













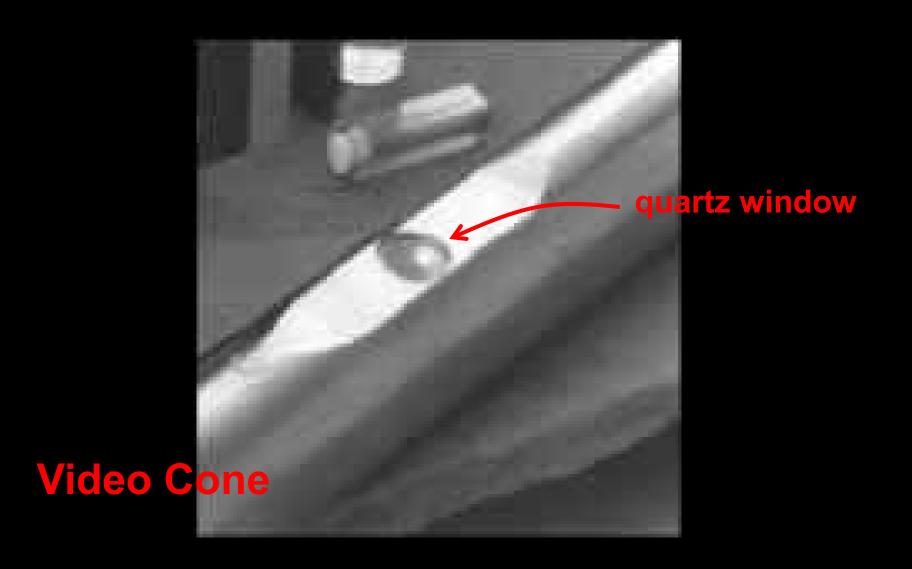




Pressuremeter Cone



Magnetometer Cone





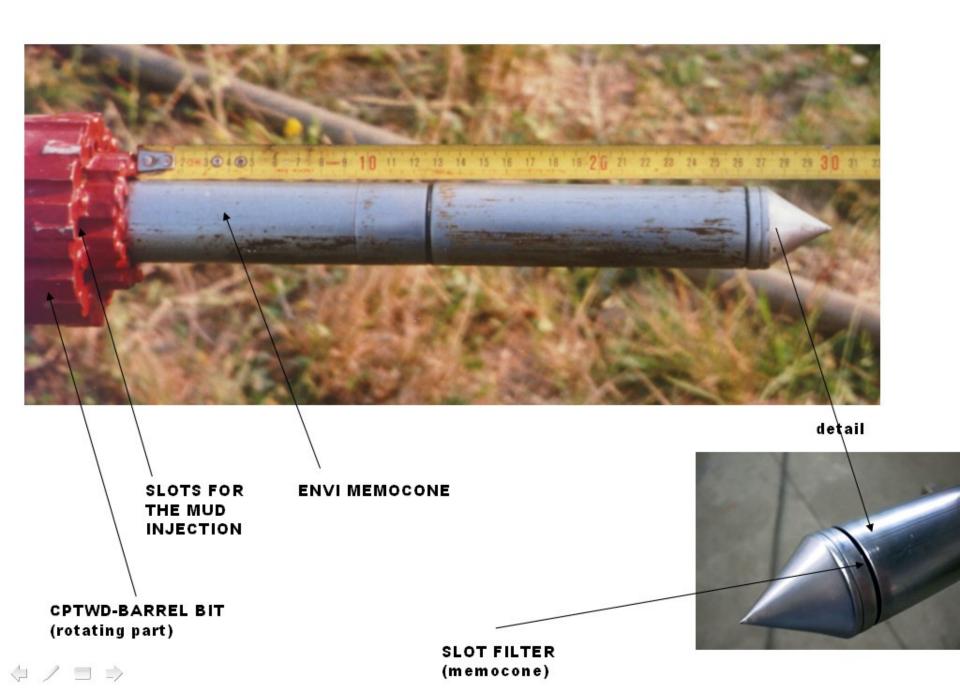






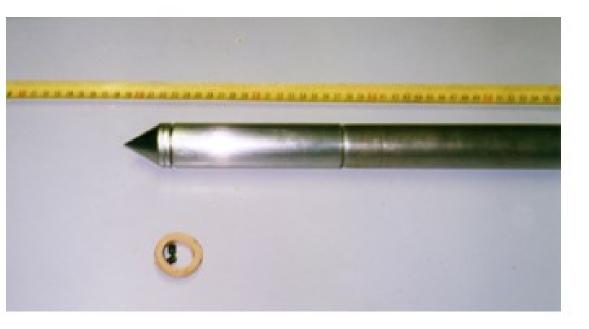


DETAIL OF MEMOCONE AND THE CPTwd-BARREL BIT



king a cable between the rods that carry the alrea<u>dy-elaborated and already-</u>dig

print out the test while boring.



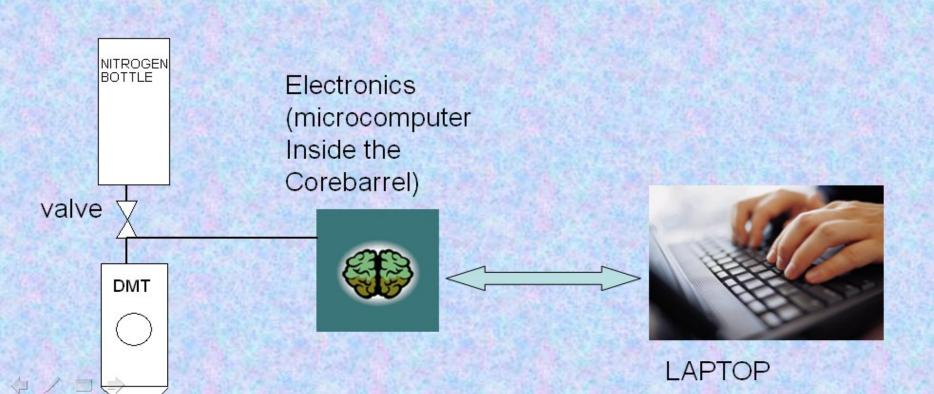




BASIC OPERATIONS

Prior to any pushing it has to be done the SETTING of the Medusa:

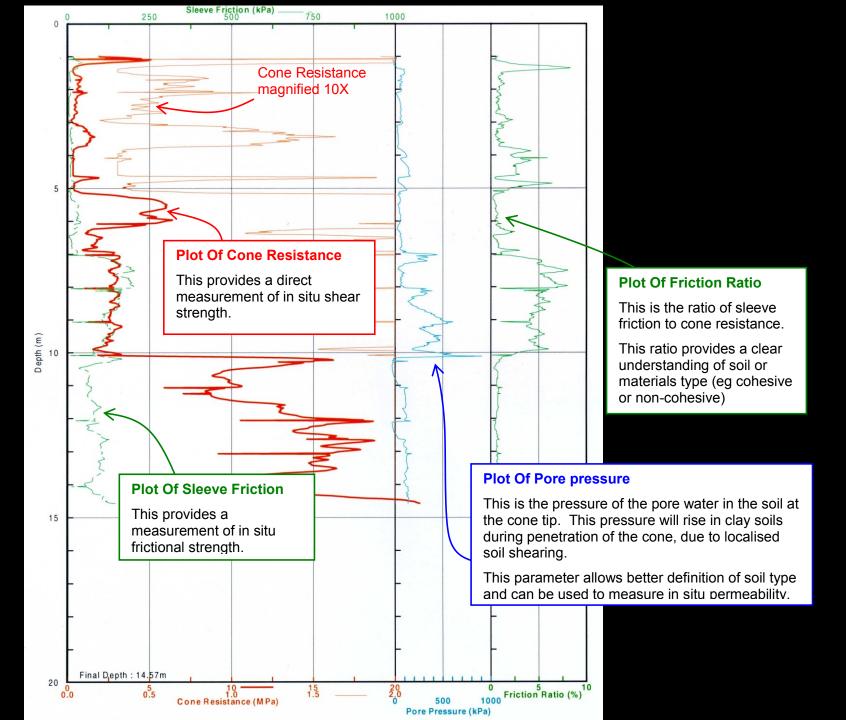
- •refilling/controlling the pressure of the nitrogen bottle
- Control the DMT and the membrane
- connecting the electronics to the laptop
- PROGRAM THE TEST





