

10 Advantages of Using Televiwer Surveys in Geotechnical Mining Studies



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Televiwer surveys consist of a continuous log of orientated, unwrapped images of drillhole walls. Two complementary methods are available: an 'acoustic televiwer' (ATV) which uses an acoustic signal from a rotating sonar transducer and an 'optical televiwer' (OTV) which uses a high resolution digital color camera equipped with a light source.

Acoustic and optical televiwers are becoming routinely used to capture structural geotechnical data for use in pit slope and underground design. They provide rapid and accurate high-resolution oriented images of the borehole walls and can be used as a replacement for manual core orientation techniques.

01 | Time Efficiency

Taking an orientation mark at every drill run, marking the orientation line, assessing its reliability and manually measuring each structure orientation from the orientation line is highly time consuming. When using the televiwer file in the software WellCAD, the logger only needs to digitize the relevant structures on the images, the orientations and depth of each structure is automatically calculated and collated in a table in the software.

02 | High Quality Data

When using traditional core orientation methods, the person in charge of the logging needs to assess the nature of every structure in the core. There is a risk of incorrectly accounting for artificial breaks induced by drilling or core handling which reduces the quality of the rock mass. Generating structural data from ATV/OTV surveys means that only the natural structures are taken into account, artificial breaks being absent on the televiwer image. This results in a more accurate estimate of the in-situ rock mass quality.

03 | Reliable Data

Acquiring the structural orientation information from a televiwer survey file removes the possible human error associated with the manual measurement from orientated cores.

04 | Better Time Management

Traditional logging of structural data from orientated core requires constant geotechnical supervision of the drill crew while doing orientation acquisition

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and logging at the drill site. Using ATV/OTV surveys the geotechnical logger can be on site for a single visit to log all the core at the end of the drilling program. This has a time advantage and moreover a significant cost advantage.

05 | Rapid Orientation Conversion

Televiewer orientation data are rapidly converted in WellCAD from their apparent orientation i.e. relatively to the core axis to true orientation using a high definition borehole deviation survey file recorded during the televiewer survey acquisition.

06 | Better Characterisation of Fracture Zones

The orientation and true thickness of fracture zones are very important for the geotechnical characterisation as these can play a vital role in the overall pit slope stability. It is very challenging to accurately assess the true thickness and orientations of these zones from the recovered broken core and the orientation line is generally lost when a fractured zone is intersected. Providing that the borehole is stable, a televiewer survey will record the image in such a zone without much difficulty. The true thickness, the dip and dip direction of the fracture zone contacts will easily be assessed from the televiewer file. To guarantee the stability of the borehole, a PVC pipe could, if needed, be inserted in the hole and depending on certain conditions, an acoustic image could be acquired through the PVC pipe.

07 | Accurate Depth Measurement

Drill core depth can sometimes be quite approximate with the recovered core length not exactly matching the depth given by the drillers. The televiewer survey file can in this case be taken as a reference. The survey is generally undertaken from bottom to the top for a smooth data acquisition, using a high precision meter measurer on the winch, guaranteeing reliable depth measurement.

08 | Useful for other Disciplines

Acoustic or optical survey files can be used by hydrogeologists to accurately locate water inflow zones and understand which fractures convey water when coupled with a spinner test survey.

09 | Costs Benefits

Populating a structural database from televiewer surveys is generally more cost effective than using traditional core orientation techniques. Less time is spent orienting the core, measuring the orientation, undertaking QAQC of the measurements etc.

10 | Benefits to the Design

The use of televiwer survey lead to a more accurate structural database, with more reliable statistical parameters for each joint sets within the rock mass. This ultimately tends to improve the rock mass characterization and increase the confidence given to the design. Using televiwer survey in geotechnical mining studies can lead to the development of steeper inter-ramp angles resulting in reduced waste stripping volumes and potentially significant mining costs savings.

Contacts

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