ARCH 324 - Structures 2, Winter 2009

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DETERMINE BUCKLING LOAD \(P_e\), BASED ON THE EULER EQUATION FOR A 3' LONG WOOD 2\(\times\)4" (USE FULL DIMENSIONS) ENDS PINNED. \(K = 1.00, \ E = 1500\ \text{ksi}\)

IF \(F_y = 6\ \text{ksi}\), WHAT IS MINIMUM LENGTH FOR WHICH THE EULER EQUATION IS VALID?

**Euler Equation:**

\[
P_e = \frac{\pi^2 EA}{(KL/4)^2}
\]

\[
P_e = \frac{\pi^2 (1500) B}{(96/577)^2}
\]

\[P_e = 4.28 K\]

**Min. Valid Length:**

\[
L = \frac{\pi^2 E}{(KL/4)^2}
\]

\[L = \frac{\pi^2 (1500)}{(96/577)^2}
\]

\[L = \frac{\pi^2 (1500)}{\sqrt[4]{96/577}} = 28.66" \ (\text{minimum})\]