a discussion

IGS Technical Note

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 & SCPT

Dilatometer & SDMT

Seismic Dilatometer

Vane Shear

Tee-Bar

Push-Sampling

Piezometer Installation

In Situ Permeability

Some of the Field Fleet

Esme – 10-20t all-terrain

Beryl – 15t 4 wheel drive

Eunice – 20t 6x4 bogey

Baby Jayne – 15t portable

Minnie - Mini-Jack-Up

A Reminder re CPT Calibration and Quality

In a 2014 Technical Note I explained that IGS offers a number of CPT Types:

- 10cm^2 compression cones - both piezo & non-piezo - 100MPa, 25MPa & 10MPa
- 15cm^2 compression cones - piezo - 100MPa including seismic & conductivity modules
- 15cm^2 subtraction cones - both piezo & non-piezo - 100MPa

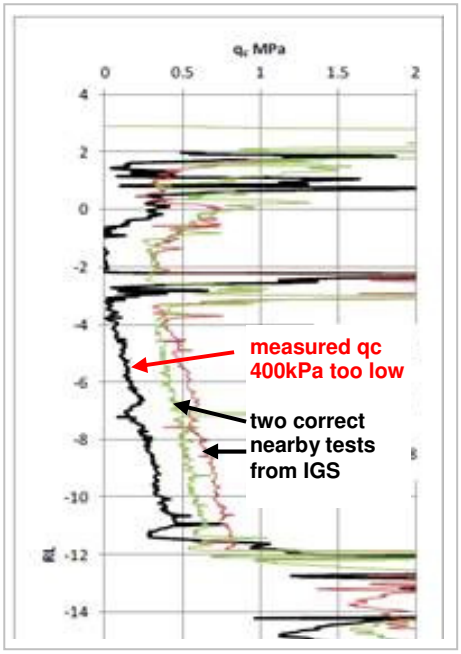
All of these are of high quality from reputable manufacturers (Geomil and Vertek).

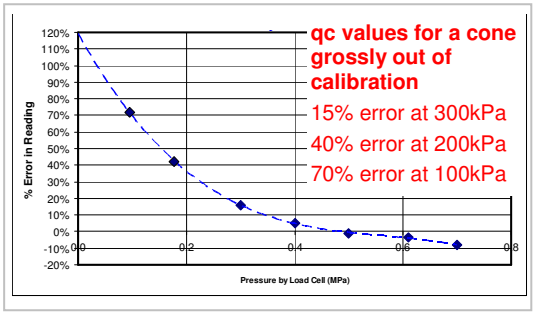
Every IGS cone is regularly and routinely in-house calibrated and adjusted by IGS to give the best possible data for our clients' intended purposes. A typical calibration is attached.

Note the remarkable accuracy achieved in the low ranges - eg 0-1MPa and 0-10MPa. This is targeted by our in-house calibrating, and exceeds the highest standard specified by ISO 22476-1:2012 - ie "Application Class 1" - meaning the data can be used for design in soft to stiff soils.

CPTs are beautifully constructed devices full of sensitive and potentially very accurate strain gauges. Then we (and others) shove them into the ground where they are subjected to vertical and lateral forces and, unseen, are banged around quite a lot - like it or not. That's why at IGS we calibrate and maintain them so rigorously; a costly but necessary process.

The untitled pics below are data from cones that have not been loved in this way; one pic shows the percentage error of one cone in the lower ranges; the other shows a terribly wrong CPT test plot (just qc) compared to two that are correct. In neither case are the wonky cones from IGS, but we might expect such performance if we did not look after our gear and calibrate it and adjust it so frequently.





In both of these cases the very poor data led to serious project problems. Both of them were only "picked up" by aggressive inquiry by clients who cared; both problems were denied by testers.

