	130,16
1,61	11,58	90,02	3,45	11,80	117,85	5,46	12,05	130,63
1,68	11,59	91,58	3,52	11,81	118,45	5,53	12,06	132,32
1,74	11,60	93,39	3,66	11,83	118,96	5,61	12,07	131,32
1,81	11,60	94,48	3,74	11,84	119,77	5,68	12,08	133,68

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino B

Epsilon %	A cm2	s1-s3 kPa
5,90	12,11	132,92
5,98	12,12	133,48
6,05	12,13	133,59
6,17	12,14	134,10
6,21	12,15	134,93
6,29	12,16	135,03
6,37	12,17	135,59
6,44	12,18	135,93
6,52	12,19	136,25
6,68	12,21	137,13
6,76	12,22	137,23
6,85	12,23	137,55
6,92	12,24	137,88
6,99	12,25	138,43
7,06	12,26	138,33
7,28	12,29	139,32
7,36	12,30	138,99
7,51	12,32	139,20
7,65	12,34	139,86
7,79	12,36	140,74
7,94	12,38	141,39
8,01	12,39	141,50
8,07	12,39	142,27
8,15	12,40	142,37
8,22	12,42	142,91
8,30	12,43	142,57
8,45	12,45	143,43
8,52	12,46	143,53
8,59	12,46	144,07
8,66	12,47	144,60
8,74	12,49	144,91
8,81	12,50	145,02
8,89	12,51	146,19
9,04	12,53	146,39
9,19	12,55	147,44
9,26	12,56	147,74
9,48	12,59	148,25
9,63	12,61	148,65
9,70	12,62	148,32
9,77	12,63	148,26
9,84	12,64	148,36
9,91	12,65	147,88
9,98	12,66	148,40
10,06	12,67	148,06

Restituzione fotografica dopo la prova



Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

PROVA TRIASSIALE UU (ASTM D2850)

Provino B

Dati del Cliente

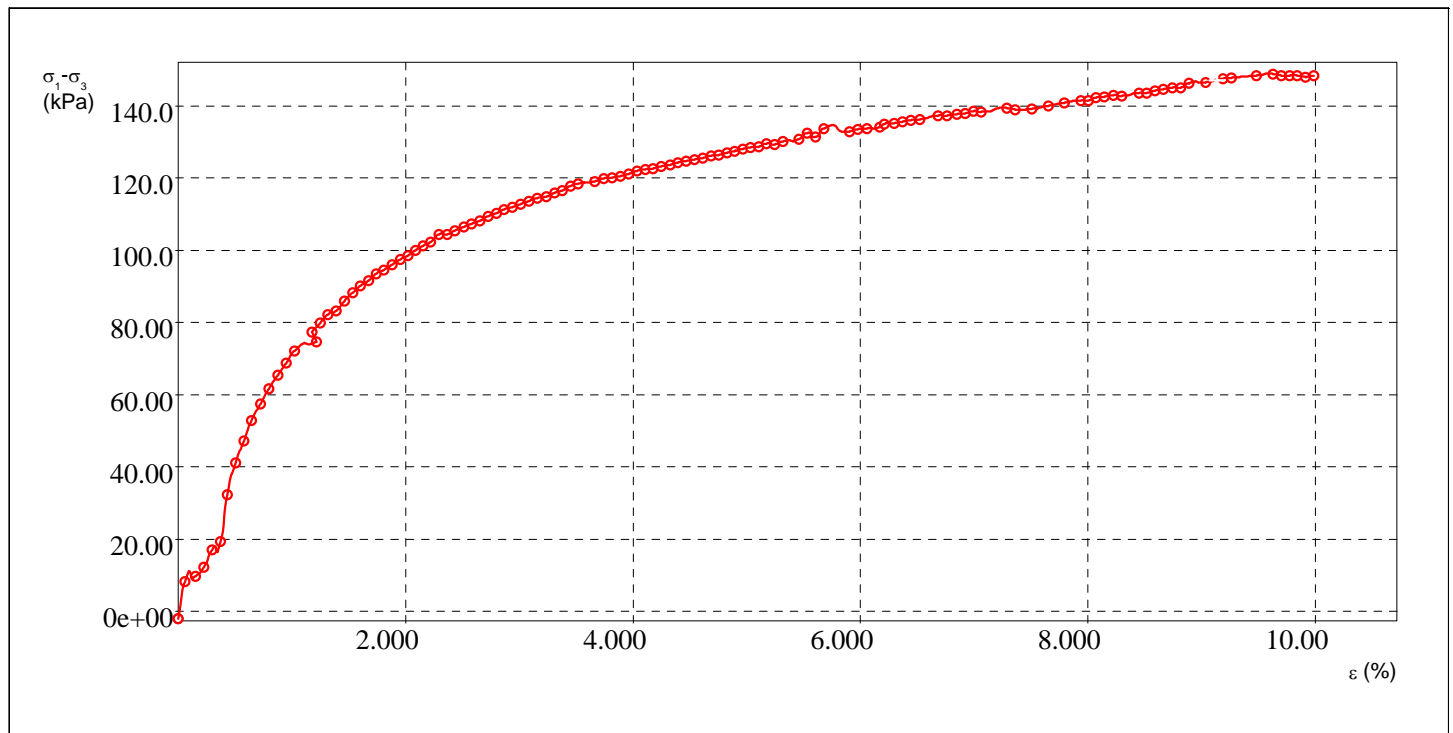
Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Fresciano
Sondaggio	34
Campione	3
Profondità	7.10-7.50

Dati acquisiti

dH mm	dN N
0,00	2,43
0,05	9,45
0,12	11,07
0,17	14,04
0,23	19,44
0,28	22,14
0,33	37,00
0,38	46,99
0,44	54,01
0,49	60,49
0,55	65,89
0,61	70,75
0,67	75,07
0,72	79,12
0,78	82,90
0,92	86,14

dH mm	dN N
0,89	89,12
0,95	92,09
1,00	94,79
1,06	96,02
1,11	99,38
1,17	102,08
1,22	104,24
1,27	106,13
1,32	108,29
1,38	109,64
1,43	111,53
1,48	113,15
1,53	114,50
1,59	116,39
1,64	117,74
1,69	119,09

dH mm	dN N
1,75	121,73
1,80	121,79
1,85	123,14
1,91	124,49
1,96	125,57
2,02	126,65
2,07	128,00
2,13	129,08
2,18	130,43
2,24	131,24
2,29	132,32
2,34	133,40
2,40	134,48
2,46	135,29
2,51	136,64
2,57	137,45



Il Direttore del Laboratorio

[Signature]

Lo Sperimentatore

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rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino B

dH mm	dN N
2,62	139,07
2,67	139,88
2,78	140,69
2,84	141,77
2,90	142,31
2,95	142,85
3,01	143,66
3,07	144,74
3,12	145,28
3,18	145,82
3,23	146,64
3,29	147,18
3,34	147,99
3,39	148,80
3,45	149,34
3,51	149,88
3,56	150,69
3,61	151,23
3,67	152,04
3,72	152,58
3,77	153,39
3,83	154,20
3,88	154,47
3,93	155,55
3,99	155,55
4,04	156,63
4,15	157,44
4,20	159,59
4,26	158,52
4,32	161,48
4,49	160,95
4,54	161,76
4,60	162,03
4,69	162,84
4,72	163,92
4,78	164,19
4,84	165,00
4,90	165,54
4,96	166,08
5,08	167,43
5,14	167,70

dH mm	dN N
5,31	169,59
5,37	169,59
5,54	171,21
5,59	170,94
5,71	171,48
5,81	172,56
5,92	173,91
6,03	174,99
6,09	175,26
6,14	176,34
6,19	176,61
6,25	177,42
6,31	177,15
6,42	178,50
6,47	178,77
6,53	179,58
6,59	180,39
6,64	180,93
6,70	181,20
6,76	182,82
6,87	183,36
6,98	184,98
7,04	185,52
7,20	186,60
7,32	187,41
7,37	187,14
7,43	187,22
7,48	187,49
7,53	187,03
7,59	187,84
7,65	187,57

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino C

Dati del Cliente

Cliente	Geotecnica Palazzi - Giomarelli		
Indirizzo			
Cantiere	Fresciano		
Sondaggio	34		
Campione	3		
Profondità	7.10-7.50		

Dati del provino

Data del sondaggio			
Sezione provino	11,394 cm ²	Densità umida iniziale	2,033 g/cm ³ γ_n
Altezza iniziale	76,000 mm	Densità umida finale	2,214 g/cm ³ γ_f
Altezza finale	64,996 mm	Densità secca	1,651 g/cm ³ γ_d
No. Tara 1	1	Umidità iniziale	23,141 % W_o
Peso tara 1	10,000 g	Umidità finale	14,644 % W_f
Tara + peso umido iniziale	186,08 g	Saturazione iniziale	98,379 % S_o
No. Tara 2	2	Saturazione finale	99,255 % S_f
Peso tara 2	28,600 g	Indice dei vuoti iniziale	0,635 e_o
Tara + peso umido finale	192,530 g	Indice dei vuoti finale	0,398 e_f
Tara + peso secco	171,590 g	Densità secca finale	1,931 g/cm ³ γ_{df}
Peso specifico dei grani	2,700 g/cm ³		

