ARCH 324 - Structures 2, Winter 2009

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# 14-1 (2) a

CALCULATING THE LOAD

**GIVEN:** \( f_b = 24 \text{ ksi} \)

\[ W \times 30 \times 116 \]

\[ \frac{w}{l} \]

\[ l = 64' \]

FOR `W 30 x 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,

\[ f_b = \frac{Mx}{I} = \frac{M}{S_x} = f_b \]

\[ \therefore M = S_x \times f_b \]

\[ \therefore M = 329 \text{ (in)}^3 \times 24 \text{ (ksi)} \]

\[ \therefore M = \frac{7896 \text{ k-in}^2}{12} \]

\[ \Rightarrow M = 658 \text{ k-in} \]

\[ \therefore M = \frac{Wl}{8} \Rightarrow W = \frac{M \times 8}{l} \]

\[ \therefore W = \frac{658 \text{ k-in} \times 8}{64'} \]

\[ \therefore W = 82.25 \text{ k} \]