



## Becker Drill Instrumentation

The Becker Penetration Test (BPT, or Becker Drill Test) is used in geotechnical investigations for coarse grained soils that are too hard for SPT testing. The test is particularly useful when liquefaction is a concern in earthquake-prone areas. A diesel hammer drives a double walled pipe into the ground. As in the SPT test, the number of blows required to drive the last 300 mm is recorded. This number is correlated to SPT blow counts to assess soil strength.

### Why Instrument the Becker Penetration Test?

The energy output of the Becker drill diesel hammer varies with the air-fuel mixture, temperature and pressure, with the soil resistance and with other parameters. In order to account for this variability, the hammer energy must be measured. The most reliable way to determine the energy is by force and acceleration measurement. For an accurate assessment of soil strength with the Becker test it is also important to know how much of the resistance occurs at the pile toe. Only by understanding the transferred energy and knowing the end bearing component can the BPT blow count be reliably used in a correlation with SPT values.

### How Does GRL Instrument the Becker Test?

GRL Engineers use a Pile Driving Analyzer® (PDA) to measure the energy transferred into a Becker casing instrumented with strain transducers and accelerometers. The resistance distribution and end bearing component are obtained by performing CAPWAP® analyses on the signals collected with the PDA. GRL Engineers have been successfully measuring the energies and assessing the resistance distribution of Becker Drills for several years, in dozens of job sites around the country, sometimes in conjunction with optional static load tests.

### Benefits of Beck Drill Instrumentation:

- Measures energy in geotechnical environments that are too hard for SPT testing
- Can be used to assess soil strength when the end bearing component of resistance is known



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