Elaborazione dati acquisiti

Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa	Epsilon %	A cm2	s1-s3 kPa
0,00	11,39	0,71	1,95	11,62	112,94	4,41	11,92	147,27
0,06	11,40	5,70	2,01	11,63	114,49	4,47	11,93	147,84
0,16	11,41	9,70	2,08	11,64	116,03	4,54	11,94	148,19
0,22	11,42	11,35	2,22	11,65	119,12	4,61	11,94	149,21
0,29	11,43	13,00	2,28	11,66	120,66	4,75	11,96	149,90
0,36	11,43	12,28	2,35	11,67	121,97	4,82	11,97	150,47
0,49	11,45	14,62	2,49	11,69	124,33	4,89	11,98	151,26
0,50	11,45	24,29	2,63	11,70	128,31	4,95	11,99	151,83
0,61	11,46	38,87	2,70	11,71	127,75	5,03	12,00	152,16
0,66	11,47	50,15	2,78	11,72	130,25	5,09	12,01	152,73
0,73	11,48	58,35	2,93	11,74	131,14	5,16	12,01	153,07
0,80	11,49	65,59	3,00	11,75	132,19	5,23	12,02	153,63
0,88	11,50	71,18	3,20	11,77	134,90	5,30	12,03	154,19
0,96	11,50	76,06	3,27	11,78	136,41	5,51	12,06	155,64
1,03	11,51	80,45	3,34	11,79	137,00	5,65	12,08	155,86
1,10	11,52	84,15	3,48	11,80	139,09	5,73	12,09	157,07
1,18	11,53	91,23	3,55	11,81	140,36	5,88	12,11	157,27
1,25	11,54	91,04	3,69	11,83	141,70	6,02	12,12	157,70
1,32	11,55	93,78	3,76	11,84	142,33	6,16	12,14	158,35
1,39	11,55	96,99	3,83	11,85	142,91	6,24	12,15	159,10
1,47	11,56	99,48	3,91	11,86	143,94	6,32	12,16	159,42
1,53	11,57	101,28	3,98	11,87	144,06	6,39	12,17	159,73
1,60	11,58	103,54	4,05	11,88	144,63	6,54	12,19	159,93
1,72	11,59	105,99	4,12	11,88	145,66	6,62	12,20	160,45
1,81	11,60	109,15	4,19	11,89	145,55	6,69	12,21	160,55
1,88	11,61	111,39	4,26	11,90	146,35	6,77	12,22	160,86

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

Provino C

Epsilon %	A cm2	s1-s3 kPa
6,84	12,23	161,40
6,92	12,24	161,48
7,00	12,25	161,57
7,19	12,28	161,90
7,28	12,29	162,39
7,56	12,33	163,00
7,63	12,34	163,31
7,80	12,36	164,11
7,85	12,36	164,24
8,00	12,38	165,29
8,07	12,39	165,16
8,14	12,40	165,46
8,21	12,41	165,13
8,28	12,42	165,43
8,35	12,43	165,95
8,43	12,44	165,81
8,49	12,45	166,78
8,57	12,46	166,64
8,71	12,48	166,81
8,93	12,51	167,28
9,07	12,53	167,67
9,29	12,56	167,91
9,36	12,57	168,43
9,57	12,60	168,25
9,72	12,62	168,40
9,79	12,63	168,91
9,93	12,65	169,72
9,99	12,66	169,93
10,20	12,69	170,70
10,27	12,70	170,56
10,34	12,71	171,06
10,41	12,72	171,36
10,48	12,73	171,44
10,54	12,74	171,52
10,62	12,75	171,80
10,68	12,76	171,89
10,75	12,77	171,97
10,82	12,78	172,47
10,96	12,80	172,62
11,03	12,81	173,11
11,10	12,82	172,98
11,24	12,84	173,56
11,31	12,85	175,22
11,46	12,87	173,55

Epsilon %	A cm2	s1-s3 kPa
11,82	12,92	174,52
11,89	12,93	174,79
11,97	12,94	174,85
12,04	12,95	174,70
12,12	12,96	175,17
12,34	13,00	175,15
12,42	13,01	175,92
12,48	13,02	175,69
12,55	13,03	175,96
12,63	13,04	176,01
12,71	13,05	176,27
12,77	13,06	176,55
12,84	13,07	177,93
12,92	13,08	176,88
12,99	13,10	177,63
13,14	13,12	177,26
13,21	13,13	177,52
13,28	13,14	177,16
13,43	13,16	177,69
13,50	13,17	177,96
13,57	13,18	178,01
13,64	13,19	178,27
13,85	13,23	178,85
14,07	13,26	179,43
14,13	13,27	178,74
14,20	13,28	178,60
14,28	13,29	179,06
14,34	13,30	178,58
14,41	13,31	178,09
14,48	13,32	178,14

Restituzione fotografica dopo la prova



Il Direttore del Laboratorio
[Signature]

Lo Sperimentatore
[Signature]

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

PROVA TRIASSIALE UU (ASTM D2850)

Provino C

Dati del Cliente

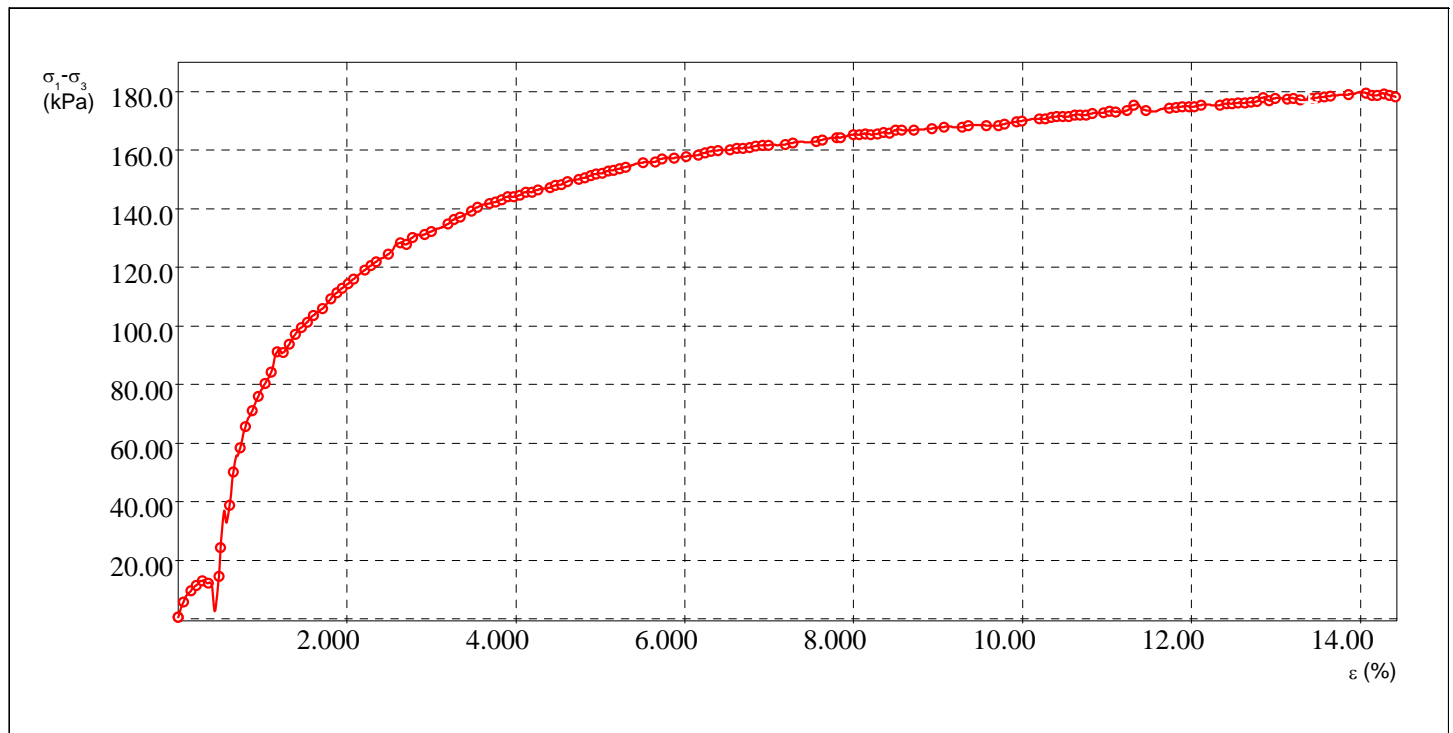
Cliente	Geotecnica Palazzi - Giomarelli
Indirizzo	
Cantiere	Fresciano
Sondaggio	34
Campione	3
Profondità	7.10-7.50

Dati acquisiti

dH mm	dN N
0,00	0,81
0,05	6,50
0,12	11,07
0,17	12,96
0,22	14,85
0,27	14,04
0,37	16,74
0,38	27,81
0,46	44,56
0,50	57,52
0,56	66,97
0,61	75,34
0,67	81,82
0,73	87,49
0,78	92,63
0,84	96,95

dH mm	dN N
0,89	105,18
0,95	105,05
1,00	108,29
1,06	112,07
1,11	115,04
1,16	117,20
1,22	119,90
1,30	122,87
1,37	126,65
1,43	129,35
1,48	131,24
1,53	133,13
1,58	135,02
1,69	138,80
1,74	140,69
1,79	142,31

dH mm	dN N
1,89	145,28
2,00	150,16
2,06	149,61
2,11	152,65
2,22	153,93
2,28	155,28
2,43	158,79
2,49	160,68
2,54	161,49
2,64	164,19
2,70	165,81
2,81	167,65
2,86	168,51
2,91	169,32
2,97	170,67
3,02	170,94



Il Direttore del Laboratorio

[Signature]

Lo Sperimentatore

[Signature]

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.



