

USE OF GEOSYNTHETICS REINFORCED SOIL FOR BLAST PROTECTION & GROUND SHOCK MITIGATION

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Blasts can cause significant damage to both above-ground and underground structures. This is due to the air pressure exerting on the structure and the ground shock traveling in the soil. Above-ground protective structures in the form of earth walls can be erected to mitigate blast pressure above ground. In addition, ground treatment can be done to 'improve' the soil mass such that ground shock can be mitigated. Over the last few years, full scaled blasts tests have been conducted on various types of Reinforced Soil/Earth (RS) walls and trenches. These blast trials were conducted in Woomera, Australia and Singapore from 1998 to 2007. The RS walls consist of soil/earth, which are reinforced with geosynthetics (polymeric fabrics/materials). RS 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. RS walls can 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. For ground shock mitigation, trenches were filled with soil mixed with polystyrene (EPS) particles were tested and found to be able to mitigate ground shock well. Blast trial results from the numerous trials conducted will be presented in this paper.