

PROJECT DESCRIPTION

Swedish Nuclear Fuel and Waste Management Company (SKB) & Tyréns

Stockholm, Sweden



The design of the final nuclear repository design has been initiated by SKB and as a first step the system design of the underground facility has been executed.

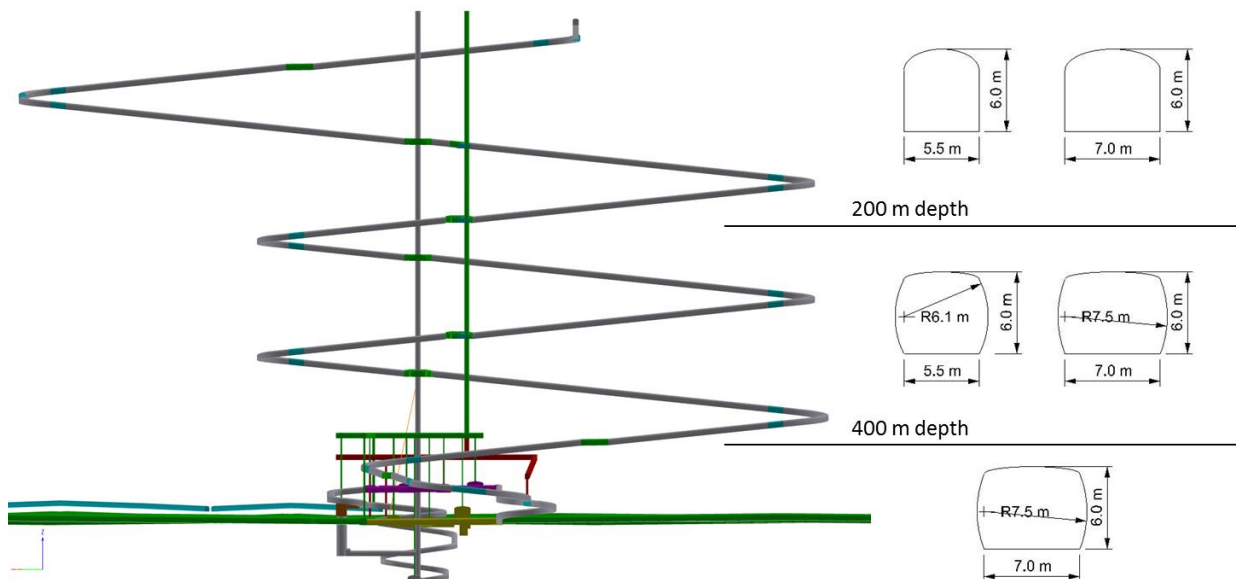
ITASCA'S ROLE

Itasca has taken part in the project with responsibility over rock mechanical problems and analyses. The work included support of layout decisions through analyses and rock mechanical expertise. The analyses with *FLAC* and *FLAC3D* have mainly focused on the rock stress redistributions around the facility. The work involved finding the amount of tunnels and shafts in different rock domains, as well as necessary rock reinforcements. The system design work also included risk analysis of the project.

PROJECT RESULTS

A large number of analyses in *FLAC* were performed during the project. One question that was studied was the optimal shape of the access ramp tunnel. Since the tunnel goes from the ground surface to more than 400 meters below, the rock mechanical failure conditions varies from one level to another.

The different simulations showed that the tunnel width should be larger than the height, that curved walls were better than straight, that a flat roof was better than an arched roof. These findings became even more evident as the tunnel reached further down below the ground surface. The different tunnel profiles for the ramp are displayed in the image below.



Ramp access tunnel with recommended tunnel profiles