



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



Minnie - Mini-Jack-Up



An Update On CPT Types Available at IGS

IGS offers a number of different CPT Types:

- 10cm² compression cones - both piezo & non-piezo - 100MPa, 25MPa & 10MPa
- 15cm² compression cones - piezo - 100MPa including seismic & conductivity modules
- 15cm² subtraction cones - both piezo & non-piezo - 100MPa

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

Every cone is in-house calibrated and adjusted by IGS to give the best possible data.

A Discussion Worth Having

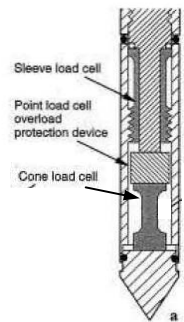
There is a perception (a myth??) that subtraction cones (hereinafter S-Type) are inferior in quality compared to compression cones (hereinafter C-Type).

At IGS we say “that all depends on how you define quality”. One useful definition is that “quality means satisfying or exceeding the client’s needs”. What do you need?

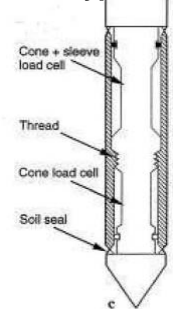
The table below forms a conversation about the characteristics of C-Type vs S-Type, based on IGS’s experience with calibrating and operating both types over more than a decade, for various clients and projects, with many differing needs to be satisfied or exceeded.

- Both C-Type and S-Type can be piezo or non-piezo. If piezos the piezometer elements are the same in each - there is no difference in the accuracy of pore pressure readings made by either cone type.
- Each cone type has a load cell 100% focused on measurement of tip resistance - there is no difference in the accuracy of tip readings made by either C-Type or S-Type cones.
- In a C-Type cone the sleeve load cell is sized to suit the sleeve load capacity of the cone. This must arguably make it at least potentially more sensitive than determination of sleeve resistance by an S-Type cone; a small load cell is used to measure a small load. However it also limits the sleeve capacity available and in hard and dense soils this can “refuse” a test long before tip capacity is reached.
- In an S-Type cone the sleeve friction is determined by subtracting the reading of one large load cell from that of another large load cell. This must arguably make it at least potentially less sensitive than determination of sleeve resistance by a C-Type cone. However in an S-Type cone there is effectively no limit to the sleeve capacity and thus in hard and dense soils deeper tests are typically possible.
- There is no doubt that an S-Type cone is more stable during a test and during a job, showing less “drift” and less need for adjustment or repair during the calibration process. It is also much stronger and more durable physically and hence less damage/drift prone.

C-Type



S-Type



Comparison of Calibrations

The attached two sheets are typical run-of-the-mill calibrations from IGS’s calibration and adjustment lab; one for an S-Type cone and one for a C-Type cone. There is no practical difference between these two calibrations - in fact the sleeve of this particular S-Type cone is a trace better than that of the C-Type cone. Both are excellent.

The bottom line: IGS can make S-Type tests at lower cost than C-Type, due to the S-Type’s robustness. IGS’s future pricing will reflect this difference. As always it will be your choice - we will test as you like to the highest quality possible - using always fresh calibrated cones, of your chosen type.

