

SMALL-SCALE EXPERIMENTAL TEST ON THE EFFECT OF IN-SITU TROPICAL SOIL ON SHALLOW BURIED CHARGE BLAST INTENSITY

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The data on the influence of specific soil type on the intensity of buried mines blast loading magnitude is vital especially in validating and refining numerical simulation. The data is also crucial in achieving optimal design of protective systems against landmines threat. However, the absence of data in experimental studies specifically on tropical soils in their natural condition eventually motivates efforts to carry out in-situ blast tests. Small-scale experimental blast tests therefore, have been carried out to measure the intensity of blast loading resulting from shallow-buried detonation in in-situ tropical residual soil.

In this experiment, a portable apparatus was developed to perform multiple blast tests at a chosen testing site, consisting of 0.5 m x 0.5 m steel jig, sacrificial steel target plate, and instrumentations setup fixtures which in total weigh about 22 kg. Two methods of measurement were employed namely optical method using high speed video camera, and instrumentation method by means of accelerometer. The response of the apparatus and acceleration-time data of localised blast impact on the steel target plate were recorded. Other data such as blast pressure and crater dimension were observed, while for geotechnical data, in-situ soil samples were analysed to obtain its properties. Charges used are between 15 to 20 g TNT-equivalent commercial explosive, whereas depth of burial (DoB) and stand-off distance (SoD) are kept at specific constant values. Consequently, magnitude, time and duration of blast impact imparted by soil ejecta from tropical residual soil at natural condition were determined.