ARCH 324 - Structures 2, Winter 2009

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REATIONS:
\[ \Sigma H_{R_1} = 0 = 28w(8) - R_2(18) \]
\[ R_2 = 12.44 \text{w} \]

\[ \Sigma H_{R_2} = 0 = R_1(18) - 28w(10) \]
\[ R_1 = 15.56 \text{w} \]

\[ \Sigma F_y = 0 \checkmark \]

TRANSFORMED SECTION:
\[ h = \frac{50}{2} = 15 \]

\[ I_{tr} = \frac{21(10)^3}{12} = 1750 \text{ in}^4 \]
STRAIN COMPACTION:" 
ASSUME WOOL CONTROLS - CHECK STEEL

\[ \frac{E_w}{2000} = 0.0009 \quad F_w = F/E = 1000 \times (2000) = 27 \text{ ksf} > 22 \text{ ksf} \]

\( \therefore \) STEEL CONTROLS MAX STRAIN

\[ E_s = \frac{22}{20000} = 0.00011 \quad F_w \times E = 0.00073 (2000) = 1.467 < 1.8 \text{ ksf} \]

\( \therefore \) OK

FIND MAX ALLOWABLE MOMENTS FOR EACH

\( f = \frac{M_o}{I} \quad M = f \times \frac{E}{E} \times 146(1750)/5 = 513.3 \text{ k-f} = 42.78 \text{ k-f} \)

\( \text{(FOR STEEL)} \)

\( = 22(1750)(5w) = 513.3 \text{ k-f} = 42.78 \text{ k-f} \)

\( \therefore \) MOMENTS AGREE

FIND \( w \):

\[ M = 42.78 = 27.7w \]

\( \therefore w = 1.54 \text{ k/1} = 43.25 \text{ k TOTAL} \)