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Polymer retrofit of CMU walls for blast protection

In-fill Concrete Masonry Unit (CMU) walls are very common in construction. These walls are normally designed to resist wind loads in the order of 0.30 psi. Under blast loading, CMU walls contain substantial mass which provides some blast resistance. However, they provide minimal ductility to absorb the energy associated with an explosion. This study evaluates the performance of polymer coatings on the tension face of a CMU wall. The polymer is expected to provide the necessary ductility to the wall system. Various polymer-CMU bond characteristics are evaluated to determine optimal blast-retrofit design. Twenty four small-scale samples with six different bond designs were tested for performance under flexure. The polymer-retrofit concept was evaluated in the field using live explosives simulating a large vehicle bomb. The polymer addition to the wall provided the necessary ductility, which resulted in the wall system surviving the blast. The poster will present the results of the small-scale testing as well as the results of the full-scale field testing of one wall.