DEVELOPMENT OF A LIGHTWEIGHT, PORTABLE AIRBLAST BARRIER

John E. Crawford, Kenneth B. Morrill
Karagozian & Case Structural Engineers 625 North Maryland Avenue Glendale, CA 91206-2245

A design concept for a lightweight, portable airblast barrier is described, which can be used to protect equipment, structures, and personnel from terrorist bombs. Because these barriers are easily installed and air-mobile, they can be rapidly deployed giving government, industrial and commercial concerns an immediate reduction in their vulnerability to and risk of terrorist attacks.

The results from blast tests of this barrier establishes the feasibility of using a lightweight, portable, airblast barrier that can be rapidly deployed to protect facilities from terrorist bombs. The central features of the airblast barrier described are its ease of installation, demonstrable protection (as indicated by experimental data), portability and air mobility (to ensure rapid availability), and use of materials that provide maximum strength for minimum weight. The barrier is composed of a synthetic fabric (either E-Glass or Kevlar) wrapped onto a frame constructed with tubular composite sections. The frame is anchored to the ground using a system that requires only hand tools and minimal disturbance of the soil. The ¼-scale tests conducted indicate that the design concept developed by Karagozian & Case for the airblast barrier provides protection even for charge sizes of 10,000 pounds. For 500-pound charges of TNT at a standoff of 40 feet, the barrier remains undamaged and can reduce the airblast by substantially more, depending on configuration, than a factor of 2 and stop debris generated by a blast. Based on the responses observed in other barrier tests, the design concept shown may be able to cut the airblast by as much as a factor of 5.