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Evaluation of Settlement of Coastal Embankments Using Finite Elements Method

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Abstract : Coastal embankments play an important role in coastal structures by reducing the effect of the wave forces and controlling the movement of sediments. Many coastal areas are underlain by weak and compressible soils. Estimation of during construction settlement of coastal embankments is highly important in design and safety control of embankments and appurtenant structures. Accordingly, selecting and establishing of an appropriate model with a reasonable level of complication is one of the challenges for engineers. Although there are advanced models in the literature regarding design of embankments, there is not enough information on the prediction of their associated settlement, particularly in coastal areas having considerable soft soils. Marine engineering study in Iran is important due to the existence of two important coastal areas located in the northern and southern parts of the country. In the present study, the validity of Terzaghi’s consolidation theory has been investigated. In addition, the settlement of these coastal embankments during construction is predicted by using special methods in PLAXIS software by the help of appropriate boundary conditions and soil layers. The results indicate that, for the existing soil condition at the site, some parameters are important to be considered in analysis. Consequently, a model is introduced to estimate the settlement of the embankments in such geotechnical conditions.

Keywords : consolidation, settlement, coastal embankments, numerical methods, finite elements method
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