

ARLANDA LINK - A NEW RAILWAY BENEATH ARLANDA AIRPORT IN STOCKHOLM, SWEDEN, - A TECHNICAL BLASTING CHALLENGE.

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ABSTRACT

The Arlanda Link project is for the time being the most interesting project in Sweden, concerning rock and blasting technology.

The total amount of rock excavated beneath Arlanda airport comprises 800 000 m³ divided in four parallel tunnels measuring a total length of 8,5 km, with a rock covering of only 5-15 m between the tunnel roof and existing terminal buildings.

A railway between Stockholm and Arlanda has been a priority for a long time. The goal is to connect a railway with the flying-network. The route between Stockholm Central station and Arlanda will be driven by a shuttle making a speed of 200 km/h and the trip will take only 19 min.

Three railway stations will be built directly beneath the terminals. Two of the underground stations are intended for the shuttle from Stockholm. From the stations one will be able to reach desired terminal by escalators and elevators. The third station, which will be placed beneath Sky-City, is intended for long distance and commuter trains.

The total estimated cost of the project is about 5 billion Swedish kronor and has both Swedish and foreign financiers. Arlanda Link Consortium (ALC), among others consisting of the two Swedish contractors NCC och SIAB, started the construction of the tunnels in the autumn 1995. The project will continue for four years.

Nitro Consult has made risk analysis to establish criteria and control of vibrations, settlements and crack growth for buildings above the tunnel. Trialblasts with regression analysis and scaling law diagram have been carried out. Design and follow-up of the drill and loading patterns are also a part of the control.

Very sensitive computer equipment is installed inside the terminals and Sky-City which among other things control the close airtraffic. This equipment has been vibration isolated to stand against the vibrations from the blasting rounds and thereby avoiding any disastrous accidents. An extensive monitoring and supervising program has been installed for safe control. Via UVS Remote, telephone modem and UVS 1500 Vibration Time History Recorder vibrations from several blasting faces can be presented directly via computer to

both the site offices and to our own head office 50 km away.

This means that one can quickly decide if there is need for changes in the drill and charging plans and thereby actively plan the blasting in a safe and economical manner.