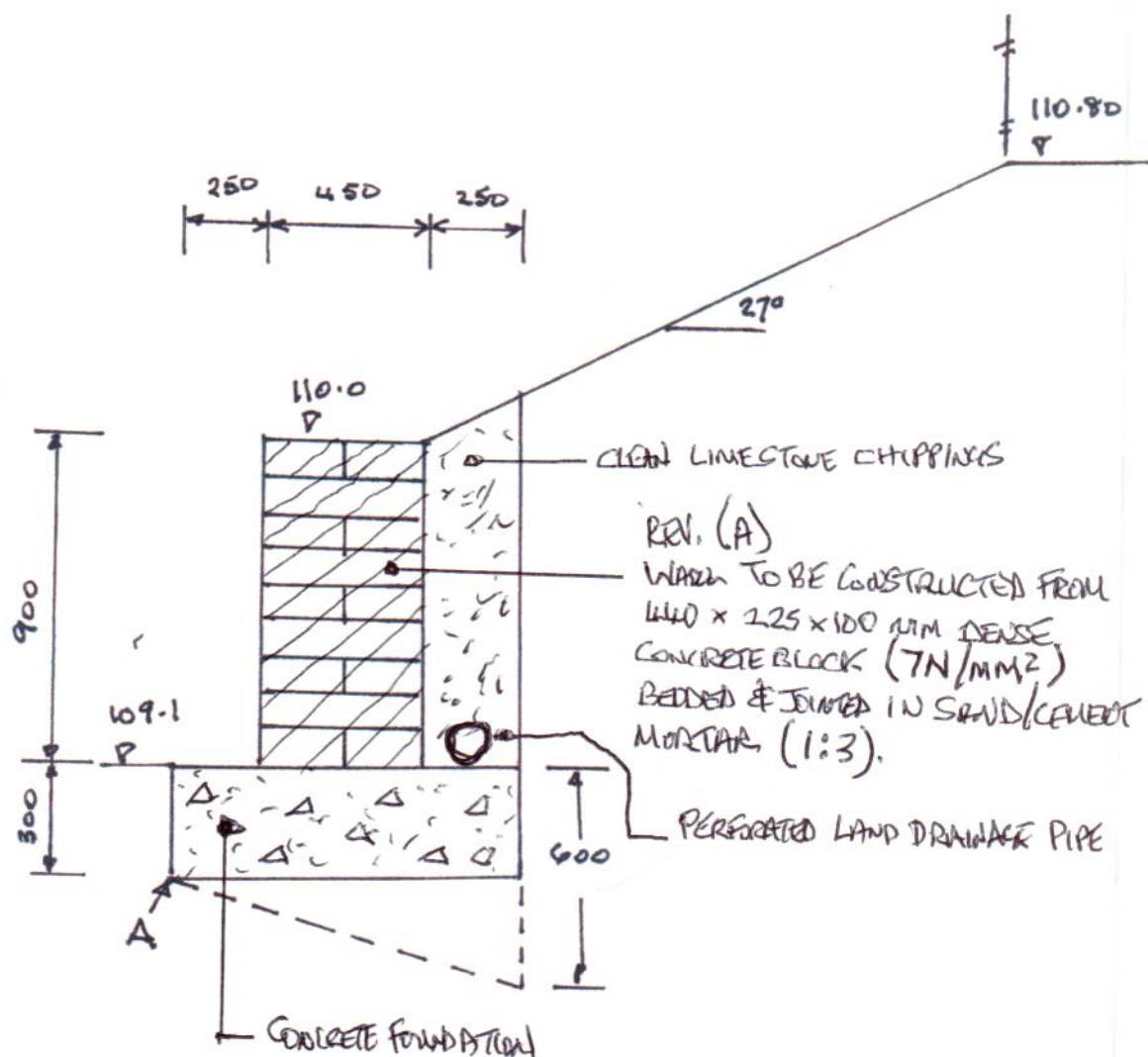


Calculation Sheet - REVISION (A) - 10.12.2021 *DF*
MATERIAL TYPE FOR WALL INDICATED
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1/3 (A)

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2/3(A)

$$P_a = 1.2 \times 20 \times 0.8 = 19.2 \text{ kN/m}^2$$

$$P_s = 10/3 = 3.3 \text{ kN/m}^2$$

Taking moments about 'A'

$$\text{Overturning } M_a = \frac{19.2 \times 1.2^2}{6} = 4.6 \text{ kNm}$$

$$P_s = \frac{1.2^2}{2} \times \frac{10}{3} = 2.4 \text{ kNm}$$

$$\underline{\text{Total} = 7 \text{ kNm}}$$

Righting Moment

$$\text{Base} = \frac{0.95^2}{2} \times 3 \times 22 = 2.98 \text{ kNm}$$

$$\text{Item} = 0.9 \times 0.45 \times 20 \left(\frac{0.45}{2} + 0.25 \right) = 3.85 \text{ kNm}$$

$$\text{Free draining} = 0.95 \times 0.25 \times 20 \left(\frac{0.7}{2} + \frac{0.25}{2} \right) = 3.9 \text{ kNm}$$

$$\text{Surcharge} = 10 \times 0.7 \times \left(\frac{0.7}{2} + 0.25 \right) = 4.2 \text{ kNm}$$

$$\text{Total} = 14.93 \text{ kNm}$$

$$F. \text{ of } s = \frac{14.93}{7} = \underline{\underline{2.13 \therefore \text{OK}}}$$

Sliding

$$\begin{aligned} \text{Horizontal force} &= 0.5 P_a h + P_s \times h \\ &= 0.5 \times 19.2 \times 1.2 + 3.3 \times 1.2 \\ &= 11.5 + 4 \\ &= \underline{\underline{15.5 \text{ kN}}} \end{aligned}$$

Wt. of units

$$\text{Base} = 0.95 \times 3 \times 22 = 6.27 \text{ kN}$$

$$\text{Skin} = 0.9 \times 45 \times 20 = 8.10 \text{ kN}$$

$$\text{Free Draining} = 0.95 \times 25 \times 20 = 4.75 \text{ kN}$$

$$\text{Surcharge} = 10 \times 0.7 = \underline{7.0 \text{ kN}}$$

$$26.12 \text{ kN}.$$

$$\text{Coeff of friction using } \phi = 30^\circ = 0.58$$

$$\therefore \text{Resisting force} = 0.58 \times 26.12$$

$$= 15.15 \text{ kN}.$$

This is not sufficient.

Passive resistance with back of
base thickness increased to 0.6m

$$= 1 \times \frac{0.6^2}{2} \times 3 \times 20 = 10.8 \text{ kN}$$

$$\text{Overall resistance} = 25.95 \text{ kN}.$$

$$F \text{ of } S = \frac{25.95}{15.15} = \underline{\underline{1.7}} \therefore \text{OK}.$$