PROVA TRIASSIALE UU (ASTM D2850)

dH mm	dN N
3,08	171,75
3,13	173,10
3,19	173,10
3,24	174,18
3,35	175,53
3,40	176,34
3,45	176,88
3,51	178,23
3,61	179,31
3,66	180,12
3,71	181,20
3,76	182,01
3,82	182,55
3,87	183,36
3,92	183,90
3,98	184,71
4,03	185,52
4,19	187,68
4,30	188,22
4,35	189,84
4,47	190,38
4,57	191,19
4,69	192,27
4,74	193,35
4,80	193,89
4,86	194,43
4,97	194,97
5,03	195,78
5,09	196,05
5,15	196,59
5,20	197,40
5,26	197,67
5,32	197,94
5,46	198,75
5,53	199,56
5,75	200,91
5,80	201,45
5,93	202,80
5,96	203,07
6,08	204,69
6,13	204,69

dH mm	dN N
6,29	205,51
6,35	206,32
6,41	206,32
6,48	207,67
6,51	207,67
6,62	208,21
6,79	209,29
6,89	210,10
7,06	210,91
7,11	211,72
7,27	211,99
7,38	212,53
7,44	213,34
7,54	214,69
7,59	215,12
7,75	216,58
7,80	216,58
7,86	217,39
7,91	217,93
7,96	218,20
8,01	218,47
8,07	219,01
8,12	219,28
8,17	219,55
8,22	220,36
8,33	220,90
8,39	221,71
8,44	221,71
8,54	222,79
8,60	225,11
8,71	223,33
8,92	224,95
8,98	225,49
9,03	226,03
9,09	226,30
9,15	226,30

Provino C

dH mm	dN N
9,21	227,11
9,37	227,65
9,44	228,86
9,49	228,73
9,54	229,27
9,60	229,54
9,66	230,08
9,71	230,62
9,76	232,60
9,82	231,43
9,87	232,60
9,98	232,51
10,04	233,05
10,10	232,78
10,20	233,86
10,26	234,40
10,31	234,67
10,37	235,21
10,53	236,56
10,69	237,91
10,74	237,18
10,79	237,18
10,85	237,99
10,90	237,53
10,95	237,07
11,00	237,34

Il Direttore del Laboratorio

Lo Sperimentatore

rev.	data	eseguito da	elaborato da
01	09/02/06	Farinelli A.	Sfalanga A.

PROVA EDOMETRICA (ASTM D2435)

Dati del Cliente

Cliente Geotecnica Palazzi-Giomarelli
 Indirizzo
 Cantiere GEOITALIA - Fresciano (FI)
 Sondaggio 34
 Campione 3
 Profondità 7.10-7.50


Dati del provino

Data del sondaggio			
Sezione	20.000 cm ²	Densità umida iniziale	1.960 g/cm ³ γ_n
Altezza iniziale	20.000 mm	Densità umida finale	2.047 g/cm ³ γ_f
Altezza finale	18.500 mm	Densità secca iniziale	1.535 g/cm ³ γ_d
No. Tara 1	6	Umidità iniziale	27.662 % W_0
Peso tara 1	59.830 g	Umidità finale	23.331 % W_f
Tara + peso umido iniz.	138.24 g	Saturazione iniziale	98.482 % S_0
No. Tara 2	4	Saturazione finale	100.548 % S_f
Peso tara 2	27.670 g	Indice dei vuoti iniziale	0.758 e_0
Tara + peso umido fin.	103.420 g	Indice dei vuoti finale	0.627 e_f
Tara + peso secco finale	89.090 g	Densità secca finale	1.660 g/cm ³ γ_{df}
Peso specifico dei grani	2.700 g/cm ³		

Note : materiale rigonfiante. Isp stimato circa 20 kPa. Modulo a 25 kPa da non considerare.

Gradino	P' kPa	ε %	e	M MPa	Cv cm ² /s	K m/s	Metodo	C alfa %
1	12.5	0.336	0.764					0.000
2	25.0	0.052	0.757	3.22				0.000
3	50.0	0.516	0.749	5.39	3.120e-004	5.687e-011	Casagrande	0.025
4	100.0	1.917	0.725	3.57	2.480e-004	6.819e-011	Casagrande	0.088
5	200.0	4.120	0.686	4.54	2.060e-004	4.461e-011	Casagrande	0.138
6	400.0	7.296	0.630	6.30	1.630e-004	2.535e-011	Casagrande	0.149
7	800.0	11.321	0.559	9.94	1.340e-004	1.324e-011	Casagrande	0.206
8	1600.0	15.842	0.480	17.69				0.000
9	800.0	15.298	0.489					
10	400.0	14.179	0.509					
11	200.0	12.809	0.533					
12	100.0	11.232	0.561					
13	50.0	10.037	0.582					
14	25.0	8.510	0.609					
15	12.5	7.746	0.622					

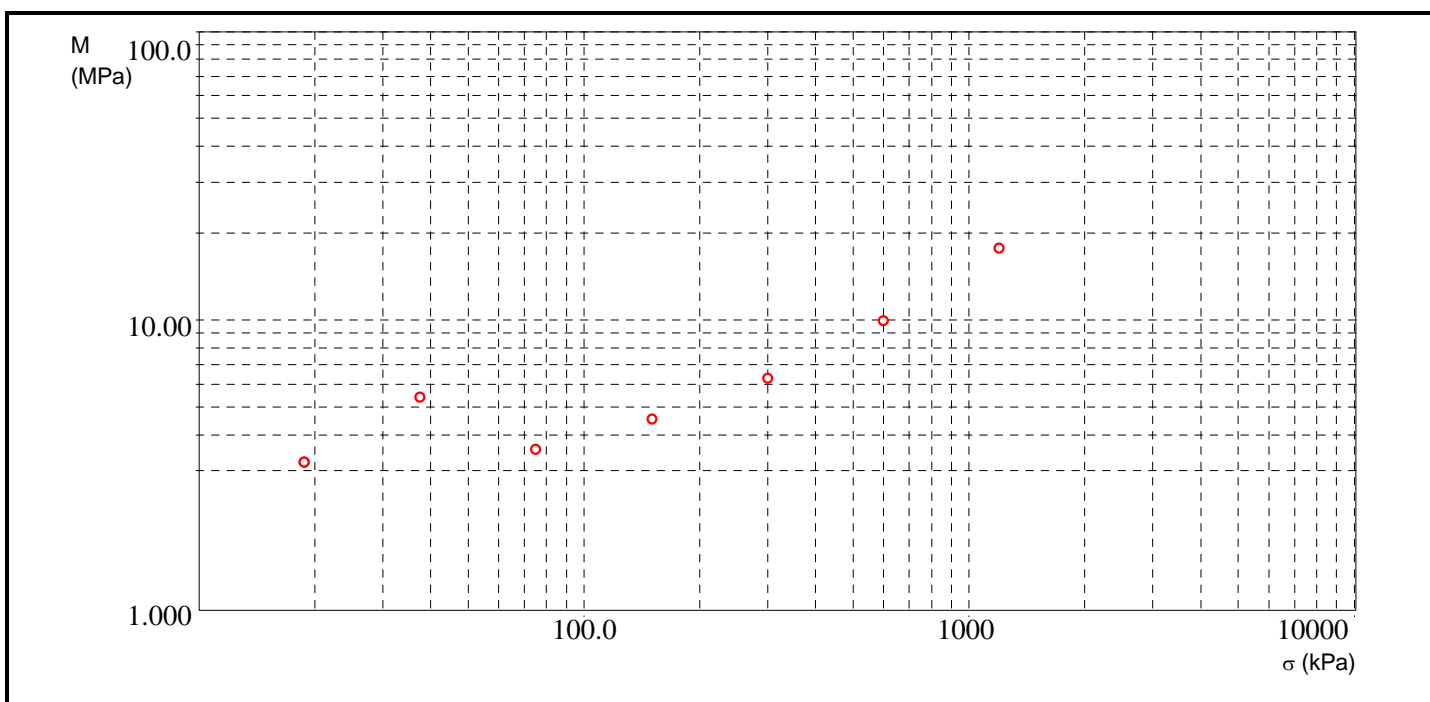
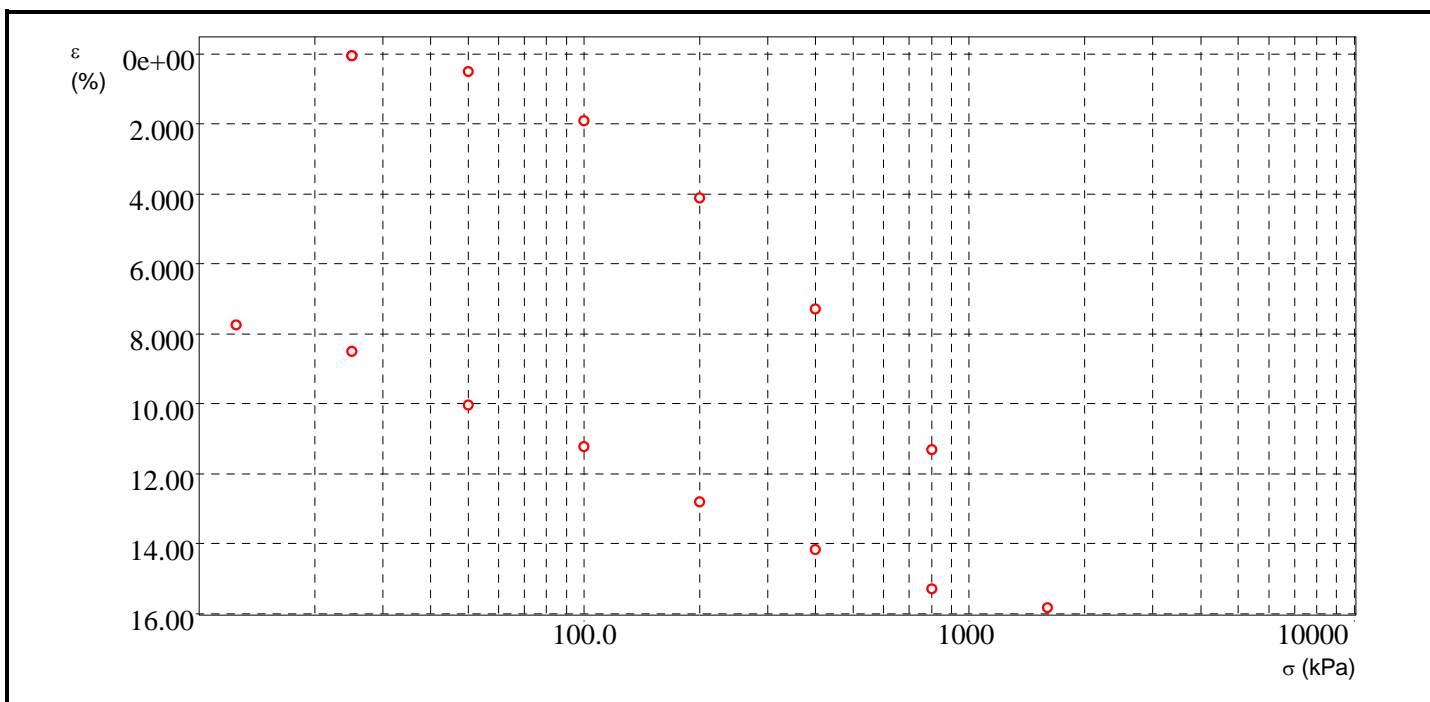
Il Direttore del Laboratorio


