

Carroll & Williams LLP

Consulting Structural Engineers

Telephone : (01743) 368006 Facsimile : (01743) 245475

Project **Team Elite Limited**
Crawford Street, Newport

By :

Date :

Project No :

Sheet No :

C5013

Sk. A

Design Parameters / Assumptions :

Applied surcharge load = 2.5 Kn/m^2 .

Available ground bearing pressure = 50.0 Kn/m^2 .

Assumed design wind speed = 23 m/sec .

Maximum density of retained material = 18 Kn/m^3 .

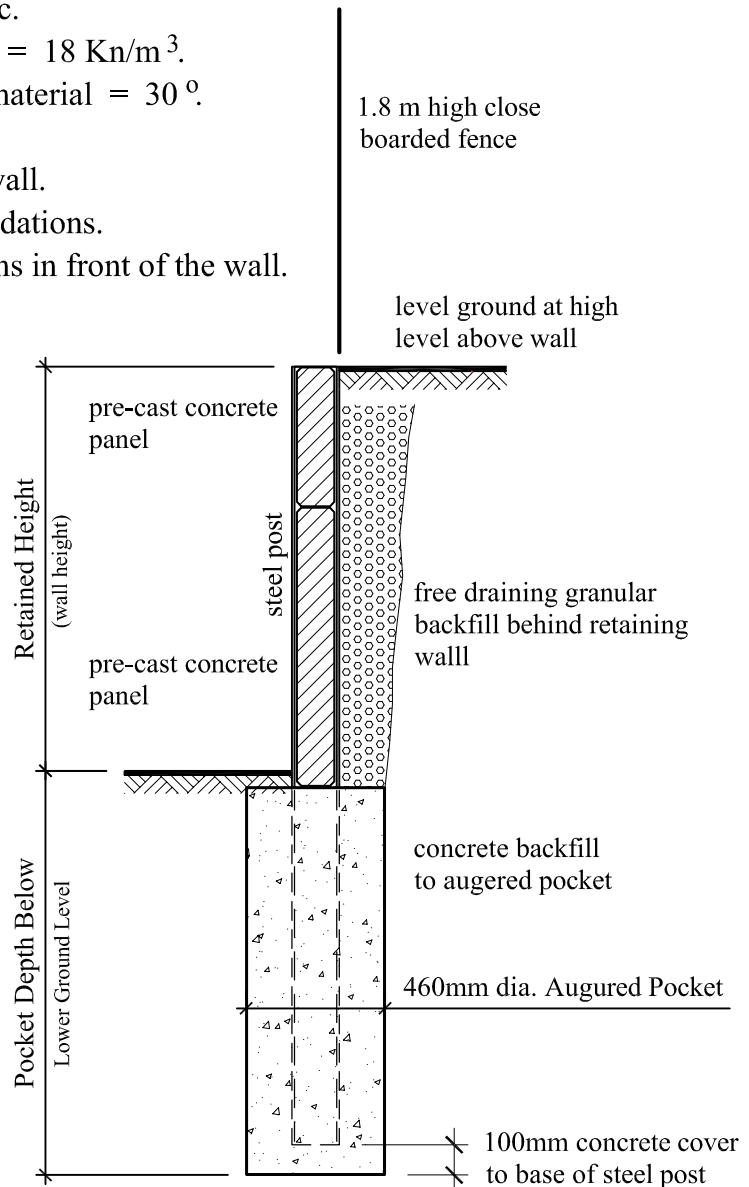
Minimum angle of repose of retained material = 30° .

Level ground at top of wall.

