A wooden beam is fabricated by nailing together three pieces of dimension lumber as shown. The cross-sectional dimensions of the beam are shown. The beam must support an internal shear force of $V = 600$ lb.

(a) Determine the maximum horizontal shear stress in the cross section for $V = 600$ lb.

(b) If each nail can provide 120 lb of horizontal resistance, determine the maximum spacing $s$ for the nails.
The simply supported beam shown consists of a W 21×44 structural steel wide flange shape \([E = 29,000 \text{ ksi}; I = 843 \text{ in.}^4]\). For the loading shown, determine the beam deflection at point \(A\).
A W 530×92 structural steel wide flange shape \([E = 200 \text{ GPa}; I = 554 \times 10^6 \text{ mm}^4]\) is loaded and supported as shown. Determine the force and moment reactions at supports A and C.
Consider a point in a structural member that is subjected to plane stress. Normal and shear stresses acting on horizontal and vertical planes at the point are shown.

a. Determine the principal stresses and the maximum in-plane shear stress acting at the point.

b. Show these stresses on an appropriate sketch.

c. Compute the absolute maximum shear stress at the point.