Lo Sperimentatore


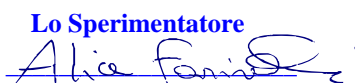
PROVA EDOMETRICA (ASTM D2435)

Dati del Cliente

Cliente	Geotecnica Palazzi-Giomarelli
Indirizzo	
Cantiere	GEOITALIA - Fresciano (FI)
Sondaggio	34
Campione	3
Profondità	7.10-7.50



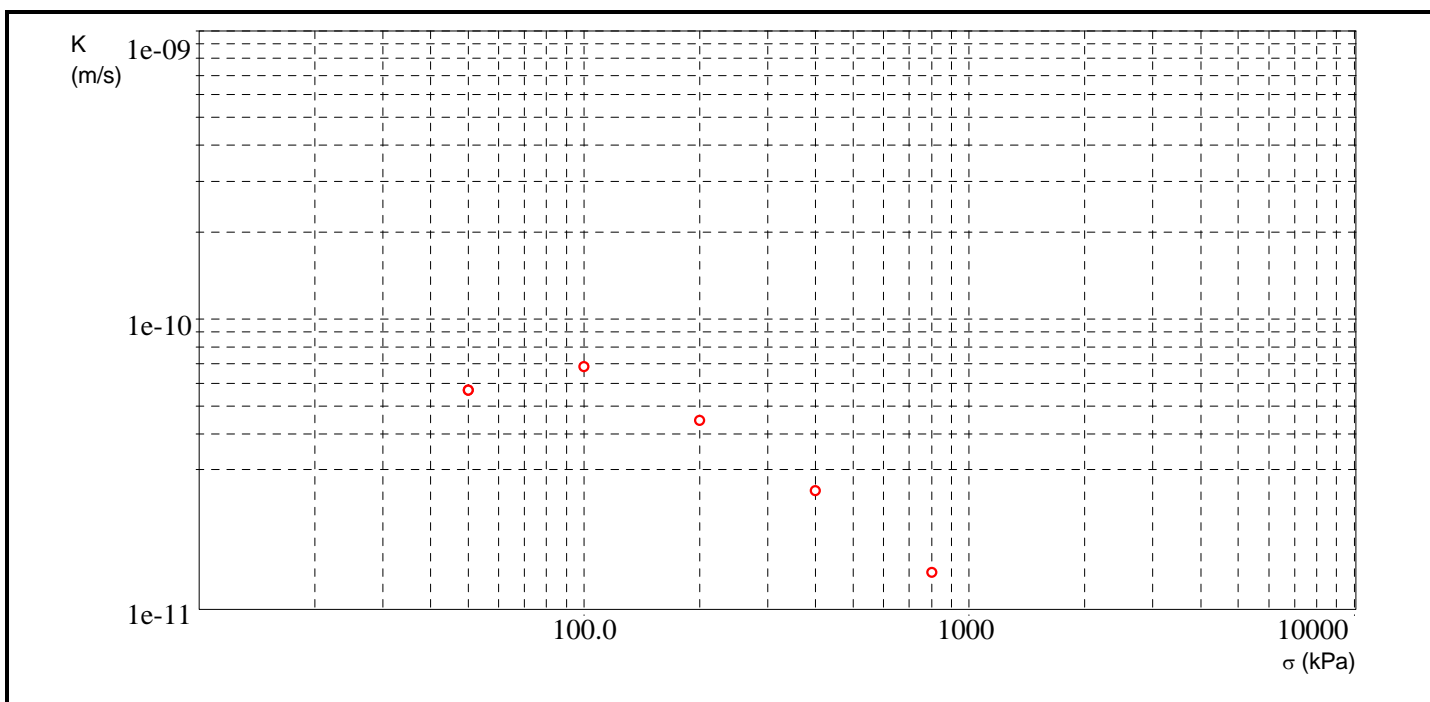
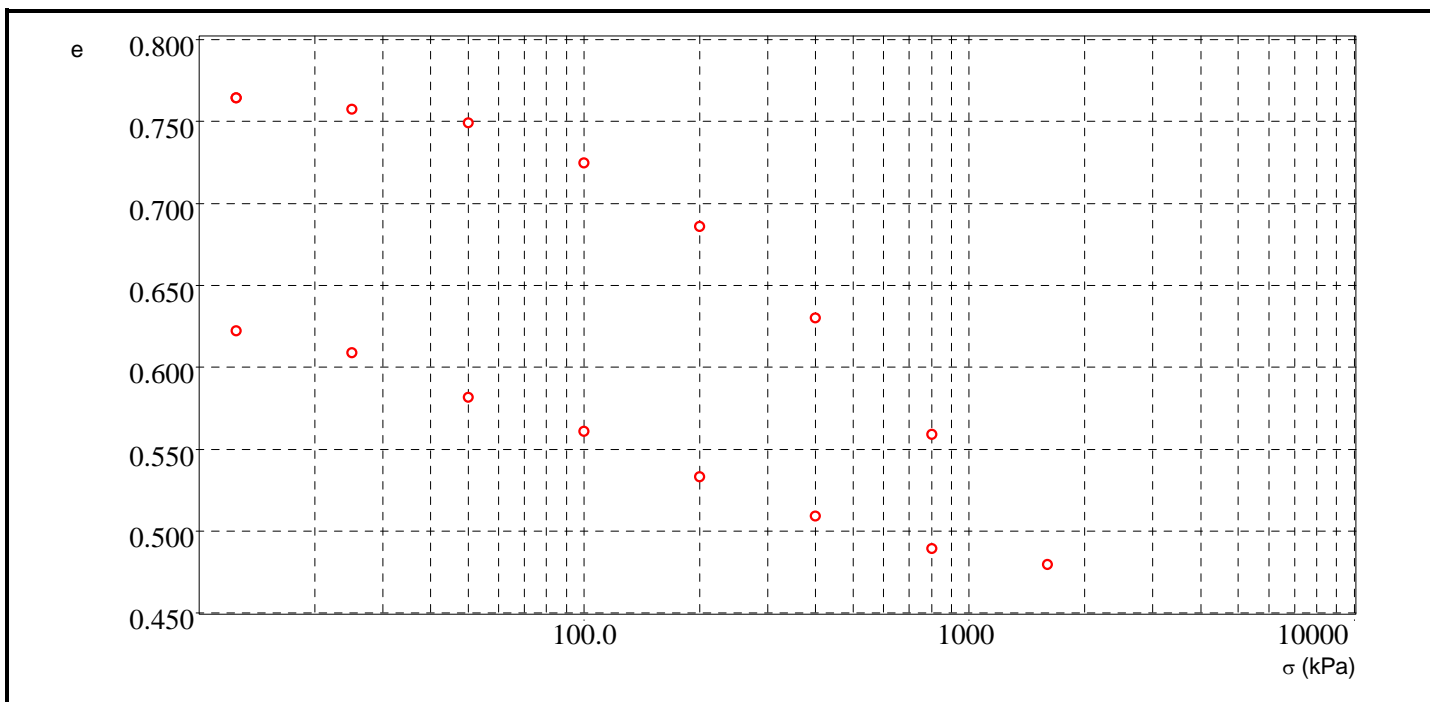
Il Direttore del Laboratorio


Lo Sperimentatore



PROVA EDOMETRICA (ASTM D2435)

Dati del Cliente

Cliente	Geotecnica Palazzi-Giomarelli
Indirizzo	
Cantiere	GEOITALIA - Fresciano (FI)
Sondaggio	34
Campione	3
Profondità	7.10-7.50



