# STRESS CHANGE MEASUREMENT

**Sigra undertakes stress change monitoring in rocks. This may be undertaken for reservoir monitoring or mining purposes. In combination with fluid pressure monitoring, it is a powerful way to determine what is happening in the ground.**

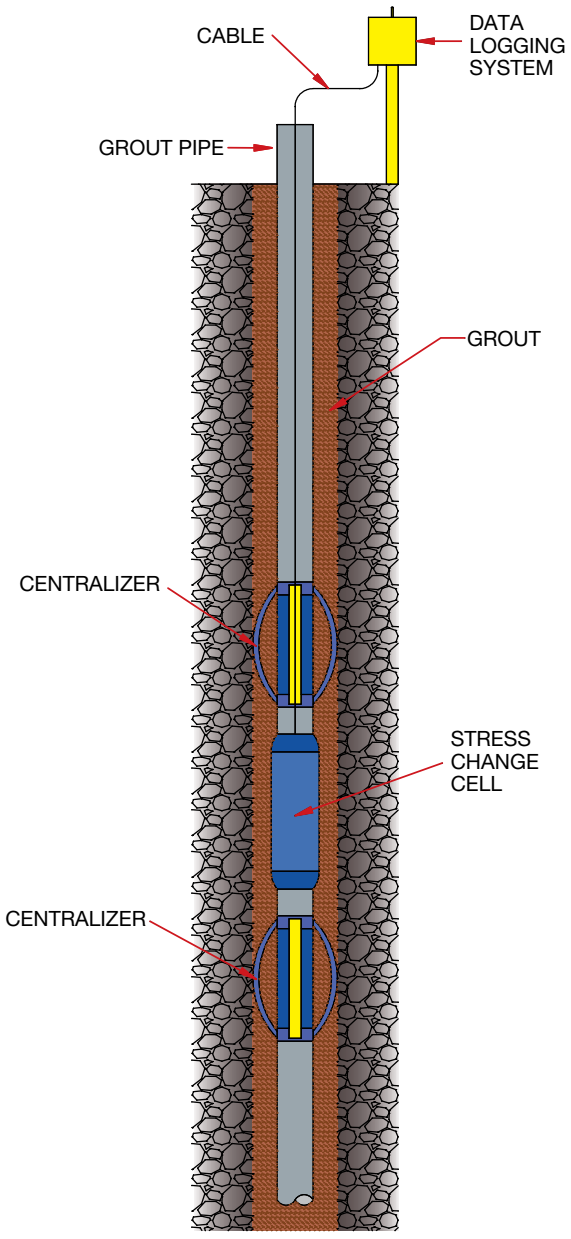
Sigra's installation process involves grouting a stress change cell into a borehole.

Where only the vertical stress change is required the cell is fitted with axial vibrating wire strain gauges and requires no orientation in a vertical hole. Its installation is relatively low cost.

Where full three dimensional stress changes are required the stress change cell is hollow and strain gauged. It has on board electronics which sample from the gauges and built in magnetometers and accelerometers. The tool communicates up an umbilical wire. The grout that must be used with this tool is of a special design that pre-loads the cell. Thus the device can be used to monitor stress increases or decrease. In this case the cells are of significant cost and great care must be exercised to install them correctly.

An intermediate cost device may be used to give biaxial and uniaxial stress change information. This comprises a cell with four transverse vibrating wire strain gauges and an axial vibrating wire strain gauge. It may be orientated through dropping a survey tool on to a mule shoe arrangement in the back of the grout tube prior to grouting.

In the case of any of the cells excessive ground movement will lead to shearing of the connecting cable and loss of data. They are therefore unsuitable for long term monitoring where goafs may form and associated large settlements occur.




Grouted-in stress change cell for ground monitoring

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