

PRELIMINARY DESIGN OF CONCRETE STRUCTURES

PRELIMINARY DESIGN OF SLAB

$$h \geq 1/30 \cdot l_{n,max}$$

$$h = 1/30 \times 8075 = 269.2mm \longrightarrow \text{high of slab } 300mm$$

PRELIMINARY DESIGN OF COLUMN

C1

$$f_{cd} = 25 \text{ MPa}, N_{Rd} = 2702 \text{ kN}$$

$$N_{Ed} = A_c \times f_{cd}$$

$$A_c = N_{Rd} / f_{cd} = 2702 \cdot 10^3 / 25 \cdot 10^6 = 0.10808 \text{ m}^2$$

$$a = \sqrt{0.10808} = 0.329m \longrightarrow \text{dimension of column } 300 \times 350 \text{ mm} \longrightarrow 0.09 \text{ m}^2$$

C2

$$f_{cd} = 25 \text{ MPa}, N_{Rd} = 1382 \text{ kN}$$

$$N_{Ed} = A_c \times f_{cd}$$

$$A_c = N_{Rd} / f_{cd} = 1382 \cdot 10^3 / 25 \cdot 10^6 = 0.0691 \text{ m}^2$$

$$a = \sqrt{0.0691} = 0.263m \longrightarrow \text{dimension of column } 300 \times 250 \text{ mm} \longrightarrow 0.075 \text{ m}^2$$

PRELIMINARY DESIGN OF FOUNDATION PAD

1.

$$N_{Ed} = 2199.761 \text{ kN}, R_{da} = 400 \text{ kPa}$$

$$z_d \cong (0.08 - 0.15)N_{Ed} = 175.92 \text{ kN}$$

$$A_{eff} \geq \frac{2199.76 + 175.92}{400} = 5.7392 \text{ m}^2 \longrightarrow \text{dimension of foundation pad } 2.4 \times 2.4 \text{ m}$$

2.

$$N_{Ed} = 1352 \text{ kN}, R_{da} = 400 \text{ kPa}$$

$$A_{eff} \geq \frac{N_{Ed} + z_d}{R_{da}}$$

$$z_d \cong (0.08 - 0.15)N_{Ed} = 175.92 \text{ kN}$$

$$A_{eff} \geq \frac{2199.76 + 175.92}{400} = 5.7392 \text{ m}^2 \longrightarrow \text{dimension of foundation pad } 2.4 \times 2.4 \text{ m}$$