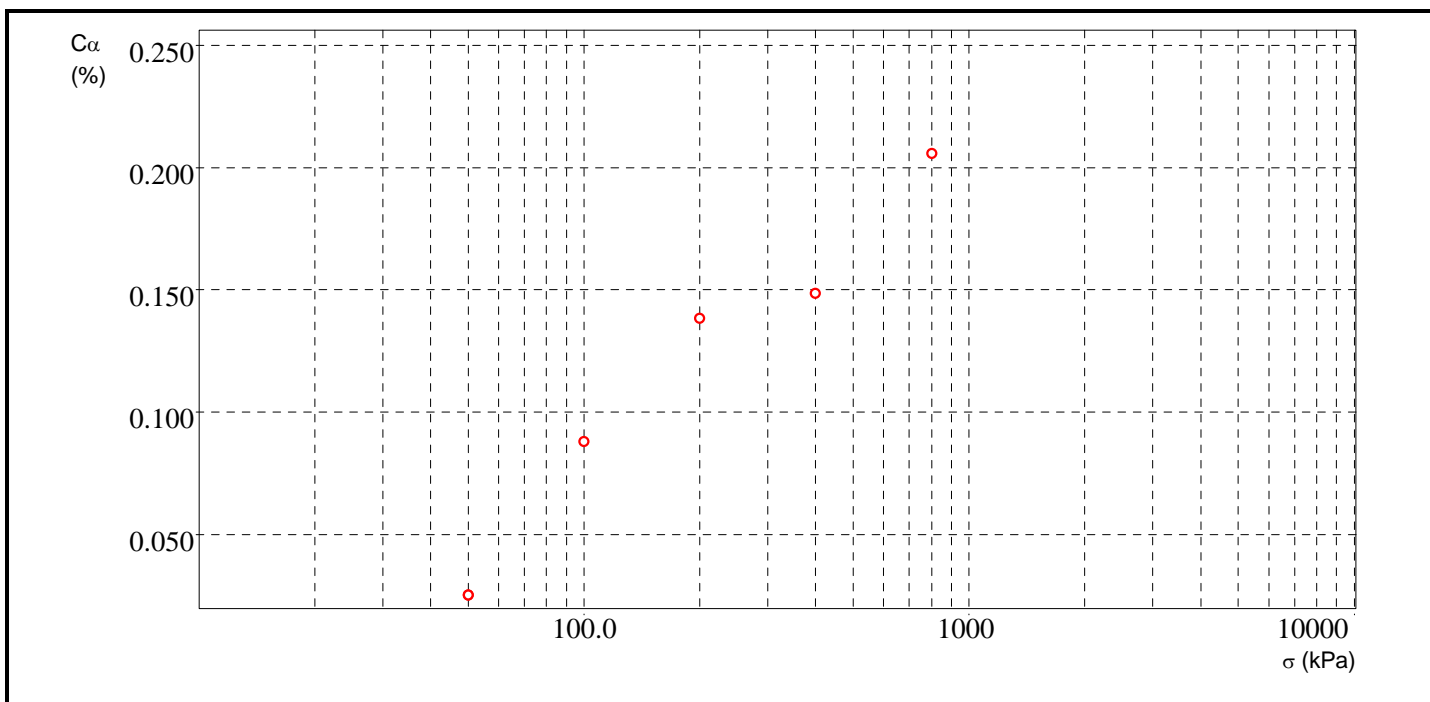
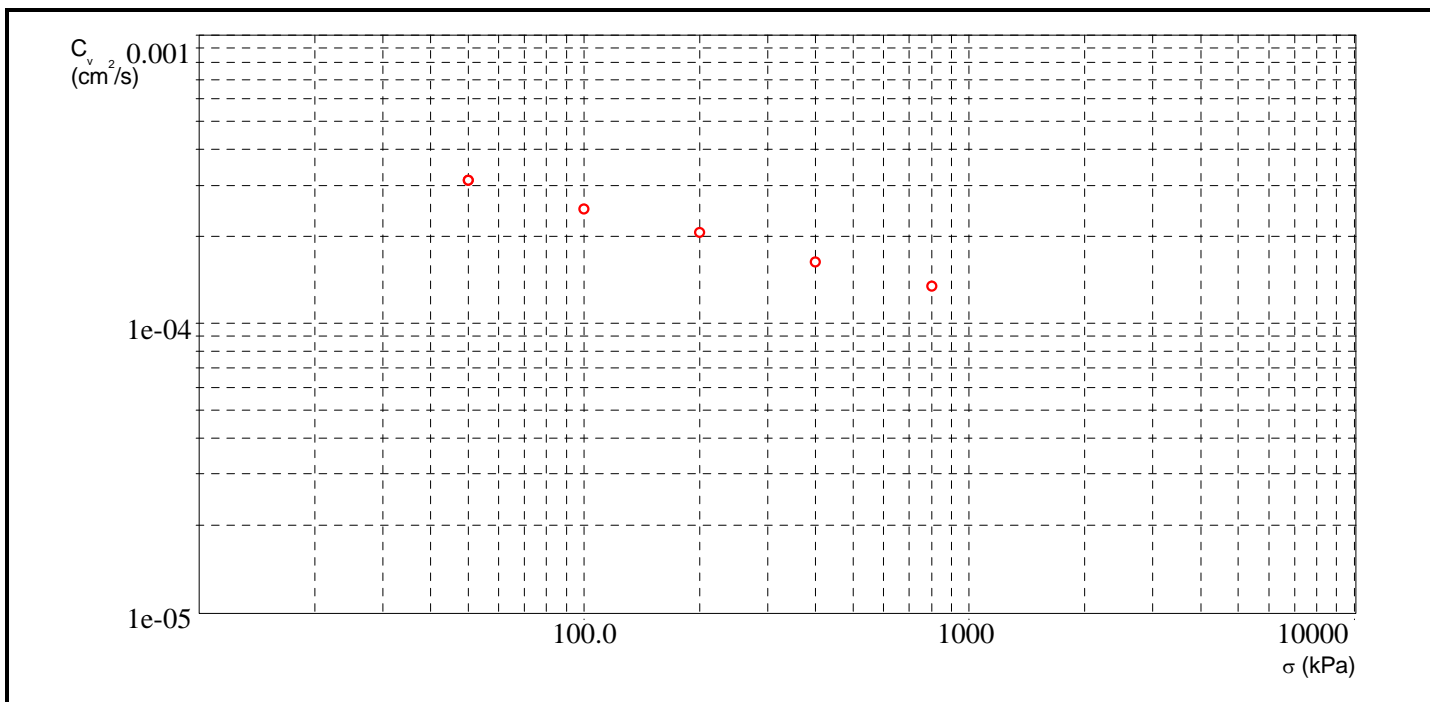
Il Direttore del Laboratorio


Lo Sperimentatore


PROVA EDOMETRICA (ASTM D2435)

Dati del Cliente

Cliente	Geotecnica Palazzi-Giomarelli
Indirizzo	
Cantiere	GEOITALIA - Fresciano (FI)
Sondaggio	34
Campione	3
Profondità	7.10-7.50



Il Direttore del Laboratorio


Lo Sperimentatore


PROVA EDOMETRICA (ASTM D2435)

Cliente Geotecnica Palazzi-Giomarelli
 Cantiere GEOITALIA - Fresciano (FI)
 Sondaggio 34
 Campione 3
 Profondità 7.10-7.50

Dati del provino

Data del sondaggio		Densità umida iniziale	1.960 g/cm ³ γ_n
Sezione	20.000 cm ²	Densità umida finale	2.047 g/cm ³ γ_f
Altezza iniziale	20.000 mm	Densità secca iniziale	1.535 g/cm ³ γ_d
Altezza finale	18.500 mm	Umidità iniziale	27.662 % W_0
No. Tara 1	6	Umidità finale	23.331 % W_f
Peso tara 1	59.830 g	Saturazione iniziale	98.482 % S_0
Tara + peso umido iniz.	138.24 g	Saturazione finale	100.548 % S_f
No. Tara 2	4	Indice dei vuoti iniziale	0.758 e_0
Peso tara 2	27.670 g	Indice dei vuoti finale	0.627 e_f
Tara + peso umido fin.	103.420 g	Densità secca finale	1.660 g/cm ³ γ_{df}
Tara + peso secco finale	89.090 g		
Peso specifico dei grani	2.700 g/cm ³		

Cedimenti in funzione del tempo

Gradino 01 12.5 kPa		Gradino 02 25.0 kPa		Gradino 03 50.0 kPa		Gradino 04 100.0 kPa	
dt min	dH mm	dt min	dH mm	dt min	dH mm	dt min	dH mm
0.050	0.027	0.050	0.000	0.050	0.045	0.050	0.141
0.080	0.027	0.080	0.000	0.080	0.047	0.080	0.151
0.126	0.027	0.126	0.000	0.126	0.048	0.126	0.155
0.201	0.027	0.201	0.000	0.201	0.050	0.201	0.162
0.320	0.027	0.320	0.000	0.320	0.051	0.320	0.164
0.508	0.028	0.508	0.000	0.508	0.053	0.508	0.170
0.808	0.029	0.808	0.001	0.808	0.058	0.808	0.178
1.285	0.029	1.285	0.000	1.285	0.060	1.285	0.187
2.042	0.031	2.042	0.002	2.042	0.062	2.042	0.201
3.247	0.032	3.247	0.001	3.247	0.065	3.247	0.209
5.163	0.034	5.163	0.002	5.163	0.067	5.163	0.217
8.210	0.034	8.210	0.002	8.210	0.069	8.210	0.229
13.054	0.034	13.054	0.002	13.054	0.072	13.054	0.257
20.755	0.034	20.755	0.003	20.755	0.079	20.755	0.281
33.001	0.032	33.001	0.004	33.001	0.083	33.001	0.297
52.472	0.017	52.472	0.005	52.472	0.087	52.472	0.320
83.430	0.005	83.430	0.006	83.430	0.089	83.430	0.337
132.654	0.011	132.654	0.005	132.654	0.092	132.654	0.347

Risultati

ϵ	0.336	%
e	0.764	
Metodo		
Cv		
Ca		
M		
K		

Risultati

ϵ	0.052	%
e	0.757	
Metodo		
Cv		
Ca		
M	3.221	MPa
K		

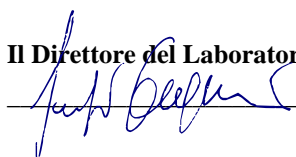
Risultati

ϵ	0.516	%
e	0.749	
Metodo	Casagrande	
Cv	3.120e-004	cm ² /s
Ca	0.025	%
M	5.390	MPa
K	5.687e-011	m/s

Risultati

ϵ	1.917	%
e	0.725	
Metodo	Casagrande	
Cv	2.480e-004	cm ² /s
Ca	0.088	%
M	3.569	MPa
K	6.819e-011	m/s

Il Direttore del Laboratorio



Lo Sperimentatore





PROVA EDOMETRICA (ASTM D2435)

Cliente	Geotecnica Palazzi-Giomarelli
Cantiere	GEOITALIA - Fresciano (FI)
Sondaggio	34
Campione	3
Profondità	7.10-7.50