reducing geotechnical uncertainty

100MPa Compression Piezocone Calibration Report

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

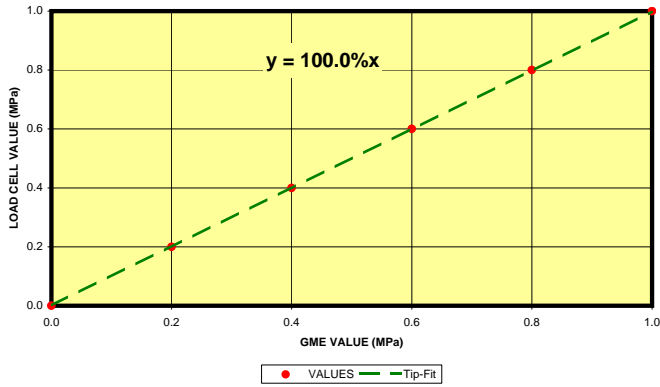
No: C10CFIIP.C11036

Tip Details Area (sq cm) 10 Capacity (MPa) 100 Cal Date 28/10/2014

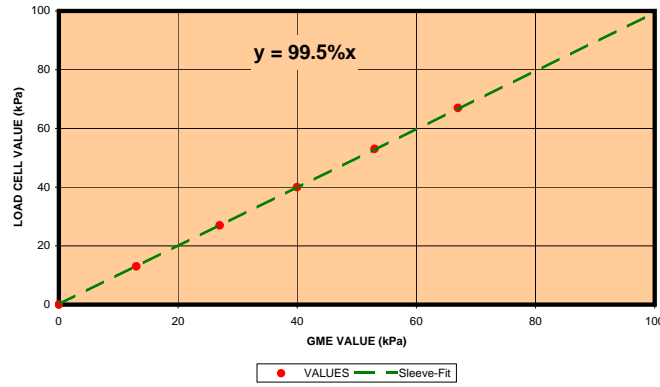
Sleeve Details Area (sq cm) 150 Capacity (kPa) 1500 Cal Date 28/10/2014

Piezo Details Capacity (kPa) 5000 Cal Date 28/10/2014

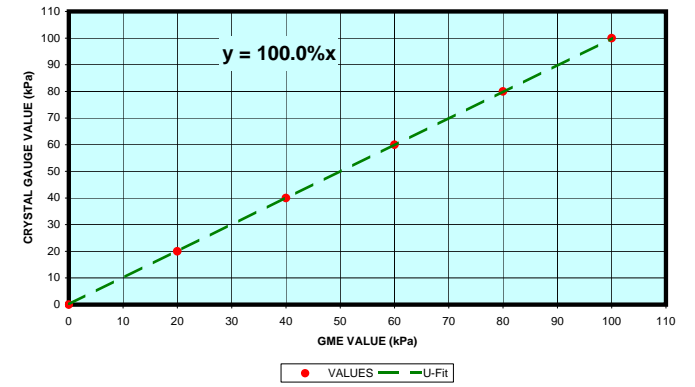
Zero to 1.0MPa (bottom 1% of range)



