Seismic Retrofit Scheme & Performance Objective

Objective: Collapse Prevention and Minimize Live Safety Hazard for BSE-1N (475-yr) Seismic Hazard

1. Residential Levels:
   Retrofit Beam-Column Connections on floors 17 to 21 to Increase Ductility of Weak-Axis Column Connections.

2. Commercial / Office Levels:
   Add Viscous Damper Braced Frames from Ground to 8th Floor in Longitudinal Direction to Dissipate Energy and Reduce Demand on Connections.

Connection Types & Full-Scale Laboratory Testing

1. Haunched Beam-To-Column Strong Axis: Laboratory Tested

2. Haunched Beam-To-Column Weak Axis: Laboratory Tested

3. Beam-To-Column Weak Axis: Laboratory Tested

4. Pre-Northridge Beam-Column Strong Axis: Not tested since adequate information available in the literature

Building Seismic Performance

- Detailed nonlinear response history analysis using Perform-3D software
- Nonlinear modeling of beam-column connections, panel zones and columns
- Full-scale laboratory test results incorporated into connection modeling
- Site-specific BSE-1N ground motion records (10 pairs)
- Analyses showed that building is vulnerable to collapse in the upper levels of the structure for some ground motions and the lower levels for others.