

HW 2**Reading:**

Read "MSC Stadium Addition" posted on Stellar

Read Chapters B and D of the Spec (AISC Steel Manual Spec on website)

Problem 1**Northwestern University Stadium Pressbox**

Read "MSC Stadium Addition" posted on Stellar and write about the framing scheme selected.

This could address the loads, why the framing scheme was selected, and see if you can suggest a better alternative to the framing scheme.

Problem 2

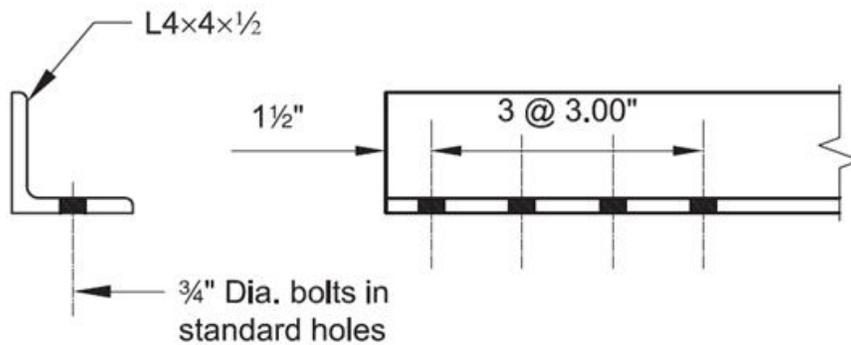
What is E for steel (Young's modulus)? Does it vary? What are typical values for the yield stress of steel (A36 and A992)? What does yield stress mean? Who publishes the steel specification?

Problem 3

Assume you want to design a square bar for a tension of 20k dead load and 80k live load, what is the size of the bar using both ASD and LRFD? Assume A36 steel. Using ASD, what is the elongation of this member if it is 30ft long?

Problem 4

What is the net area of this angle? What is the LRFD yield strength and rupture strength? Assume A36 steel and $U=0.8$.



Problem 5

Below is a section of a house gable roof. The rafter and tie shown is spaced at 2 ft on center in plan (so this section is 2ft on center). Suppose we want to use a round solid steel bar for the collar tie, instead of a 2x6 as shown below...what size do we need for strength? How much will it elongate? Assume 15psf for dead load of roof (ignore self weight), and 55psf of snow load since in New Hampshire (this is projected load, if applied to rafter it would be $55\text{psf} \times 8/10$).

Hint: Solve for reactions at top of wall first, then cut in half and crease FBD.

