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Study of soil resistivity using wenner four pin method: Case study

Abstract

Soil resistivity is usually measured at the selected site either for new installation or in the existing grounding system. In this paper, soil resistivity test has been done to study the soil resistivity around the 33 kV substation according to IEEE 81-1983 standard. A factory site located in Kulim Hi-tech, Malaysia has been selected to research on the soil resistivity. The soil resistance measured in this study is then be calculated in using the soil resistivity formula. The soil resistivity shows that the longer the distance between rods, the lower the resistivity of soil due to larger soil volume. The lowest soil resistivity around the substation is 3.454 Ω.m, which is on the left side of the substation with a distance of 5 meters between the rods followed by front side with 15.71 Ω.m, right side with 34.243 Ω.m and backside with 45.239 Ω.m. While the highest soil resistivity is 176.306 Ω.m on the right side of the substation with a 2-meter distance between each rod.

Keywords

33 kV substation; Soil resistance; Soil resistivity; Soil volume; Wenner 4-pin method