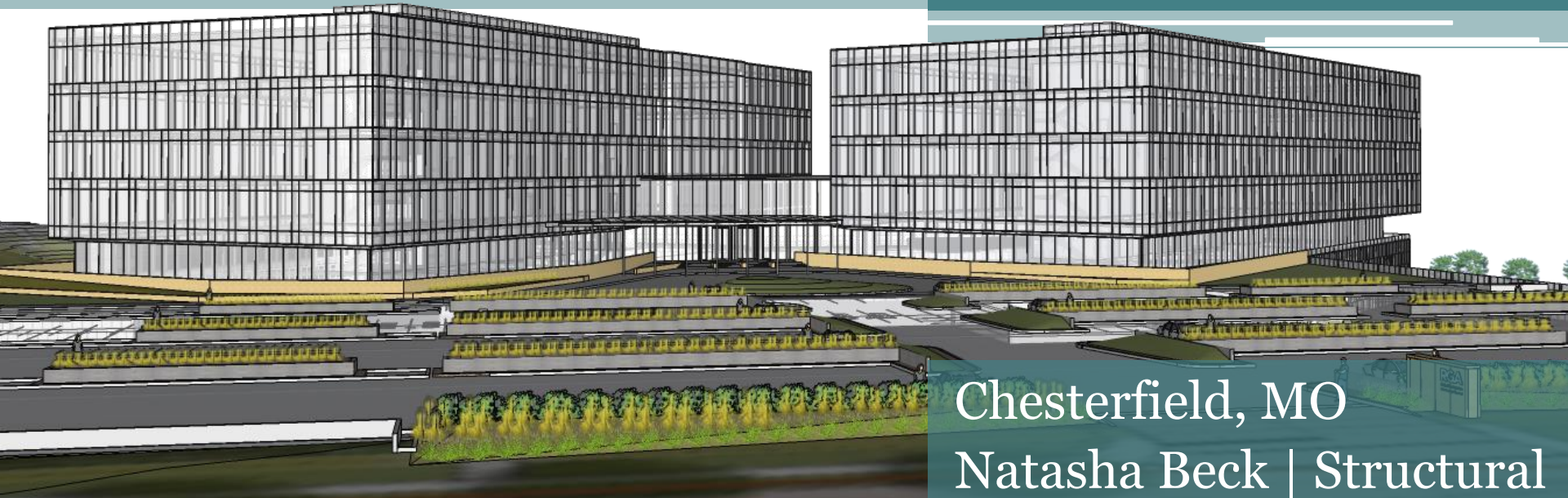


RGA Global Headquarters Lateral System Analysis Study



Chesterfield, MO
Natasha Beck | Structural

