

Savilahti Underground Sport and Event Center

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ABSTRACT

An underground sport and event center is being constructed in the area called Savilahti, located in the city of Kuopio. The facility is designed for 2500 people but it also serves as a civil defence shelter for 7000 people. This type of concept is very common in Finland. The span of the largest cavern hall is 50 m which is the largest underground span in Finland. The length of the cavern hall is 88 m, height 17 m and total volume 88 000 m³. Interesting feature is, and also a challenge that Savilahti cavern utilizes the old existing underground caverns that were built already in late 1930's and served for military purposes. Savilahti cavern is situated relatively close to the rock surface with minimum rock roof around 15 m. The cavern is situated in tonalitic gneiss and granite with good properties and quality,

but the area has also joints and several fracture zones that needed rock investigations and special attention in the design process. Rock mechanics simulations were performed with 3DEC-code to ensure the cavern stability and fulfill the requirements for the civil defense shelter.

At the time of writing this abstract the construction works are underway. The cavern was excavated during 2021-2022. The photogrammetry was intensively used e.g. for rock mapping, modelling, grouting and rock support design. The rock monitoring with several extensometers were also performed during excavation. The results showed that the measured displacements were close (a bit less) to the anticipated ones. Savilahti underground sport and event center will be completed and ready for use in spring 2024.



Figure 1. Savilahti Underground Sport and Event Center (Photo: LUOLA, www.savilahti.com).