# IGS News

**Contact IGS**
www.insitu.com.au
0407 INSITU (0407 467 488)
Fax 07 3358 4366

**Contact Allan McConnell**
allan@insitu.com.au
0417 748 669

**Geotechnical Services**
CPT & Piezocone
Dilatometer
Seismic Dilatometer
Vane Shear
Tee-Bar
Eziprobe Sampling
Piezometer Installation
In Situ Permeability

**Field Fleet ("the girls")**

*Esme* – 10-20t all-terrain


*Beryl* – 15t 4 wheel drive


*Eunice* – 20t 6x4 bogey


*Baby Jayne* – 15t portable

## Sydney base evolves into increased NSW work

In our last newsletter we advised that IGS now operates from a Sydney base. We thought this was "big news". It turns out to be the case.

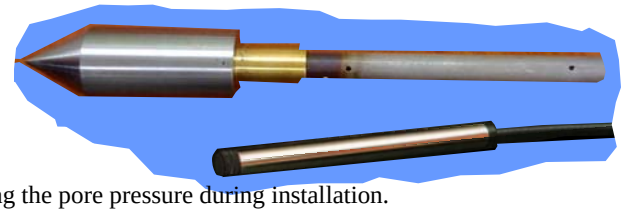
Our work around Sydney and, as importantly, other parts of NSW has increased since we made this move. Obviously, reduced establishment charges and greater availability enhances our service to NSW clients.

## Push-in standpipes and piezometers – Growing in popularity

We are experiencing a growth in client requests for push-in piezometers and standpipes. They are popular.

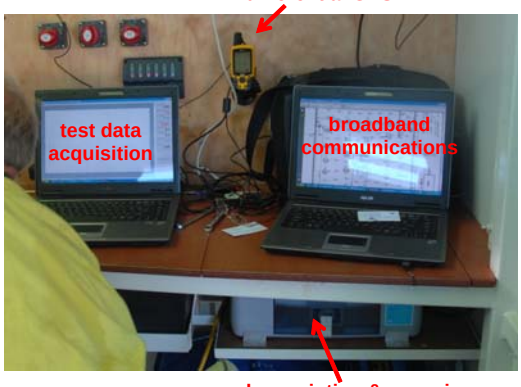
We now offer installation of vibrating wire units and more economical and simpler open standpipe piezometers. Either type can be installed very efficiently using our CPT pusher equipment.

These instruments supplied by Geotechnical Systems Australia



A word of warning: It is possible to overstress VW piezo transducers with excess pore pressure generated during pushing . This is avoided by monitoring the pore pressure during installation.

## Broadband, differential GPS and colour printing on every rig




Each IGS rig has full-time on-board broadband connection independent of its data acquisition system. Also colour printing and differential GPS.

It is standard practice on every job to generate a Google Earth compatible kmz file that holds the GPS data for every test.

Double click on the sample file attached to the email with this newsletter for a demonstration of the worth of this, to you.

## IGS protocol for "test type" for CPT testing (copy attached)

IGS has a large number of different CPT cones and several CPT types, ranging from our simplest and most robust 100MPa non-piezo 15sqcm subtraction cones to our super-sensitive 10MPa piezo-cones that have extremely high resolution and accuracy.

And each client on each project has their own ideas of "what they want from the testing". Maybe this even changes test-to-test on a particular job.

To help communicate about this and to ensure satisfaction of client expectations we have developed a test-type protocol, describing options and assigning a simple, easy to use test type numbering system so a client can choose to suit their needs and budget.

*reducing geotechnical uncertainty*

Edition 09-06

## EXPLANATION OF CPT TEST TYPES TABULATED BELOW

13 April 2009

At IGS we define "quality service" as being satisfactory implementation of the class or type of test required by the client, to suit their particular needs. Note that**:**

- It is certainly not high quality to fail to meet any particular client's technical expectations.
- Equally though, neither is it high quality to provide a class or type of test that any particular client neither needs nor wants for their particular application. Particularly, for instance, if that class or type of test takes longer (and thus costs more) than a test that would otherwise have fully suited the client's needs.

As we offer a range of different CPT test types, all of "high quality" for their particular application, it is convenient to tabulate these and define a system of test designation (ie test-type-name) to assist in communicating with clients and helping them direct IGS as succinctly as possible in regard to their needs.

There is no international or Australian standard to guide us in preparing this classification system so we have prepared our own hierarchy of test types and unambiguously designated these Types IGS-1, IGS-2, IGS-3 and IGS-S and IGS-R as tabulated below. The classification system has evolved from our own experience with our own clients and is a reflection of our own current opinions. We would appreciate any feedback from any client and advise that the classification system might evolve with time and with hoped-for constructive client feedback.