In both cases project delays occurred - and many many many $$$$ would have been wasted if they had not been picked up. They were both re-tested and found to be wrong.

watch out for snake oil salesmen and others bearing goods that might not meet your expectations

reducing geotechnical uncertainty

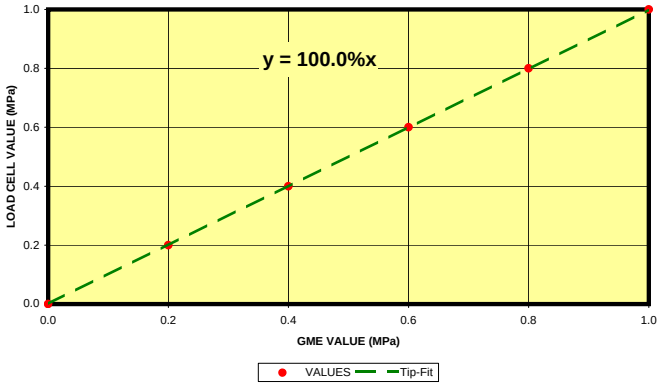
100MPa Compression Piezocone Calibration Report

This cone has been re-calibrated. Use appropriately-dated calibration file

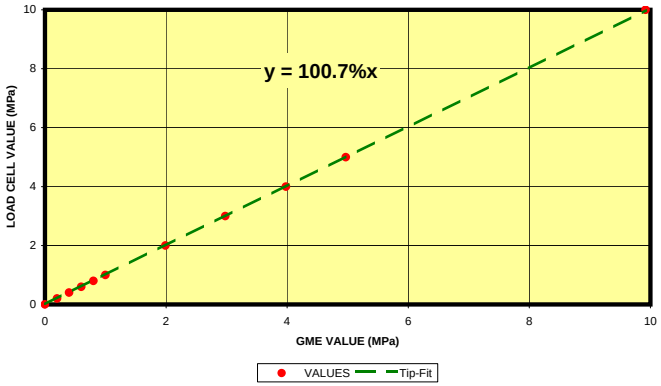
No: C10CFIIP.E29

Tip Details Area (sq cm) 10 Capacity (MPa) 100 Cal Date 17/11/2015

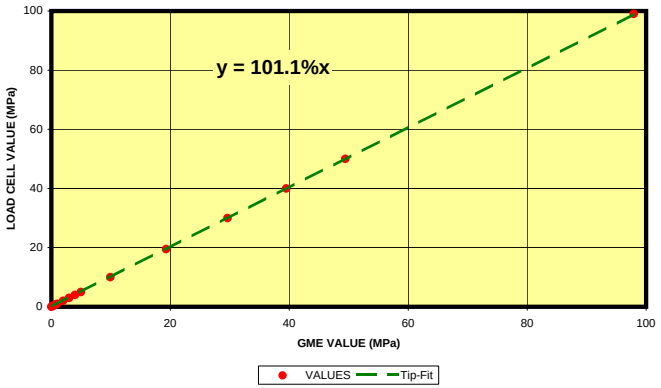
Zero to 1.0MPa (bottom 1% of range)



Zero to 10MPa (10% of range)

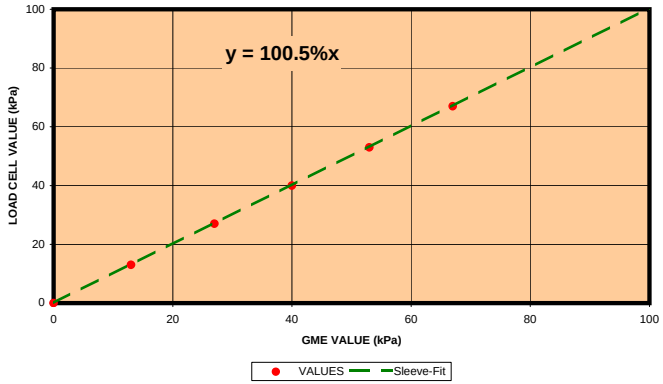


Zero to 100MPa (100% of range)

