

Intisari

Pengembangan wilayah untuk permukiman perlu dilakukan untuk memenuhi kebutuhan lahan dalam mengatasi pertumbuhan penduduk di Kecamatan Piyungan. Untuk menjamin keberlangsungan konstruksi permukiman di daerah tersebut perlu diketahui karakteristik geologi teknik sebagai dasar dalam menentukan kemampuan geologi teknik untuk permukiman.

Penelitian dilakukan dengan cara pemetaan geologi teknik di lapangan serta analisis data sekunder berupa peta kerentanan bencana geologi. Pemetaan geologi teknik menghasilkan informasi geologi berupa morfologi, sifat fisik tanah dan batuan, struktur geologi, serta data tambahan untuk informasi geologi teknik berupa sifat keteknikan tanah dan batuan, kedalaman muka airtanah, dan kemudahan penggalian. Daya dukung batuan berdasarkan hasil klasifikasi massa batuan *Geological Strength Index* (GSI), sedangkan daya dukung tanah berdasarkan hasil *Dynamic Cone Penetrometer* (DCP). Dari informasi geologi teknik yang terkumpul dapat dilakukan zonasi kemampuan geologi teknik untuk permukiman pada daerah penelitian. Zonasi kemampuan geologi teknik dilakukan dengan metode evaluasi *semi qualitative*, yaitu *Analytical Hierarchy Process* (AHP).

Hasil penelitian berupa karakteristik geologi teknik di daerah penelitian terdiri dari : satuan batupasir, satuan lapili, satuan batupasir tufan, satuan breksi andesit, endapan pasir dan endapan lempung kepasiran. Satuan batupasir memiliki daya dukung sebesar 135 ton/m² dan kuat tekan 8,32 MPa. Satuan lapili memiliki daya dukung sebesar 135 ton/m² dan kuat tekan 22,81-44,65 MPa. Satuan batupasir tufan memiliki daya dukung sebesar 45 ton/m² dan kuat tekan 3,36-18,6 MPa. Satuan breksi andesit memiliki daya dukung sebesar 45 ton/m² dan kuat tekan 27,04 MPa. Endapan pasir memiliki daya dukung sebesar 11-35 ton/m² dan diklasifikasikan dalam tanah pasir (SP) bergradasi buruk dan keterdapatan tanah berukuran lanau dan lempung. Endapan lempung pasiran memiliki daya dukung sebesar 6,5-8,6 ton/m², batas cair sebesar 27-32,3%, dan indek plastis sebesar 7,25-10,2%. Zona kemampuan geologi teknik di daerah penelitian terdiri dari : zona kemampuan tinggi dengan area 33%, zona kemampuan sedang 45%, dan zona kemampuan rendah 22% dari total daerah penelitian.

Kata kunci: pengembangan wilayah, karakteristik geologi teknik, zona kemampuan geologi teknik.

Abstract

The development of the areas for settlement needs to be performed to meet the needs of land in addressing the population growth in Kecamatan Piyungan. To ensure the sustainability of the construction of settlements in the areas, it needs to determine the characteristics of engineering geology as a basis in determining the ability of engineering geology for the settlements.

This research was conducted by using engineering geological mapping in the field and secondary data analysis of geological disaster vulnerability map. Engineering geological mapping generated geological information, such as morphology, physical properties of soil and rocks, geological structures, as well as additional data for engineering geological information in the form of engineering properties of soil and rocks, the depth of groundwater level, and the ease of excavation. Carrying capacity of rocks is based on the result of Geological Strength Index (GSI) rock mass classification, while the carrying capacity of the land based is based on the result of Dynamic Cone Penetration (DCP). From engineering geological information collected, engineering geological capability zone can be performed to the settlements on the research areas. Engineering geological capability zone is conducted by the evaluation method of Analytical Hierarchy Process (AHP).

The research results are the characteristics of engineering geology of the research areas, consisting of: sandstone unit, lapilli unit, tuffaceous sandstone unit, andesite breccia unit, sand deposit and sandy clay deposit. Sandstone unit has a carrying capacity of 135 tons/m² and compressive strength of 8.32 MPa. Sand deposit has a carrying capacity of 11-35 tons/m² and is classified as sandy soil (SP) with bad gradation and there are silt and clay-sized soil. Sandy clay deposit has a carrying capacity of 6.5-8.6 tons/m², the liquid limit of 27-32.3%, and plastic index of 7.25-10.2%. Engineering geological capability zone in the research areas consists of: high capability zone with an area of 33%, medium capability zone of 45% and low capability zone of 22% from the total of research area.

Keywords: *area development, characteristics of engineering geology, engineering geological capability zone.*