## NORMAL CLASS TESTING

| Type | Brief Description (and client role) | Typical Application | Methods Typically Employed by IGS Operator |
|---|---|---|---|
| **IGS-1** | **Standard Piezocone Testing**<br>Client must (pre-testing) brief IGS on their choice of this type. Little or no client involvement is required during testing progress.<br>Objective is good quality data, including good pore pressure response. However, if pore pressure response problems evolve in any "difficult" test zone, time is not squandered trying to solve them.<br>Typically a client is hoping for reasonably high productivity using this method. | For use when clients want a reliable soil profile and to establish design parameters to historically-normal levels of client expectation.<br>May be the base test type chosen for a known soft clayey soil project for overall site profiling.<br>Good quality pore pressure response is usually achieved and "normal" dissipation tests can be made. | Usually 100MPa, 10cm$^2$ compression cone is used.<br>Cone is carefully prepped and pore pressure measurements are made as test progresses.<br>If soil behaviour spoils piezo response in some zones, test penetration is paused briefly to permit "catch up".<br>Should difficult soil layers be encountered (eg gravely bands or hard fissured layers causing tilt), test may need to be immediately discontinued – at discretion of IGS operator. |
| **IGS-2** | **Subtraction Piezo-Cone Testing**<br>Client must (pre-testing) brief IGS on their choice of this test type. Little or no client involvement is required during testing progress.<br>Objective is good quality data, including good pore pressure response. However, if pore pressure response problems evolve in any "difficult" test zone, time is not squandered trying to solve them.<br>Typically a client is hoping for high productivity using this method, even in some difficult-to-penetrate soils (eg bands of dense sands, hard fissured clays, etc) | For use when clients want a reliable soil profile and to establish design parameters at "site characterisation" level.<br>May be the base test type chosen for a variable or unknown soil type for overall site profiling.<br>Good quality pore pressure response is usually achieved and "normal" dissipation tests can be made. | Usually 100MPa, 15cm$^2$ subtraction cone is used.<br>Cone is carefully prepped and pore pressure measurements are made as test progresses.<br>If soil behaviour spoils piezo response in some zones, test penetration is continued.<br>Should difficult soil layers be encountered (eg gravely bands or hard fissured layers causing tilt), test can typically be carefully continued – at discretion of IGS operator. |
| **IGS-3** | **Subtraction Non-Piezo-Cone Testing**<br>Client must (pre-testing) brief IGS on their choice of this type. Little or no client involvement is required during testing progress.<br>As cone does not have a piezo-element, cone preparation is much simpler and quicker – leads to higher project productivity.<br>Can be used even in some difficult-to-penetrate soils (eg dense sands, hard fissured clays, etc). | For use when clients want a reliable soil profile and to establish design parameters at "site characterisation" level. But pore pressure response is not required.<br>May be the base test type chosen for a variable or unknown soil type for overall site profiling. IGS recommends this if budget control is critical and site characterisation is the objective. | Usually 100MPa, 15cm$^2$ subtraction cone is used.<br>Should difficult soil layers be encountered (eg gravely bands or hard fissured layers causing tilt), test can typically be carefully continued – at discretion of IGS operator. |

## SPECIAL CLASS TESTING

| Type | Brief Description (and client role) | Typical Application | Methods Typically Employed by IGS Operator |
|---|---|---|---|
| **IGS-S** | **Special-Class Testing.**<br>Client must advise IGS of their expectations, as test productivity may sometimes be reduced using this method.<br>Objective is best possible pore pressure response in "difficult" ground, but still maintaining reasonably high productivity.<br>Client might intervene during progress to shift test type to IGS-R, accepting lower test productivity that results in this shift. | Typically used at targeted locations after site characterisation by IGS-1, IGS-2 or IGS-3 testing.<br>Client wishes to obtain inputs into determination of soil parameters to a "specially" high level.<br>Typical objectives may be assessment of soil properties for design of embankments or preloads over soft to firm and stiffer clay-type foundation soils. Dissipation tests should be achieved to a high standard. | Cone capacity is selected to suit the ground being targeted (eg 100MPa or 10MPa cone choice is made). 10cm$^2$ compression cone is used.<br>Pore pressure measurements are closely watched as test progresses. If soil behaviour spoils piezo response in any zones, test penetration is stopped while response monitoring continues.<br>If piezo "recovers" in (say) 10-15 minutes test penetration is re-started. If piezo does not "recover" in (say) 10-15 minutes, test penetration might also be started but client accepts consequences of possible zones of reduced pore pressure response. (Note that client can up-grade to IGS-R if desired). |
| **IGS-R** | **Quasi-Research Class Testing**.<br>Client must be closely engaged in decision process as in extreme conditions test productivity may be quite low using this method.<br>Objective is best possible pore pressure response in "difficult" ground, more-or-less regardless of productivity. | Typically used at targeted locations after site characterisation by IGS-1, IGS-2 or IGS-3 testing.<br>Client wishes to obtain inputs into determination of soil parameters to the highest practically achievable level.<br>Typical objectives may be assessment of preconsolidation pressure of very soft clays, or assessment of preload progress based on qc or qt parameters. Dissipation tests should be achieved to best possible standard. | Cone capacity is selected to suit the ground being targeted (eg 100MPa or 10MPa cone choice is made). 10cm$^2$ compression cone is used.<br>Pore pressure measurements are closely watched as test progresses. If soil behaviour spoils piezo response in any zones, test penetration is stopped while response monitoring continues.<br>If piezo "recovers", test penetration is re-started. If piezo does not "recover", cone may be pulled out, hole may be water-filled and test may be recommenced with a re-prepped cone. |