SUPPORT LOADING RESULTING FROM THE EXPLOSION OF MUNITIONS ABOVE A PROTECTIVE ROOF

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When a cased charge munition explodes above a roof, the roof is loaded by both blast and fragment impact. With the requirement for lighter forms of protective construction for use in expeditionary operations, comes the requirement to design lighter supporting structures for overhead protection. There is little available design guidance.

In early 2006, QinetiQ carried out a series of experiments to investigate the loading transmitted to roof supports from charges detonated close to typical overhead protection.

The paper describes and discusses the following:

- The experimental procedure and problems of measuring the loads.
- The results obtained with explanation of features of interest.
- The way in which the design of the roof and the supports can modify the support loading.

Analyses of the general problem and of the experimental results are included. It is shown how the design of the roof and the design of the supports can modify the loading transmitted to the supports. In particular the maximum transmitted load and the load-time profile may be modified.

The paper concludes with recommendations for design of structures and the planning of experiments.