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DESIGNING REFINERY FOUNDATIONS ON MARGINAL SOILS IN INDONESIA

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ABSTRACT

A number of new refineries are planned for Indonesia and an existing refinery is currently being expanded. Most of these refineries are near the sea, and, hence, the subsurface soil conditions present a challenge to the foundation design because the soils are weak and compressible. Specifically, two of the three planned refineries are located in East Java where soft, compressible marine soils were found from the ground surface to more than 20 m below the surface. The existing Cilacap Refinery is being expanded by 20% from its present capacity of more than 300,000 barrels per day. The soil conditions at this refinery have continued to inhibit using conventional foundations.

This poster shows solutions used and proposed for supporting refinery foundations on marginal soils. Problems associated with large tank settlements are also addressed.

Examples include East Java, where the foundation design must incorporate a foundation that will support both large lateral and large axial loads. Piles were specially designed to resist the large horizontal forces generated during an earthquake while maintaining sufficient capacity to support the large axial loads imposed by the weight of the structure.

Because of the number of piles required for supporting storage tanks, and, consequently, the increased cost, ground improvement has generally proved to be less expensive than developing deep foundations. This poster shows several ground improvement techniques used successfully at Cilacap. It also provides an insight into recommendations made for ground improvement for future tanks at Cilacap and the new refineries planned for East Java.

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