Dati del provino

Data del sondaggio		Densità umida iniziale	1.960 g/cm ³	γ_n
Sezione	20.000 cm ²	Densità umida finale	2.047 g/cm ³	γ_f
Altezza iniziale	20.000 mm	Densità secca iniziale	1.535 g/cm ³	γ_d
Altezza finale	18.500 mm	Umidità iniziale	27.662 %	W_0
No. Tara 1	6	Umidità finale	23.331 %	W_f
Peso tara 1	59.830 g	Saturazione iniziale	98.482 %	S_0
Tara + peso umido iniz.	138.24 g	Saturazione finale	100.548 %	S_f
No. Tara 2	4	Indice dei vuoti iniziale	0.758	e_0
Peso tara 2	27.670 g	Indice dei vuoti finale	0.627	e_f
Tara + peso umido fin.	103.420 g	Densità secca finale	1.660 g/cm ³	γ_{df}
Tara + peso secco finale	89.090 g			
Peso specifico dei grani	2.700 g/cm ³			

Cedimenti in funzione del tempo

Gradino 05 200.0 kPa		Gradino 06 400.0 kPa		Gradino 07 800.0 kPa		Gradino 08 1600.0 kPa	
dt min	dH mm	dt min	dH mm	dt min	dH mm	dt min	dH mm
0.050	0.447	0.050	0.903	0.050	1.522	0.050	2.276
0.080	0.457	0.080	0.915	0.080	1.545	0.080	2.298
0.126	0.464	0.126	0.926	0.126	1.554	0.126	2.305
0.201	0.474	0.201	0.933	0.201	1.570	0.201	2.356
0.320	0.481	0.320	0.942	0.320	1.583	0.320	2.387
0.508	0.494	0.508	0.955	0.508	1.594	0.508	2.409
0.808	0.505	0.808	0.967	0.808	1.610	0.808	2.420
1.285	0.515	1.285	0.986	1.285	1.634	1.285	2.440
2.042	0.529	2.042	1.005	2.042	1.653	2.042	2.471
3.247	0.541	3.247	1.028	3.247	1.683	3.247	2.490
5.163	0.557	5.163	1.057	5.163	1.711	5.163	2.539
8.210	0.579	8.210	1.088	8.210	1.766	8.210	2.591
13.054	0.614	13.054	1.139	13.054	1.826	13.054	2.657
20.755	0.640	20.755	1.189	20.755	1.886	20.755	2.725
33.001	0.677	33.001	1.244	33.001	1.962	33.001	2.814
52.472	0.722	52.472	1.301	52.472	2.047	52.472	2.913
83.430	0.749	83.430	1.345	83.430	2.117	83.430	2.991
132.654	0.780	132.654	1.386	132.654	2.176	132.654	3.063

Risultati

ε	4.120	%
e	0.686	
Metodo	Casagrande	
Cv	2.060e-004	cm ³ /s
Ca	0.138	%
M	4.538	MPa
K	4.461e-011	m/s

Risultati

ε	7.296	%
e	0.630	
Metodo	Casagrande	
Cv	1.630e-004	cm ³ /s
Ca	0.149	%
M	6.297	MPa
K	2.535e-011	m/s

Risultati

ε	11.321	%
e	0.559	
Metodo	Casagrande	
Cv	1.340e-004	cm ³ /s
Ca	0.206	%
M	9.939	MPa
K	1.324e-011	m/s

Risultati

ε	15.842	%
e	0.480	
Metodo		
Cv		
Ca		
M	17.695	MPa
K		

Il Direttore del Laboratorio

Lo Sperimentatore

PROVA EDOMETRICA (ASTM D2435)

Cliente Geotecnica Palazzi-Giomarelli
 Cantiere GEOITALIA - Fresciano (FI)
 Sondaggio 34
 Campione 3
 Profondità 7.10-7.50

Dati del provino

Data del sondaggio		Densità umida iniziale	1.960 g/cm ³ γ_n
Sezione	20.000 cm ²	Densità umida finale	2.047 g/cm ³ γ_f
Altezza iniziale	20.000 mm	Densità secca iniziale	1.535 g/cm ³ γ_d
Altezza finale	18.500 mm	Umidità iniziale	27.662 % W_0
No. Tara 1	6	Umidità finale	23.331 % W_f
Peso tara 1	59.830 g	Saturazione iniziale	98.482 % S_0
Tara + peso umido iniz.	138.24 g	Saturazione finale	100.548 % S_f
No. Tara 2	4	Indice dei vuoti iniziale	0.758 e_0
Peso tara 2	27.670 g	Indice dei vuoti finale	0.627 e_f
Tara + peso umido fin.	103.420 g	Densità secca finale	1.660 g/cm ³ γ_{df}
Tara + peso secco finale	89.090 g		
Peso specifico dei grani	2.700 g/cm ³		

Cedimenti in funzione del tempo

Gradino 09 800.0 kPa		Gradino 10 400.0 kPa		Gradino 11 200.0 kPa		Gradino 12 100.0 kPa	
dt min	dH mm	dt min	dH mm	dt min	dH mm	dt min	dH mm
0.050	3.179	0.050	3.038	0.050	2.814	0.050	2.538
0.080	3.167	0.080	3.036	0.080	2.811	0.080	2.538
0.126	3.165	0.126	3.035	0.126	2.810	0.126	2.537
0.201	3.164	0.201	3.032	0.201	2.806	0.201	2.536
0.320	3.162	0.320	3.030	0.320	2.802	0.320	2.535
0.508	3.160	0.508	3.026	0.508	2.799	0.508	2.534
0.808	3.155	0.808	3.018	0.808	2.796	0.808	2.532
1.285	3.152	1.285	3.011	1.285	2.792	1.285	2.521
2.042	3.141	2.042	3.001	2.042	2.788	2.042	2.515
3.247	3.130	3.247	2.991	3.247	2.777	3.247	2.508
5.163	3.120	5.163	2.982	5.163	2.765	5.163	2.499
8.210	3.113	8.210	2.972	8.210	2.753	8.210	2.491
13.054	3.098	13.054	2.956	13.054	2.734	13.054	2.482
20.755	3.093	20.755	2.934	20.755	2.719	20.755	2.468
33.001	3.083	33.001	2.913	33.001	2.696	33.001	2.444
52.472	3.073	52.472	2.893	52.472	2.668	52.472	2.417
83.430	3.069	83.430	2.867	83.430	2.632	83.430	2.384
132.654	3.067	132.654	2.853	132.654	2.607	132.654	2.342

Risultati

ϵ	15.298	%
e	0.489	
Metodo		
Cv		
Ca		
M		
K		

Risultati

ϵ	14.179	%
e	0.509	
Metodo		
Cv		
Ca		
M		
K		

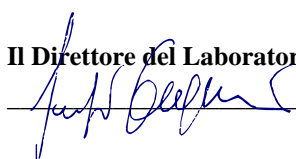
Risultati

ϵ	12.809	%
e	0.533	
Metodo		
Cv		
Ca		
M		
K		

Risultati

ϵ	11.232	%
e	0.561	
Metodo		
Cv		
Ca		
M		
K		

Il Direttore del Laboratorio



Lo Sperimentatore



PROVA EDOMETRICA (ASTM D2435)

Cliente Geotecnica Palazzi-Giomarelli
 Cantiere GEOITALIA - Fresciano (FI)
 Sondaggio 34
 Campione 3
 Profondità 7.10-7.50

Dati del provino

Data del sondaggio		Densità umida iniziale	1.960 g/cm ³	γ_n
Sezione	20.000 cm ²	Densità umida finale	2.047 g/cm ³	γ_f
Altezza iniziale	20.000 mm	Densità secca iniziale	1.535 g/cm ³	γ_d
Altezza finale	18.500 mm	Umidità iniziale	27.662 %	W_0
No. Tara 1	6	Umidità finale	23.331 %	W_f
Peso tara 1	59.830 g	Saturazione iniziale	98.482 %	S_0
Tara + peso umido iniz.	138.24 g	Saturazione finale	100.548 %	S_f
No. Tara 2	4	Indice dei vuoti iniziale	0.758	e_0
Peso tara 2	27.670 g	Indice dei vuoti finale	0.627	e_f
Tara + peso umido fin.	103.420 g	Densità secca finale	1.660 g/cm ³	γ_{df}
Tara + peso secco finale	89.090 g			
Peso specifico dei grani	2.700 g/cm ³			

Cedimenti in funzione del tempo

Gradino 13 50.0 kPa		Gradino 14 25.0 kPa		Gradino 15 12.5 kPa		
dt min	dH mm	dt min	dH mm	dt min	dH mm	
0.050	2.235	0.050	1.982	0.050	1.697	
0.080	2.234	0.080	1.979	0.080	1.697	
0.126	2.234	0.126	1.977	0.126	1.695	
0.201	2.233	0.201	1.976	0.201	1.695	
0.320	2.232	0.320	1.975	0.320	1.691	
0.508	2.231	0.508	1.974	0.508	1.688	
0.808	2.229	0.808	1.973	0.808	1.688	
1.285	2.226	1.285	1.971	1.285	1.688	
2.042	2.222	2.042	1.968	2.042	1.687	
3.247	2.217	3.247	1.964	3.247	1.687	
5.163	2.211	5.163	1.961	5.163	1.687	
8.210	2.202	8.210	1.957	8.210	1.685	
13.054	2.192	13.054	1.950	13.054	1.682	
20.755	2.179	20.755	1.942	20.755	1.672	
33.001	2.159	33.001	1.923	33.001	1.665	
52.472	2.137	52.472	1.900	52.472	1.652	
83.430	2.112	83.430	1.879	83.430	1.640	
132.654	2.085	132.654	1.849	132.654	1.615	

Risultati

ϵ	10.037	%
e	0.582	
Metodo		
Cv		
Ca		
M		
K		

Risultati

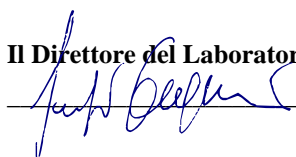
ϵ	8.510	%
e	0.609	
Metodo		
Cv		
Ca		
M		
K		

Risultati

ϵ	7.746	%
e	0.622	
Metodo		
Cv		
Ca		
M		
K		

Risultati

Il Direttore del Laboratorio



Lo Sperimentatore



PROVA EDOMETRICA (ASTM D2435)

