

AIR-INDUCED GROUND PRESSUREWAVES IN A GRANULAR SOIL MATERIAL

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Norwegian Defense Research Establishment (NDRE) has for some time been concerned with different aspects of protection against the effects of ground pressurewaves. This report deals with the problem of generation and transmission of air-induced ground pressurewaves in soil materials, especially sand. In order to study the problem one made use of the 400 mm diameter shock tube at NDRE together with a sandfilled container. Considerable effort went into designing the test equipment and determining a preparation method for the sand sample in the container. The measuring equipment, but the transducers had to be made fit the special measurement requirements in the sand. For this purpose it was necessary to develop a grain pressure transducer and an accelerometer which were used in a certain measuring and data reduction procedure. Several preliminary studies and experiments were necessary in this connection before satisfactory testseries could be conducted for a given set of the air shockwave strength, sand density and moisture. This report sums up different aspects of the experimental and theoretical activities and the results that were obtained. The experiments gave data for the acceleration, grain pressure and the kinematic properties of the induced ground pressurewave in the sand. Data and information concerning the generation mechanism were alsoobtained. To a certain extent the data were correlated to theoretical parameters of practical importance. The overall conclusion was that these data and information were representative for free field conditions in the sand as the ground pressurewave moved through the sand.