

RESPONSE OF A RECTANGULAR REINFORCED CONCRETE STRUCTURE SUBJECTED TO INTERNAL DETONATION OF CASED CHARGES

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ABSTRACT

Adherence to prescriptive guidelines in land sterilization due to ammunition storage is one of the engineering challenges in land-scarce Singapore. Therefore, fast running software such as the performance-based Klotz Group Engineering Tool (KGET), which assesses debris hazards from the breakup of reinforced concrete (RC) structures, may become important tools to overcome this national challenge. One of the critical parameters required in the KGET is the debris launch velocity (DLV), which has been established through experimental and numerical studies on cubical structures. The work presented in this paper evaluates the validity of past studies on rectangular RC structures subjected to both bare and cased charge. A decoupled three step numerical modelling approach is proposed and used in this study. Results indicated that the DLV of the structural components did not differ significantly if bare charge was considered. In the event of an internal detonation of cased munition, obvious differences in the DLV of the walls and roof were observed. This was attributed to the impact of fragments from the breakup of the cased munition, which drives the need for more studies to correlate DLV and the effects of fragment impact from the breakup of cased charges.