50 kN static penetrometer and rotary rig mounted on Hovercraft





Client: McConnell Consulting Test No: VS - 05 Project: Virgin Simulator Site Location: Location: Brisbane Airport R.L.: -DGPS Position: 56J 0510143, 6967030 W.L.: -Predrilling Depth: 0.00 m S.P. : -Sleeve Friction (kPa) _ 10 15 Depth (m) 25 30 35 40 Insitu Geotech Services Pty. Ltd. Tested By: SW & GB Test Date: 06/12/2002 IGS No: 1012 Job No: 02-020 Tested in accordance with AS 1289.6.5.1 -1999. PO Box 2163 Fortitude Valley BC. QLD. 4008. Page No: 1 of 1 Ph: 0407 467 488 E-mail: igs@insitu.com.au

Fax: 0409 467 488

Website: www.insitu.com.au

Approved Signatory: Millian Date: 06/12/2002

CONE PENETROMETER TEST RESULT

Client: McConnell Consulting

Test No : DBB-05 (G)

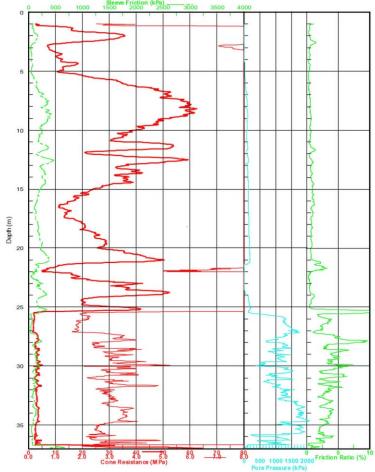
Project: Daikyo Budds Beach Location: Surfers Paradise

DGPS Position: 56J 0541851, 6903173

RL. : -W.L. : -

Predrill Depth: 1.00m

S.P. : -



Tested By: SW & RC Test Date: 31/01/2004 IGS No: 1548 Job No: 0401-27 Tested in accordance with AS 1289.6.5.1-1999. Insitu Geotech Services Pty. Ltd.

PO Box 2163 Fortitude Valley BC. QLD. 4008.

Ph: 0407 467 488 Fax: 0409 467 488

E-mail: igs@insitu.com.au Website: www.insitu.com.au

Page No: 1 of 1

Approved Signatory: Millian Date: 31/01/2004

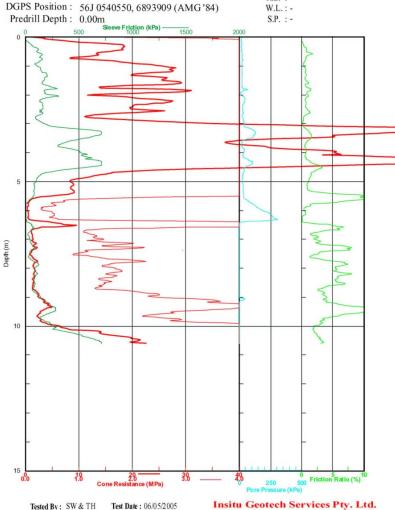
CONE PENETROMETER TEST RESULT

R.L. : -

Client: McConnell Consulting Test No: MC-SC-08

Project: SOHO II

Location: Varsity Lakes, Robina



IGS No: 2187 Job No: 0505-04 Tested in accordance with AS 1289.6.5.1-1999.

PO Box 2163 Fortitude Valley BC. QLD. 4008.

Page No: 1 of 1 Ph: 0407 467 488 Approved Signatory: Millian Date: 06/05/2005 Fax: 07 3254 4530

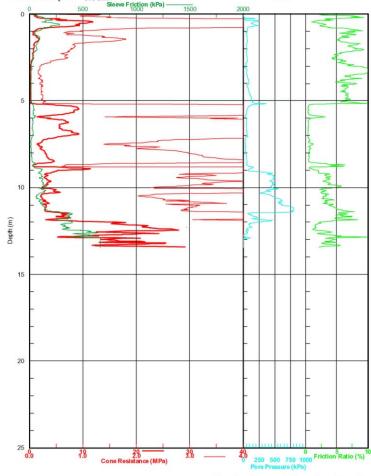
E-mail: igs@insitu.com.au Website: www.insitu.com.au

CONE PENETROMETER TEST RESULT

Client: Wagstaff Piling Test No: WP-FA-C02 Project: 184 Fison Ave West Location 'A'

Location: Eagle farm

R.L. : -DGPS Position: 56J 0508919, 6965173 (AMG '84) W.L.: -Predrill Depth: 0.00m S.P. : -

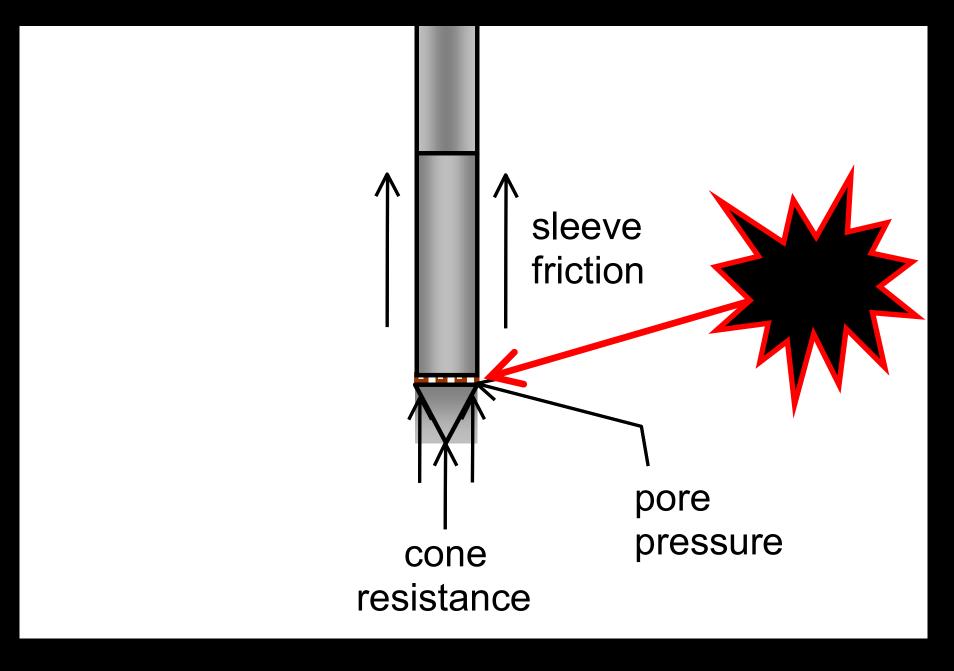


Tested By: SW & TH Test Date: 25/10/2005 IGS No: 2400 Job No: 0510-25

Insitu Geotech Services Pty. Ltd.

PO Box 2163 Fortitude Valley BC. QLD. 4008. Tested in accordance with AS 1289.6.5.1-1999.

