

The Use of Piezocone Penetration Test Data for the Assessment of Iron Ore Tailings Liquefaction Susceptibility

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Abstract : The Iron Ore Quadrangle, located in the state of Minas Gerais, Brazil is responsible for most of the country's iron ore production. As a result, some of the biggest tailings dams in the country are located in this area. In recent years, several major failure events have happened in Tailings Storage Facilities (TSF) located in the Iron Ore Quadrangle. Some of these failures were found to be caused by liquefaction flowslides. This paper presents Piezocone Penetration Test (CPTu) data that was used, by applying Olson and Peterson methods, for the liquefaction susceptibility assessment of the iron ore tailings that are typically found in most TSF in the area. Piezocone data was also used to determine the steady-state strength of the tailings so as to allow for comparison with its drained strength. Results have shown great susceptibility for liquefaction to occur in the studied tailings and, more importantly, a large reduction in its strength. These results are key to understanding the failures that took place over the last few years.

Keywords : Piezocone Penetration Test CPTu, iron ore tailings, mining, liquefaction susceptibility assessment

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