CVEN 483 – ETABS Work Assignments (due 9/23)

1. Find lateral stiffness for each 2D frame = lateral force/lateral displacement. Also compare moment, shear and axial load diagrams.

\[
\text{W18x40 Pin Pin 1 kip}
\]
\[
\text{W18x40 Pin Pin 1 kip}
\]

\[
\text{6x6x1/4 2-Angle Pin}
\]

Find lateral stiffness for each 2D frame = lateral force/lateral displacement. Also compare moment, shear and axial load diagrams.

2. Compare lateral stiffness (1 kip / \( \Delta \)) with and without end offset, add a 6” concrete floor plate (use 2 plates connected to the joints), and a rigid diaphragm. Compare lateral displacements, and moment, shear, and axial load diagrams.

\[
\text{18x24 RC column and beam members (50% member end offset)}
\]

\[
\Delta_2
\]

\[
\text{Fixed}
\]

Compare lateral stiffness (1 kip / \( \Delta_2 \)) with and without end offset, add a 6” concrete floor plate (use 2 plates connected to the joints), and a rigid diaphragm. Compare lateral displacements, and moment, shear, and axial load diagrams.
ETABS –Build Model and Loading based on the following Structures

Date Assigned: February 1, 2016  Date Due: February 15, 2016 (tentative)

The structural floor plan of a six-story (ground plus 6 floors) office building is shown on the next page. The roof covers the hole used for the elevator shaft and stairwells. Story floor systems consist of one-way pan joists supported on column lines A through F. The design loads for the floor (in addition to the self-weight) include a superimposed dead load of 20 psf; partition live load of 15 psf; live load of 75 psf; and cladding load per story level of 0.25 kip/ft around the building perimeter. The dimensional variables for the project are defined as: L = 30 ft; Bw = 6”; Sw = 66”, tw = 24”, t=5”, framing beam width = 24”, framing beam depth =24+5= 29”, columns 24”x24”; first story height is 16 ft, and remaining story heights are 12 ft. In addition to the gravity loading, add a lateral wind load applied to the geometric center of each story of 5, 10, 15, 20, 25, and 30 kips, respectively for the 1st, 2nd, etc, floor, respectively. Use load cases from ASCE 7 that consider D, L and W loadings.
**Plan View**

- **Section 1-1**
  - Pan joist - rib direction (typ)
  - Hole for Elevator shafts and stairwells

- **Section 2-2**
  - Pan joist - rib direction (typ)

**Dimensions**
- L = 30 ft
- fc' = 4,000 psi
- fy = 60,000 psi
- Bw = 6 in.
- Sw = 66 in.