

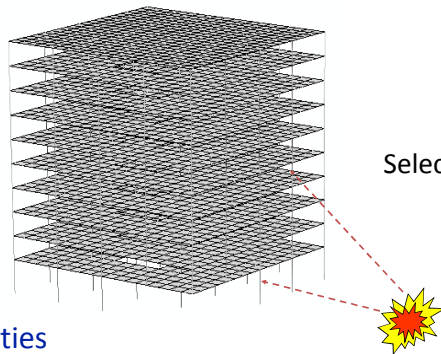
# PROGRESSIVE COLLAPSE OF MULTI-STORY STEEL FRAME BUILDINGS: Phase II

## Objective

Develop a numerical approach that captures the underlying behavior and resistance mechanisms in progressive collapse

## Progressive Collapse

The spread of an initial local failure, eventually resulting in the collapse of an entire structure or a disproportionately large part of it.



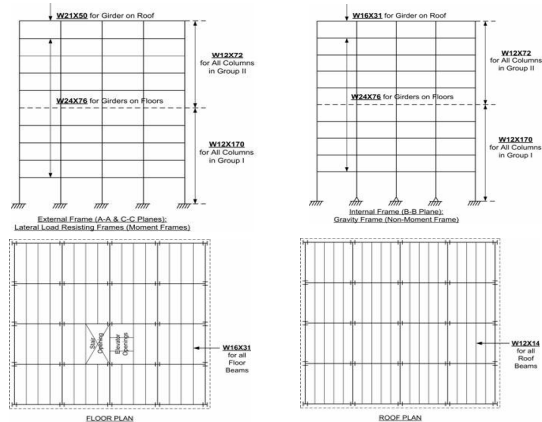
Selected Building Model



Murrah Federal Building, Oklahoma City, 1995)

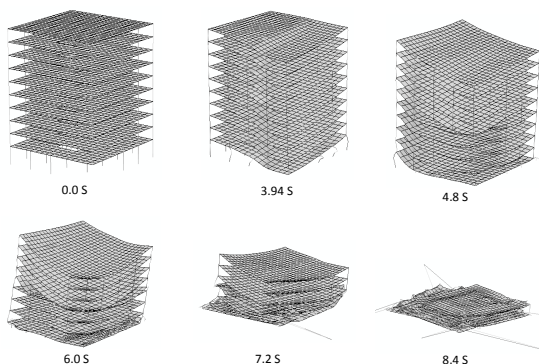
## Structural Properties

- Plan: 120'-00" × 120'-00"
- Span length: 30'-00" (4 × 4 bays)
- Height: 146'-00" (1st story: 20' others 14')
- Outer connections - moment resisting
  - seismic design category: B
  - exposure category: B
  - basic wind speed: 90 mph
- Inner connections - resisting shear
- Beams, girders and columns (A992)
- Slab: 4 ksi normal weight concrete

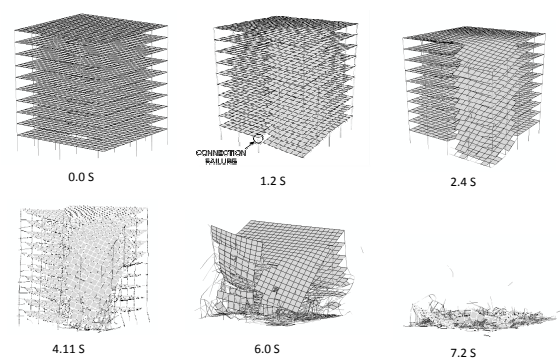


## Results

- Lateral load resistant frames showed better performance.
- Rigid - hinge vs. moment - shear connections would not be a critical factor if the initial damage is localized.
- Column size transition zones should be addressed.



Simple and Rigid Connections



Moment and Shear Connections