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ARCH 324 - Structures 2, Winter 2009

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3 Moment Equation:

\[ M_A L_1 + ZH_B (L_1 + L_2) + M_C L_2 = 6 \left[ (EI \theta_1 + EI \theta_2) \right] \]

\[ M_A = 12k (10') = 120 \text{ k} \]
\[ L_1 = 24' \]
\[ L_2 = 30' \]
\[ M_C = 0 \text{ (unrestrained end)} \]
\[ L_1 + L_2 = 54' \]

\[ EI \theta_1 = \frac{PL_1^2}{16} + \frac{WL_1^2}{24} = \frac{16(24)^2}{16} + \frac{24(24)^2}{24} = 1152 \]

\[ EI \theta_2 = \frac{5PL_1^2}{81} = \frac{5(9)(30)^2}{81} = 500 \]

\[ (EI \theta_1 + EI \theta_2) = 1652 \]

\[ 120(24) + 2 H_B(54) + 0(30) = 6 \left[ 1652 \right] \]

\[ H_B = 65.11 \text{ k-ft} \]

Sum Reactions by Superposition:

\[ \text{Loads:} \quad 12k \quad 120k \quad 16k \quad 9k \]

\[ \text{Moments:} \quad 120 \quad 5.0 \quad 65.1 \quad 217 \quad 217 \]

\[ \text{Total:} \quad 34267 \quad 25883 \quad 0.83 \]

\[ A \quad B \quad C \]