

CE 468 – Geotechnical Design

ASSIGNMENT #0

A footing will be constructed 2 m below from the ground surface having width of 2.5 m and length of 25 m, applying 180 kPa of gross foundation pressure on bearing soil. The footing underlies by 12 m thick sand deposit having wet and saturated unit weights of 15.7 kN/m^3 and 15.9 kN/m^3 , respectively. Water table is at 2 m depth from the ground surface. Calculate the immediate settlement under the footing 5 years after the construction by using Schmertmann's Approximation. Cone tip resistance values through the soil profile obtained from CPT are given in table below.

NOTE: Take $\gamma_{\text{water}} = 9.8 \text{ kN/m}^3$. Divide soil into sublayers having equal thickness of 0.2B.

| Depth Interval (m) (from ground surface) | Cone Tip Resistance (MPa) |
|--|---------------------------|
| 0 – 1.0 | 2.50 |
| 1.0 – 2.5 | 3.50 |
| 2.5 – 3.0 | 3.50 |
| 3.0 – 3.5 | 7.00 |
| 3.5 – 4.5 | 3.00 |
| 4.5 – 5.0 | 8.50 |
| 5.0 – 6.5 | 17.00 |
| 6.5 – 7.5 | 6.00 |
| 7.5 – 8.5 | 10.00 |
| 8.5 – 10.0 | 4.00 |
| 10.0 – 10.5 | 6.50 |
| 10.5 -14.0 | 12.00 |
| >14.0 | Bedrock |