

Appendix D

Retaining Wall Calculations

RETAINING WALL DESIGN

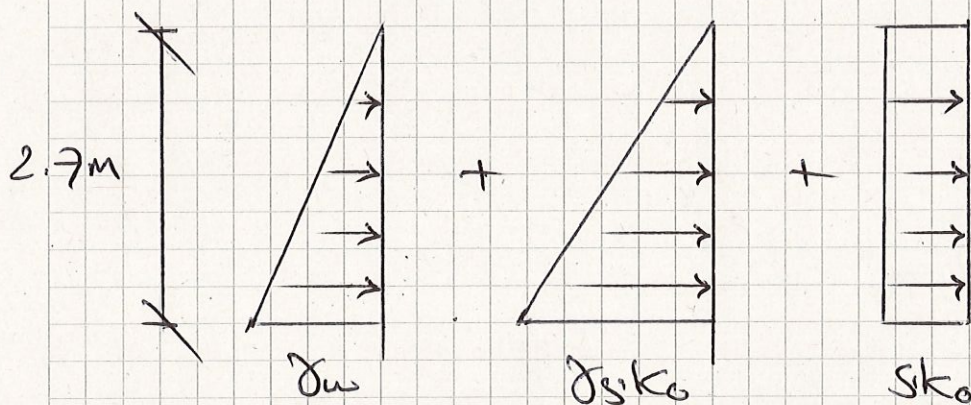
ASSUMPTIONS:

$$\gamma_w = 10 \text{ kN/m}^3$$

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

$$s = 5.0 \text{ kN/m}^2$$

$$k_0 = 1.$$



$$\gamma_w = 2.7 \times 10 = 27 \text{ kN/m}$$

$$\gamma_s k_0 = 2.7 \times 18 \times 1.0 = 48.6 \text{ kN/m}$$

$$s k_0 = 2.7 \times 5.0 \times 1.0 = 13.5 \text{ kN/m}$$

MULTIFRAME ANALYSIS:

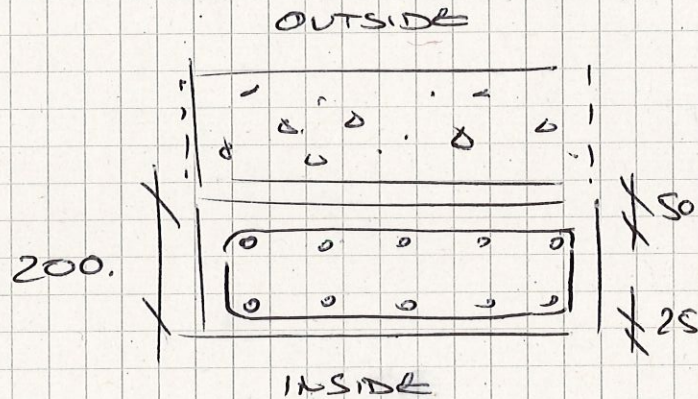
$$M = 44 \text{ kNm/m}$$

$$V = 82 \text{ kN/m}$$

* FOR 1m STRIP OF RC RETAINING WALL.

PROJECT	22 LANN ROAD		
PROJECT No.	3197	DATE	09.12.21
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		REV	

ASSUME 200 THK WALL,



$$d_1 = 200 - 50 - 8 = 142 \text{ mm}$$

$$d_2 = 200 - 25 - 8 = 167 \text{ mm}$$

MINIMUM REINFORCEMENT.

$$k_o = \frac{M}{f_{ck} \cdot b d^2} = \frac{44.106}{32 \cdot 1000 \cdot 167^2}$$

$$= 0.049$$

$$z = d \cdot \left(0.5 \sqrt{0.25 - \frac{3k_o}{3.4}} \right)$$

$$= 159 \text{ mm}$$

PROJECT	22 Llan Road		
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$$A_{s, req} = \frac{M}{0.87 \cdot f_y \cdot z}$$

$$= \frac{44 \cdot 10^6}{0.87 \cdot 500 \cdot 159}$$

$$= 636 \text{ mm}^2/\text{m}$$

TRY: HRS AT 200 CENTRES

$$\therefore A_{s, prov} = 1005 \text{ mm}^2/\text{m}$$