Page No: 1 of 1 Ph: 0407 467 488 E-mail: igs@insitu.com.au Approved Signatory: Millian Date: 25/10/2005 Fax: 07 3254 4530 Website: www.insitu.com.au



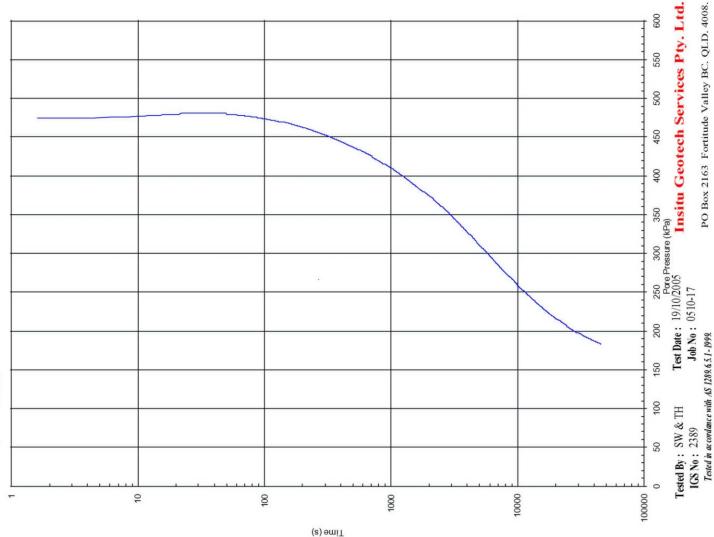
PORE PRESSURE DISSIPATION TEST RESULT

Client: Golder Associates Project: Da Vinci Project

Test No :GA-DV-C11 PPDT-15

Location: Brisbane Airport

Test at Depth: 15.00 M R.L. 56J 0510225, 6967131 (AMG '84) 0.00m DGPS Position: Predrill Depth:



E-mail: igs@insitu.com.au Website: www.insitu.com.au

Date: 19/10/2005 Fax: 0409 467 488

Approved Signatory: //William

Page No: 1 of 1

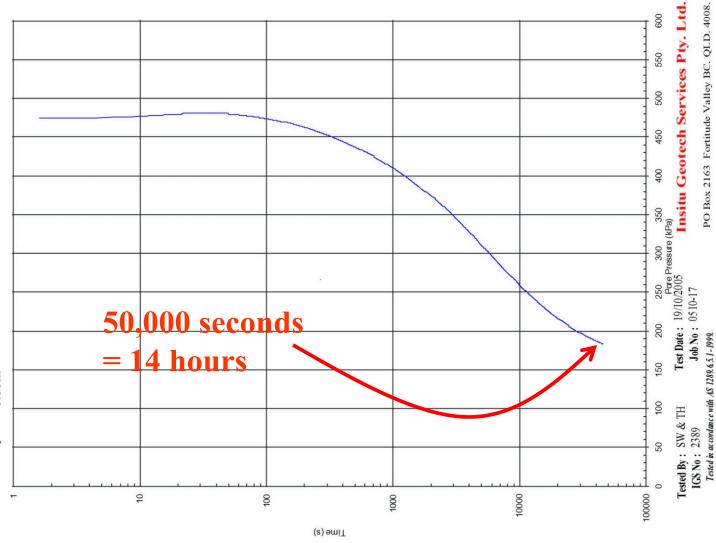
PORE PRESSURE DISSIPATION TEST RESULT

Client: Golder Associates Project: Da Vinci Project

Test No :GA-DV-C11 PPDT-15

Location: Brisbane Airport

Test at Depth: 15.00 M R.L. 56J 0510225, 6967131 (AMG '84) 0.00m DGPS Position: Predrill Depth:



E-mail: igs@insitu.com.au Website: www.insitu.com.au

Date: 19/10/2005 Fax: 0409 467 488

Page No: 1 of 1

Approved Signatory: Mullian

CONE PENETRATION TESTING

IN GEOTECHNICAL PRACTICE

T. LUNNE, P.K. ROBERTSON AND J.J.M. POWELL



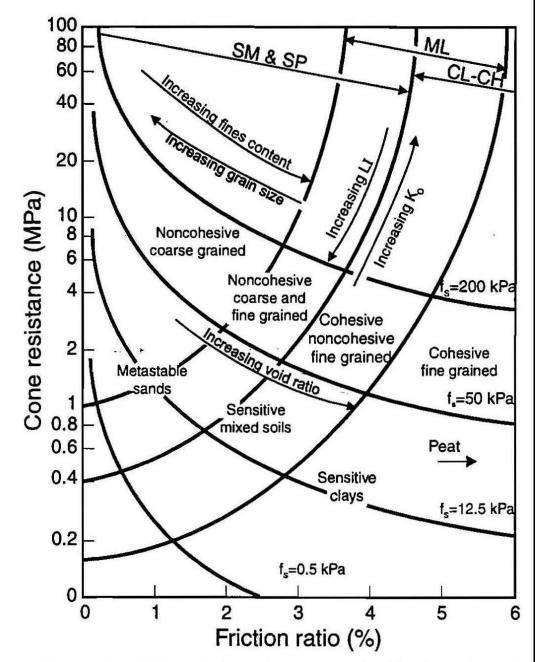
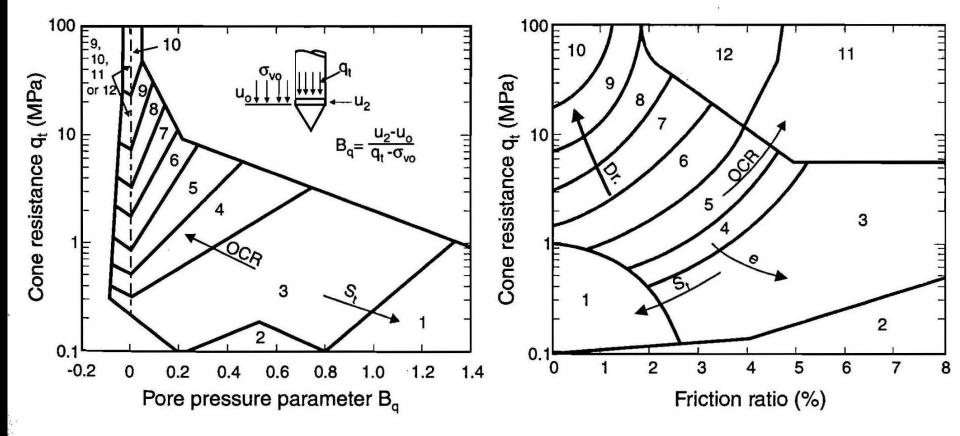


Figure 5.6 CPT soil behaviour type classification chart by Douglas and Olsen (1981).



Zone: Soil Behaviour Type	Zone:	Soil Behaviour Type:
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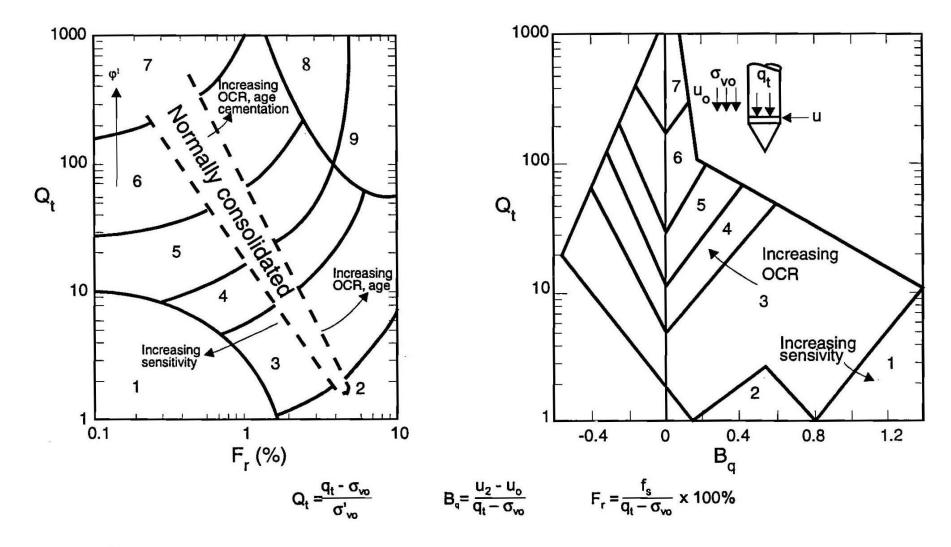
- Sensitive fine grained
- Organic material
- 3. Clay
- 4. Silty clay to clay

- 5. Clayey silt to silty clay
- 6. Sandy silt to clayey silt
- 7. Silty sand to sandy silt
- 8. Sand to silty sand

- 9. Sand
- 10. Gravelly sand to sand
- 11. Very stiff fine grained*
- 12. Sand to clayey sand*

Figure 5.7 Proposed soil behaviour type classification system from CPTU data (after Robertson et al., 1986).

Overconsolidated or cemented.