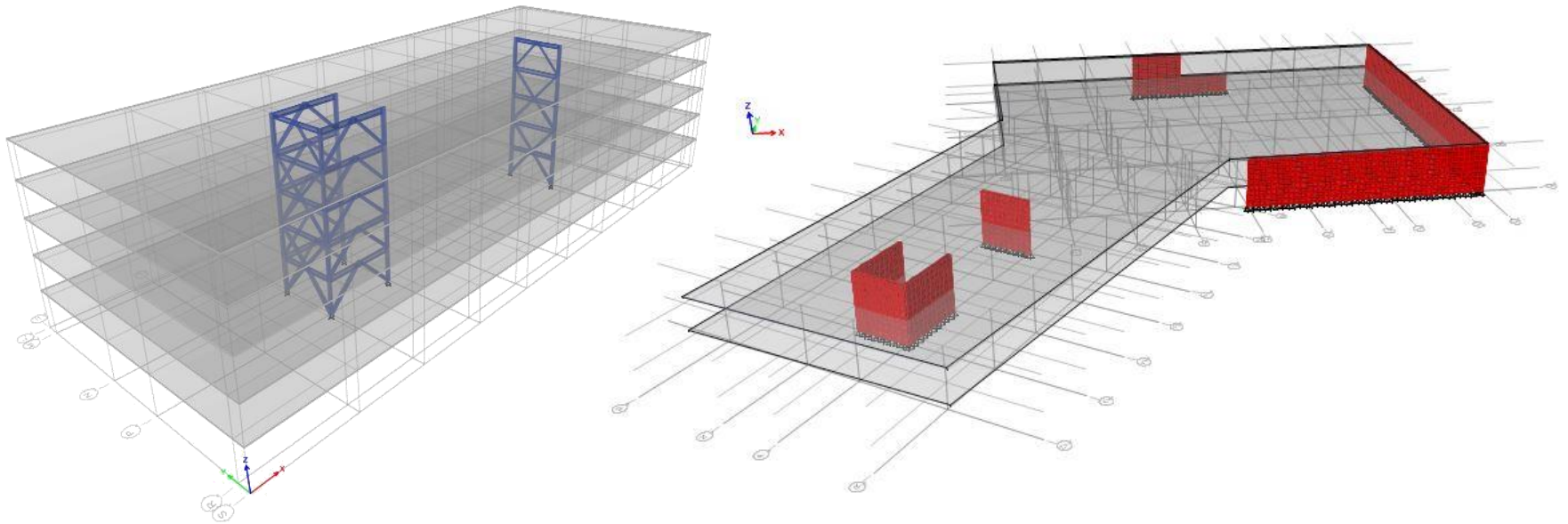
Area Considered

- Seismic expansion joints create four separate structural buildings
- E.J. = 2 1/2”

