LESSON OBJECTIVES
1. Calculate the axial load on a column in a multi-story building, given pressures and building dimensions.
2. Calculate the distributed load \( w \) (units: lbs/ft or kips/ft) on girders, given pressures and building dimensions.
3. Calculate the distributed load \( w \) (units: lbs/ft or kips/ft) on fill beams, given pressures and building dimensions.
4. Calculate the maximum moment on girders and fill beams, given pressures and building dimensions.

EXAM 1: WEDNESDAY, 9/14/16, IN CLASS. Q&A TUESDAY NIGHT. LOTS OF RESOURCES ON WEBSITE

IN CLASS – BUILDING ONE
From Wednesday’s Lesson:

HOMEWORK (Due Monday. Standard Homework: Presentation Counts)
Use units of kip-ft for moment and kips for axial forces.
Use the floor plan below for problem 1. IMPORTANT NOTE: This is the same building as Lesson 5, so take a picture or scan your homework before you hand it in, as the answers should be remarkably similar (but not identical).

1. Given: The floor plan shows column locations, girders, and fill beams. The slab thickness is 4” (unit weight of concrete \( \gamma_{\text{conc}} = 150 \text{ lb/ft}^3 \)). The fill beams are W16x26, the girders are W18x35, and the columns are W14x90.

\( ^1 \) John Heisman took a fairly hard-line position on the issue of ball security.
For each of the elements listed, determine the tributary width and compute the maximum moment (units: kip-ft) due to dead load.

a. Exterior Fill Beam (e.g., along column line D)
b. Interior Fill Beam (e.g., along column line C) – COMPARE THE RESULT TO LESSON 5
c. Exterior Girder (e.g., along column line 1)
d. Interior Girder (e.g., along column line 2)

2. Assuming that the previous building is a single story building, determine the dead load axial forces on columns A4, B4, and B3.

READ THIS: Whether you use The Tributary Area Approach or The Line Diagram Approach, the maximum moment will be extremely similar if the number of fill beams is greater than or equal to three. When the number of fill beams is greater than or equal to 3 and that number is an odd number, the results are identical. However, NEVER use the Tributary Area Approach to compute girder moments if the number of fill beams is less than 3.

3. IF THE TRIBUTARY AREAS METHOD IS APPLICABLE, USE IT. IF THE TRIBUTARY AREA METHOD IS NOT APPLICABLE, USE LOAD PATH.
   a. Determine the maximum moment on a typical interior fill beam due to dead load.
   b. Determine the maximum moment on Girder AB due to dead load.

Given:
The floor plan below supports a 8” thick concrete slab (concrete unit weight = 150 lb/ft³)
Fill beams are W16x26
Girders are W18x35