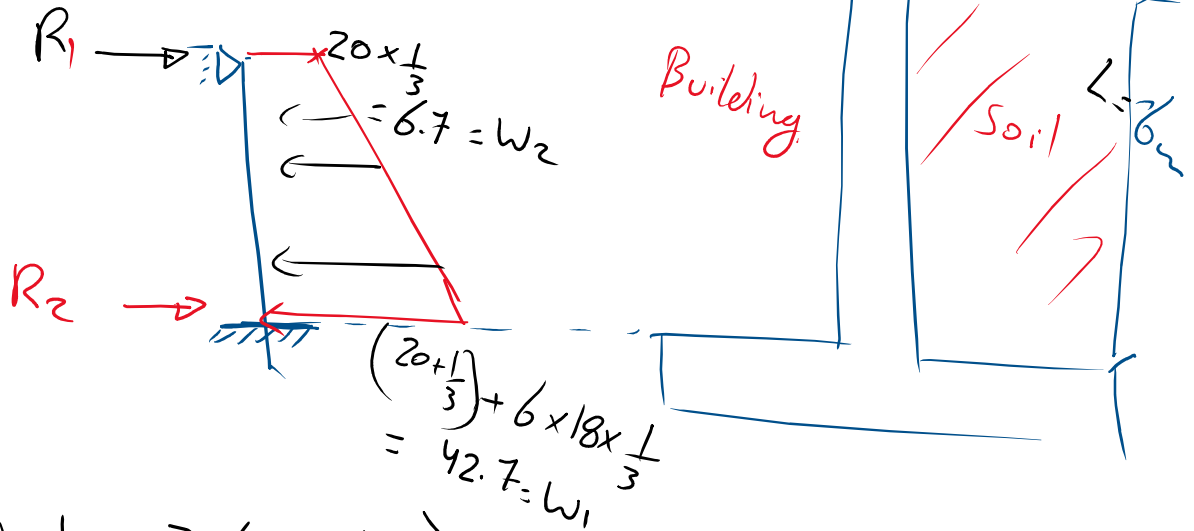


# Example Basement Wall

Design the Basement Wall shown, assume  $f_c = 28 \text{ MPa}$ .

$f_y = 420 \text{ MPa}$        $\gamma_s = 18 \text{ kN/m}^3$

$q_{\text{wall}} = 240 \text{ kN/m}$        $k_0 = \frac{1}{3}$

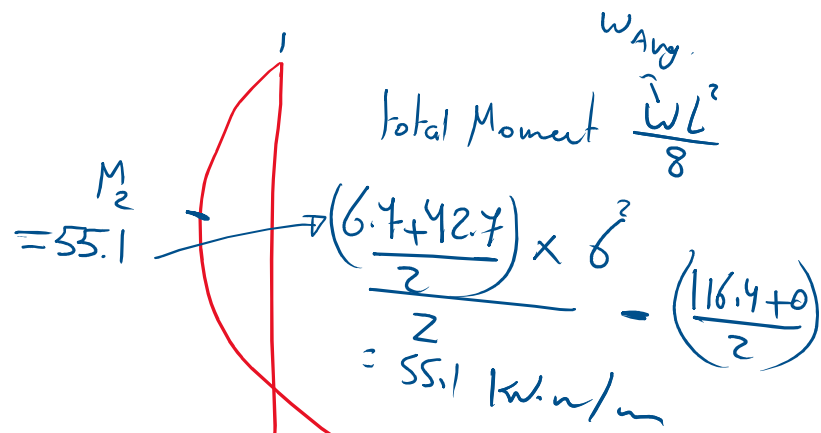
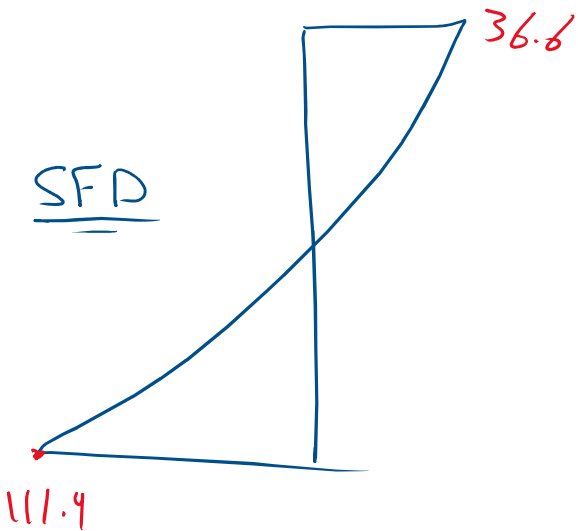


For 1 story.

$$R_1 = 0.1 W_2 L + \frac{3}{8} (W_1 - W_2) L$$

$$R_1 = (42.7 - 6.7) \times 0.1 \times 6 + 6.7 \times 6 \times \frac{3}{8} = 36.6 \text{ kN/m}$$

$$\sum F_y = 0 \rightarrow R_2 = \frac{42.7 + 6.7}{2} \times 6 - 36.6 = 111.4 \text{ kN/m}$$



$$M_1 = \frac{W_2 L^2}{8} + \frac{(W_1 - W_2) L^2}{15} = 116.4 \text{ kN.m/m}$$

$$\Rightarrow \underbrace{V_u = P_u}_{\text{assume}} = 111.4 \times 1.6 = \underline{\underline{178.24}}$$

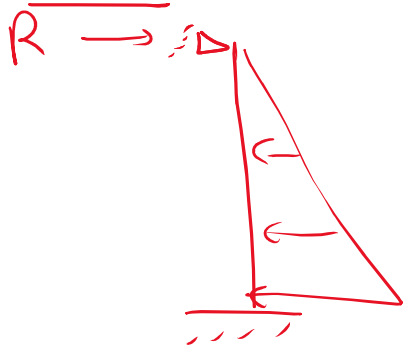
$$\phi V_c = V_u$$

$$0.75 \times (0.166) \frac{\sqrt{28} \times 1000 \times d}{1000} = 1.6 \times 111.4$$

$$d = 269 \text{ mm} \rightarrow h = 350 \text{ mm}$$

$$d \geq 70 \text{ mm}$$

\* Notes



$$R = 0.1WL$$