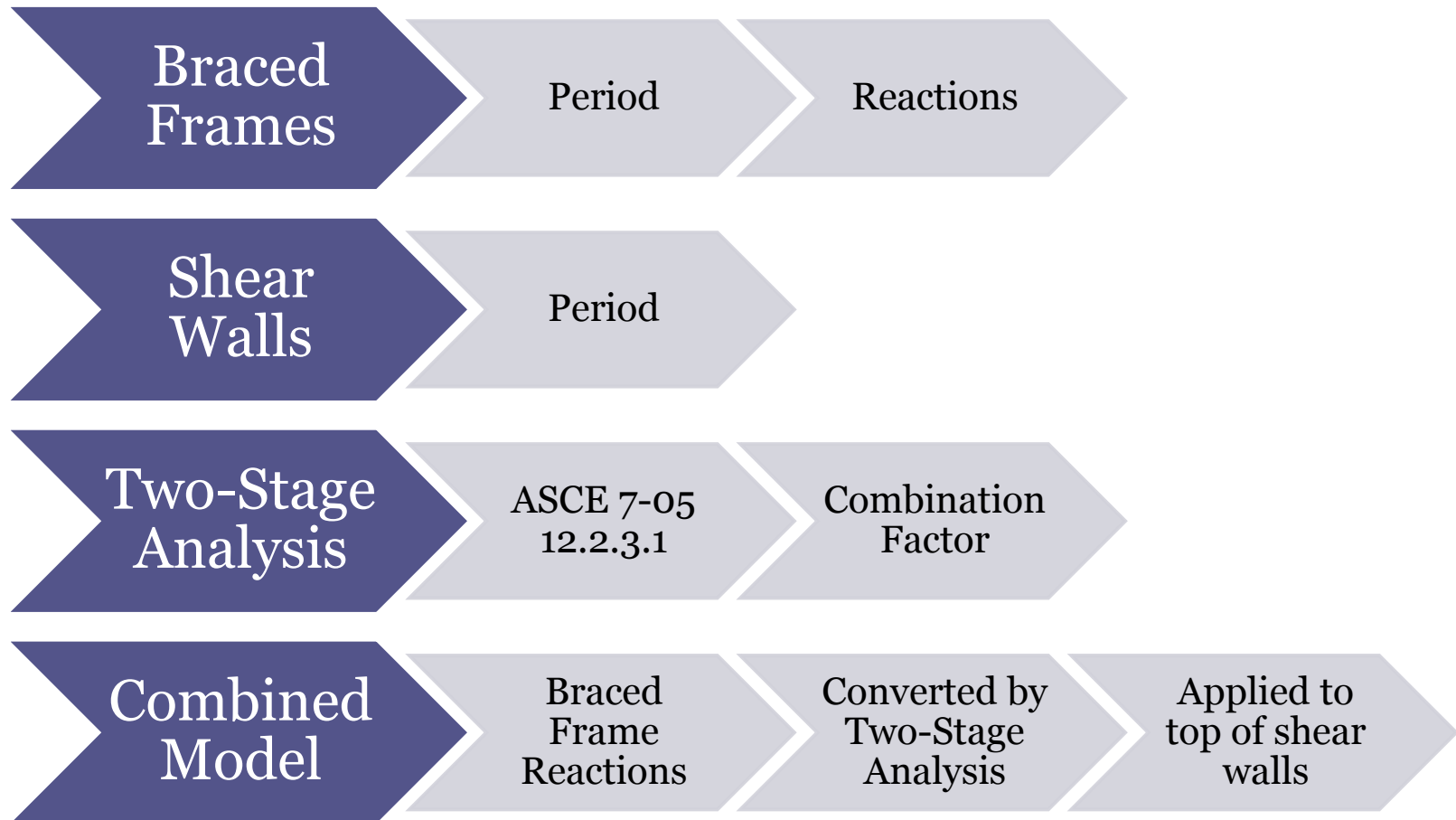


Lateral Elements Modeled

- Two Stage Analysis procedure
- Office: brace frames
- Parking garage: shear & foundation walls

