

**GEOLOGI DAN DAYA DUKUNG TANAH
BERDASARKAN KONDISI HIDROGEOLOGI DAN SIFAT MEKANIK TANAH
PADA LOKASI RENCANA BANDARA INTERNASIONAL
DAERAH TEMON DAN SEKITARNYA, KABUPATEN KULON PROGO,
DAERAH ISTIMEWA YOGYAKARTA**

SARI

Rika Wandansari Hidayah

111.110.026

Lokasi penelitian secara administratif berada di Daerah Temon dan sekitarnya, Kabupaten Kulon Progo, Daerah Istimewa Yogyakarta. Luas wilayah penelitian 6,8 km x 4,5 km. Secara koordinat UTM zona 49 S berada pada koordinat 392193 mE - 396596 mE dan 9126000mN – 9132789mN.

Satuan geomorfologi daerah penelitian ialah Berdasarkan aspek litologi, struktur geologi dan stadia erosi dibagi menjadi 10 satuan bentuk lahan yaitu Dataran aluvial (F1), Dataran limpah banjir (F22), Tubuh sungai (F23), Gosong sungai (F13), Gumuk pasir (A1), Dataran aluvial pantai (A3), Gisik (M3), Perbukitan Terdenudasi (D14), Lembah Terdenudasi (D15), dan Bukit Sisa (D3). Daerah penelitian dibagi menjadi lima satuan yaitu Satuan breksi Kaligesing (Oligosen Akhir-Miosen Awal), Satuan batupasir-vulkanik Kaligesing (Oligosen Akhir-Miosen Awal), Lava Andesit Kaligesing (Oligosen Akhir-Miosen Awal), Endapan Aluvial Sungai (Holosen) dan Endapan Aluvial Pantai (Holosen).

Hasil pengamatan daerah penelitian memiliki muka air tanah yang relatif dangkal dan kandungan kimia air yang layak. Kandungan kimia air tersebut berpengaruh terhadap konstruksi pondasi. Hasil pengamatan daerah penelitian terbagi empat jenis klasifikasi tanah yaitu lempung, lempung pasir, pasir lempungan dan pasir. Hasil analisis daya dukung tanah pada daerah penelitian berdasarkan empat metode yaitu Metode Terzaghi dengan nilai daya dukung antara 10,95 ton/m²-46,53 ton/m² dengan daya dukung ijin 3,65 ton/m²-15,51 ton/m², Metode Meyerhof hasil nilai daya dukung antara 36,17 ton/m²-180,15 ton/m² dengan daya dukung ijin 12,06 ton/m²-60,17 ton/m², Metode Hansen hasil nilai daya dukung antara 42,66ton/m²-160,7 ton/m² dengan daya dukung ijin 14,22 ton/m²-53,58 ton/m², dan Metode Vesic hasil nilai daya dukung antara 43,43 ton/m²-165,1 ton/m² dengan daya dukung ijin 14,47 ton/m²-55,02 ton/m². Beban yang dibutuhkan untuk menopang satu buah pesawat ialah 412,8 ton sehingga dibutuhkan sistem perencanaan pondasi yang tepat.

Perencanaan pondasi yang digunakan ialah pondasi sistem cakar ayam. Sistem pondasi cakar ayam berupa pelat beton yang dipaku pada tanah bila dibebani berulang-ulang, maka kontak hubungan antara tanah dasar dibawah pelatnya lebih terjaga, dibandingkan dengan pelat yang hanya diletakkan diatas tanah. Bidang kontak antara pelat dan tanah terjamin selalu rapat, maka pelat selain kuat juga awet, sehingga pelat tersebut digunakan untuk pembuatan runway bandara.

ABSTRACT

The setting of the research is located in Temon and the surrounding area, Kulon Progo, Yogyakarta. The area of the study is 6.8 km x 4.5 km. By coordinates UTM zone 49 S is at coordinates 392193mE-396596mE and 9126000mN-9132789mN.

Geomorphology study area unit is based on the aspects of lithology, geological structure and stadia erosion which is divided into 10 units of landforms. Those are alluvial flats (F1), Plain overflow flood (F22), Body of river (F23), Point bar (F13), Sand dunes (A1), alluvial plains beach (A3), beach (M3), Denudated hills (D14), Denudated Valley (D15), and Residual hill (D3). The area of the study is divided into five units namely Breccia Kaligesing Unit (Late Oligocene-Early Miocene), Sandstone-volcanic Kaligesing Unit (Late Oligocene-Early Miocene), Lava-andesite Kaligesing (Late Oligocene-Early Miocene), Deposition Alluvial River (Holocene) and Deposition Alluvial Beach (Holocene).

The observation of the study shows that a water table is relatively shallow and proper water chemistry. Moreover, the content of the water chemistry affects to the foundation construction. The observation of the study is divided into four types of soil classification, namely clay, sandy clay, silt sand and sand. The results analysis of the land carrying capacity is based on four methods, namely Terzaghi method with bearing capacity of between 10,95 tons/m²-46,53 ton/m² with a safe bearing capacity of 3,65 tons/m²-15,51 tons/m², Meyerhof method results between the bearing capacity of 36,17 ton/m²-180,15 ton/m² with safe bearing capacity 12,06 ton/m²-60,17 ton/m², Hansen method results between the bearing capacity 42,66 ton/m²-160,7 ton/m² with safe bearing capacity 14,22 tons/m²-53,58 tons/m², and the Vesic method results support between bearing capacity of 43,43 tons/m²-165,1 tons/m² with safe bearing capacity 14,47 ton/m²-55,02 ton/m². The load which is required to sustain the planes is 412,8 tons that the planning system needs the proper foundation.

The design that is used is the scribble foundation system. The scribble foundation system in the form of a concrete slab is attached to the ground when loaded repeatedly, then contact the relationship between the subgrade under the plate more awake, compared with a plate that is placed just above the ground. The contact area between the plate and the ground is always guaranteed tightly, in addition to strong plate is also durable, so that the plate is used for the manufacture of the airport runway.