Test Plan: 175_10

Test Goals

1. Determine if/how pore pressure influences the initial deformation
2. Determine if a critical pore pressure exists such that creep deformation can be halted
3. Determine if pore pressure influences the elastic moduli (bulk compressibility)

Test Stages

The test will be composed of three different "stages", with each stage focusing on one of the test goals.

Preconsolidation

Preconsolidate the sample with 20 MPa (2,900 psi) confining pressure and zero pore pressure.

Stage 1: influence of pore pressure on the initial consolidation

The objective here is to perform a creep/consolidation test with final pressures:

- P_{con} = 30 MPa (4,350 psi);
- P_{pore} = 10 MPa (1,450 psi).

This stage will be ended when the following criteria has been met:

- fractional density is approximately 0.95;
- or when the sample has been allowed to creep for 48 hours.

Stage 2: influence of pore pressure on strain rate

The objective here is to determine if sufficient pore pressure may be applied to the sample such that the strain rate is negligible. This will be completed by incrementally increasing the P_{pore} while holding P_{con} constant. The following steps will be completed:

1. Increase pore pressure from by 5 MPa, i.e., from 10 to 15 MPa while maintaining constant confining pressure of 30 MPa;
2. Wait a least 24 hours while under these conditions, or until an accurate strain rate may be determined;
3. Increase the pore pressure by 5 MPa, i.e., from 15 to 20 MPa while maintaining constant confining pressure of 30 MPa;
4. Wait a least 24 hours while under these conditions, or until an accurate strain rate may be determined.

Stage 3: influence of pore pressure on the drained bulk modulus

The objective here is to determine if pore pressure influences the elastic moduli (drained bulk modulus). This will be completed by cycling the confing pressure over suitable ranges such that the bulk modulus may be determined while the sample is also under a pore pressure.

- This stage should be completed when the confining fluid temperature has cooled to ambient conditions.

The following steps will be completed during this stage:

1. Decrease the confining pressure from 30 MPa to 25 MPa over a period of 5 minutes;
2. Increase the confining pressure back up to 30 MPa over a period of 5 minutes;
3. Repeat steps 1 and 2;
4. Bleed off the pore pressure from 20 MPa to 10 MPa;
5. Decrease the confining pressure from 30 MPa to 25 MPa over a period of 5 minutes;
6. Increase the confining pressure back up to 30 MPa over a period of 5 minutes;
7. Repeat steps 4 and 5;
8. Decrease the confining pressure from 30 MPa to 15 MPa over a period of 5 minutes;
9. Increase the confining pressure back up to 20 MPa over a period of 5 minutes;
10. Bleed off the pore pressure from 10 MPa to 0 MPa;
11. Decrease the confining pressure from 20 MPa to 5 MPa over a period of 5 minutes;
12. Increase the confining pressure back up to 10 MPa over a period of 5 minutes;
13. Bleed off the remaining confining pressure and end the test.