

TESTING AND ANALYSIS OF EXPLOSIONS IN A RECONFIGURABLE MODEL CITY

M. Stanley¹, R. Abernathy¹, P. Hassig², C. K. B. Lee³, D. Tennant⁴ & H. Levin³

¹*New Mexico Tech, Energetic Materials Research and Testing Center
801 Leroy Place, Socorro, NM 87801, USA*

²*Weidlinger Associates Inc.
4551 Glencoe Avenue, Suite 350, Marina del Rey, CA 90292, USA*

³*Weidlinger Associates Inc.
399 West El Camino Real, Suite 200, Mountain View, CA 94040, USA*

⁴*Weidlinger Associates Inc.
6301 Indian School Road NE, Suite 501, Albuquerque, NM 87110, USA*

A major terrorist threat worldwide is the use of large vehicle bombs in urban settings. Detonation of these devices can cause, significant damage to buildings, building components and infrastructure resulting in economic loss and a high numbers of casualties. Urban landscapes provide a complicated setting for generation of airblast loads. Urban canyons focus and channel airblast resulting in significant enhancement of loads at range from the detonation. Buildings reflect pressure to increase loading at some locations and shield other areas mitigating the loads. The complex interaction between buildings, streets and alley ways has not been studied in detail other than at subscale. The following paper describes the use of a reconfigurable urban test bed to study the complex blast environment in a series of extensively instrumented tests. Computational fluid dynamic (CFD) calculations are validated against test data and used to extend the data from the testing.