Birzeit University
Soil Mechanics, ENCE 331
Homework Assignment 2
(Due to 23 Jan 2024, 10:00 p.m.)

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1. Point loads of magnitude 125, 250, and 500 kN act at A, B, and C, respectively. Determine the increase in vertical stress at a depth 10 m under point D, see **Fig. 2.1.**

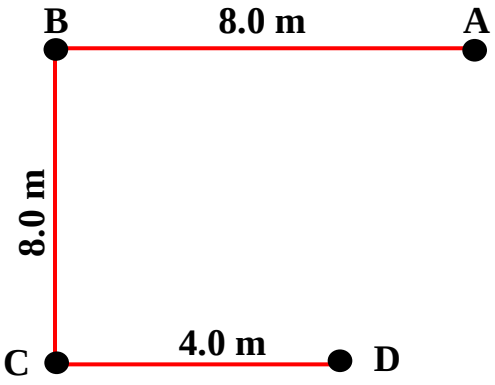

Fig. 2.1.

2. Determine the increase of stresses at point A due to two line-loads as shown in **Fig. 2.2.**

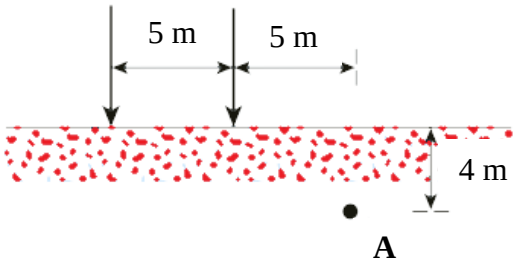

Fig. 2.2.

3. For the **Fig. 2.3**, given $B = 4\ m, q = 100\ \ kN/m^2\ , z = 1\ m, and\ x = 1\ m.$ Find $\Delta\sigma_z$ at point A.

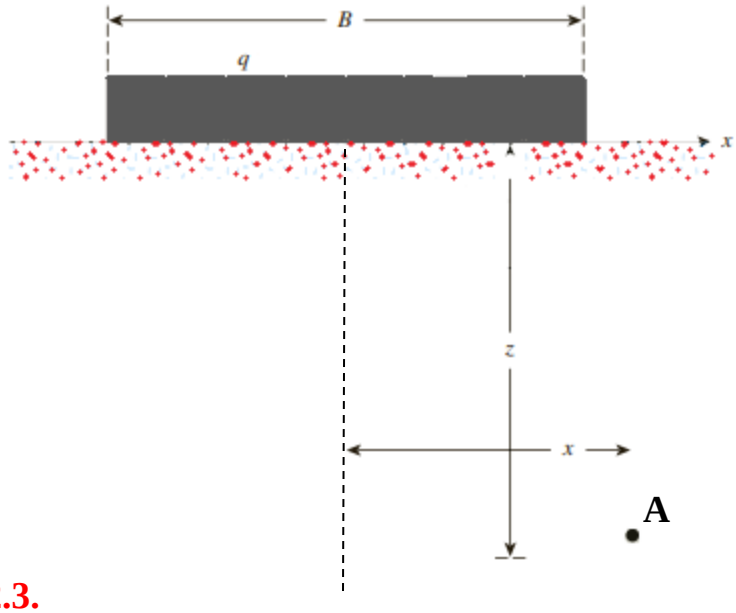

Fig. 2.3.

4. A flexible rectangular area is subjected to a uniform distributed load of $q = 330\ kN/m^2$. Determine the increase in vertical stress, $\Delta\sigma_z$, at a depth of $z = 6\ m$ under points A, B, and C, see **Fig. 2.4.**

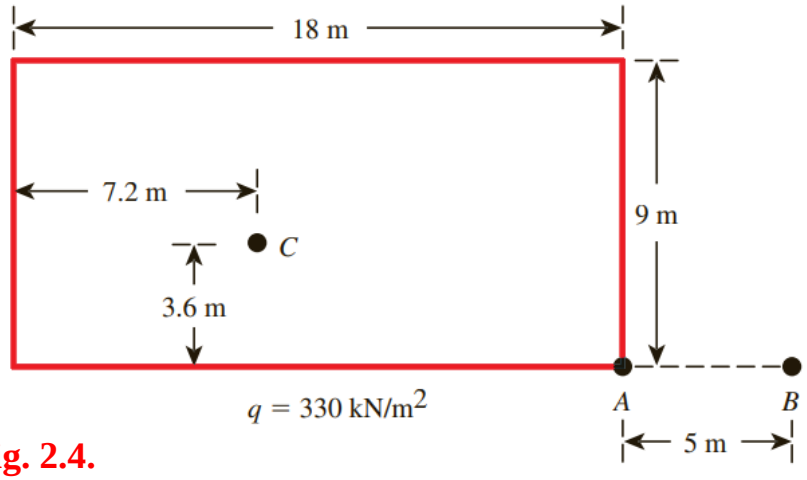

Fig. 2.4.

