

## Estimating Pile Toe Levels for Capacity Assessment of Piers and Wharves in the Philippines

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**Abstract :** There are a number of decades-old piers and wharves in Manila, Philippines, that are currently being used for container and bulk cargo handling port operations. These structures fulfill a very important role in the economy and hence have undergone rehabilitation and assessment of capacity to accommodate current and future operational requirements. The capacity assessment would include structural and pile geotechnical evaluation. Unfortunately, old marine structures in the Philippines may not have a complete set of as-built information. In certain instances, critical information, such as pile toe levels, is missing in the documentation. A combination of direct tests, geophysical tests, and numerical analysis/modelling has been performed to estimate existing pile toe levels of open-type piers and anchored quay wall wharves in Manila. These techniques were applied to both concrete and steel piles. This paper presents the tools utilized, testing setup, and techniques used for estimating toe levels of existing piles for certain structures, including the challenges encountered and applied solutions.

**Keywords :** geophysical testing, pile toe level, structural assessment, piers, wharves

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