

GEOTECHNICAL PROPERTIES OF RAW AND PROCESSED BUKIT GOH BAUXITE IN ACCORDANCE WITH INTERNATIONAL MARITIME SOLID BULK CARGOES (IMSBC) CODE

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ABSTRACT

Recently, a bulk carrier carrying 46 400 tons of bauxite from Kuantan, Pahang destined to arrive in China capsized about 150 nautical miles off the coast of Vietnam with 18 fatalities and only one survivors. The marine safety investigation into the loss of the Bulk Jupiter has uncovered evidence to suggest liquefaction of cargo led to loss of stability. The aim of this study is to determine the geotechnical properties of both raw and processed Bukit Goh bauxite located in Kuantan; and compare the results with International Maritime Solid Bulk Cargoes (IMSBC) Code. Bauxite deposits usually contain a higher percentage of clay and siliceous materials. The silica present in the bauxite usually are concentrated in the finer grained fraction of the bauxite deposit. The fine particles in bauxite caused the bauxite to have higher moisture content and increases the risk of liquefaction to occur during the bauxite's transportation in cargo. The main objective of having beneficiation process is to minimize the silica content in bauxite, as well as to improve the geotechnical properties of bauxite so that it passes the specification of IMSBC Code for cargo shipping purpose. In this research, a series of laboratory tests will be conducted and the results will reflect the geotechnical properties of Bukit Goh Bauxite and the correlation of the bauxite's properties can be done. Both the raw and processed Gebeng Bauxite underwent moisture content test, specific gravity test, particle size distribution, and X-ray fluorescence (XRF) to obtain the desired data. The results show that average moisture content of raw bauxite is 24.81% which exceeded the recommended value of maximum 10% while the average moisture content of processed bauxite is only 6.69%. The average fine material for raw bauxite is 38.40% which should not be greater than 30% per IMSBC Code standard while for processed bauxite is 21.40%. Hence, it is preferable if the bauxite from Bukit Goh mine undergoes beneficiation process before being transported to reduce the risk of cargo liquefaction.

Keywords: Bukit Goh, Kuantan, Bauxite, Geotechnical Properties, Liquefaction, International Maritime Solid Bulk Cargoes (IMSBC) Code