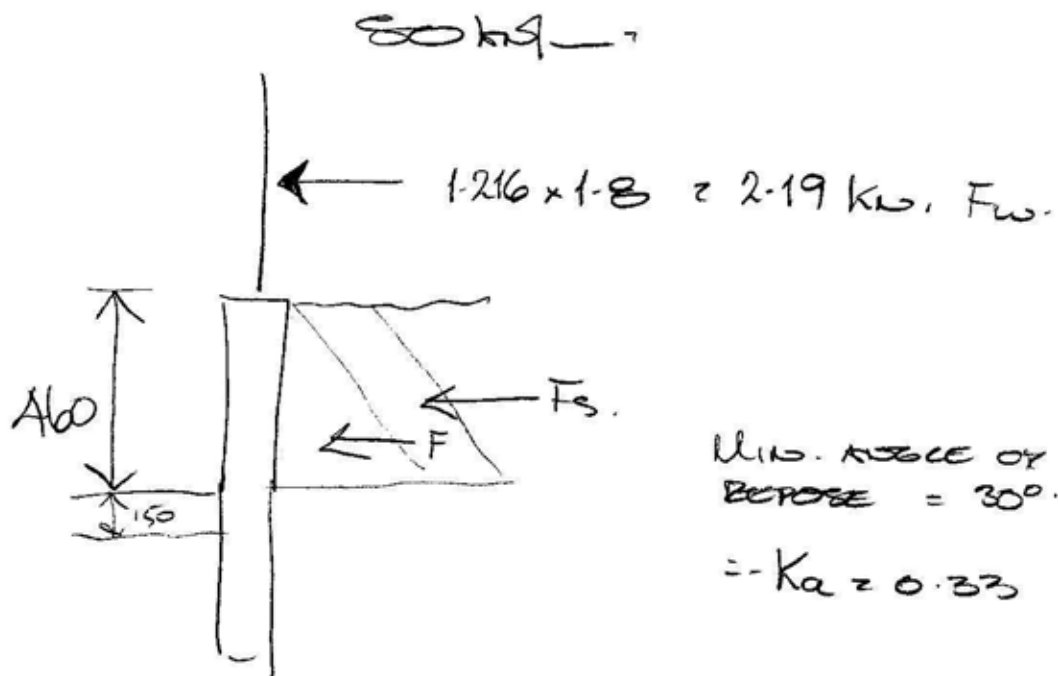
No ground water pressure on back of wall.

No surcharge load from adjoining foundations.

No allowance for unplanned excavations in front of the wall.



Wall Height	Pocket Depth Below Ground	Steel Post Size
460 mm	1600 mm	152 x 152 x 23 uc
920 mm	2200 mm	152 x 152 x 23 uc
1380 mm	2800 mm	152 x 152 x 23 uc
1840 mm	3600 mm	152 x 152 x 37 uc



$$F = 0.5 \times 0.33 \times 18.0 \times 0.61^2 = 1.11$$

$$F_s = 0.33 \times \frac{2.5}{1.8} \times 0.61 = 0.50$$

$$F_w = 1.216 \times 1.8 = 2.19$$

$$M_F = 1.11 \times 0.61/3 = 0.124 \times 1.4 = 0.174$$

$$M_{F_s} = 0.5 \times 0.61/2 = 0.153 \times 1.6 = 0.245$$

$$M_{F_w} = 2.19 \times (0.61 + 0.9) = \frac{3.307}{3.584 \times 1.8} \times 1.05 = \frac{3.472}{3.891 \times 1.8}$$

$$= 6.45 (\times 1.5) = 9.68$$

$$= 7.00 (\times 1.25) = 8.75$$

1.5 1.6

LOW POCKET

$$L_A = \frac{1600}{1500} \times \frac{2}{3} = \frac{1000}{666.67}$$

$$R_L = 0.05 \times 1600 \times \frac{750}{2} = \frac{6000}{8625}$$

$$M_e = \frac{1000}{666.67} \times \frac{8625}{106} = 3.83 \times 8.6 = 9.813 \text{ kN.m}$$

Col. $152 \times 152 \times 23 \text{ uc.}$

$$L_e = 610 \times 2 = 1220$$

$$L_e/y_g = 33.15$$

$$\lambda = 20.4 \therefore \text{pb is 275}$$

$$\text{pb. } S_x = 275 \times 184 \times 10^3 / 106 = 50.6 \text{ kN.m}$$

$$920 (1070).$$

$$F = 0.5 \times 0.33 \times 18.0 \times 1.07^2 = 3.40$$

$$F_B = 0.33 \times 2.5 \times 1.07 = 0.88$$

$$F_W = 1.216 \times 1.8 = 2.19$$

$$M_F = 3.4 \times 1.07/3 = 1.213 \times 1.4 = 1.698$$

$$M_{FB} = 0.88 \times 1.07/2 = 0.471 \times 1.6 = 0.754$$

$$M_{F10} = 2.19 \times (1.07 + 0.9) = \frac{4314}{5998 \times 1.8} \times 105 = \frac{4530}{6982 \times 1.8}$$

$$= 10.796 (\times 1.5) = 12568 (\times 1.25)$$

$$= 16.19 = 15.71$$

POCKET 20.

