

THE SWEDISH TUNNEL TRIALS – A COMPARISON BETWEEN TESTS AND CALCULATIONS

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During the 1990's the Swedish Armed Forces changed its strategy tactics from a great number of permanent fortifications to a moveable defence. This defence demands new type of protection - mobile protection built into the military unit material such as reinforced vehicles, moveable protection following the military unit and fixed protected installations between which the military units can move.

The fixed protection could be existing infrastructure (road tunnels, viaducts etc.), natural terrain formations or prepared tunnels in rock with enough size to hold a small unit. This third alternative should have such high protection level that it would be possible to act from and/or recover in.

Research on how these protections should look like has been done by the Swedish Defence Research Agency (FOI). A series of trials, as well in full scale as in model scale has been carried out. In a number of stages, a tunnel system was built into the rock and in each stage different charges were detonated at different distances from the tunnel opening. During all stages, measurements of the pressure and impulse density were done inside the tunnel. In addition to some of the trials numerical simulations were done. A goal with the trials has been to verify the theoretical/empirical formulas that have been used by the Swedish Armed Forces and the Swedish Fortifications Agency (FORTV).

This paper will compare some of the results that are an outcome from the full scale and model scale trials with results that are an outcome from calculations.