

ABSTRACT

Houses generally function as buildings for shelter and meet basic human needs. In its construction, construction failures often occur due to errors in land use and lack of soil geological studies. To minimize the risk of failure or damage to development, it is important to explore the subsurface conditions. Soil exploration can be carried out by geophysical surveys using the Vertical Electrical Sounding (VES) geoelectric method which is linked to geotechnical investigations, namely Cone Penetration Test (CPT) and Standard Penetration Test (SPT). In this study, secondary data from the three methods in the planning of housing 'X' in Semarang Regency was obtained. This study aims to determine the subsurface hard layer by using VES, CPT and SPT geoelectric data to be used as a determinant of the location of the building foundation. The geoelectric method is used to determine the subsurface lithology using the electrical properties of the earth (resistivity). The CPT method is carried out to determine the value of soil carrying capacity, while the SPT method is carried out to determine the subsurface layer by drilling the soil and find out the pressure value of each soil layer. The shallow foundation hard layer is found at a depth of about 3-5 m where the CPT value is more than 10 Mpa with a solid density, in the geoelectric data the resistivity value is 29.9-167 Ω m, and in the SPT data shows the N-SPT value of 5-15 with a firm to rigid consistency. The hard layer for the deep foundation is found in the breccia layer or layer that shows an N-SPT value of more than 30, this layer is found at a depth of 17.5–26 m.

Kata Kunci : *Hard layers, Vertical Electrical Sounding (VES), Cone Penetration Test (CPT), Standard Penetration Test (SPT).*