Dati del Cliente

Cliente Geotecnica Palazzi-Giomarelli
 Indirizzo
 Cantiere GEOITALIA - Fresciano (FI)
 Sondaggio 34
 Campione 3
 Profondità 7.10-7.50

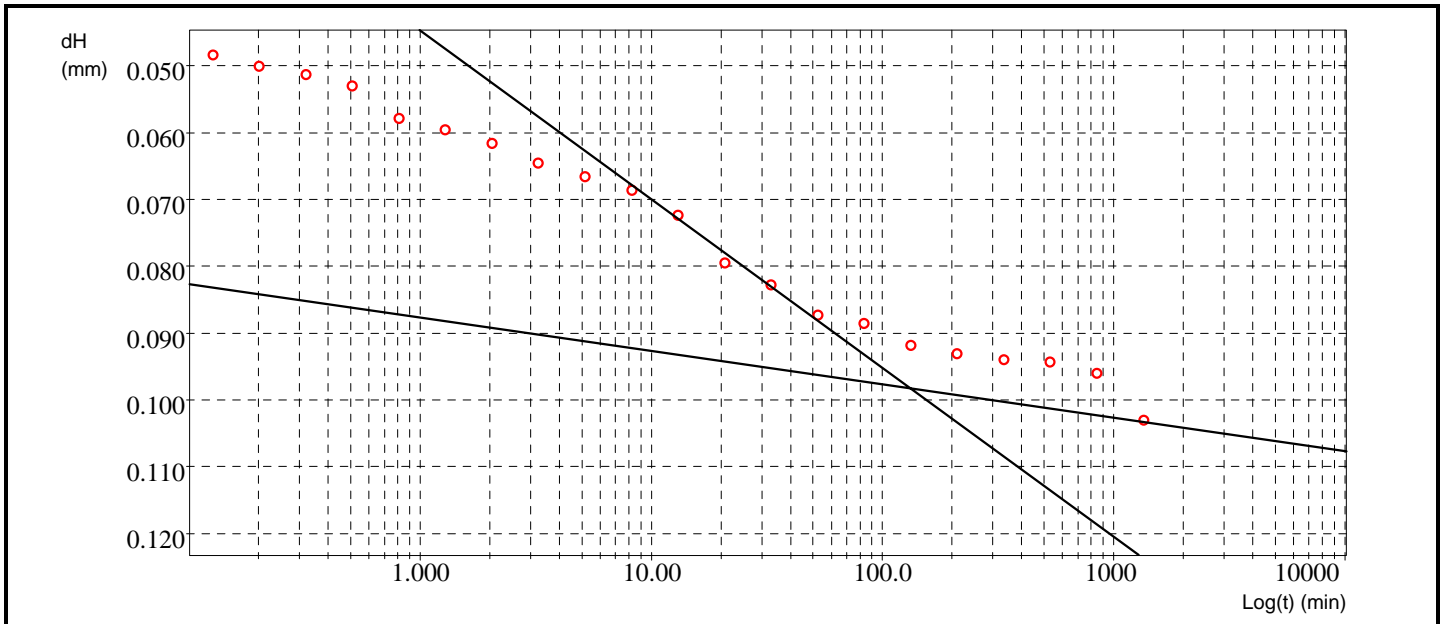
Dati acquisiti del gradino 03

σ_v 50.0 Kpa

dt min	dH mm
0.05	0.045
0.08	0.047
0.13	0.048
0.20	0.050
0.32	0.051
0.51	0.053
0.81	0.058
1.28	0.060
2.04	0.062
3.25	0.065
5.16	0.067

dt min	dH mm
8.21	0.069
13.05	0.072
20.76	0.079
33.00	0.083
52.47	0.087
83.43	0.089
132.65	0.092
210.92	0.093
335.36	0.094
533.23	0.094
847.83	0.096

dt min	dH mm
1348.05	0.103



Risultati di elaborazione

ϵ	0.516	%
e	0.749	
Metodo	Casagrande	
Cv	3.12e-004	cm ² /s
Ca	0.025	%
M	5.390	MPa
K	5.69e-011	m/s

Il Direttore del Laboratorio



Lo Sperimentatore





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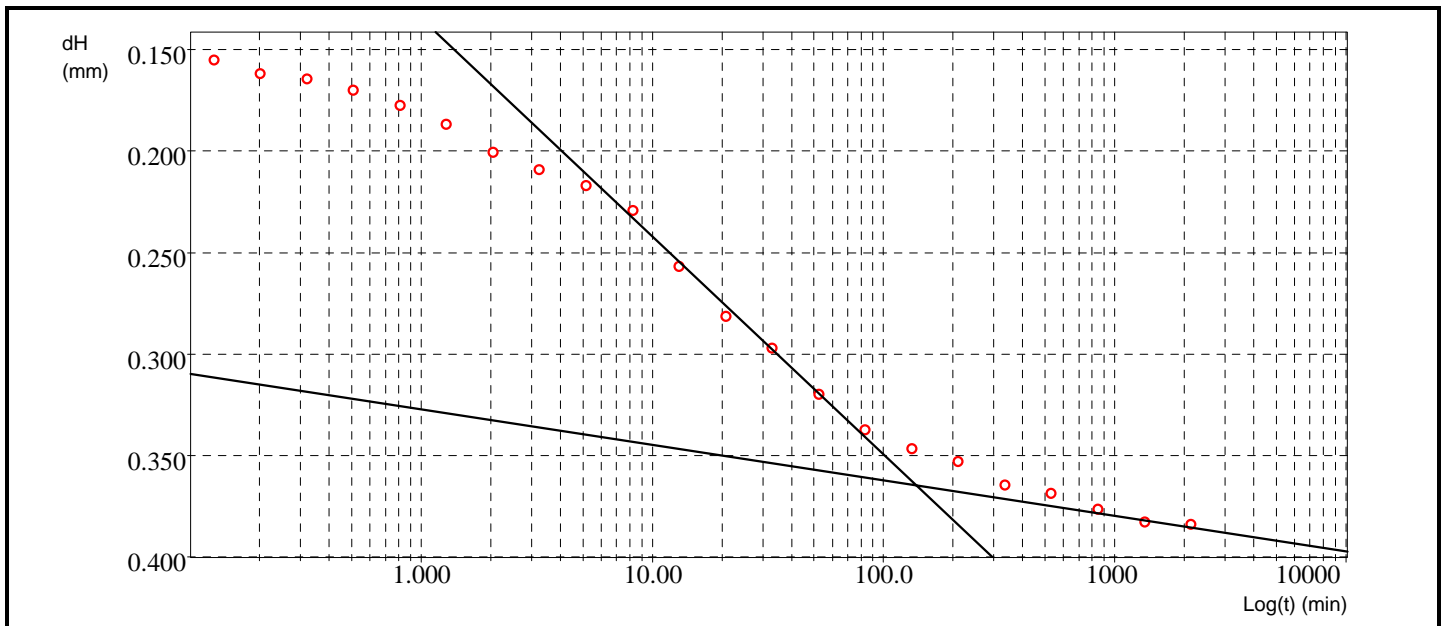
Dati acquisiti del gradino 04

σ_v 100.0 Kpa

dt min	dH mm
0.05	0.141
0.08	0.151
0.13	0.155
0.20	0.162
0.32	0.164
0.51	0.170
0.81	0.178
1.28	0.187
2.04	0.201
3.25	0.209
5.16	0.217

dt min	dH mm
8.21	0.229
13.05	0.257
20.76	0.281
33.00	0.297
52.47	0.320
83.43	0.337
132.65	0.347
210.92	0.353
335.36	0.365
533.23	0.369
847.83	0.377

dt min	dH mm
1348.05	0.383
2143.40	0.384



Risultati di elaborazione

ϵ	1.917	%
e	0.725	
Metodo	Casagrande	
Cv	2.48e-004	cm ² /s
Ca	0.088	%
M	3.569	MPa
K	6.82e-011	m/s

Il Direttore del Laboratorio

Lo Sperimentatore



PROVA EDOMETRICA (ASTM D2435)

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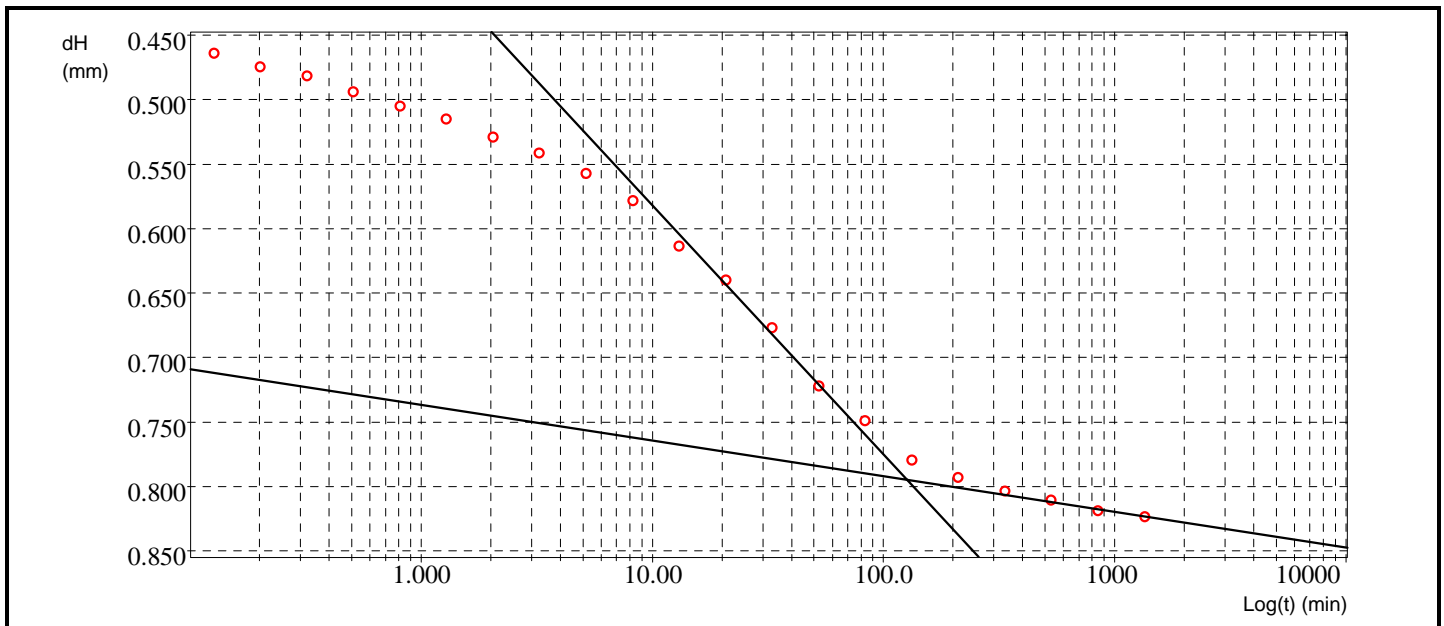
Dati acquisiti del gradino 05

