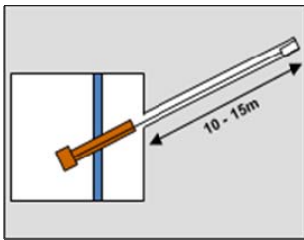


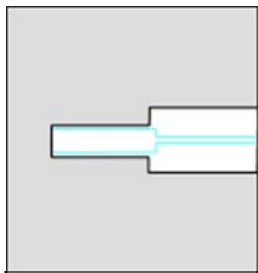


# ► The Overcoring Process



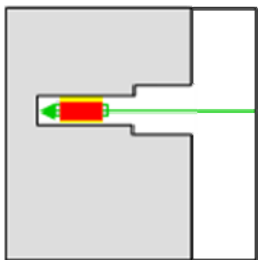
1. Access hole drilled to 10-15m

The process of drilling and over coring is a relatively straightforward exercise. The drilling equipment used is lightweight and once it has been transported to site, all in a self-contained box, may be man handled and erected within one hour. The equipment has been designed to operate in a wide range of environments and openings. An access hole is drilled to depth using a 102mm core barrel. This enables tools to be worked along the hole so that a 38mm pilot hole can accurately be drilled and a cell effectively inserted. An epoxy resin secures the cell to the rock face. This is allowed to cure for at least 16 hours depending upon environmental conditions. The cell is then overcored using the 102mm core barrel. Stress changes are measured continuously during this process.

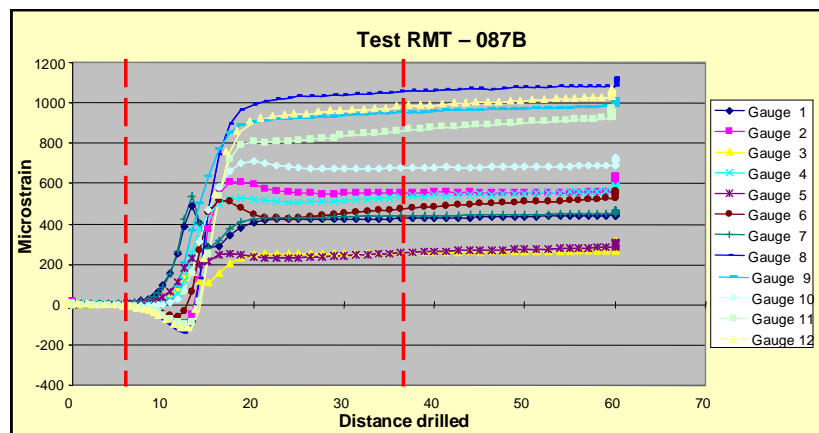


2. A pilot hole is drilled

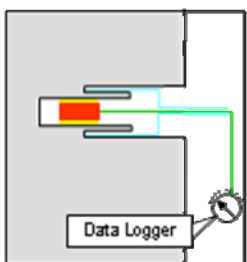
As the stress cell is over cored readings are taken of the strain changes using a data logger or strain gauge. It is important to data log information during overcoring so that the results may be analysed to ensure the reliability of the process. The graph below presents a typical result and the point where strain changes were measured. Amid the two points are recorded the interactions between the drilling and rock/glue/cell interfaces



3. A cell is inserted and grouted



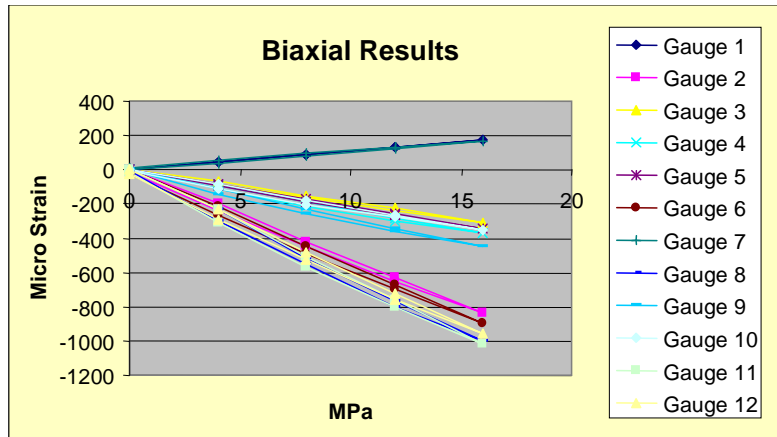
Typical results of an over core showing stress changes of all 12 strain gauges as the cell is over cored. Two points are selected, i.e. before and after over coring, where the difference in strain are recorded



4. The cell is over cored

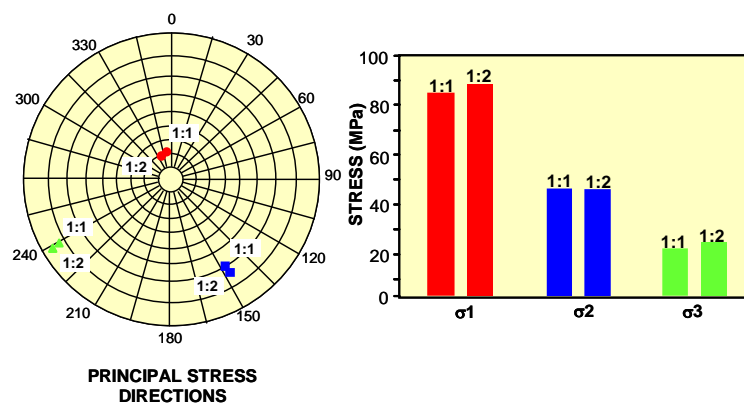
## ROCK TESTING AND ANALYSIS

To determine principal stresses the actual rock properties need to be determined. The Young's Modulus and Poisson's Ratio are determined by using a Biaxial cell, which squeezes the rock core around its circumference. The properties are then calculated by back analysing the strain changes over a range of confining pressures.



### THE RESULTS

The results may be plotted on a stereo graph. The mean trend and dip is determined by computation. The ratio between  $\sigma_1$ ,  $\sigma_2$ , &  $\sigma_3$  may be calculated.



### ADVANTAGES

Actual rock properties are determined using the biaxial cell and therefore a direct correlation between strain and stress is made. The method is accurate and a high level of confidence can be attributed to the results. Redundancy is built into the system. Any errors or onerous results from the 12 gauges may be eliminated with out being statistically significant.

For further information please contact:

Peter Altounyan  
 Technical Director Consultancy  
 Tel: +44 (0)1283 522201  
 Email: paltounyan@golder.com