

COMPONENT HIGH EXPLOSIVE TESTING OF BARE AND RETROFITTED COLUMNS

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INTRODUCTION

Structural collapse is the leading cause of death in terrorist bombings of buildings. Conventional construction for most facilities used by the government typically do not include protection from structural damage caused by possible terrorist bomb attacks. Under a blast condition, a column is subjected to large horizontal loads for which it was not designed to resist. This can cause the column to fail due to shearing and/or bending, resulting in building collapse. In order to enhance the protection level for the occupants of existing critical government facilities, retrofit technologies and methods are being developed to prevent building collapse. If these technologies are to be implemented in the field, they must be cost effective, be able to be applied for a wide variety of structural designs and in diverse locations and situations. These technologies must also be validated to ensure adequate protection levels are obtained and they must be readily available to the engineering community. In order to improve understanding of column behavior leading to failure and potential collapse and to develop retrofit methods to prevent column failure, testing of columns is necessary. The Defense Threat Reduction Agency (DTRA) with Karagozian and Case (K&C) conducted eight column component tests. These tests were conducted using the column reaction structure built at Chestnut Test Site on Kirtland AFB New Mexico. The purpose of these tests was to evaluate retrofit concepts for columns.