Fourth year

Soil mechanics 2

Test number one

Monday 2, 11, 2024

Answer for the following two questions

Question one:

A, and B, are two footings of size 1.5 x 1.5 m each placed in position as shown in **Figure one**. Each of the footings carries a column load of 400 kN. Determine by the Boussinesq formula, the vertical stress, $\boldsymbol{\sigma_Z}$ at depth 2.5 m under footing, B. Assume the loads at the centers of footings act as point loads.

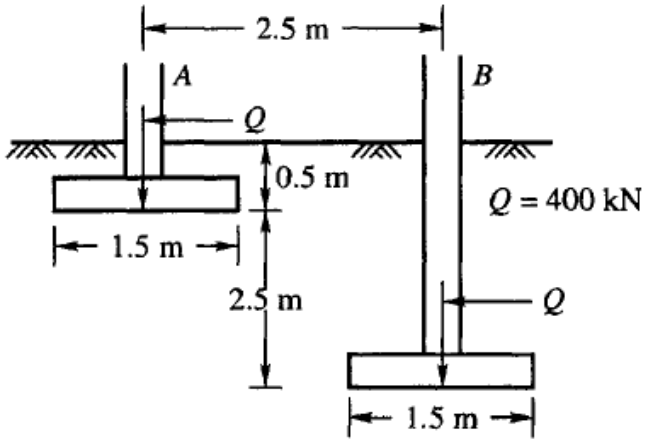

Figure one

Question two:

A series of direct shear tests was performed on a soil sample. Each test was carried out until the specimen sheared (failed). The laboratory data for the tests are tabulated as in **Table 2**. Determine the soil's cohesion, **C**, and angle of internal friction, **Φ**.

Table 2: Result of direct shear test.

Test number	1	2	3	4
Normal stress, σ_n (kN/m^2)	10	19	28	48
Normal stress, τ_f (kN/m^2)	22	25	28	35