Zone Soil behaviour type

- 1. Sensitive, fine grained;
- 2. Organic soils-peats;
- 3. Clays-clay to silty clay;

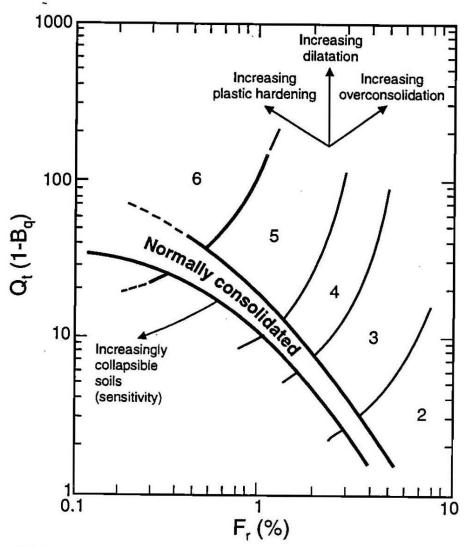
Zone Soil behaviour type

- 4. Silt mixtures clayey silt to silty clay
- 5. Sand mixtures; silty sand to sand silty
- 6. Sands; clean sands to silty sands

Zone Soil behaviour type

- 7. Gravelly sand to sand;
 - Very stiff sand to clayey sand
- 9. Very stiff fine grained

Figure 5.8 Soil behaviour type classification chart based on normalized CPT/CPTU data (after Robertson, 1990).



NOTES:

- 1. Sensitive fine grained
- 2. Organic soils peats
- 3. Clays clay to silty clay
- 4. Silt mixtures clayey silt to silty clay
- Sand mixtures silty sand to sandy silt
- 6. Sands clean sand to silty sand

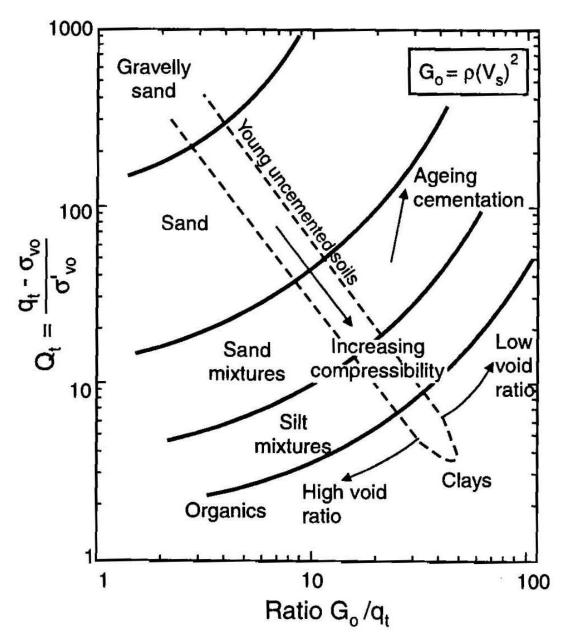


Figure 5.10 Soil classification chart based on normalized cone resistance and small strain shear modulus.

Table 5.8 Estimation of constrained modulus, *M*, for clays (Adapted from Sanglerat, 1972) (after Mitchell and Gardner, 1975)

$M=1/m_{\nu}=\alpha_m\cdot q_c$			
q_c < 0.7 MPa 0.7 < q_c < 2.0 MPa q_c > 2.0 MPa	$3 < \alpha_m < 8$ $2 < \alpha_m < 5$ $1 < \alpha_m < 2.5$	Clay of low plasticity (CL)	
$q_c > 2$ MPa $q_c < 2$ MPa	$3 < \alpha_m < 6$ $1 < \alpha_m < 3$	Silts of low plasticity (ML)	
$q_c < 2 \text{ MPa}$	$2 < \alpha_m < 6$	Highly plastic silts and clays (MH, CH)	
$q_c < 1.2 \text{ MPa}$	$2 < \alpha_m < 8$	Organic silts (OL)	
$q_c < 0.7 \text{ MPa}$ 50 < w < 100 100 < w < 200 w > 200	$1.5 < \alpha_m < 4$ $1 < \alpha_m < 1.5$ $0.4 < \alpha_m < 1$	Peat and organic clay (P_t, OH)	

w = water content

5.5.3.2 Constrained modulus

Most correlations between CPT results and the drained constrained modulus, M, refer to the tangent modulus, as found from oedometer tests. The reference value of M is normally based on the effective vertical stress, σ'_{vo} , before the start of the *in situ* test; this value is denoted M_o .

Based on a review of available calibration chamber tests, Lunne and Christophersen (1983) recommended that an estimate of M_o for NC unaged and uncemented predominantly silica sands can be obtained from:

$$M_o = 4q_c$$
 for $q_c < 10$ MPa

$$M_o = 2q_c + 20 \text{ (MPa)}$$
 for 10 MPa $< q_c < 50 \text{ MPa}$

$$M_o = 120 \text{ MPa}$$
 for $q_c > 50 \text{ MPa}$

Lunne and Christophersen also included OC sands in their study and recommended as a rough guideline to use:

$$M_o = 5q_c$$
 for $q_c < 50$ MPa

$$M_o = 250 \text{ MPa}$$
 for $q_c > 50 \text{ MPa}$

For an additional stress $\Delta \sigma'_{v}$, Lunne and Christophersen recommended Janbu's (1963) formulation to compute M for the stress range σ'_{vo} to $\sigma'_{vo} + \Delta \sigma'_{v}$:

$$M = M_o \sqrt{\frac{\sigma'_{vo} + \Delta \sigma_v/2}{\sigma'_{vo}}}$$
 (5.57)

Recently Eslaamizaad and Robertson (1996) suggested an alternative method to estimate M_o from CPT results, based on assessment of extensive calibration tests on quartz sands (Baldi *et al.*, 1986 and Fioravante *et al.*, 1991). Curve fitting techniques were used to develop correlations for sands with different stress history.

The method presents a correlation incorporating normalized cone resistance and normalized vertical effective stress in the form of:

$$M_{o} = k_{M} p_{a} \left(\frac{\sigma'_{vo}}{p_{a}}\right)^{n} \tag{5.58}$$

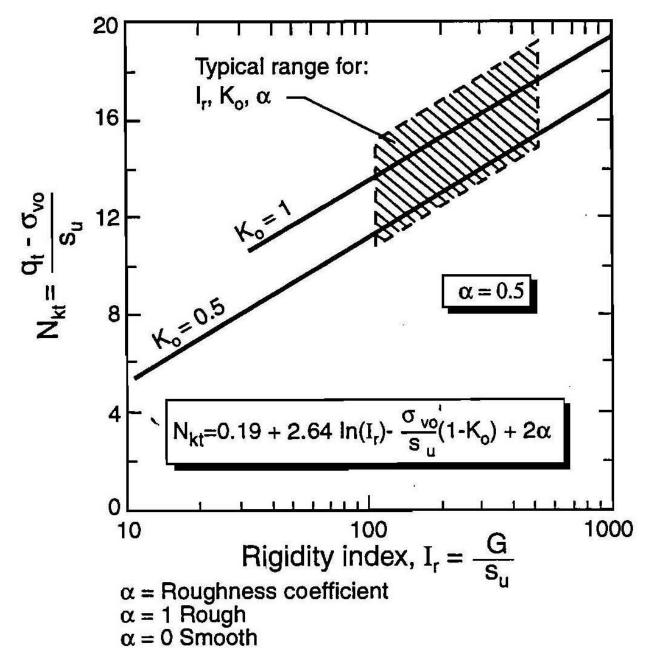


Figure 5.21 Theoretical solution for N_{kt} (from Teh, 1987).

