

## Statistical Variability of Soil Parameters within the Copper Belt Region of the Democratic Republic of the Congo

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**Abstract :** The accurate determination of the engineering parameters of soil is necessary for the design of geotechnical structures, such as Tailings Storage Facilities. The shear strength and saturated permeability of soil and tailings samples obtained from 14 sites located in the copper belt in the Democratic Republic of the Congo have been tested at six commercial soil laboratories in South Africa. This study compiles a database of the test results proved by the soil laboratories. The samples have been categorised into clay, silt, and sand, based on the Unified Soil Classification System, with tailings kept separate. The effective friction angle ( $\Phi'$ ) and cohesion ( $c'$ ) were interpreted from the stress paths, in  $s'$ - $t$  space, obtained from triaxial tests. The minimum, lower quartile, median, upper quartile, and maximum values for  $\Phi'$ ,  $c'$ , and saturated hydraulic conductivity ( $k$ ) have been determined for the soil sample. The objective is to provide statistics of the measured values of the engineering properties for the TSF borrow material, foundation soils and tailings of this region.

**Keywords :** Democratic Republic of the Congo, laboratory test work, soil engineering parameter variation, tailings storage facilities

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