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Plane of Equal Settlement above HDD's Borehole before Operational Condition

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Abstract : This study is a review of the nature of soil arching that develops in the upper layer of soil during drilling processes before pulling product pipe inside the hole. This study is based on the results of some parametric studies which are investigating the behavior of drained sandy soil above HDD borehole using Plaxis finite element solution. The influence of drilling mud injection in these series of analyses has been ignored. However, a suitable drilling mud pressure helps to achieve stable arch when the height of soil cover over the drilling borehole is not enough. In this study, the soil response to the formation of a HDD borehole is compared to arching theory developed by Terzaghi (1943). It is found that Terzaghi's approach is capable of describing all of the behaviour seen when a stable arch forms. According to the numerical results, a suitable safe depth of 4D, D is borehole diameter, is suggested for typical range of HDD borehole in sandy soil.

Keywords : HDD, Plaxis, finite element, arching, settlement, drilling
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