Arch 324

Name 1	 	 	<u> </u>
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Columns

Description

This project uses observation and calculation to understand the effect of slenderness on column capacity.

Goals

To observe the buckling behavior of columns through physical modeling.

- To find the controlling slenderness ratio.
- To calculate the critical buckling and crushing loads.

Procedure

- 1. For the 1/16"x1/4" basswood column provided, with L=6" calculate the controlling (weak axis) slenderness ratio and Pcr using the Euler equation. Use K=1.0.
- 2. Find the actual critical buckling load approximating the load with your finger.
- 3. Repeat the procedure for L=3" and L=1".
- 4. Calculate the slenderness and Pcr for both of these lengths.
- 5. Calculate the ultimate crushing load based on the max compressive stress, Fc.
- 6. Approximately locate P for each length on the load vs. slenderness curve shown below



Equations:

Basswood Properties

Emin = 1,650,000. psi

Fc = 4745 psi Area = 0.015625 in² d_1 = 0.25 in d_2 = 0.0625 in

L = 1" L/d = P =

