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ARCH 324 - Structures 2, Winter 2009

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USE 3-MOMENT EQUATION TO SOLVE BEAM REACTIONS:

3-MOMENT EQUATION:

\[ M_A + 2M_B (L_1 + L_2) + M_C L_2 = 6 \left[ EI \theta_1 + EI \theta_2 \right] \]

\[ M_A = 12(8) = 96 \text{ k} \]
\[ M_B = ? \text{ (Find)} \]
\[ M_C = 0 \text{ (unrest. end)} \]
\[ L_1 = 24 \]
\[ L_2 = 30 \]
\[ L_1 + L_2 = 54 \]
\[ EI \theta_1 = \frac{WJ}{24} = \frac{24(24)^2}{24} = 576 \]
\[ EI \theta_2 = \frac{4FL}{61} = \frac{4(18)(30)^2}{61} = 760 \]
\[ [EI \theta_1 + EI \theta_2] = 576 + 760 = 1376 \]

\[ 96(24) + 2(18)(54) + 0(30) = 6[1376] \]

\[ M_B = 55,111 \text{ k} \]

REACTIONS BY SUPERPOSITION:

FBD of LOADS:

FBD of MOMENT:

\[ A = 25.704 \text{ k} \uparrow \]
\[ B = 18.133 \text{ k} \uparrow \]
\[ C = 10.163 \text{ k} \uparrow \]