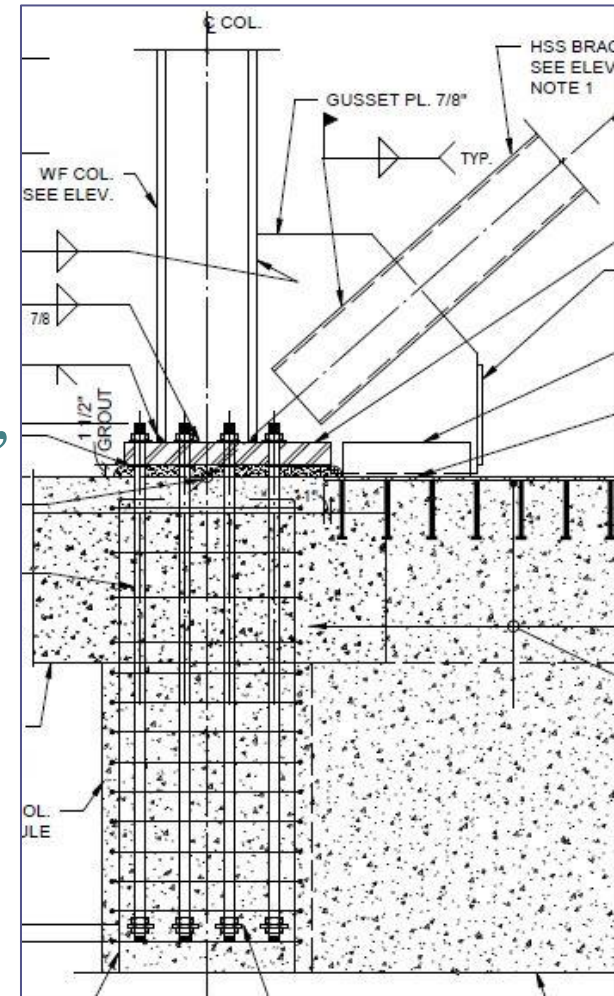


Modeling Process



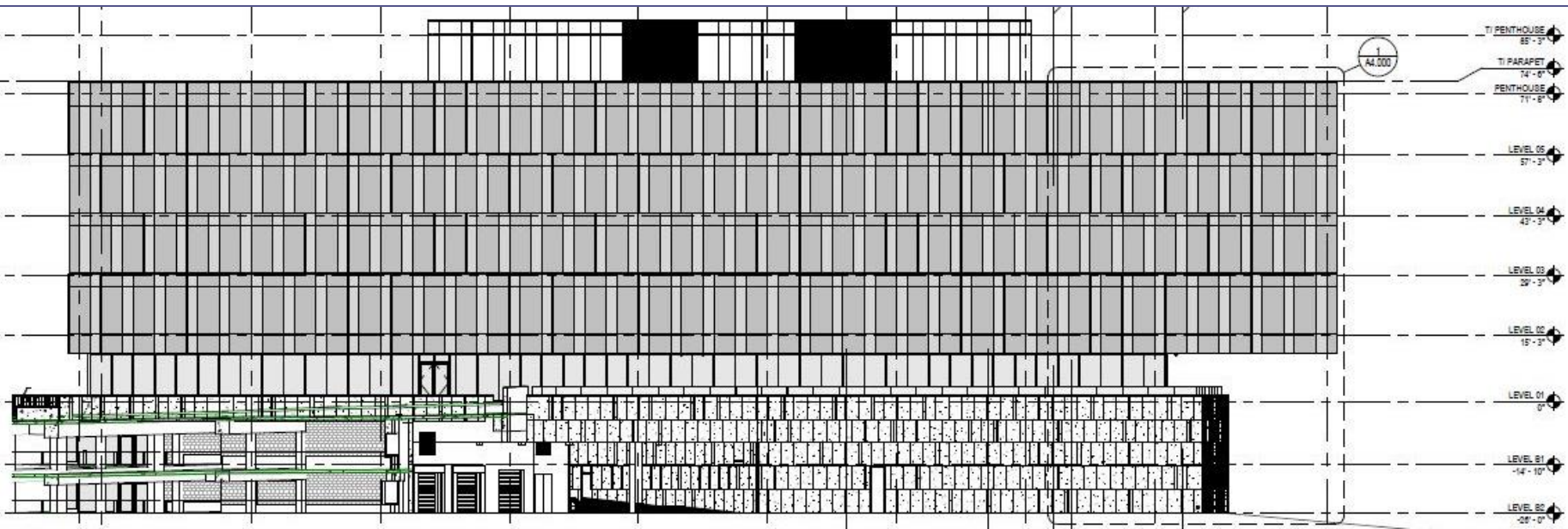
Modeling Considerations

- Base conditions
 - Brace frames-pinned base
 - Shear walls-pinned base
- Rigid Diaphragms
 - Office-composite concrete T=6 1/2"
 - Parking-slabs 7 1/2" to 9 1/2"
- Irregularities
 - Non-parallel systems irregularity in parking garage

