

STEEL FRAME COMPONENTS SUBJECTED TO BLAST LOADS

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Progressive collapse is the leading cause of deaths in terrorist bombings of buildings. In order to determine the potential for progressive collapse of a building subjected to a terrorist bomb attack, it is necessary to understand the initial damage caused by the direct blast effects on structural elements and connections, as well as the response of the entire building following the initial damage. There has been a fair amount of research conducted to understand the behavior of reinforced concrete elements to direct blast effects. Modeling of reinforced concrete columns, beams, and connections can be conducted with a reasonable degree of confidence. In contrast, data on steel member and connection response to blast is sparse. The Defense Threat Reduction Agency (DTRA) is conducting a series of tests to determine the behavior of steel frame components subjected to blast loads. This testing effort is concentrating on gathering test data and developing analytical models of the behavior of steel members and connections to blast loads. Design guidance for both new structures and retrofits to existing structures to prevent member/connection failure will also be developed. In this paper, the testing program will be outlined and test results will be presented.