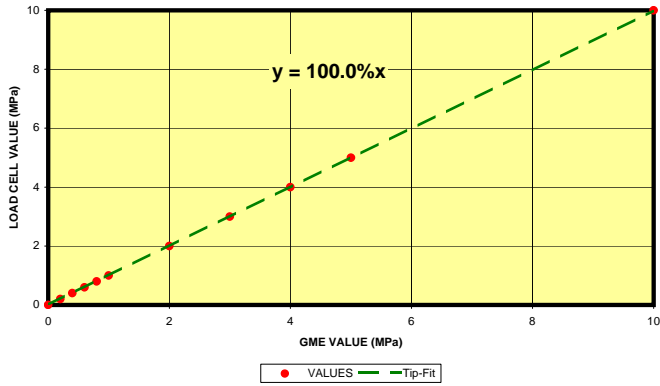
Zero to 100kPa



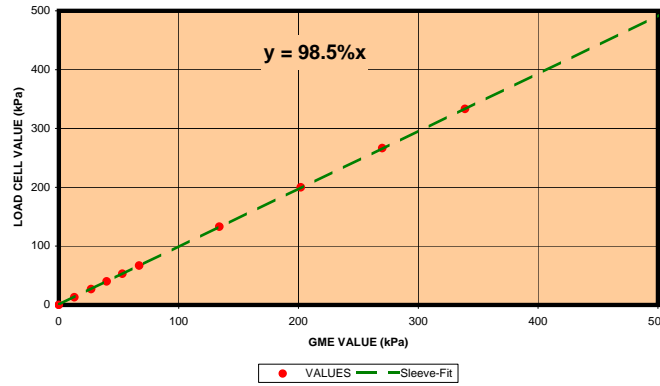
Zero to 100kPa



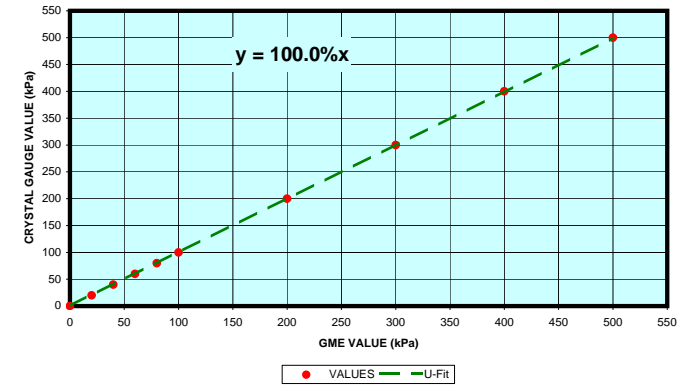
Zero to 10MPa (10% of range)



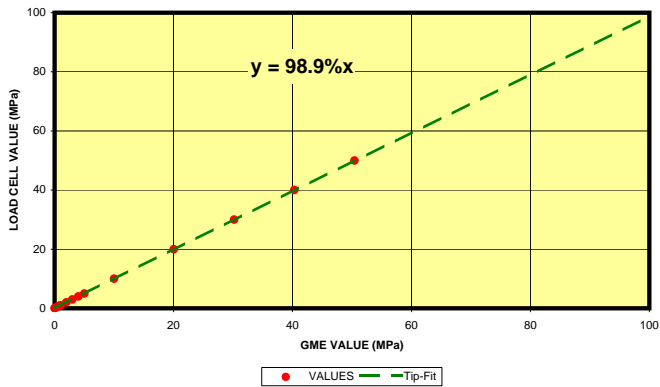
Zero to 500kPa



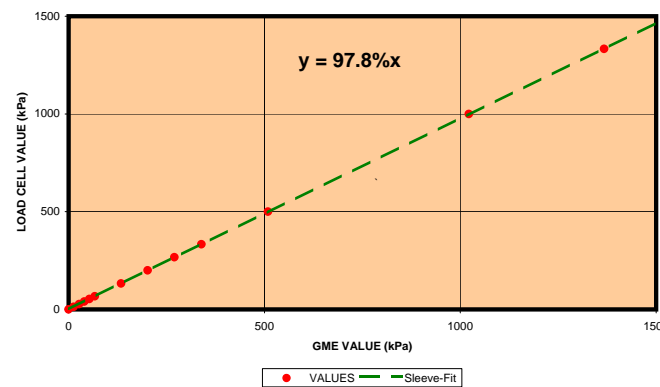
Zero to 500kPa



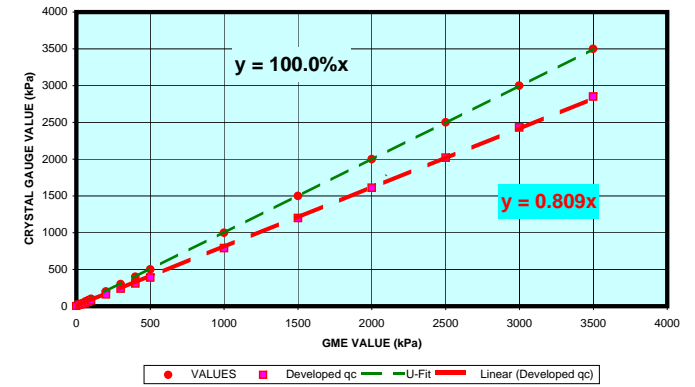
Zero to 100MPa (100% of range)



Zero to 1500Pa (extrapolated past 1333kPa)



Zero to 3500kPa (Red Y = Naf)



