

MILITARY APPLICATIONS OF RAPIDLY CONSTRUCTED NON-CONCRETE EARTH WALLS

S. Chew¹, H. Tan¹, H. W. Andy¹, Z.W. He¹ & S. Anand²

¹ *Department of Civil Engineering, National University of Singapore (NUS), Singapore*

² *Defence Science and Technology Agency (DSTA), Singapore*

There is a need to look into new ways of reducing blast damage in a number of military applications. Reinforced Soil/Earth (RS) walls have been shown to be highly effective in mitigation blast effects in previous blast trials conducted in Woomera, Australia and Singapore from 1998 to 2006. These walls consist of soil/earth, which are reinforced with polymeric fabrics/materials called geosynthetics. This paper aims to convey the possibility of these walls as a viable alternative to conventional concrete structures for munitions storage and protective barrier in mitigating blast effects.

These earth walls are 'softer' structures compared to conventional concrete structures. As such, they are better able to absorb blast loads compared to concrete. Various configurations and types of RS walls have been constructed and tested in various blast trials with the walls subjected both to close range and far range blasts. Design charts have been obtained. These can facilitate the design of these RS walls for various military applications for example munitions storage facilities, command posts and barrier walls etc. RS walls can also be used as emergency or contingency storage spaces in times of need as they can be rapidly constructed within a day and require minimal specialized labor. Blast trial results from the numerous trials will be summarized in this paper to show the applicability of RS walls. Possible configurations of these new storage spaces and protective barriers will also be presented.