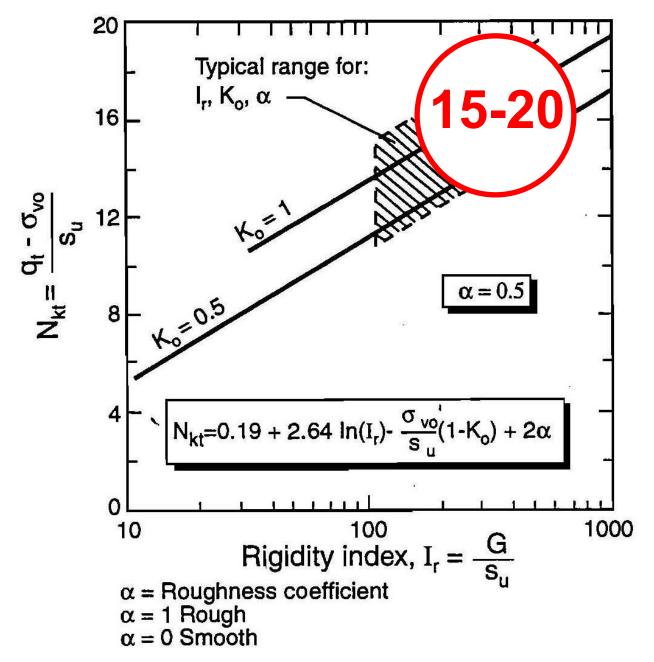
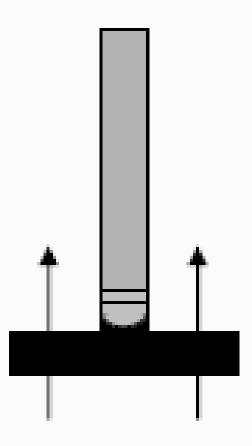
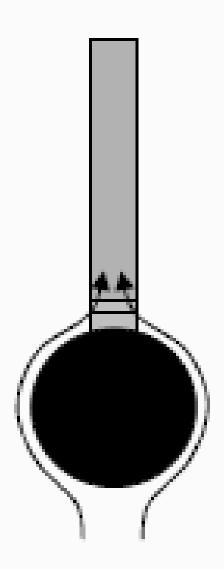


Figure 5.21 Theoretical solution for N_{kt} (from Teh, 1987).

