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Blast Testing of Loaded Mass Timber Structures Yields Positive Results

Four tests covered a spectrum of blast loads.

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PETER FABRIS, CONTRIBUTING EDITOR

Blast tests on three existing two-story, single-bay cross-laminated timber (CLT) structures at Tyndall Air Force Base were successful, according to WoodWorks, a program working with the Wood Products Council.

“On-site observations were decidedly positive; all structures remained intact under significant explosive loading well beyond their design capacity,” according to a council news release. This was the second phase of blast testing on CLT structures conducted by WoodWorks.

“Last year, we tested the structures under their own self-weight,” said Bill Parsons, vice president of operations for WoodWorks. “Those tests were successful and, this year, we built on that effort by testing whether the design methods established as a result of those initial tests needed to be adjusted when the buildings carried typical gravity loads and included different connection configurations, increased panel thickness, and alternate mass timber wall systems.”

One building used 5-ply CLT front wall panels, the second used off-the-shelf prefabricated angle brackets, and the third included nail-laminated timber (NLT) front panels. All three structures remained standing following the fourth and largest blast, intended to take the structures well beyond their design intent. While panel rupture was observed on all front and side wall panels, the buildings maintained enough residual capacity to remain intact and safe to enter, the release says.

Richard P. Vlosky, Ph.D.

Director, Louisiana Forest Products Development Center

Crosby Land & Resources Endowed Professor of Forest Sector Business Development

Room 227, School of Renewable Natural Resources

Louisiana State University, Baton Rouge, LA 70803

Phone (office): (225) 578-4527; Fax: (225) 578-4251; Mobile Phone: (225) 223-1931

Web Site: www.LFPDC.lsu.edu





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President, Forest Products Society; President, WoodEMA i.a.

