This abstract will be presented during LNG2023 conference on 10-13 July in Vancouver, Canada among many other innovative projects, ideas and outlooks. LNG2023 will provide a unique platform for the global LNG industry and key stakeholders to discuss, debate, and showcase the latest industry developments and opportunities.

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# OPTIMISATION OF THE FOUNDATION FOR A 225 000 M3 LNG STORAGE TANK IN KITIMAT USING DRIVEN CLOSED-END STEEL PILES NON-CONNECTED TO THE CONCRETE SLAB (RIGID INCLUSIONS).

This paper presents the optimisation of the foundation system of a 225 000 m3 LNG storage tank built in Kitimat, Canada. Site geology consists of an 160m thick alluvial deposit, composed by alternating layers of clayey silts and gravelly sands. Surficial deposits are prone to liquefaction due to their low density and the high seismic activity in the area. To mitigate this risk, the FEED design included about 1800 stone columns up to 40m depth, and 500 driven open steel piles of 1m diameter and 40 to 45m length, connected to the slab, to ensure the bearing capacity. During the tender phase, the design was optimised to a system of rigid inclusions, comprising 1937 driven closed-ended steel piles of 0.6m diameter and 19m length and a 1.1m thick structural backfill. This system allows to both ensure the bearing capacity and densify the surficial soils to mitigate the risk of liquefaction. The robustness of the design has been confirmed by the performance of: CPTs after pile installation, confirming the increase of soil density; static and dynamic pile tests, validating their bearing capacity; and, monitoring of tank settlement, verifying that settlements are within the criteria defined in the project specifications. This solution shows other advantages in terms of cost and environment, as it reduces significantly the time required to build the foundations and the quantities required. Recommendations for the evaluation of the carbon footprint of the foundation are presented.