ARCH 324 - Structures 2, Winter 2009

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CALCULATING THE LOAD

GIVEN: \( f_b = 24 \text{ ksf} \)
\( W = 30 \times 116 \)

\[
\frac{W \times ft}{l = 64'}
\]

FOR \( W = 30 \times 116' \) from Table
\( D = 35 \) WE GET,
\[ S_x = 329 \text{ in}^3 \]

FOR A SIMPLY SUPPORTED UNIFORMLY LOADED BEAM,

MAXIMUM MOMENT \( M = \frac{Wl}{8} \)

NOW,
\[ f_b = \frac{M_c}{I} = \frac{M}{S_x} = f_b \]

\[ \therefore M = S_x \times f_b \]
\[ \therefore M = 329 \text{ (in)}^3 \times 24 \text{ (k/ft)} \]
\[ \therefore M = 7,896 \text{ k-in} = 7,896 \text{ k-in} \]
\[ \therefore M = 658 \text{ k-ft} \]

\[ \therefore M = \frac{Wl}{8} \]
\[ \therefore W = \frac{M \times 8}{l} \]
\[ \therefore W = 658 \frac{\text{k-ft}}{64'} \times 8 \]
\[ \therefore W = 822.25 \text{k} \]