100MPa Subtraction Piezocone Calibration Report

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

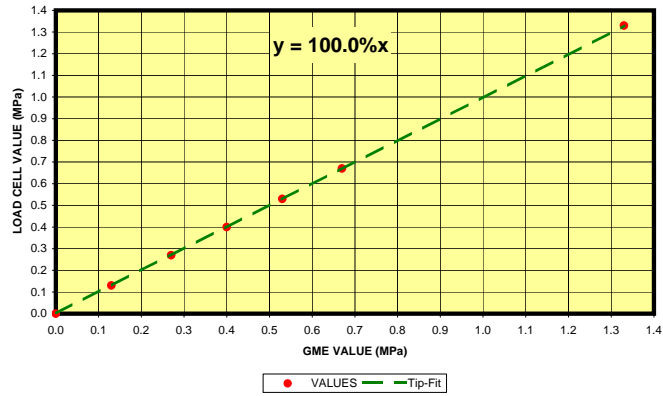
No: S11103

Tip Details Area (sq cm) 15 Capacity (MPa) 100 Cal Date 7/11/2014

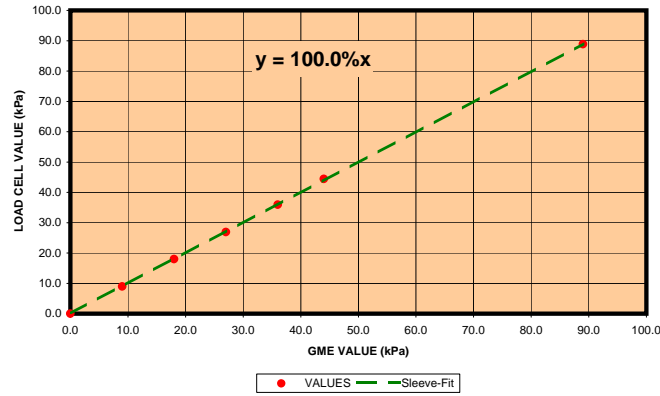
Sleeve Details Area (sq cm) 225 Capacity (kPa) 6667 Cal Date 7/11/2014

Piezo Details Capacity (kPa) 5000 7/11/2014

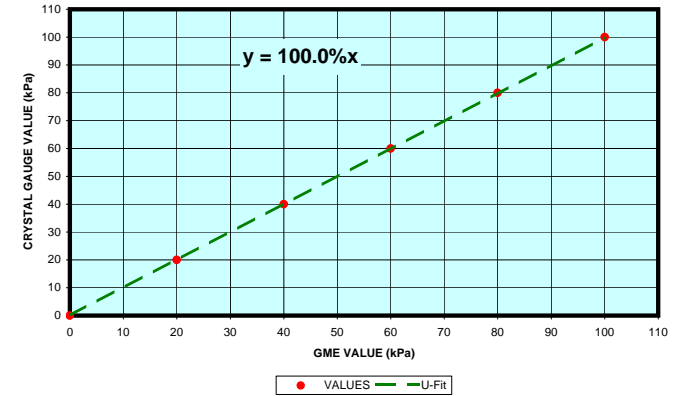
Zero to 1.33MPa (bottom 1.3% of range)



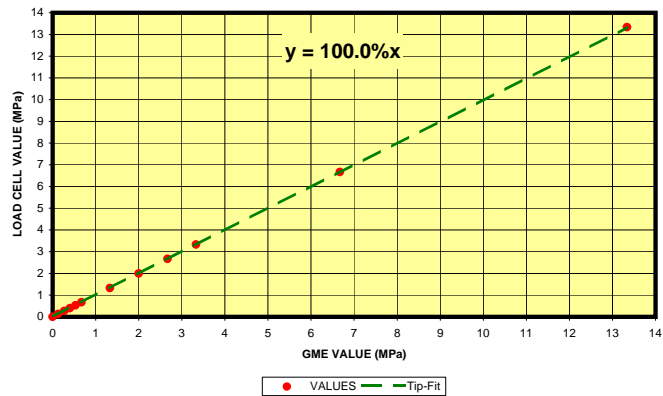
Zero to 89kPa (bottom 1.3% of range)



