PROGRESSIVE COLLAPSE OF MULTI-STORY STEEL FRAME BUILDINGS: Phase I

Objectives
- Establish Analysis procedure
- Trace the collapse behaviors for various conditions
- Determine effective failure criteria range
- Parametric study
- Derive damage prediction
- Develop fast running algorithm

Model Definition
- Geometry modeling
- Material modeling
- Simplification

Failure Criteria
- Material or geometric failure

Numerical Analysis
- Element elimination in external criteria screening technique
- Numerical stabilization by variable boundary condition technique
- Time-cost analysis to establish optimal process

Behavior
- Applied material
- Applied failure criteria
- Occurred damage
- Debris action
- Background Database

Time-History Signal processing
- Select appropriate procedure
- Determine Warning Signal characteristics

Damage Assessment Tool
- Behavior and Symptom Observation
- Condition Assessment and Identification
- Optimal sensor placement
- Damage and Action Report
- Future Behavior Prediction and Warning