

53:134 Structural Design II, Spring 2006

HW #18 Beam-Column Design

A W14 x 99 of A992 steel is used as a 14-foot-long beam-column with $K_x = 0.9$ and $K_y = 1.0$. The member is braced against sidesway, the ends are restrained, and there are transverse loads between the ends. The member is subjected to a factored axial compressive load of 500 kips and a factored bending moment of 360 ft-kips about the strong axis. Use $C_b = 1.6$ and determine whether this member satisfies the provisions of the AISC Specification.

Requirements:

- For determination of $\phi_c P_n$, use both the equations in the code and the compression design table (Pages 4-12~4-151 of the Code).
- For determination of $\phi_b M_n$, use both the equations in the code and the beam design chart (Pages 5-71~5-102 of the Code).
- No need to check shear failure.