

THE EFFECTIVENESS OF BLAST WALLS

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Sound-pollution around military training facilities poses a severe problem to neighbouring communities. Blast walls are often used for reducing impulse noises from large-caliber weapons. This paper describes a combined experimental and numerical study of the effectiveness of blast walls. The diffraction of weak shock waves around scale models of a screen and a dike-shaped wall was studied in a shock tube. Measurements were also performed on a 1:10 scale model of an actual howitzer test site. This study has demonstrated that a screen has a higher shielding efficiency than a dike, though the differences become marginal at greater distances from the wall. Since less energy is reflected back in the direction of the weapon, the use of a dike is favorable over the screen with regard to the conditions for the gun personnel. Some calculations were made with the linear-acoustic formalism of Oberhettinger, the acoustic sound diffraction model TOMAS, and the fluid dynamics code BLAST. The acoustic models overestimate the reduction by the walls, while results obtained by the BLAST-code are in fairly good agreement with experimental data.