CE456 – Written Home Work Number 3
Due On or Before Thursday, October 4, 2018

(1) Using the figures, Figure CA-7.1 and Figure CA-7.2 (Fig.CA-7.1_2.pdf on class website), (a) find the value of $K$ if $G_A = 0.6$ and $G_B = 3.0$, for a braced frame. (b) Find the value of $K$ if $G_A = 1.0$ and $G_B = 4.0$, for a sidesway frame.

(2) From Figure 4-9 (page 123) of the Textbook, The value of $\lambda$ must be less than $0.56\sqrt{E/F_y}$ for an I-shape member to be considered non-slender. Using $F_y = 50$ ksi and the $h/t_w$ values given in Table 1-1, (i) show why the 4 large W44 members are consider "slender" for compression. Note: the slender members for all the W members are marked with a superscript $c$, for example, W44×335$^c$. (ii) Find a W40 member which is not slender for compression.

(3) A design problem. Given a 16-ft column as shown in the figure with the loads given as: $D = 400$ kips and $L = 450$ kips. (a) Find an appropriate W10 for the situation. (b) Find an appropriate W14 for the situation. (c) Find an appropriate W16 for the situation. It would be simple to use the compression values of Table 4-1 of the steel manual for parts (a) and (b). A trial and error is needed for part (c).

(4) Do book problem 5.5-3. Use LRFD only.