

■ Design Conditions ■

Design Code : KDS2021-CONC./ACI318

Material Data

$$f_{ck} = 24 \text{ N/mm}^2$$

$$f_y = 400 \text{ N/mm}^2$$

$$q_e = 200.0 \text{ kN/m}^2$$

Dimension

$$\text{Fdn} : 3000 \times 3000 \times 500 \text{ mm } (c_c=75\text{mm})$$

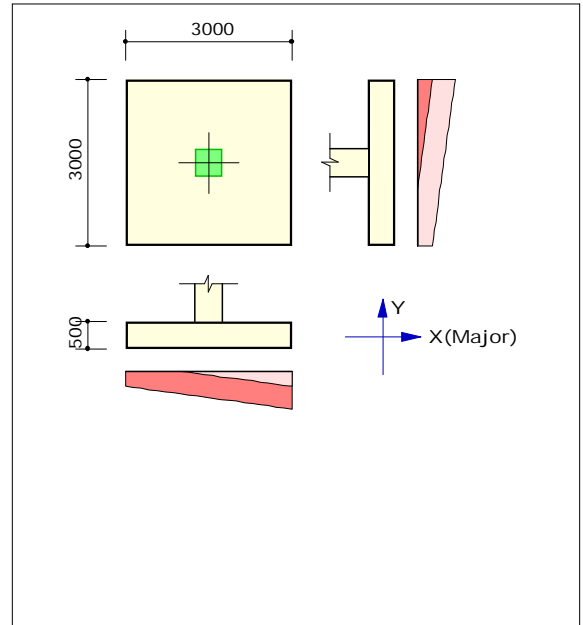
$$\text{Col.} : 500 \times 500 \text{ mm}$$

Additional Load

$$\text{Soil Load} : H = 1.5 \text{ m (Weight} = 238.3 \text{ kN)}$$

$$\text{Surcharge} : W_s = 5.0 \text{ kN/m}^2$$

$$\text{Self Wt.} : 105.9 \text{ kN}$$



■ Applied Loads ■

$$P_s = 1000.0, \quad P_u = 1000.0 \text{ kN}$$

$$M_{sx} = 500.0, \quad M_{ux} = 500.0 \text{ kN}\cdot\text{m}$$

$$M_{sy} = 500.0, \quad M_{uy} = 500.0 \text{ kN}\cdot\text{m}$$

■ Check Soil Bearing Capacity ■

Check Service Load

$$q_{s, \max} = 383.6 \text{ kN/m}^2 > q_e = 200.0 \text{ kN/m}^2 \text{ ---> N. G.}$$

Factored Soil Pressure

$$q_{u, \max} = 400.7 \text{ kN/m}^2$$

■ Check Bending Moment ■

Location	Mu (kN·m/m)	ρ (%)	A _{st} (mm ² /m)	Spacing			
				D22	D25	D29	D32
Y-Y Dir.	200.36	0.356	1475	@260	@300	@300	@300
X-X Dir.	200.52	0.400	1567	@240	@300	@300	@300
Min Bar		0.200	1000	@300	@300	@300	@300

■ Check Shear Force ■

Strength Reduction Factor $\phi = 0.750$

Check Beam Shear

$$V_{uy} = 643.0 \text{ kN} < \phi V_{cy} = 760.4 \text{ kN} \text{ ---> O. K.}$$

$$V_{ux} = 658.5 \text{ kN} < \phi V_{cx} = 719.6 \text{ kN} \text{ ---> O. K.}$$

Check Punching Shear

$$V_{u, \text{col}} = 909.5 \text{ kN} < \phi V_c = 1763.7 \text{ kN} \text{ ---> O. K.}$$