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Permissible Horizontal Displacements during the Construction of Vertical Shafts in Soft Soils at the Valley of Mexico: Case History

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Abstract : In this paper, the results obtained when monitoring the horizontal deformations of the soil mass are detailed, during each of the construction stages of several vertical shafts located in the soft soils of the Valley of Mexico, by means of the flotation method. From the analysis of these results, the magnitude and percentage relationship with respect to the diameter and depth of excavation of the horizontal deformations that occurred during the monitoring period is established. Based on the horizontal deformation monitoring system and the information provided by the supervisor's site log, the construction stages that have the greatest impact on deformations are established. Additionally, an analysis of the deformations is carried out, which takes into account the resistance and deformability characteristics of the excavated soils, as well as the prevailing hydraulic conditions. This work will allow construction engineers and institutions in charge of infrastructure works in the Valley of Mexico to establish permissible ranges for horizontal deformations that can occur in very soft and saturated soils, during the different construction stages; improving response protocols to potentially dangerous behaviors.

Keywords : vertical shaft, flotation method, very soft clays, construction supervision
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