It is generally acknowledged that experienced drillers can provide information on the nature of the ground being penetrated from the behaviour of the rotary rig as a hole is drilled.

**CONTINUOUS PROFILE OF STRATA PROPERTIES**

- Real time data capture
- Rapid, accurate and reliable information
- Provision of a more complete data set
- Fast and cost-effective

**DRILLING PARAMETER RECORDING**

Soil Engineering has equipped its fleet of rotary rigs with the latest version of drilling parameter recording (DPR) equipment. The rigs are equipped with data loggers to record five drilling parameters:

- Thrust
- Torque
- Flush pressure
- Rotation speed
- Drilling rate (i.e. rate of penetration)

DPR boreholes are typically formed using destructive drilling methods, using either drag or tricone (rock roller) bits, or even down-the-hole hammers (including simultaneous casing systems), depending on the sub-surface conditions and the purpose of the investigation. The flush can be water, mud or air/air mist. DPR can also be used when rotary coring to supplement the information obtained using either conventional or wireline equipment.

When used with rotary coring DPR can provide very useful supplementary information in strata where core recovery can be poor, such as very weak or fractured rocks, or in alternating strong and weak strata where the latter can be “scrubbed away”.

**APPLICATIONS**

Continuous profile of strata properties to provide a more complete data set

- Used with rotary drilling
- Open hole with rock roller or drag bit
- Down-the-hole hammer
- Simultaneous casing systems
- Core drilling
- Vertical and inclined holes
- Real time display
- Multiple parameters
- Graphical presentation and AGS4 data
- Data transfer to PC via USB or directly from rig as email
- Determine drilling indices
- Fast and cost-effective

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During drilling data is instantaneously displayed on the screen of the data logger. The data is stored on the logger’s internal memory and is downloaded when required. Information can be sent directly from the field to any e-mail address by electronic transfer.

**APPLICATIONS INCLUDE**

- Establishing the depth to top of competent rock overlain by weathered and/or highly fractured strata, e.g. for piling purposes
- Proving the thickness of a particular rock type across an area, or below a structure. Useful when piling into rock containing weaker strata, or where piles have to be formed into a specific layer
- Establishing soil/rock profiles below large structures such as storage tanks or water treatment structures
- Establishing soil/rock profiles along pipeline or tunnel routes. Particularly useful in establishing the displacement of strata due to faulting
- Accurately delineating the top and base of sand bands or channels, cemented zones, flint bands or layers containing coarse gravel
- Providing accurate, rapid and reliable information on grouting projects, such as helping to delineate areas where grouting is, or is not, required
- Can be used to establish the effectiveness of grouting by comparing pre and post grouting DPR records
- Defining cavities, both natural and man made, and zones of collapsed ground
- Can be used for ground stabilisation/grout validation
- Very useful for obtaining high quality ground information in high risk, position critical and time limited scenarios such as live rail, tidal and extreme climate environments

By equipping a rig with sensors and a data logger the behaviour of the rotary rig can be used to produce in real time a continuous profile of the nature of the soils and rocks being penetrated.