NUMERICAL MODELING OF COMPOSITE CONCRETE - DURISOL WALLS

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ABSTRACT

Protective walls are constructed to protect both civilians and military personnel from blast effects. Dynablok (DB) walls are used as an effective protective system for retrofitting existing masonry walls or for constructing new, better protected, buildings. DB walls consist of concrete poured between two sheathings of a material known as Durisol, a proprietary product made of mineralized wood shavings as the aggregate. The sheathings are interconnected to the reinforcement prior to the addition of concrete.

In order to compare the performance of these innovative walls to simple reinforced concrete (RC) walls, a set of reinforced concrete and DB slabs were tested in the blast simulation facility at the University of California San-Diego (UCSD). Beams made of DB and concrete were also constructed and tested in the pendulum facility at PTR&DC. Based on these tests results, numerical computations of these tests were used to calibrate material models available in LS-Dyna hydrocode. In the course of this study, laboratory tests on the DB material were conducted at both UCSD and BGU.