

**PENYELIDIKAN KARAKTERISTIK LAPISAN TANAH DAN
ANALISIS DAYA DUKUNG TANAH MENGGUNAKAN UJI
SONDIR/*CONE PENETRATION TEST* (CPT)**

Muhammad Zaky Fadlan M.¹, Iman Handiman², Herianto²
Jurusan Teknik Sipil Fakultas Teknik Universitas Siliwangi
Jalan Siliwangi No. 24 Tasikmalaya, Jawa Barat, Indonesia
Email : zakypadlan741@gmail.com

ABSTRAK

Uji sondir/*cone penetration test* merupakan salah satu metode penyelidikan tanah/*soil investigation* yang bertujuan untuk mengetahui daya dukung tanah pada setiap lapisan yang berguna untuk menentukan kedalaman dan tipe fondasi sebuah bangunan. Berdasarkan 2 titik pengujian sondir yang dilakukan, lapisan tanah keras pada Pembangunan Gedung Sekolah Tinggi Ilmu Adab Budaya Islam Riyadlul Ulum Wadda'wah Condong-Tasikmalaya terletak pada kedalaman 3 m dengan tahanan konus (q_c) 18 MPa dan 4,2 m dengan tahanan konus (q_c) 16 MPa, yang didominasi oleh karakteristik tanah lempung. Perhitungan daya dukung tanah menggunakan data titik sondir 2 (terlemah) dengan nilai reaksi perletakan 50 ton, 75 ton, dan 110 ton (berdasarkan perhitungan analisis struktur menggunakan program *SAP 2000*) dihasilkan tipe fondasi bujur sangkar dengan beberapa ukuran berbeda berdasarkan tiap metode. Metode Terzaghi (1943) menghasilkan ukuran 180 cm x 180 cm, 240 cm x 240 cm, dan 280 cm x 280 cm, metode Schmertmann (1978) menghasilkan 180 cm x 180 cm, 220 cm x 220 cm, dan 260 cm x 260 cm, sedangkan metode Skempton (1951) menghasilkan rentang 180 cm x 180 cm, 240 cm x 240 cm, dan 280 cm x 280 cm. Secara garis besar perbedaan hasil perhitungan dikarenakan adanya koefisien-koefisien yang berbeda pada tiap metode, dan penyederhanaan persamaan dari tiap-tiap metode.

Kata kunci: uji sondir, daya dukung tanah, Terzaghi (1943), Schmertmann (1978)

¹ Mahasiswa Program Studi S1 Teknik Sipil, FT, Unsil

² Dosen Jurusan Program Studi Teknik Sipil, FT, Unsil

Dosen Pembimbing Tugas Akhir

**INVESTIGATION ON THE CHARACTERISTICS OF SOIL
LAYERS AND ANALYSIS OF SOIL BEARING CAPACITY USING CONE
PENETRATION TEST (CPT)**

Muhammad Zaky Fadlan M.¹, Iman Handiman², Herianto²

Civil Engineering Department, Faculty of Engineering, Siliwangi University

Jalan Siliwangi No. 24 Tasikmalaya, Jawa Barat, Indonesia

Email : zakyfadlan741@gmail.com

ABSTRACT

The cone penetration test is one of the soil investigation methods that aim to determine the bearing capacity of the soil in each layer which is useful for determining the depth and type of foundation of a building. According to the 2 cone penetration test points that were carried out, the hard soil layers in the Building Construction of Sekolah Tinggi Ilmu Adab Budaya Islam Riyadlul Ulum Wadda'wah Condong-Tasikmalaya were located at a depth of 3 m with a cone resistance (q_c) of 18 MPa and at 4.2 m depth with a cone resistance (q_c) of 16 mPa that were dominated by clay soil characteristics. The calculation of soil bearing capacity using CPT point 2 data (the weakest) with a value joint reaction of 50 tons, 75 tons, and 100 tons (based on structural analysis calculations using the SAP 2000 program) resulted in square foundation type with several different sizes according to each method. Terzaghi's method (1943) produced sizes of 180 cm x 180 cm, 240 cm x 240 cm, and 280 cm x 280 cm, Schmertmann's method (1978) resulted in 180 cm x 180 cm, 220 cm x 220 cm, dan 260 cm x 260 cm, while Skempton's method (1951) produced ranges of 180 cm x 180 cm, 240 cm x 240 cm, and 280 cm x 280 cm. In general, the differences in the calculation results were due to the different coefficients in each method, and the simplification of the equations of each method.

Keywords: *cone penetration test, soil bearing capacity, Terzaghi (1943), Schmertmann (1978)*

¹ Student of SI Civil Engineering Study Program, Unsil

² Lecturer of Civil Engineering Study Program Department, FT, Unsil
Final Assignment Lecturer Supervisor