

According to Terzaghi's bearing capacity equation Bearing Capacity of Circular foundation

$$= 1.3 C N_c + q N_q + 0.4 b \gamma N_\gamma$$

Since the angle of internal friction of sand

$$= 31 \text{ degrees}$$

The value of N_q , N_c , N_γ = 25.28, 40.41, 22.65

Since the soil is sand the Value of C is zero and the footing is resting on the soil deposit

So Bearing Capacity = $0.4 \times 2 \times 17 \times 22.65$

$$= 308.04 \text{ kN/m}^2$$

The force obtained from Plaxis = $177.28 \times 2 \times 3.14$

$$= 1113.32 \text{ kN}$$

The bearing capacity = Force / Area of the footing

$$= 1113.32 / ((\pi/4) \times 2^2)$$

$$= 354.38 \text{ kN/m}^2$$

So the bearing capacity calculated using both methods have some difference. The difference occurred can be due to the different assumptions in the Terzaghi's theory.