

ABSTRAK

IDENTIFIKASI DAYA DUKUNG TANAH DAN TINGKAT KOROSIFITAS BAWAH PERMUKAAN MENGGUNAKAN INTEGRASI DATA GEOLISTRIK, *STANDART PENETRATION TEST* DAN *CONE PENETRATION TEST* PADA DAERAH “X”, PROVINSI PAPUA BARAT

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Penelitian daya dukung tanah dan tingkat korosivitas dilakukan di sebuah daerah terletak pada Provinsi Papua Barat. Analisis daya dukung tanah dan tingkat korosifitas tanah berguna sebagai langkah mitigasi dan meminimalisir kerugian remediasi akibat kegagalan struktur pondasi dan kerusakan pipa akibat korosif dalam jangka waktu panjang. Pengukuran geolistrik dilakukan sebanyak 12 lintasan dengan panjang lintasan 235 meter dan spasi elektrode 5 meter. Pengukuran *Standart Penetration Test* (SPT) dilakukan sebanyak 6 titik dan *Cone Penetration Test* (CPT) sebanyak 6 titik. Analisis daya dukung tanah menggunakan hasil uji *in-situ* berupa *Standart Penetration Test* dan *Cone Penetration Test*. Sedangkan analisis tingkat korosifitas berdasarkan pada nilai resistivitas bawah permukaan dengan pengukuran metode geolistrik konfigurasi *wenner schlumberger*. Jenis litologi pada daerah penelitian berdasarkan integrasi data lubang bor dan geolistrik yaitu berupa pasir sedang ($>200 \Omega m$), pasir halus-sangat halus ($80-200 \Omega m$), lempung ($15-80 \Omega m$), dan lumpur ($<15 \Omega m$). Pada hasil uji SPT dan CPT menunjukkan nilai yang semakin tinggi seiring bertambahnya kedalaman. Kedalaman pondasi dalam direkomendasikan pada tingkat kekerasan sangat kaku dengan nilai N-SPT lebih dari 50 tumbukan dengan interval kedalaman 18 hingga 28 meter pada litologi lempung. Untuk pondasi dangkal, direkomendasikan pada area dengan nilai perlawanan konus (q_c) 20-40 kg/cm^2 dengan tingkat kekerasan yaitu tanah kaku di kedalaman maksimal 3 meter pada area GRS. Berdasarkan analisis nilai resistivitas pada daerah penelitian memiliki tingkat korosifitas yaitu korosif-sangat korosif dengan nilai resistivitas $<20 \Omega m$ pada litologi lumpur yang mempunyai kandungan mineral konduktif dan kadar air tinggi.

Kata kunci: *Cone Penetration Test*, Daya Dukung Tanah, Geolistrik, Kekerasan, Korosivitas, *Standart Penetration Test*.

ABSTRACT

IDENTIFICATION OF SOIL BEARING CAPACITY AND SUBSURFACE CORROSIVENESS LEVEL USING INTEGRATION OF GEOELECTRIC DATA, STANDARD PENETRATION TEST AND CONE PENETRATION TEST IN AREA “X”, WEST PAPUA PROVINCE

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Soil bearing capacity and corrosivity studies are conducted in an area located in West Papua Province. Analysis of soil bearing capacity and soil corrosivity level are useful as a mitigation step and minimizes remediation losses due to foundation structure failure and pipe damage due to corrosivity in the long term. Geoelectric measurement is conducted in 12 lines with trace length 235 meters and space of electrode is 5 meters. Standart Penetration Test (SPT) measurement is carried out at 6 points and Cone Penetration Test (CPT) at 6 points. Analysis of soil bearing capacity uses the results of in-situ tests in the form of Standard Penetration Test and Cone Penetration Test. While the corrosivity level analysis is based on the subsurface resistivity value with the measurement of the wenner schlumberger configuration geoelectric method. The type of lithology in the research area based on the integration of borehole and geoelectric data are medium sand ($>200 \Omega m$), very fine-fine sand ($80-200 \Omega m$), clay ($15-100 \Omega m$), and mud ($<15 \Omega m$). The SPT and CPT test results show higher values due to the depth increases. Deep foundation depths are recommended at very stiff hardness levels with N-SPT values more than 50 blows with depth intervals from 18 to 28 meters in clay lithology. For shallow foundation, it is recommended in areas with a conus resistance value (q_c) $20-40 \text{ kg/cm}^2$ with a hardness level that is stiff at a depth maximum 3 meters in the GRS area. Based on the analysis of resistivity values in the study area, the corrosivity level is corrosive to very corrosive with a resistivity value of less than $20 \Omega m$ in mud lithology which has a conductive mineral content and high water content.

Keywords: Cone Penetration Test, Corosivity, Geoelectric, Hardness, Soil Bearing Capacity, Standart Penetration Test.