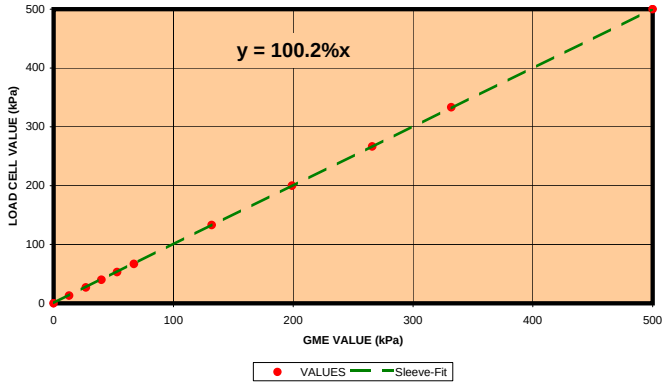


Sleeve Details Area (sq cm) 150 Capacity (kPa) 1500 Cal Date 17/11/2015

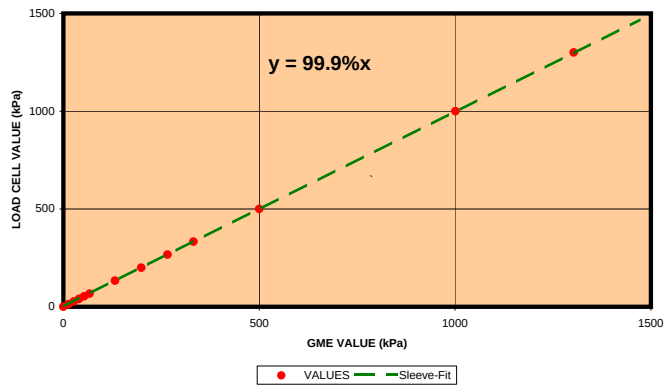
Zero to 100kPa



Zero to 500kPa

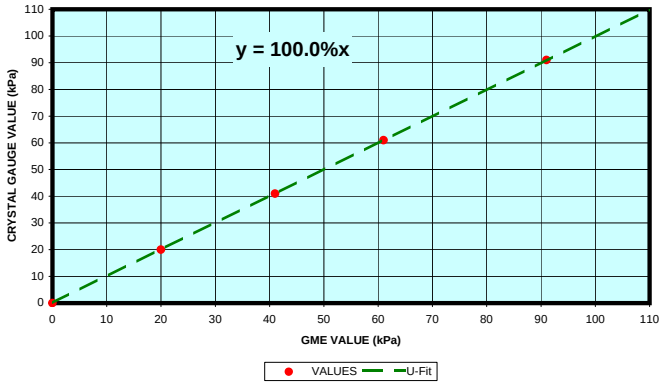


Zero to 1500Pa (extrapolated past 1333kPa)

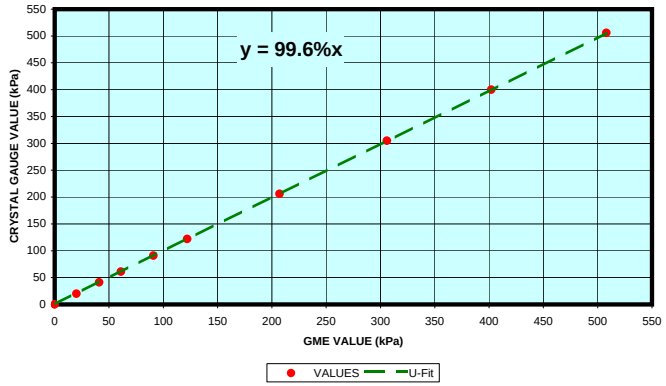


Piezo Details Capacity (kPa) 5000 Cal Date 17/11/2015

Zero to 100kPa



Zero to 500kPa



Zero to 3500kPa (Red Y = Net Area Factor - NAF)