

Finite Element Analysis

Engineering Excellence Across the Globe

At MAC Engineering, headquartered in Houston, TX, we deliver comprehensive structural design services with a global reach. One of MAC Engineering's service lines is Finite Element Modeling (FEM) for structures and buildings subjected to various loading conditions, including blast and impact.

Services Offered

1. Linear Elastic Analysis:

We provide comprehensive linear elastic analysis using advanced Finite Element Modeling (FEM) software. This service ensures accurate structural calculations for efficient design and assessment.

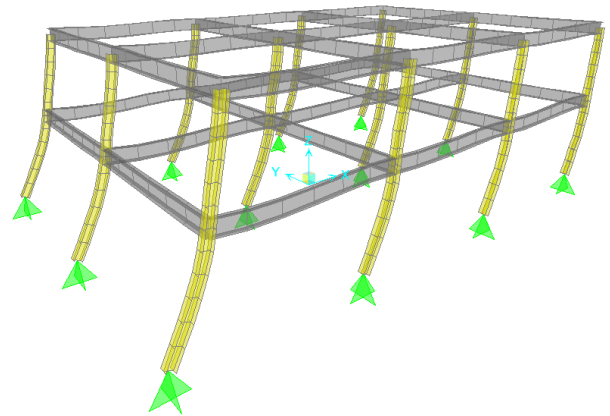
2. Nonlinear Dynamic Analyses:

MAC Engineering excels in conducting nonlinear dynamic analyses to simulate structures under extreme conditions such as blast, shock, and impact loading. These analyses are crucial for developing protective designs to enhance structural resilience against accidental explosions and malicious attacks.

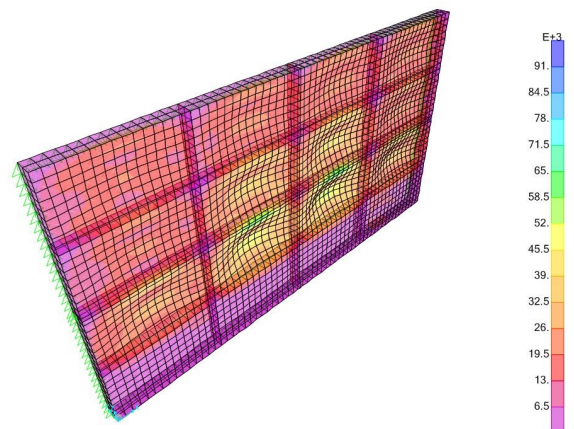
Application Areas

Our services cater to industries where protective design is critical, including:

- Industrial Operators
- Energy (Natural Gas, Hydrogen, Battery Storage)
- Critical Infrastructure (Power Grids, Data Centers)



Deflected Shape of a Steel Frame under Wind Loading



Overpressure Loading Applied to an Equipment Bulkhead

- Structural Modeling
- Finite Element Analysis
- Front End Design Support
- Submittal Review

Importance of Protective Design

Protective design against blast loading is essential for several reasons:

Safety and Security: Ensures the safety of occupants and protects critical infrastructure from potential threats.

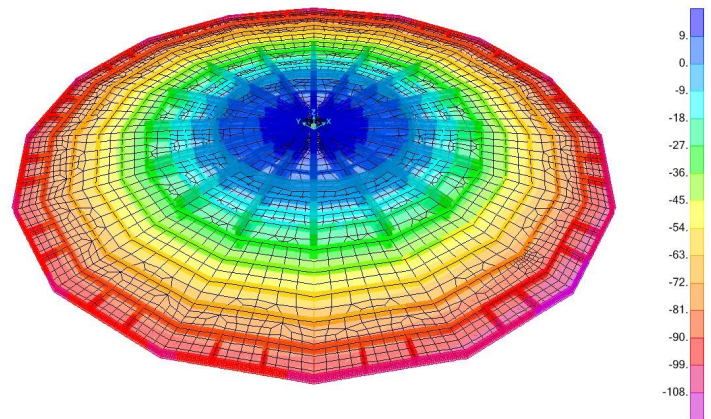
Regulatory Compliance: Many industries, including petrochemical facilities and government buildings, require adherence to standards such as ASCE 59 for general blast protection and "ASCE Design of Blast-Resistant Buildings in Petrochemical Facilities" for specific applications, to mitigate risks effectively.

Operational Continuity: Enhances the resilience of facilities to withstand unforeseen events, ensuring operational continuity and minimizing downtime.

Our Commitment

MAC Engineering is committed to delivering:

- **Expertise and Experience:** With over 20 years of experience in providing certified designs and structural analyses for blast-resistant buildings.
- **Leadership in Standards:** Our principal has contributed to industry standards, ensuring our solutions meet the highest regulatory and safety requirements.
- **Tailored Solutions:** Customized designs and analyses that address the unique needs of each project, ensuring optimal performance and safety.



Deflected Shape of Roof-top Heliport Steel Deck

Contact Us for Your Next Project

Partner with MAC Engineering and experience excellence in structural analysis and protective design. Whether you are planning a new project or assessing existing structures, our team is here to provide reliable solutions backed by decades of industry expertise.

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