$$L_A = \frac{2000}{2000} \times 2/3 = 1333.33 \quad 1466.67$$

$$R_h = 0.05 \times 460 \times \frac{100}{1000/2} = 11500 \quad \frac{12650}{15025} \quad \frac{12650}{12650}$$

$$M_R = \frac{1466.67}{1333.33} \times \frac{12650}{11500/106} = 15.33, 15.55.$$

Cor.

$$L_q = 1070 \times 2 = 2140 \quad L_{q/ny} = 58.15$$

$$K = 20.4 = pb \approx 240$$

$$pb_{Sec} = 240 \times 184 \times 10^3 / 100 = 44.16 -$$

57376 044503

$$13800 \left(1.53 \right)$$

$$F = 0.5 \times 0.33 \times 18.0 \times 1.53^2 = 6.952$$

$$T_s = 0.33 \times 2.5 \times 1.53 = 1.262$$

$$F_{10} = 1.216 \times 1.8 = 2.19$$

$$M_F = 6.952 \times 1.53/3 = 3.545 \times 1.4 = 4.964$$

$$M_{F_s} = 1.262 \times 1.5/2 = 0.946 \times 1.6 = 1.514$$

$$\begin{aligned} M_{F_{10}} &= 2.19 \times (1.53 + 0.4) = \frac{5.322}{9.722 \times 1.8} \times 1.05 = \frac{5.588}{12.07 \times 1.8} \\ &= 17.5 (\times 1.5) = 26.25 \\ &= 21.72 (\times 1.25) = 27.15 \end{aligned}$$

2-B

$$L_A = 2800 \times 3/3 = \frac{1866.67}{1733.33}$$

$$R_L = 0.05 \times 460 \times 1400/2 = \frac{16100}{14450}$$

36.05

Cor

$$L_F = 1.53 \times 2 = 3060 \quad L_{F_{10}} = 83.15$$

$$x = 20.4 \quad \therefore p_b \approx 200$$

$$\therefore 200 \times 184 \times 10^3 / 106 = 36.8 \text{ km.m} \quad \therefore \text{o.k.}$$

$$1840 (1.99)$$

$$F = 0.5 \times 0.33 \times 18.0 \times 1.99^2 = 11.76$$

$$F_s = 0.33 \times 2.5 \times 1.99 = 1.64$$

$$F_w = 1.216 \times 1.8 = 2.19$$

$$M_F = 11.76 \times 1.99/3 = 7.80 \times 1.4 = 10.92$$

$$M_{F_s} = 1.64 \times 1.99/2 = 1.63 \times 1.6 = 2.61$$

$$M_{F_w} = 2.19 \times (1.99 + 0.9) = \underline{6.329} \times 1.05 = \underline{6.65}$$

$$15.759 \times 1.8$$

$$20.156 \times 1.8$$

$$= 28.37 (x 1.5)$$

$$36.3 (x 1.25)$$

$$42.5 \text{ Km.m.}$$

$$45.4 \text{ Km.m.}$$

ROCKET

~~1.6~~ 3.6

$$L_n = 3600 \times 2/3 = \underline{2400}$$

$$P_n = 0.05 \times 460 \times \frac{1800}{2} = \underline{20700}$$

$$1.46.95$$

$$49.68$$

15.

Cor. 30 37 152 x 152 x 37 uc.

$$L_F = 1.99 \times 2 = 3980$$

$$\frac{L_{F_{ny}}}{38.7 \times 38.2} = \frac{104.18}{102.8}$$

$$X = 16.0^{13.3}$$

$$ph \approx 187 \quad 204$$

$$ph: S_{22} = \frac{187 \times 247 \times 10^3}{204 \times 310} = \frac{46.}{63.24}$$