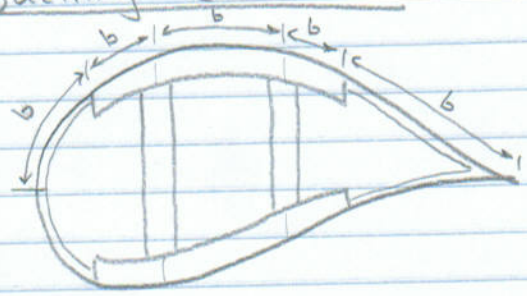
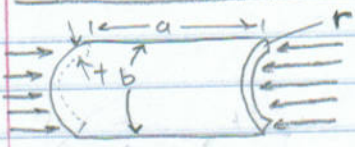
Buckling Criteria :



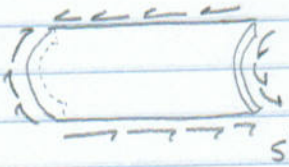
references
Roark 1975
Peery 1982

top & bottom panels



compression

+



shear

$\frac{b}{t} > 10$, $a > b$, all edges pinned

compression $\sigma_{c,cr} = \frac{1}{6} \frac{E}{1-\nu^2} \left[\sqrt{12(1-\nu^2)\left(\frac{t}{r}\right)^2} + \left(\frac{\pi t}{b}\right)^4 + \left(\frac{\pi t}{b}\right)^2 \right]$

shear $\tau_{cr} = \frac{1}{10} E \left(\frac{t}{r}\right) + 5E \left(\frac{t}{b}\right)^2$

buckling criteria $R_c + R_s^{3/2} \leq 1 \longrightarrow \boxed{\frac{\sigma_{max}}{\sigma_{c,cr}} + \left(\frac{\tau_{max}}{\tau_{cr}}\right)^{3/2} \leq 1}$

bending + shear

bending $\sigma_{b,cr} = 19.74 \frac{E}{(1-\nu^2)} \left(\frac{t}{b}\right)^2$

shear $\tau_{cr} = 4.4 \frac{E}{(1-\nu^2)} \left(\frac{t}{b}\right)^2$

buckling criteria $R_b^2 + R_s^2 \leq 1 \longrightarrow \boxed{\left(\frac{\sigma_{min}}{\sigma_{b,cr}}\right)^2 + \left(\frac{\tau}{\tau_{cr}}\right)^2 \leq 1}$