1. (50 points) Use ASD to select a practical and reasonable (not significantly overdesigned) A36 double-angle section with long legs back to back (LLBB) for the brace below based on the yielding mode, determine the number of 5/8” A325-N bolts to be used, specify/sketch all dimensions of the trial connection (using AISC standards for edge distances and bolt spacing), and check the trial selection for fracture of the double angle using the $1 - \frac{x}{L}$ expression for shear lag; if the trial selection is inadequate for fracture, simply report the allowable tensile load – **do not perform a re-selection of the angle**. Perform no other checks, at this time.

Given: Wind load of 30 kips. The simple braced frame is braced by redundant tension-only braces (redundant brace indicated with dashed line) that are disregarded when they act in compression.
2. (30 points) Use the ASD method to select the lightest possible A992 W16 section for a typical interior fill beam in the floor plan below, considering bending moment, only. The beam supports a 5½” thick normal weight concrete (unit weight = 150 lb/ft³) slab. The beam will be in strong-axis bending.

Loads to Consider: Slab Weight, Beam Self-Weight, and a live load of 50 psf.

Notes: All Connections are simple, non-moment-resisting. Assume that the slab provides full lateral support of the compression flange.

This was on the 2010 Exam 4, but it is not on the 2015 Exam 4
3. (20 points). Determine the extreme-fiber stresses at positions A and B due to the point load $P=5$ kips and indicate whether tensile or compressive. Given: The column and beam are rigidly-connected W16x26 shapes. Positions A and B represent the extreme fibers, at the base of the column.

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