



Development of a Cost-Effective CLT Panel Capable of Resisting DOS/DOD Design Basis Threats

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Organization: Karagozian & Case
 Country of: United States
 Publication:
 Material: CLT (Cross-Laminated Timber)
 Application: Ceilings
 Floors
 Walls
 Topic: Mechanical Properties
 Keywords: Ballistic Resistance
 Blast Loads
 Cost Effective
 Research Status: In Progress
 Notes: Project contact is Mark Weaver at Karagozian & Case
 Summary:

Buildings for the U.S. Department of State (DOS) and U.S. Department of Defense (DOD) often have to meet blast as well as forced entry / ballistic resistance (FE/BR) design requirements to mitigate the hazardous effects associated with terrorism. Historically, DOS and DOD buildings exposed to these threats have been constructed using concrete and steel. However, the emergence of cross-laminated timber (CLT) presents an opportunity to provide a sustainable building material alternative to owners and architects developing such structures. Several wood characteristics (i.e., propensity to rupture in a brittle fashion upon being overstressed, relatively low penetration resistance) serve to limit CLT's effectiveness in resisting blast and FE/BR threats. The proposed effort seeks to address these limitations by investigating the possibility of incorporating commercial off-the-shelf (COTS) building materials into CLT panel designs in order to meet DOS/DOD blast and FE/BR design requirements. Particular emphasis will be placed on ensuring the developed panel designs are cost competitive to facilitate their inclusion in actual buildings. The project team includes an American CLT manufacturer to quickly assess the cost impacts of incorporating COTS materials into CLT panel layouts. Additionally, representatives from the DOS, DOD, and an architecture firm routinely involved with the design of DOS buildings will be consulted to ensure programmatic, aesthetic, and detailing issues are considered during candidate panel design development.