5. **Fig. 2.5** shows the schematic of a circular water storage facility resting on the ground surface. The radius of the storage tank, R = 2.5 m, and the maximum height of water, h_w = 4 m. Determine the vertical stress increase, $\Delta\sigma_z$, at points 0, 2, 4, 8, and 10 m below the ground surface along the centreline of the tank.

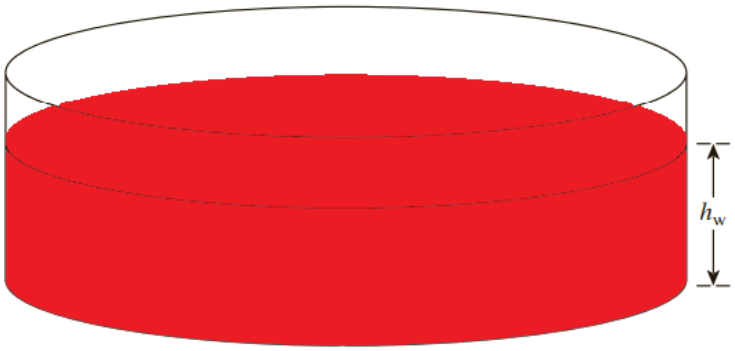

Fig. 2.5.

6. Referring to **Fig. 2.6.** For the linearly increasing vertical loading on an infinite strip of width 5 m, determine the vertical stress increase, $\Delta\sigma_z$, at A.

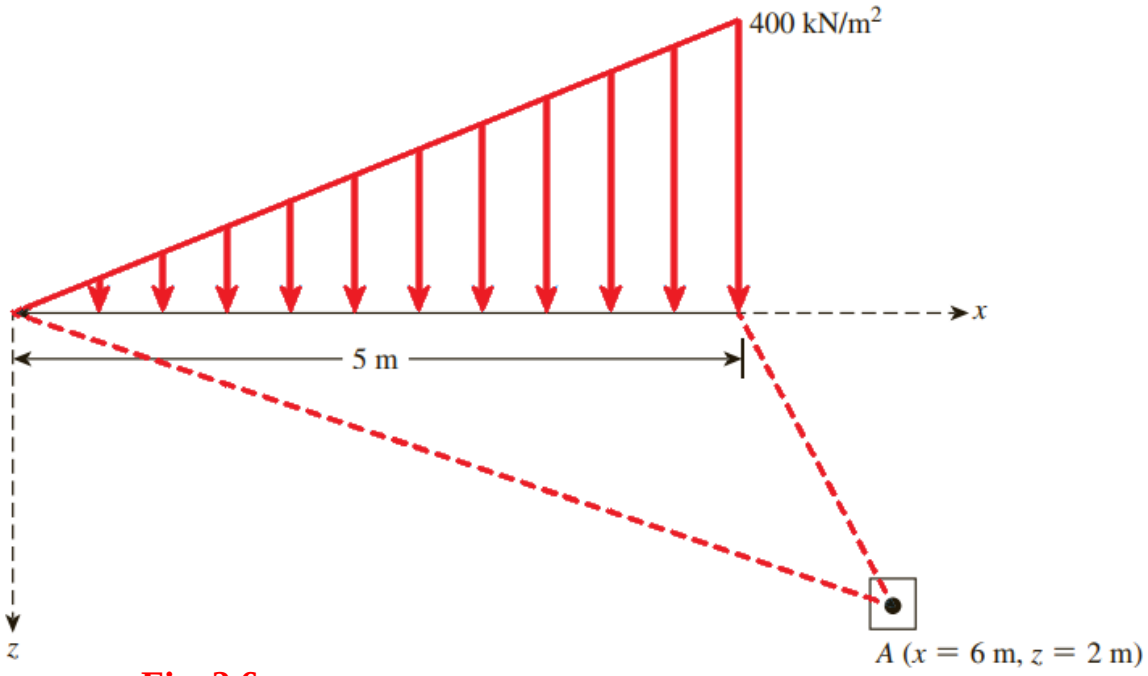

Fig. 2.6.