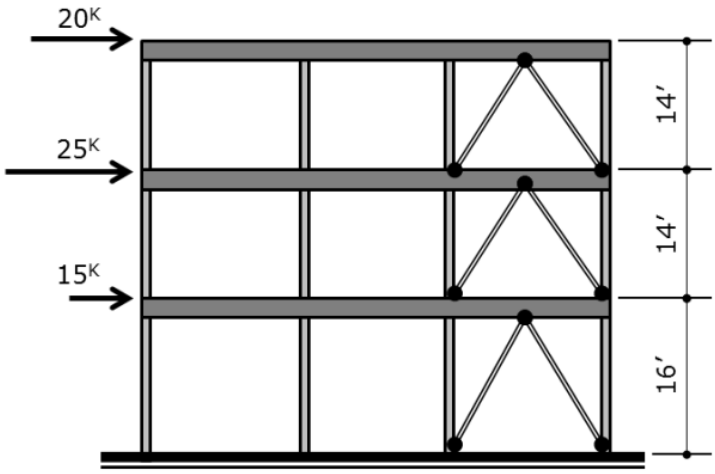
1.12 When subjected to moderate to strong earthquake ground motions, pre-1976 flat slab concrete structures can be particularly susceptible to the following failure type(s):

a. Punching shear failure of slabs at columns
b. Punching shear failure of spread footings at columns
c. X-cracking of concrete columns at the spread footing interface
d. All of the above

1.13 Using the vertical lateral force distribution on the braced frame line shown in the figure below, calculate the overturning moment at the ground level/base.

a. 870 kip-ft
b. 1,340 kip-ft
c. 1,870 kip-ft
d. 2,640 kip-ft



Elevation

1.14 Using the post-earthquake safety evaluation procedures of ATC-20, a red placard indicates which of the following posting conditions and occupancy restrictions?

a. Restricted Use - do not enter or occupy areas designated as unsafe on the placard
b. Restricted Use - do not occupy, brief entry only for possession retrieval by occupants
c. Unsafe - do not occupy, entry only by building owner
d. Unsafe - do not enter or occupy

1.15 What is the approximate building period of a 140-foot tall / 10-story office building assigned to *Seismic Design Category* D that utilizes steel buckling restrained braced frames for seismic resistance in each of the two orthogonal directions?

a. 0.8 second
b. 1.0 second
c. 1.2 second
d. 1.5 second

1.16 According to *ASCE 7-16*, seismic force-resisting systems that are expected to provide the highest level of ductility and better accommodate inelastic deformations are those systems designated as:

a. Earthquake resistant
b. Ordinary
c. Intermediate
d. Special