another discussion

IGS Technical Note

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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 Vane Shear Testing by IGS

IGS undertakes vane shear testing by direct-push methods - two systems:

- We have two more-or-less conventional, though sophisticated, gadgets from Geomil in Holland, where the vane is rotated via rods encased in a protective casing to "minimise" rod friction. Torque is measured by a load cell built into the rotation motor at the top of the rod and casing system. The whole process is driven by a PLC thingo to control rotation speed precisely. Torque vs rotation angle are auto-logged on a computer. Rod friction (torque) is measured by a 12º slip joint so that it can be deducted from total torque - this is the "classic" system that all geotechnical engineers are familiar with.
- We also have one new state-of-the-art gadget from A P Vandenberg in Holland, where the rotation motor and torque measurement gizmo is at the bottom of the rod string, just above the vane. This eliminates the need for a slip joint or any other form of rod friction correction. There is no rod friction involved; it's great; it's nice to use; it's very accurate.

Each has a "best application" in the field; it all depends on the site conditions.

IGS undertakes our own in-house vane calibrations

We don't know any others who do this. We think it's "interesting" that many geo-people habitually use un-calibrated vane testing systems to "correlate" CPT test data.

What do standards dictate?

AS and ASTM say: rotate to beyond peak strength; then rotate rapidly several times; then continue at a slow speed until a "uniform" residual is reached.

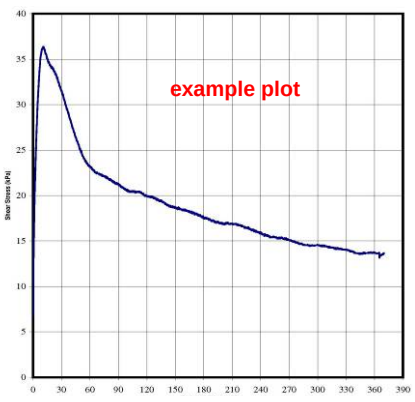
At IGS we have seen hundreds, maybe thousands, of vane tests. We observe very often that if the standards are followed, weird residual strength behaviour evolves. Values typically rise after the fast rotations then bounce or jag up & down; seldom is a nice "uniform" residual achieved.

Others may differ, but we think it's the speed changes.

Others may differ again, but we think the only reason for the rapid rotations is to try/perceive to save time and hence $.

What do we at IGS suggest?

We have made many recent tests by simply continuing the vane rotations at a single constant slow speed until a nice steady "uniform" residual is reached.



This seems to work very much better than following the standards. The data makes sense - a peak is passed - a residual is achieved.

And frankly it really doesn't take any more time overall. It normally takes about 360º of total rotation to achieve this or to asymptote to it.

As our client, it's your choice of course, every time, but our experience indicates that the above is a better way to make a vane shear test.

IGS will make this our default method unless instructed otherwise by our client.

reducing geotechnical uncertainty