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Impervious

Today, terrorism is a major threat throughout the world. In 2010 there were more than 80 confirmed attacks that killed more than 1200 and injured over 3700 people. When analyzing the Oklahoma City Bombing more deaths were caused by falling concrete than the explosion itself. This information indicates the need for stronger precast concrete walls that can minimize the effects of bullets, explosives, and debris. To meet this challenge I developed 8 thinner and lighter precast wall sections each reinforced with either wire mesh, fiberglass cloth, or fiberglass mat. These were designed to withstand a 1-pound Tannerite explosion (equivalent of a half-pound of TNT) and 2 shots from a .243 caliber center fire rifle without penetrating the drywall. My results indicated that both the wire mesh and fiberglass cloth reduced the effects of an explosion significantly, compared to a non-reinforced wall section, and had no rubble. However, due to the thinner design none of my reinforced wall sections were able to stop the effects of a .243 caliber bullet. These results show that the test wall segments did meet half of my design criteria. Therefore, additional redesign work will focus on wall thickness to complete the second design goal of a bulletproof precast wall.