Ex. RM08.1

Flat-jack type tests were carried out on the walls of a tunnel, whose axis has a dip of 7 degrees. The tunnel is located 250 meters below the surface and was drilled into granite with a specific weight of 27 kN/m³. The slots for the jacks were cut perpendicular to the tunnel walls and are oriented as shown in Figure 1. The crack reopening pressures are A = 7.56 MPa, B = 6.72 MPa, C = 7.50 MPa.

1. Calculate the principal stresses.
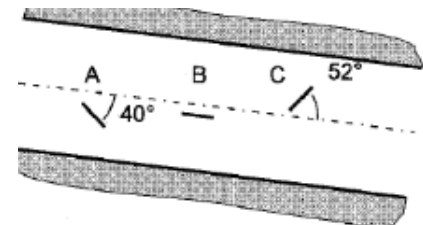
2. Compare with the vertical stress.

Ex. RM08.2

We conduct a hydraulic fracturing test in a granite. The following results are obtained:

Figure 1

Depth (m)	(Pc) (MPa)	(Ps) (MPa)	Initial pressure
500	14	8	0

The tensile strength of the rock is 10 MPa. The specific weight of the granite is 27 kN/m³. One of the principal stresses is vertical and is parallel to the well.

1. Calculate the minimum horizontal stress.

2. Calculate the maximum horizontal stress.

3. Calculate the vertical stress.

4. Determine the principal stresses."