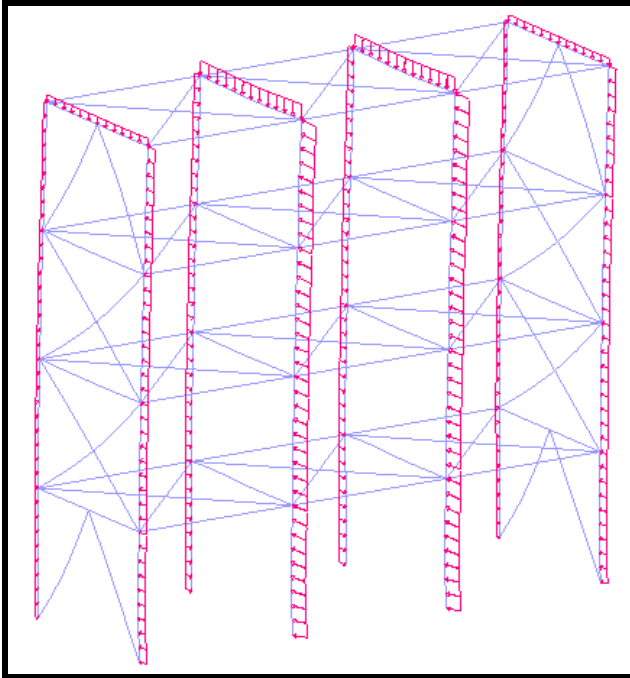


# Structural Analysis Methods

EXPLOSION RESEARCH COOPERATIVE



The Explosion Research Cooperative has supported the development of software design tools that enable participating companies to predict the response of various structures to explosions. Shown at left is an example of ADINA modeling for structural analysis.

For more information about blast resistant structural analysis, please contact:

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## ACCOMPLISHMENTS

Software tools developed by the Cooperative to analyze the dynamic response of structures to blast loads include:

- Shear wall analysis spreadsheets
- Frame analysis tools
- 2-DOF structural analysis
- Glass damage prediction tool

A Joint Industry Research Program  
by BakerRisk

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# Structural Analysis Methods

E X P L O S I O N   R E S E A R C H   C O O P E R A T I V E

## PREVIOUS STUDIES:

***Spreadsheet Analysis of Shear Walls (2004)*** To improve and more efficiently analyze the blast response of roof diaphragms and shear walls, a spreadsheet tool will be developed using pressure-impulse diagrams that will define the failure envelope for these components. The results will be incorporated into the Integrated Structural Analysis and Design Spreadsheets (ISADS) tool developed as part of the 2003 Explosion Research Cooperative program.

***Laminated Glass Damage Prediction Tool (2004)*** This study will develop a spreadsheet capable of analyzing blast response of laminated glass of any size. Common laminated glass types with various glass and interlayer thicknesses will be included.

***Guidelines and Input Tools for Using ADINA® Frame Analysis (2003)*** Examples, guidelines, and spreadsheets were developed to make the ADINA® code for dynamic analysis of steel frames subject to blast load much easier for use by structural engineers unfamiliar with blast design or the finite element analysis method.

***Integrated Structural Analysis and Design Spreadsheets (2003)*** An integrated structural analysis program was developed to allow quick assessment of the blast resistance of existing components and evaluate possible upgrades. The spreadsheet includes a combination of single-degree-of-freedom (SDOF), 2-DOF, and empirically based pressure-impulse diagrams to perform structural analysis and design.

***Two-Degree of Freedom (2-DOF) (2001)*** A two-degree-of-freedom structural analysis computer program was developed to include the effects of load shape and a variety of support conditions. The program is more accurate and less conservative than many current analysis methods.



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For additional information on participating in the Explosion Research Cooperative, visit [www.BakerRisk.com](http://www.BakerRisk.com) or email us at [Co-op@BakerRisk.com](mailto:Co-op@BakerRisk.com)