

Downhole Seismic Velocity Testing

Drillhole Specification Sheet



RDCL can test downhole shear and compressional wave seismic velocity by lowering a Geostuff BGH-3 geophone tool down the hole and testing at regular intervals. For each test the tool is locked against the wall of the hole and shear beams positioned nearby are struck at each end with a sledgehammer. The tool then records the time taken for seismic waves to travel from the surface to the geophone.

Testing a 30 m borehole usually takes ~3 hrs and requires a seismically quiet environment, i.e. no nearby earthworks, drilling etc.

Drillholes must meet the following specifications before testing can commence:

Casing Installation

- Drillholes must be cased with PVC of Internal Diameter (ID) ≥ 50 mm
- While 50 mm PVC is recommended diameters greater than 50 mm are also useable
- PVC should be smooth walled – no lips at joins
- The bottom should be capped
- The following PVC is often used: STRATA 50mm THREADED PVC-U 170409 03 PN

Grouting

- PVC must be grouted in place
- Grout must be consistent, without voids, to maintain coupling between the geophone and the ground
- ASTM standards recommend a grout mixture of 450 g bentonite, 450 g cement and 2.8 kg water
- Grout should be fully dry before testing – allow at least 5 days

Water

- Drillholes should be dry where possible
- While the tool can operate in water, standing water in a drillhole can result in “tube waves” travelling from the surface down the drillhole instead of through the ground, obscuring results
- Where drillholes have not been flushed of water, RDCL can clear water manually

Access

- RDCL will assume that 4WD access is available to the site
- An RDCL vehicle is parked on the shear beams to provide downforce, ~1.5 – 2 m away from the hole
- If 4WD access is not possible, a water cube or sandbags may be used as an alternative source of downforce

