

BLAST PERFORMANCE OF CURTAIN WALL RETROFITS: PHASE I – MODELLING & TEST PREPARATION

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Abstract: Global Affairs Canada (GAC), formerly the Department of Foreign Affairs, Trade and Development (DFATD) is investigating two potential curtain wall enhancements for one of its overseas assets. Presently, the curtain wall at the asset is suffering delamination and water infiltration. Moreover, modelling of the curtain wall system under the prescribed blast threat indicates that the existing glazing and framing are inadequate with high-hazard and blowout damage expected. Solutions were developed with a focus on the most typical window configurations: a full-height, two-lite glazed section on the ground floor; and a partial-height, two-lite glazed section in the upper-storey office spaces. The first retrofit considered is a catchment system consisting of a polycarbonate shield supported by vertical steel cables installed on either side of the existing vertical mullions. The second retrofit is a full curtain wall replacement fitted with a more robust glazing layup and steel HSS tube inserted in the aluminum mullion voids. Four test samples were constructed and will be shock-tube tested shortly to assess the blast performance of the two window configurations, enhanced with each of the retrofit options. A brief discussion on the two options with consideration of the rough-order-of-magnitude costs, construction challenges, and end-user acceptance will be presented.