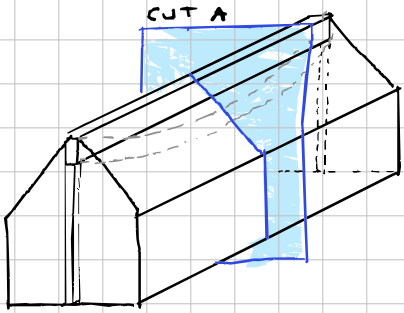
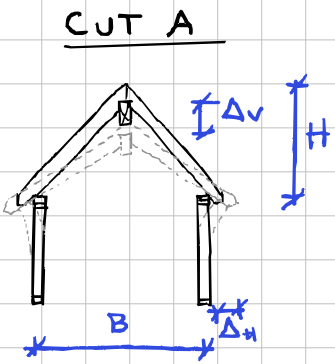
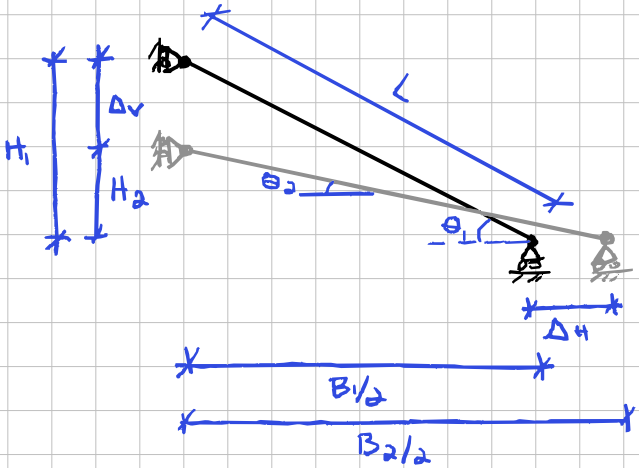
11 - Rafter horizontal thrust

1. Sketches





2. Calculate Δ_H



$$L = \sqrt{H_1^2 + \left(\frac{B_1}{2}\right)^2}$$

$$\frac{B_2}{2} = \sqrt{L^2 - H_2^2}$$

$$\frac{B_2}{2} = \sqrt{H_1^2 + \frac{B_1^2}{4} - (H_1 - \Delta v)^2} = \sqrt{H_1^2 + \frac{B_1^2}{4} - H_1^2 + 2H_1\Delta v - \Delta v^2}$$

$$\Delta_H = \frac{B_2}{2} - \frac{B_1}{2} = \sqrt{\frac{B_1^2}{4} + 2H_1\Delta v - \Delta v^2} - \frac{B_1}{2}$$