σ_v 200.0 Kpa

dt min	dH mm
0.05	0.447
0.08	0.457
0.13	0.464
0.20	0.474
0.32	0.481
0.51	0.494
0.81	0.505
1.28	0.515
2.04	0.529
3.25	0.541
5.16	0.557

dt min	dH mm
8.21	0.579
13.05	0.614
20.76	0.640
33.00	0.677
52.47	0.722
83.43	0.749
132.65	0.780
210.92	0.793
335.36	0.804
533.23	0.811
847.83	0.819

dt min	dH mm
1348.05	0.824



Risultati di elaborazione

ϵ	4.120	%
e	0.686	
Metodo	Casagrande	
Cv	2.06e-004	cm ² /s
Ca	0.138	%
M	4.538	MPa
K	4.46e-011	m/s

Il Direttore del Laboratorio

Lo Sperimentatore

PROVA EDOMETRICA (ASTM D2435)

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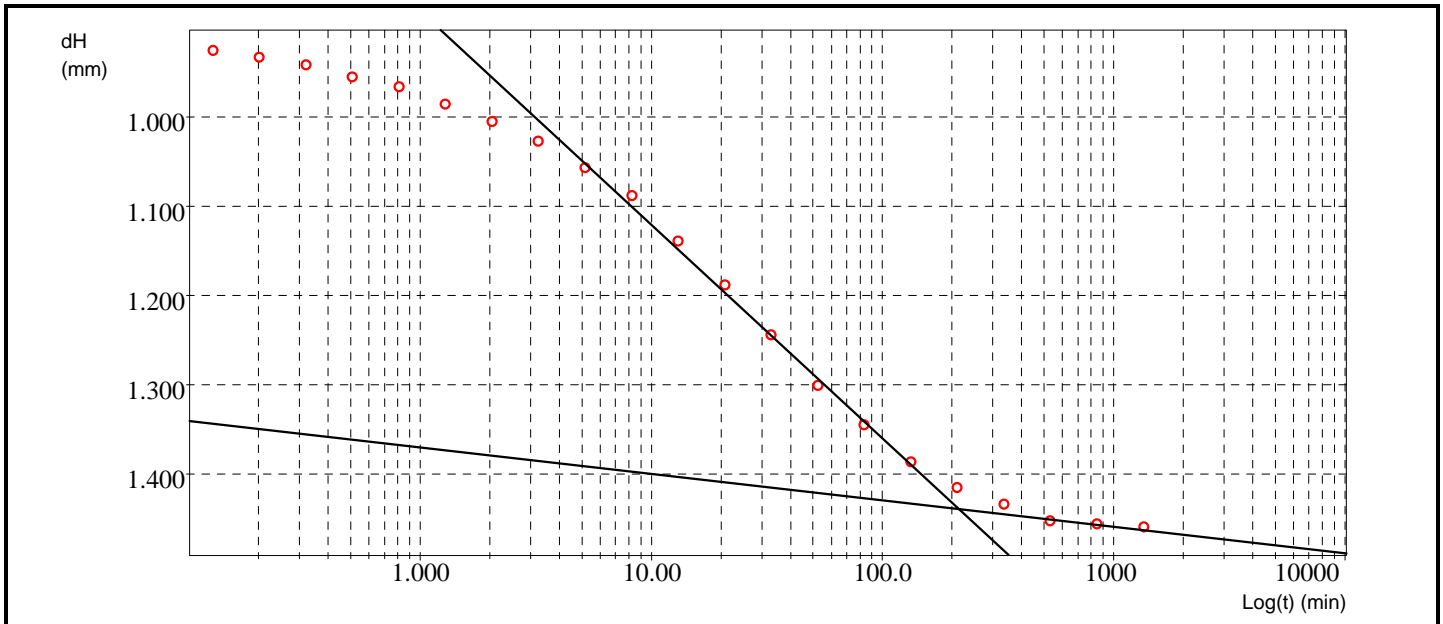
Dati acquisiti del gradino 06

σ_v 400.0 Kpa

dt min	dH mm
0.05	0.903
0.08	0.915
0.13	0.926
0.20	0.933
0.32	0.942
0.51	0.955
0.81	0.967
1.28	0.986
2.04	1.005
3.25	1.028
5.16	1.057

dt min	dH mm
8.21	1.088
13.05	1.139
20.76	1.189
33.00	1.244
52.47	1.301
83.43	1.345
132.65	1.386
210.92	1.415
335.36	1.434
533.23	1.452
847.83	1.456

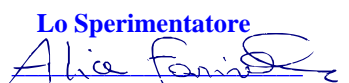
dt min	dH mm
1348.05	1.459



Risultati di elaborazione

ϵ	7.296	%
e	0.630	
Metodo	Casagrande	
Cv	1.63e-004	cm ² /s
Ca	0.149	%
M	6.297	MPa
K	2.54e-011	m/s

Il Direttore del Laboratorio


Lo Sperimentatore


PROVA EDOMETRICA (ASTM D2435)

Dati del Cliente

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 Sondaggio 34
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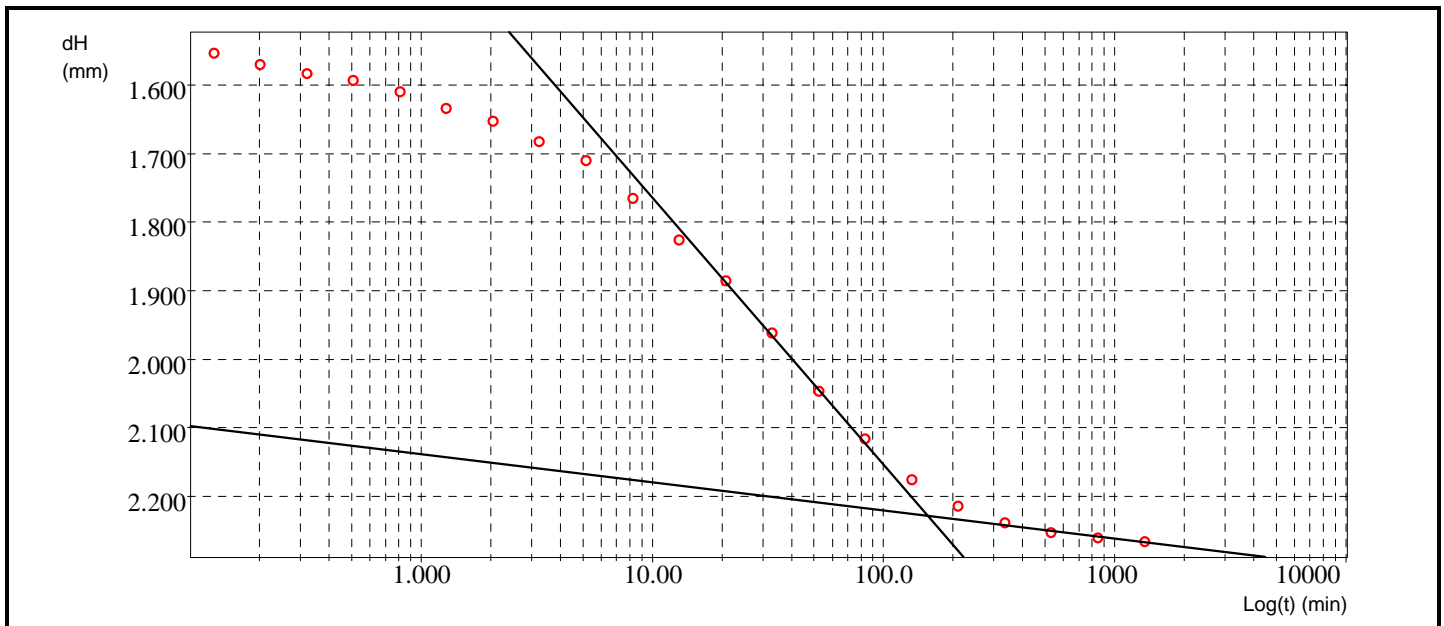
Dati acquisiti del gradino 07

σ_v 800.0 Kpa

dt min	dH mm
0.05	1.522
0.08	1.545
0.13	1.554
0.20	1.570
0.32	1.583
0.51	1.594
0.81	1.610
1.28	1.634
2.04	1.653
3.25	1.683
5.16	1.711

dt min	dH mm
8.21	1.766
13.05	1.826
20.76	1.886
33.00	1.962
52.47	2.047
83.43	2.117
132.65	2.176
210.92	2.214
335.36	2.239
533.23	2.254
847.83	2.261

dt min	dH mm
1348.05	2.267



Risultati di elaborazione

ϵ	11.321	%
e	0.559	
Metodo	Casagrande	
Cv	1.34e-004	cm ² /s
Ca	0.206	%
M	9.939	MPa
K	1.32e-011	m/s

Il Direttore del Laboratorio



Lo Sperimentatore

