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Quasi-Static Resistance Function Quantification for Lightweight Sandwich Panels: Experimental Study

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Abstract : The quasi-static resistance functions for orthogonal corrugated core sandwich panels were determined experimentally. According to the American and Canadian codes for blast resistant designs of buildings UFC 3-340-02, ASCE/SEI 59-11, and CSA/ S850-12 the dynamic behavior is related to the static behavior under uniform loading. The target was to design a lightweight, relatively cheap, and quick sandwich panel to be employed as a sacrificial cladding for important buildings. For that an available corrugated cold formed steel sheet profile in North America was used as a core for the sandwich panel, in addition to using a quick, relatively low cost fabrication technique in the construction process. Six orthogonal corrugated core sandwich panels were tested and the influence of core sheet gauge on the behavior of the sandwich panels was explored using two different gauges. Failure modes, yield forces, ultimate forces, and corresponding deformations were determined and discussed.

Keywords : cold formed steel, lightweight structure, sandwich panel, sacrificial cladding, uniform loading
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