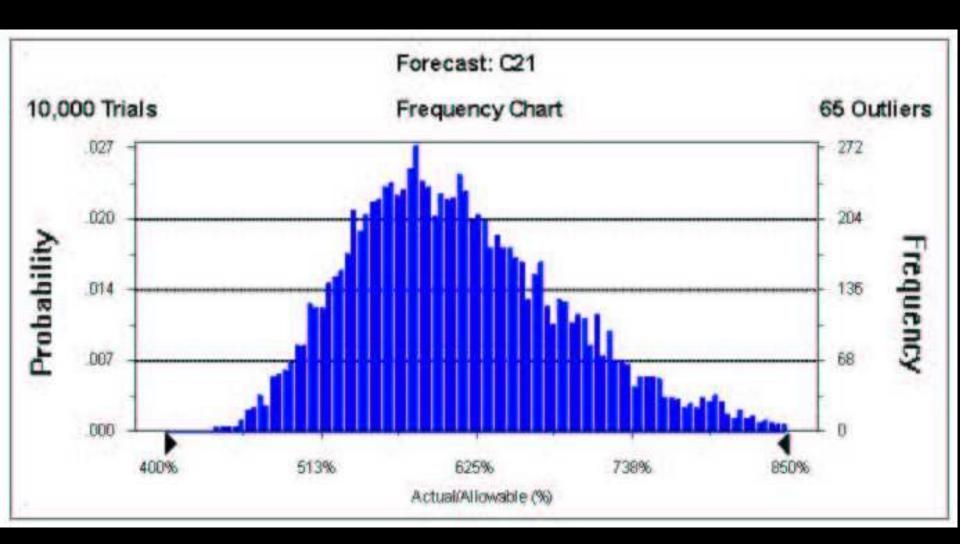
T-bar

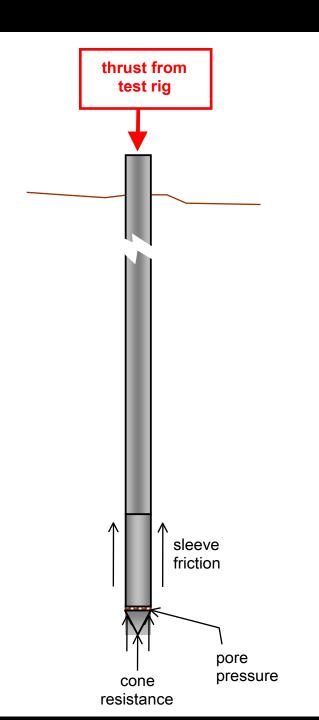


Ball

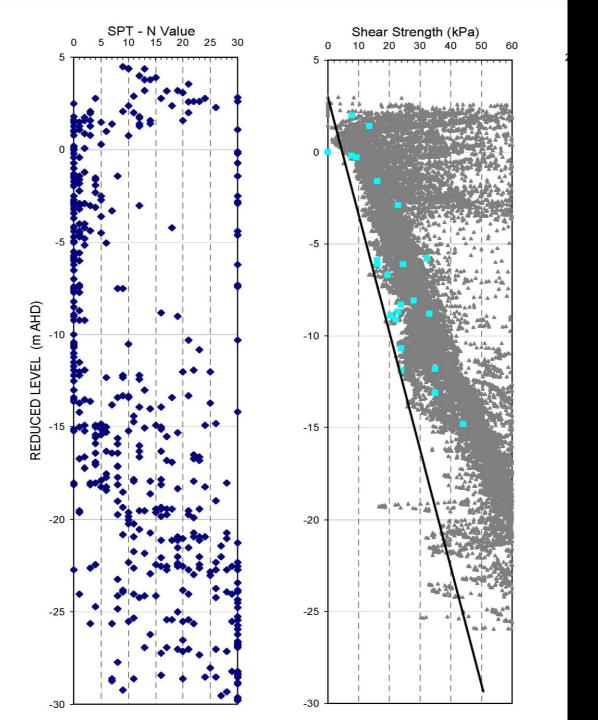


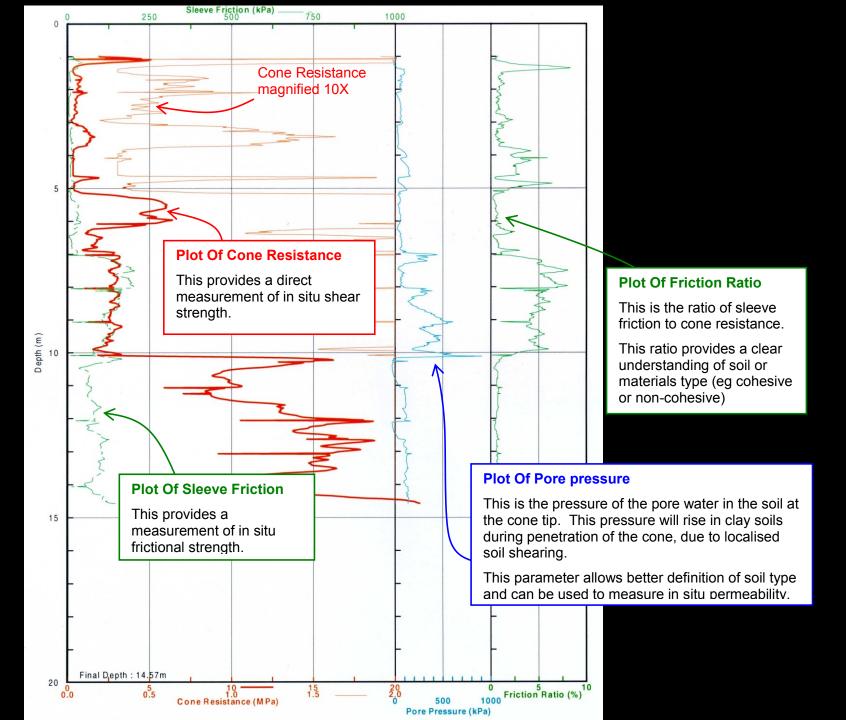






currently by far the best tool for site profiling





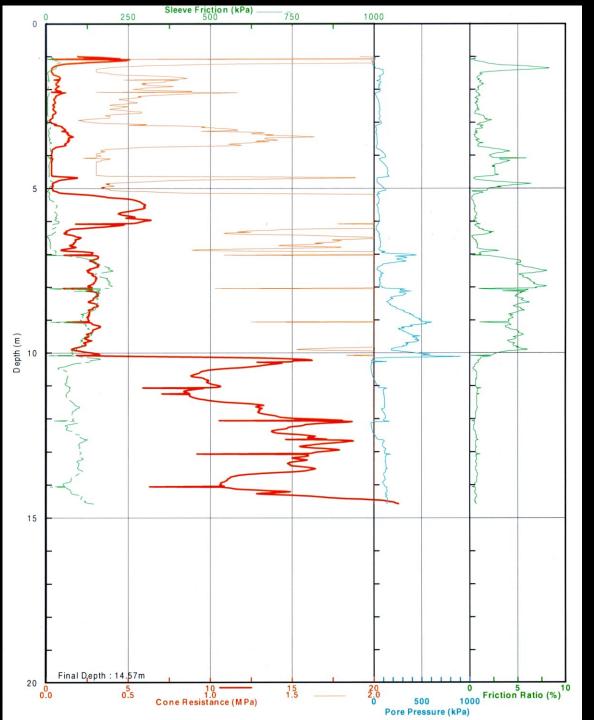
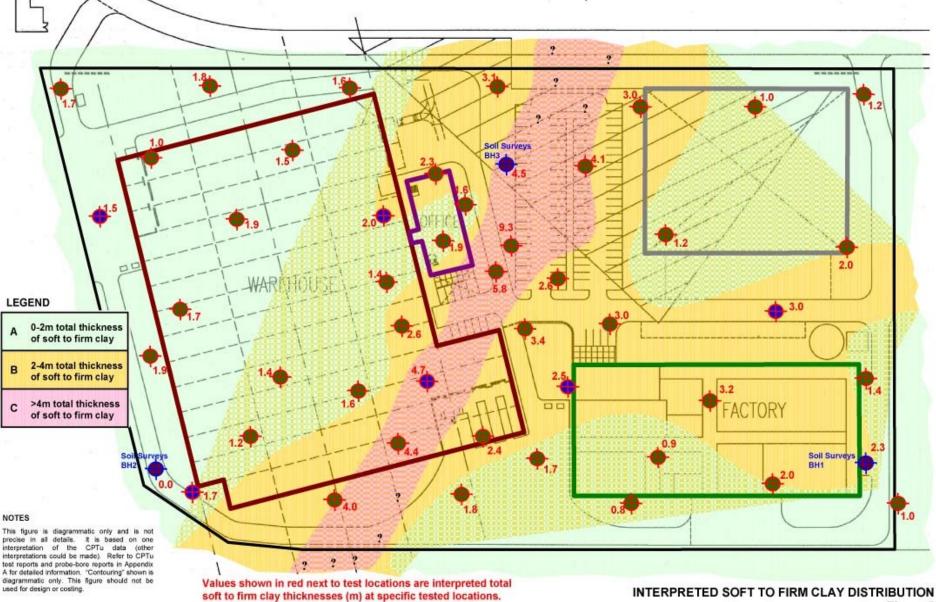


Figure 5

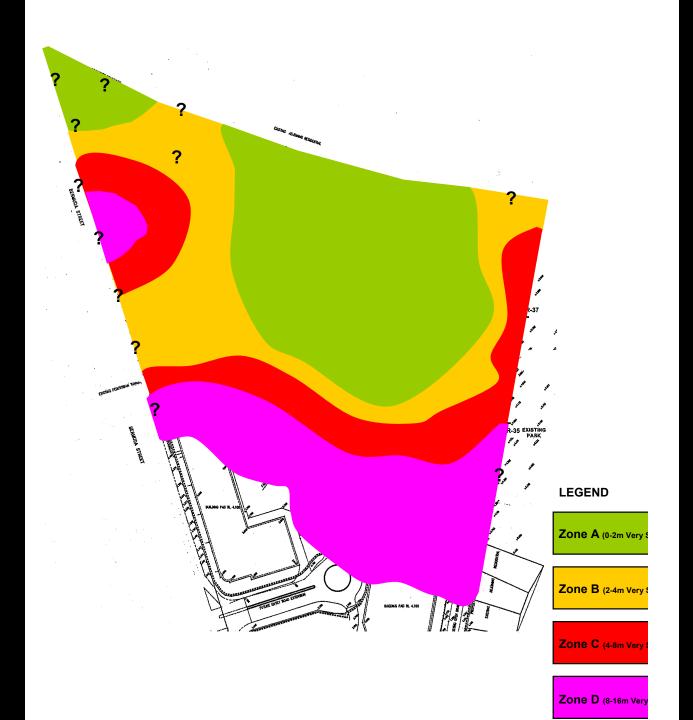


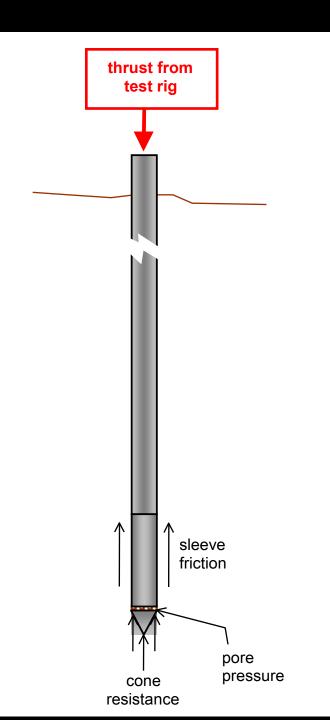












Precise profiling provides

provides

design opportunities



CONE PENETROMETER TEST RESULT

Client: McConnell Consulting

Test No: MC-SC-08

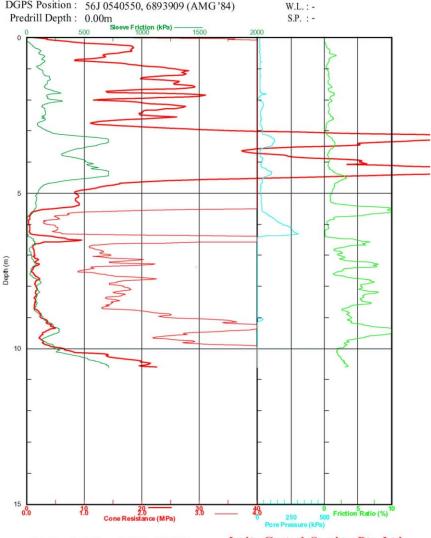
R.L. : -

Project: SOHO II

Location: Varsity Lakes, Robina

DGPS Position: 56J 0540550, 6893909 (AMG '84)

W.L.: -



Tested By: SW & TH Test Date: 06/05/2005 IGS No: 2187 Job No: 0505-04

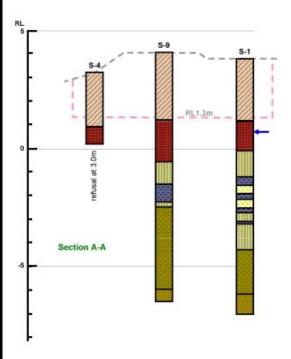
Tested in accordance with AS 1289.6.5.1-1999. Page No: 1 of 1

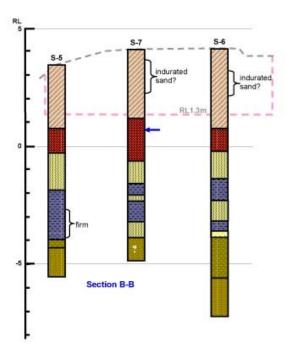
Insitu Geotech Services Pty. Ltd.

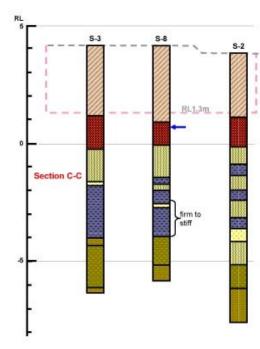
PO Box 2163 Fortitude Valley BC. QLD. 4008.

