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Investigation of the Lateral Soil Pressure on the Basement Walls Constructed Based on Top-down Method

The method for retaining the excavated pit could have a significant effect on the soil pressure acting on the retaining walls; For this purpose, since the Top-Down construction method is widely used, In this study, a series of numerical analyses has been conducted to investigate the effect of the excavation method and the distribution of the structural elements on the soil pressure distribution. Generally, for engineering purposes, active and at-rest soil pressure distribution and the Peck apparent pressure distribution (in the case of retained walls) are used for soil pressure determination. The results of the study suggest that in contrast to the at-rest and active soil pressure distribution, the pressure distribution on retaining walls has no similarity with the triangular distribution and the Peck's APD provides an acceptable estimation of soil pressure and its distribution. The results also show that with the increase of deformation due to the construction of the wall, as an example in one case, a 60% increase in ground settlement reduced the soil pressure acting on the walls by up to 15%. It's also noteworthy that this study focuses only on a special type of soil, So the result might be inapplicable to other circumstances.

Keywords: Lateral soil pressure, Top-Down method, Peck's APD, Arching effect.

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