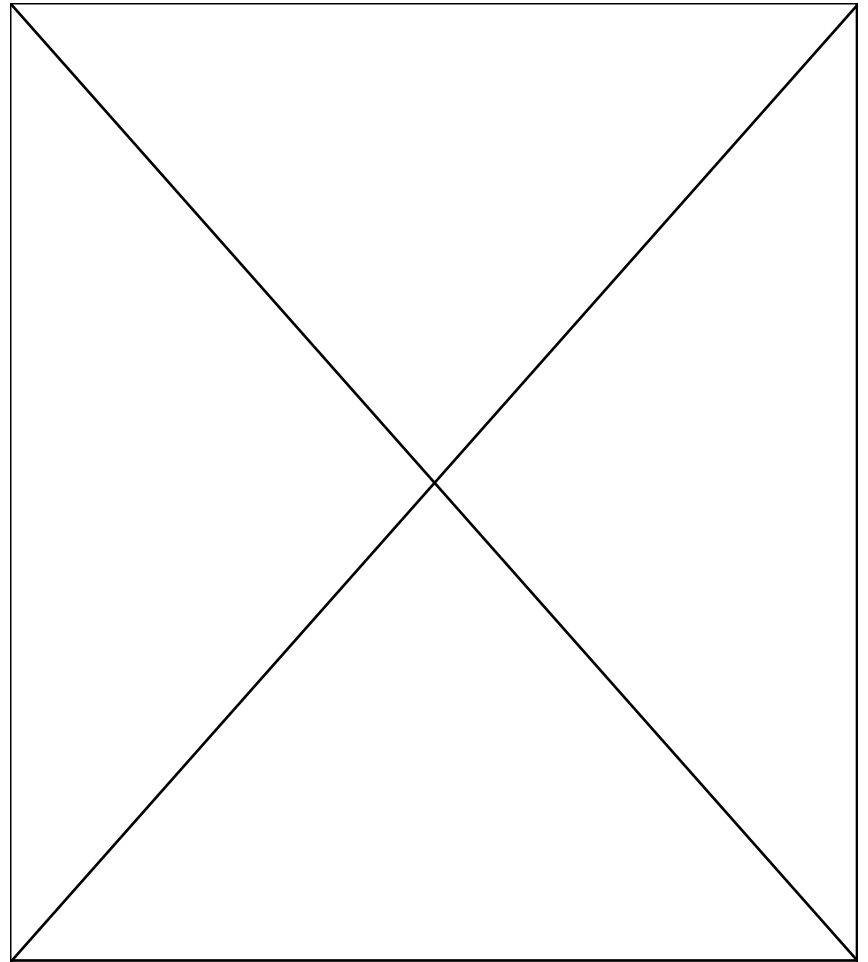
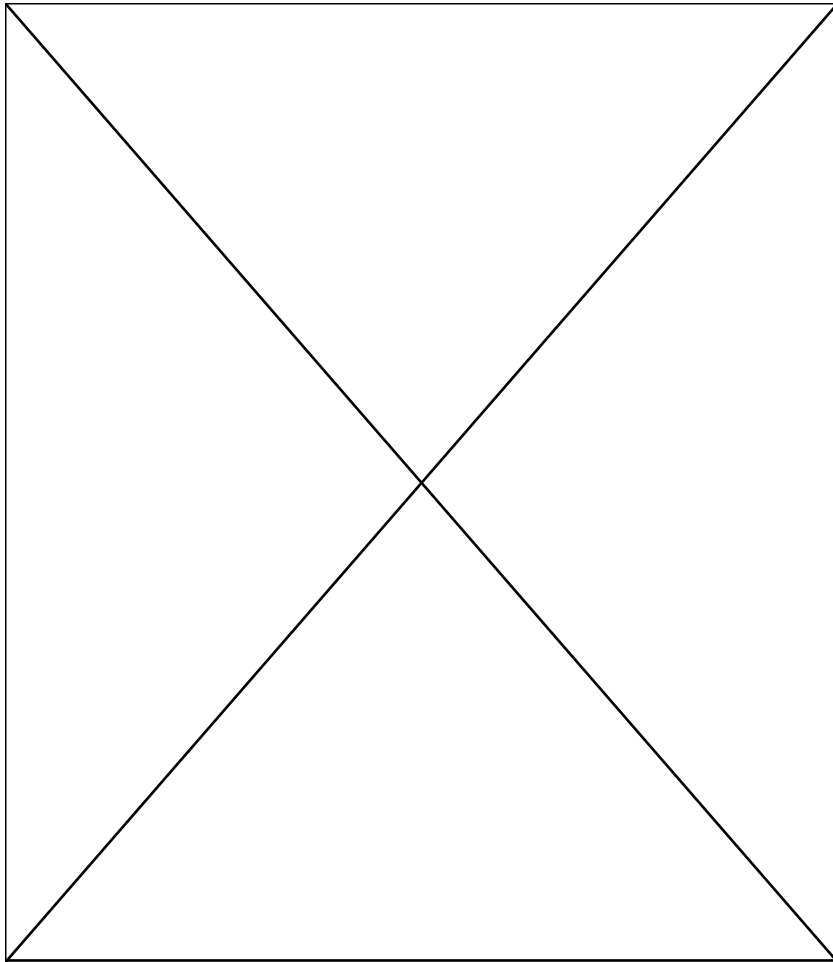