Approved Signatory: Millian Date: 06/05/2005

Ph: 0407 467 488 E-mail: igs@insitu.com.au Fax: 07 3254 4530 Website: www.insitu.com.au

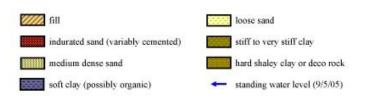


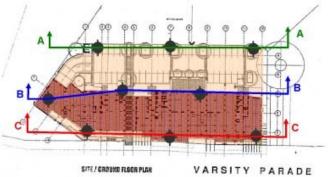




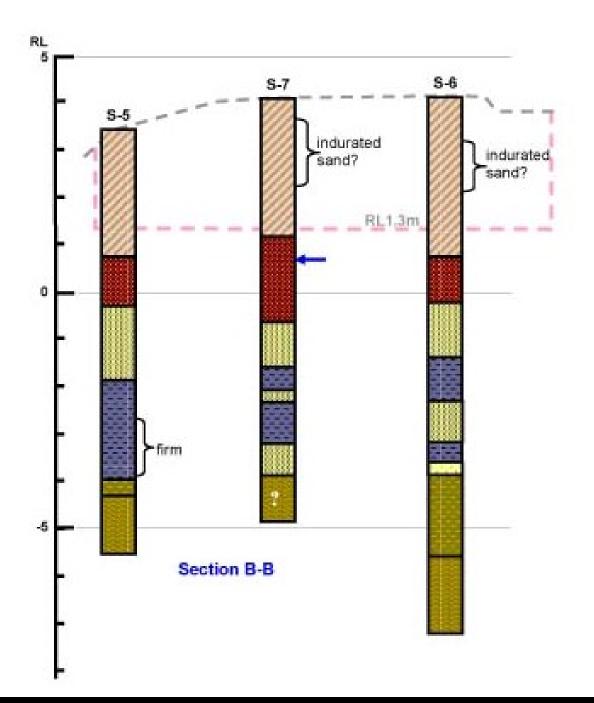
NOTES

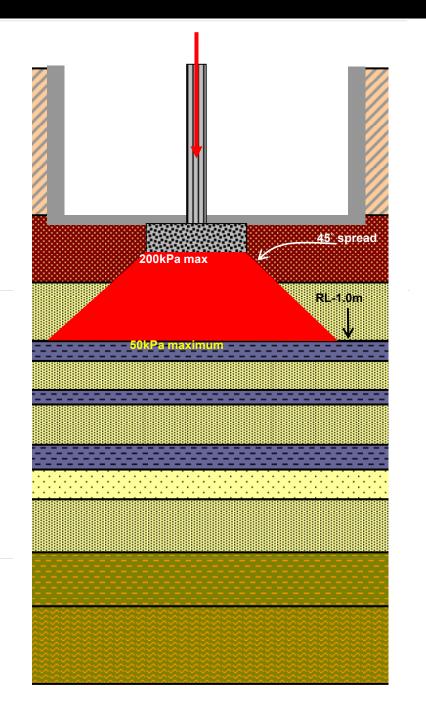
This figure is diagrammatic only and is not precise in all details. It provides one interpretation of the CPTu data (other interpretations could be made). Refer to CPTu test reports and test pits in Appendix A for detailed information. Ground surface profile shown is diagrammatic only. Levels shown are from interpolation from a plan supplied. This figure should not be used for design or costing.



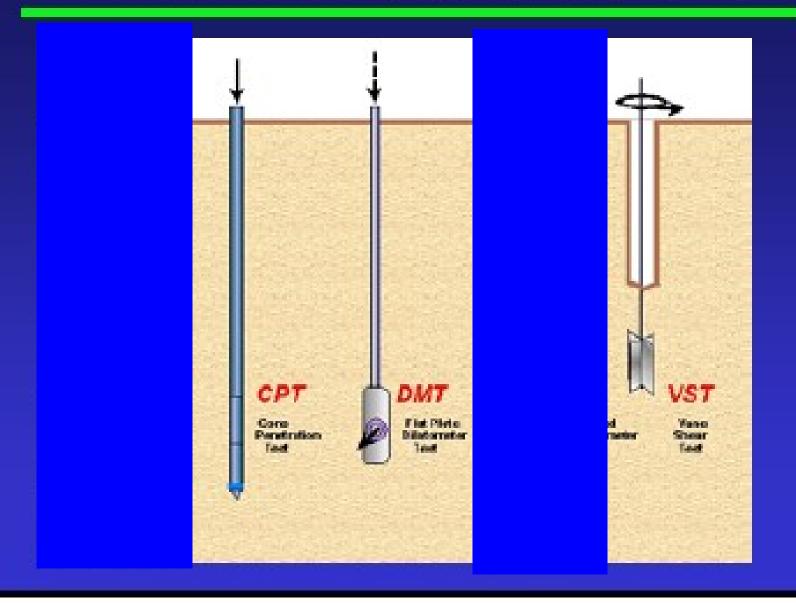


CPTu Interpretations Figure 1

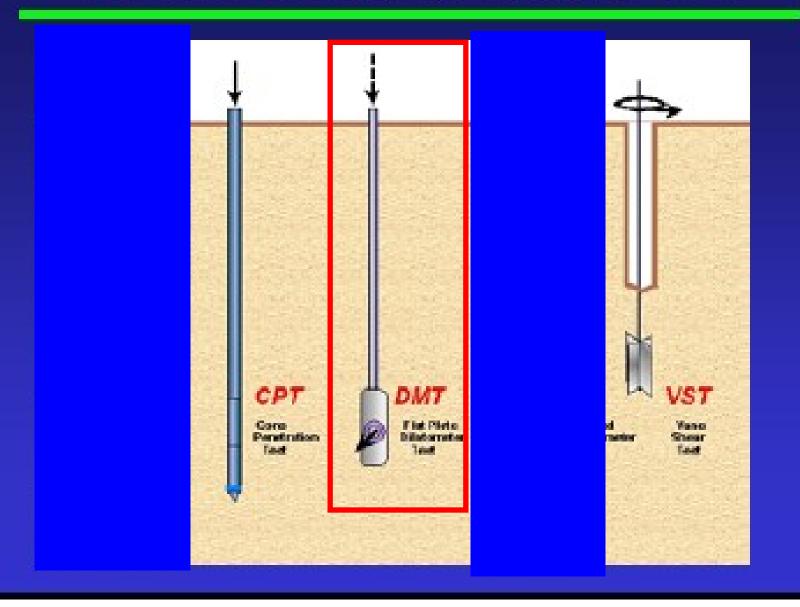




In-Situ Geotechnical Tests for Soils



In-Situ Geotechnical Tests for Soils





SilvanoMarchetti



John Schmertmann

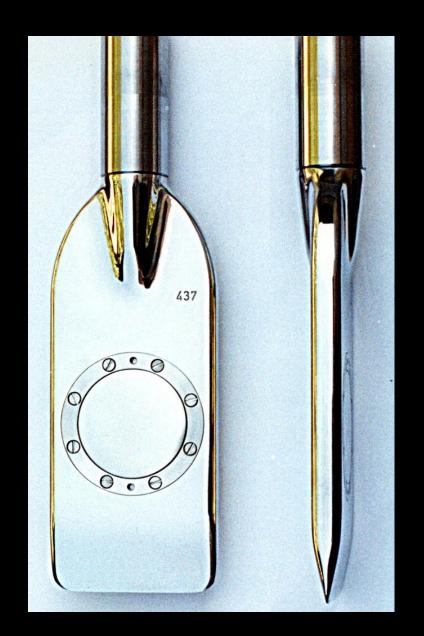
Silvano Marchetti



John Schmertmann

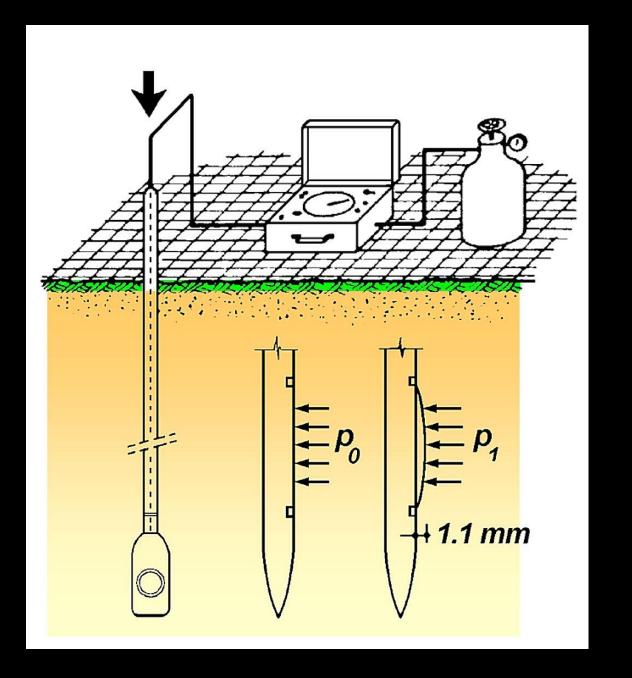
SilvanoMarchetti

-Me

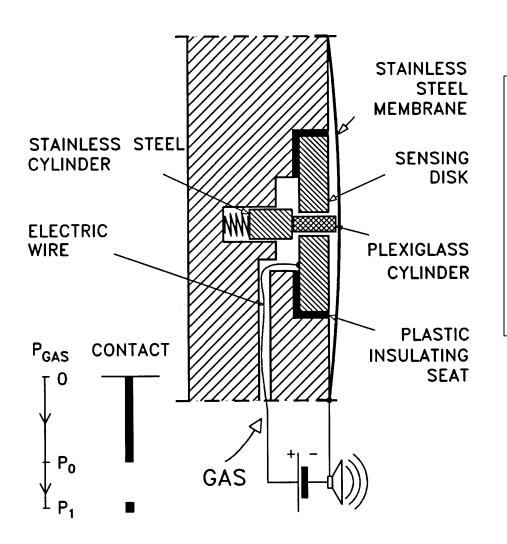




Marchetti's Dilatometer (DMT)



WORKING PRINCIPLE



Only mechanical parts.

