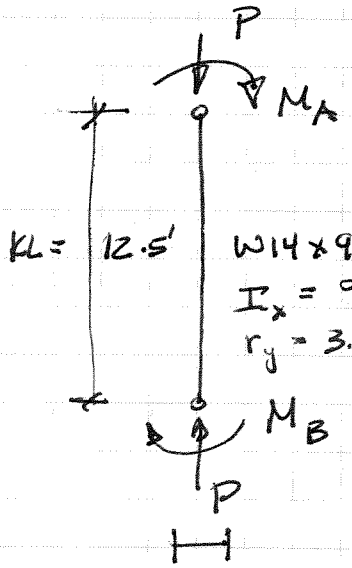
# CHAPTER 8

1.

$P_D = 100^K$, $P_L = 300^K$, $M_{D_A} = 30$ Ft-K, $M_{L_A} = 70$ Ft-K

$M_{D_B} = 15$ Ft-K, $M_{L_B} = 35$ Ft-K




a) LRFD

$P_u = 1.2(100) + 1.6(300) = 600^K$

$M_{u_A} = 1.2(30) + 1.6(70) = 148$ Ft-K

$M_{u_B} = 1.2(15) + 1.6(35) = 74$ Ft-K

DETERMINE AMPLIFICATION FACTOR, $B_1$

$C_m = 0.6 - 0.4\left(\frac{74}{148}\right) = 0.4$

$P_{e_1} = \frac{\pi^2 EI}{(KL)^2} = \frac{\pi^2(29000)(999)}{(12.5(12))^2} = 12,700^K$

$B_1 = \frac{0.4}{1 - \frac{600}{12,700}} = 0.420 > 1.0 \quad \therefore B_1 = 1.0$

AMPLIFIED MOMENT $M_u = 1.0(148) = 148$ ft-k

Column STRENGTH

For $KL_y = 12.5$ ft $\quad \phi P_n = 1060^K$ TABLE 4-1

For $L_b = 12.5$ ft $\quad \phi M_n = 573$ Ft-K TABLE 3-2

$\frac{P_u}{\phi P_n} = \frac{600}{1060} = 0.566 > 0.2 \quad \therefore$ USE EQ H1-1a

$0.566 + \frac{8}{9}\left(\frac{148}{573}\right) = 0.566 + 0.230 = 0.796 < 1.0$

$\therefore$ OK