Force Distribution

- Weight at the Level 01 interface
- Penthouse story forces

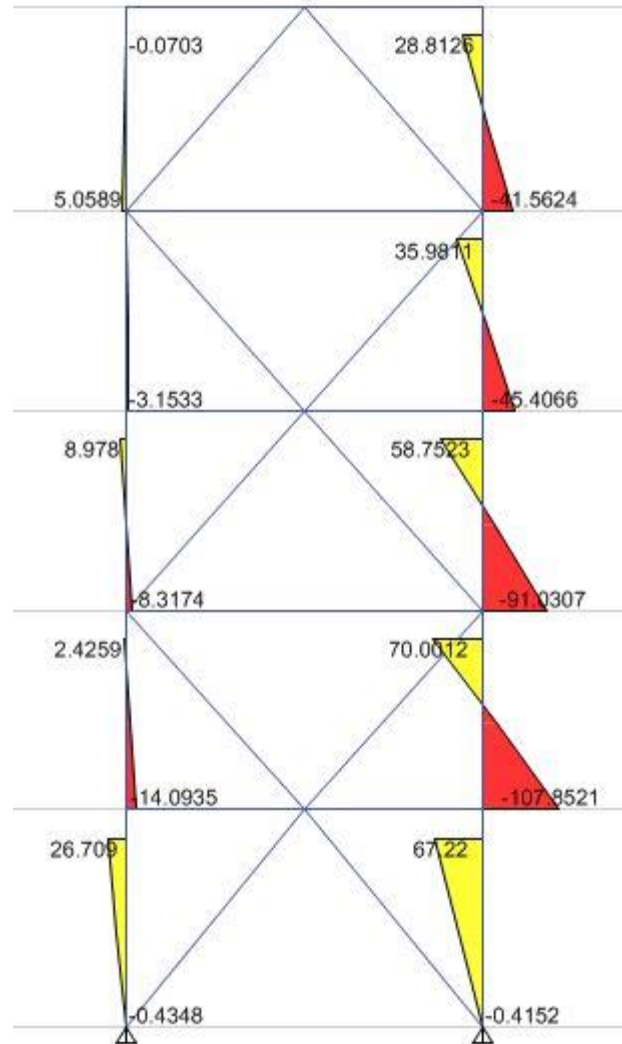


Animations



Moment Diagrams

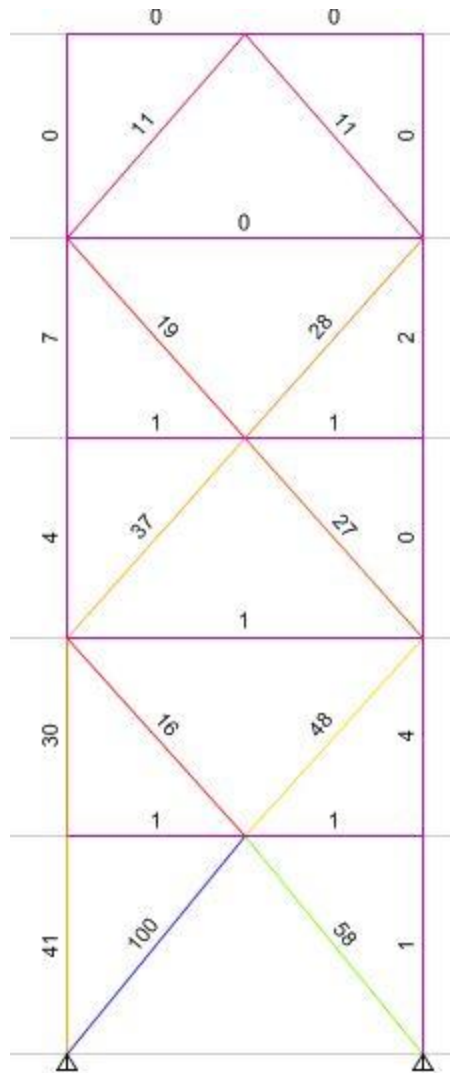
Critical Braced Frame



Braced frame
controlling case:
 $0.9D+1.0E$
Seismic Y-5%X

Member Utilization Ratios

Critical Braced Frame



Critical Shear Wall



Braced frame controlling case:
 $0.9D+1.0E$, Seismic Y-5%X

Shear wall controlling case:
 $0.9D+1.0W$, Wind Case 1-Y

Is the System Acceptable?

- System and components are adequate for strength
- Foundation is acceptable
- Serviceability-Drift
 - Wind: Meets both H/400 and H/600 drift limits found in ASCE 7 commentary
 - Seismic: Meets allowable story drift standards
 - Max. concrete building drift= $< \frac{1}{2} * EJ = 1.25''$
- System is acceptable