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Shoring System Selection for Deep Excavation

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Abstract : A study was conducted in the east region of the Middle East to assess the constructability of a shoring system for a 12-meter deep excavation. Several shoring systems were considered in this study including secant concrete piling, contiguous concrete piling, and sheet-piling. The excavation was carried out in a very dense sand with the groundwater level located at 3 meters below ground surface. The study included conducting a pilot test for each shoring system listed above. The secant concrete piling included overlapping concrete piles to a depth of 16 meters. Drilling method with full steel casing was utilized to install the concrete piles. The verticality of the piles was a concern for the overlap. The contiguous concrete piling required the installation of micro-piles to seal the gap between the concrete piles. This method revealed that the gap between the piles was not fully sealed as observed by the groundwater penetration to the excavation. The sheet-piling method required pre-drilling due to the high blow count of the penetrated layer of saturated sand. This study concluded that the sheet-piling method with pre-drilling was the most cost effective and recommended a method for the shoring system.

Keywords : excavation, shoring system, middle east, Drilling method
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