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**Stability assessment  
of the tunnel invert of  
Roskrepp hydropower  
project**

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## Background

Sira-Kvina Kraftverk is considering the opportunity to store energy through hydropower. They are interested to investigate the ability to turn Roskrepp hydropower plant into a pump-storage plant. Doing so, will cause change in water pressure in the headrace tunnel and cause potential destabilizations that can lead to destruction of the turbines.

Roskrepp headrace tunnel is an unlined tunnel with asphalt lining. The aim of the thesis is to investigate the potential engineering geological problems in relation to the asphalt lining situation that can take place in the headrace tunnel if Roskrepp hydropower plant is rebuilt into a pumped-storage plant.



Figure 1  
Corase grained granite in Roskrepp that will be tested in the laboratory.

A project work carried out prior to the thesis, involved a theoretical study on hydropower plants, asphalt properties and rock engineering aspects. It also included an engineering geological investigation at site. Rock samples were collected at Roskrepp, and is going to be used on different rock mechanical tests in laboratory. The results will be used in a stability assessment of the tunnel which will include numerical analysis in RS2. A physical model of the hydraulic situation of the headrace tunnel will be carried out as well. This test will hopefully give an idea on how the asphalt lining will respond to the rapidly change of water pressure in a potential pumped-storage situation. The collected information will give an indication of possible stability problems that can be expected if Roskrepp hydropower plant is rebuilt into a pumped-storage plant.

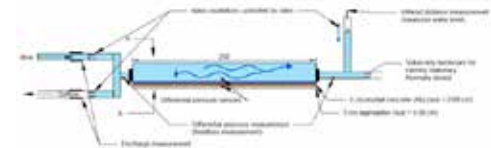


Figure 2  
A sketch of the physical model that will be carried out