ARCH 324 - Structures 2, Winter 2009

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**REQU'D USE 3-MOMENT EQUATION TO SOLVE BEAM REACTIONS.**

3-MOMENT EQUATION:

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

- \( M_A = 12 (8) = 96 \) k'\( \left( \frac{W}{L} \right) \)
- \( M_B = ? \) (Find)
- \( M_C = 0 \) (Unrest. End)

\[ EI \theta_1 = \frac{W L^2}{24} = \frac{24(24)^2}{24} = 576 \] k'\( \left( \frac{W}{L} \right)^2 \)

\[ EI \theta_2 = \frac{4.5 L^2}{81} = \frac{4(18)(30)^2}{81} = 800 \] k'\( \left( \frac{W}{L} \right)^2 \)

\[ [EI \theta_1 + EI \theta_2] = 576 + 800 = 1376 \]

\[ 96 (24) + 2(M_B)(54) + 0(30) = 6 \left[ 1376 \right] \]

\( M_B = 55,111 \) k'

REATIONS BY SUPERPOSITION

**FBD OF LOADS**

- \[ 12 \uparrow \quad 12 \downarrow \quad 12 \downarrow \quad 18 \downarrow \]

**FBD OF MOMENT**

- \[ 96 \uparrow \quad 55,111 \uparrow \]
- \[ 2.296 \uparrow \quad 4.0 \downarrow \]
- \[ 2.296 \uparrow \quad 1.837 \downarrow \]
- \[ 4.0 \downarrow \quad 4.0 \downarrow \]

\( A = 25704 \) k'\( \uparrow \quad B = 18,133 \) k'\( \uparrow \quad C = 10,163 \) k'