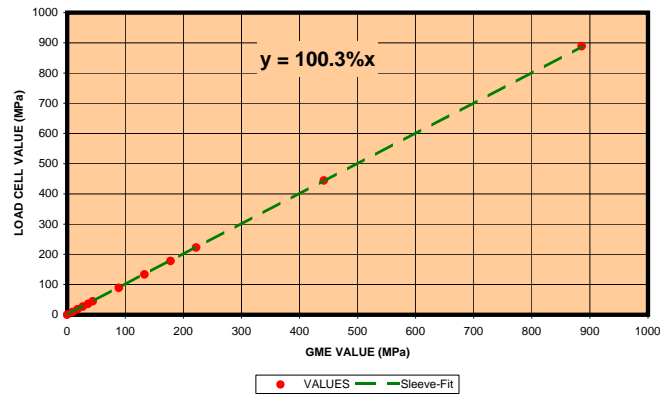
Zero to 100kPa



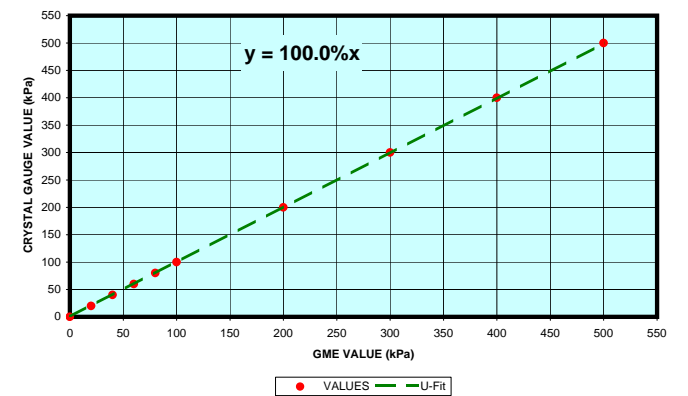
Zero to 13.33MPa (13% of range)



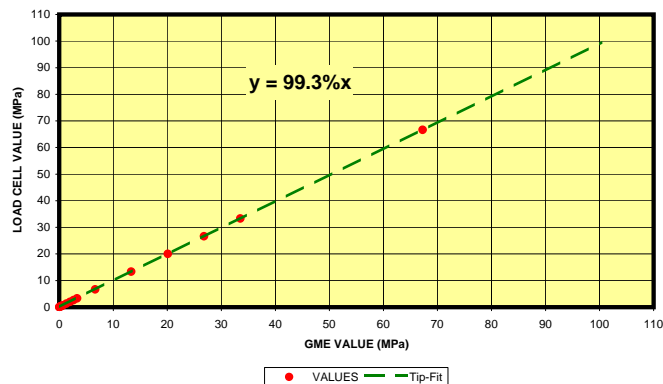
Zero to 889kPa (13% of range)



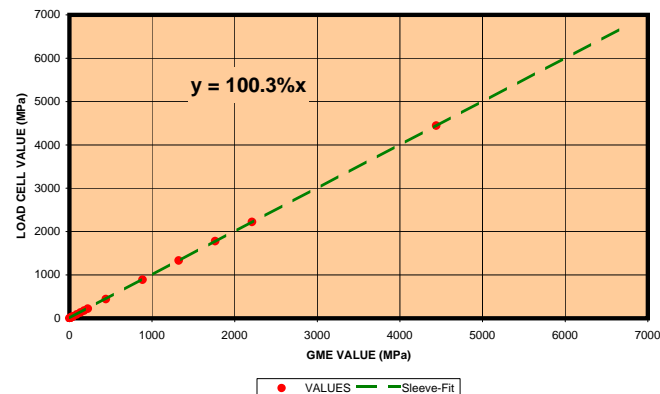
Zero to 500kPa



Zero to 100MPa (100% of range) - extrapolated beyond 67MPa



Zero to 6667kPa (100% of range) - extrapolated beyond 4444kPa



Zero to 5000kPa - extrapolated beyond 3500kPa