Fixed dimens. (\pm 0.01 mm).

Cannot be regulated.

Verify: only pressure (1.10

mm by construction)



Massimo Sacchetto









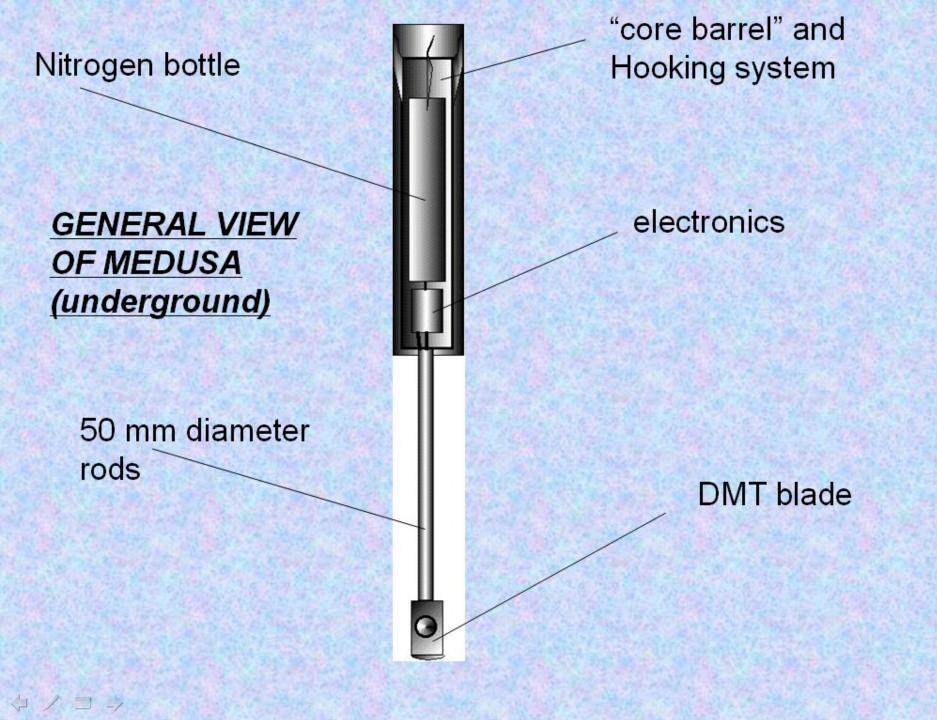
Electro
nic DMT
for
great
depth

Photo # 2

Internal Core barrel



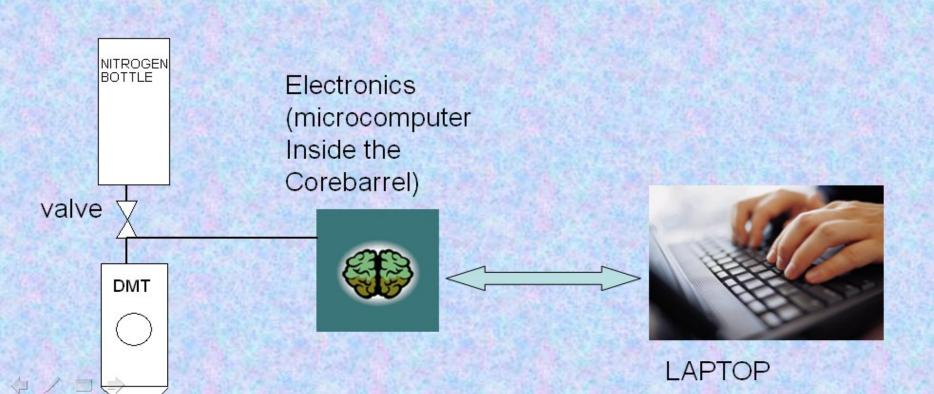
Protruding Rods and DMT



BASIC OPERATIONS

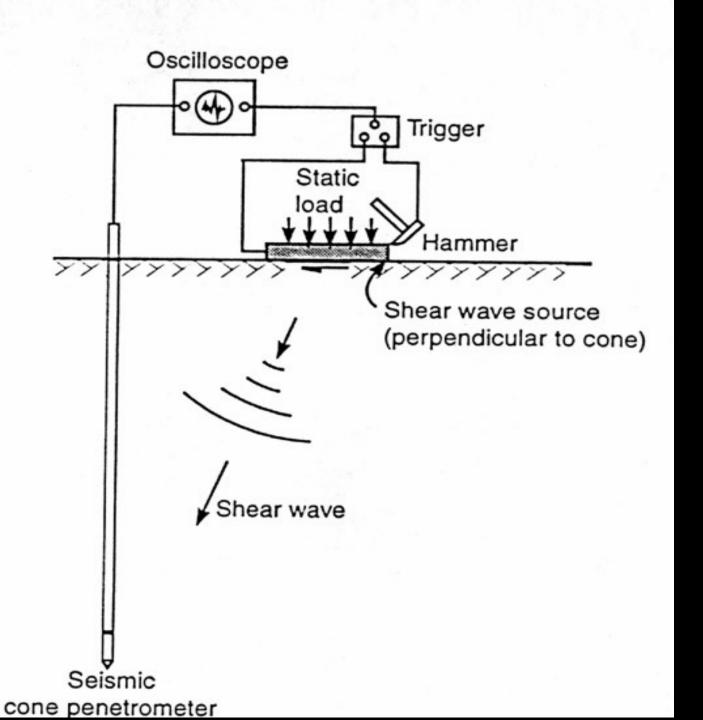
Prior to any pushing it has to be done the SETTING of the Medusa:

- •refilling/controlling the pressure of the nitrogen bottle
- Control the DMT and the membrane
- connecting the electronics to the laptop
- PROGRAM THE TEST



Company & Base	In Situ Tests Offered	Comment
GeoPave, Melbourne	CPT, CPTu, DMT	Division of VicRoads, truck rig
NewSyd, Newcastle (research & contracting)	CPT, CPTu, Seismic CPT, Conductivity Cone	Collaboration between University of Newcastle and Sydney University, truck rig
Insitu Geotech Services (IGS), Brisbane	CPT, CPTu, DMT, Vane Shear (2006), Seismic DMT (2006)	All-terrain balloon tyred testing machine
Cone Penetration Testing Services (CPTS), Brisbane	CPT, CPTu Seismic CPT, Vane Shear	Truck rig and all-terrain track rig

Company & Base	In Situ Tests Offered	Comment
GeoPave, Melbourne	CPT, CPTu, DMT	Division of VicRoads, truck rig
NewSyd, Newcastle (research & contracting)	CPT, CPTu, Seismic CPT, Conductivity Cone	Collaboration between University of Newcastle and Sydney University, truck rig
Insitu Geotech Services (IGS), Brisbane	CPT_CPTu, DMT_Vane Shear (2006), Seismic DMT (2006)	All-terrain balloon tyred testing machine
Cone Penetration Testing Services (CPTS), Brisbane	CPT, CPTu, Seismic CPT, Vane Shear	Truck rig and all-terrain track rig



SEISMIC DILATOMETER

