

PERENCANAAN PONDASI TIANG PANCANG PADA PROYEK APARTEMEN TAMANSARI CENDEKIA SEMARANG

Oleh :

Muhammad Arif Hakim¹⁾, Muhammad Ashfal Muna¹⁾, Pratikso²⁾, Abdul Rochim²⁾

Abstrak

Pertumbuhan populasi manusia yang semakin meningkat membuat kebutuhan tempat tinggal meningkat, salah satu cara untuk menanggulunginya adalah dengan membangun apartemen. Apartemen Tamansari Cendekia memiliki 24 lantai, termasuk *basement* dan *rooftop*. Tujuan dari tugas akhir ini untuk merencanakan dan menghitung daya dukung serta penurunan pondasi tiang pancang apartemen tamansari cendekia.

Permodelan struktur atas menggunakan program SAP2000 untuk mendapatkan beban dari struktur atas. Perhitungan daya dukung aksial tiang menggunakan data sondir dan menggunakan data N-SPT dengan metode Reese & Wright, Mayerhoff, US Army Corps serta kekuatan bahan. Perhitungan daya dukung lateral menggunakan metode Broms, dilanjutkan perhitungan penurunan menggunakan metode Vesic. Terakhir membandingkan perhitungan manual dan perhitungan menggunakan program Bentley Geostuctural Analysis serta Allpile.

Berdasarkan hasil perhitungan, pondasi yang digunakan adalah pondasi tiang pancang dengan kedalaman 20 m dan berdiameter 1 m. Hasil perhitungan daya dukung ijin dimulai dari manual, bentley dan allpile. Untuk *single pile* sebesar 1854.23 kN, 1906.45 kN, 1981,37 kN. PC.2 sebesar 3337.61 kN, 3728.95 kN, 3017,55 kN. PC.3 sebesar 4394.52 kN, 5023.03 kN, 4281,11 kN. PC.4 sebesar 5859.37 kN, 6262.83 kN, 5749,84 kN. PC.6 sebesar 8455.29 kN, 10642.82 kN, 8744,32 kN, PC.12 sebesar 15798.04 kN, 20503.15 kN, 16248,77 kN. PC.16 sebesar 20470.7 kN, 23253.85 kN, 19962,62 kN. PC.18 sebesar 23029.54 kN, 25552.36 kN, 22901,74 kN dan PC.21 sebesar 26867.79 kN, 30824.39 kN, 26505,33 kN. Untuk perhitungan penurunan dimulai dari manual, bentley, dan allpile. *Single pile* sebesar 32.9 mm, 29.8 mm, 25,9 mm. PC.2 sebesar 62 mm, 56.3 mm, 64,9 mm. PC.3 sebesar 85.9 mm, 80 mm, 80,2 mm. PC.4 sebesar 91.9 mm, 75.4 mm, 89,7 mm. PC.6 sebesar 91.9 mm, 71.4 mm, 84,9 mm. PC.12 sebesar 114.3 mm, 90.4 mm, 109,3 mm. PC.16 sebesar 132.9 mm, 96.6 mm, 128,3 mm. PC.18 sebesar 114.3 mm, 96.4 mm, 101,3 mm. PC.21 sebesar 114.3 mm, 101.4 mm, 112,9 mm.

Kata Kunci : Daya Dukung Aksial; Daya Dukung Lateral; Penurunan; Tiang Pancang

¹⁾Mahasiswa Fakultas Teknik Program Studi Teknik Sipil UNISSULA

²⁾Dosen Fakultas Teknik Program Studi Teknik Sipil UNISSULA

DESIGN OF DRIVEN PILE FOUNDATIONS IN THE TAMANSARI CENDEKIA APARTMENT PROJECT IN SEMARANG

Presented by :

Muhammad Arif Hakim¹⁾, Muhammad Ashfal Muna¹⁾, Pratikso²⁾, Abdul Rochim²⁾

Abstract

The increasing of human population growth causes the need for living space increases as well, and one of the things that will able to mitigate it is by constructing apartments. Tamansari Cendekia Apartment has 24 floors, including a basement and rooftop. The purpose of this final project is to plan and calculate the carrying capacity and the settlement of the driven piles of Tamansari Cendekia Apartment.

The upper structure modeling uses the SAP2000 program to get the load from the upper structure. The calculation of axial bearing capacity uses sondir data and N-SPT data with Reese & Wright, Mayerhoff, US Army Corps and material strength methods. The calculation of lateral bearing capacity uses the Broms method, followed by settlement calculations with the Vesic method. As for the last step is comparing manual calculations and calculations using the Bentley Geosturctural Analysis and Allpile programs.

Based on the calculation results, the foundation used is the pile foundation with a depth of 20 m and 1 m in diameter. The calculations result of the permits carrying capacity is starting from manual, bentley and allpile. For single pile is 1854.23 kN, 1906.45 kN, 1981,37 kN. PC.2 is 3337.61 kN, 3728.95 kN, 3017,55 kN. PC.3 is 4394.52 kN, 5023.03 kN, 4281,11 kN. PC.4 is 5859.37 kN, 6262.83 kN, 5749,84 kN. PC.6 is 8455.29 kN, 10642.82 kN, 8744,32 kN, PC.12 is 15798.04 kN, 20503.15 kN, 16248,77 kN. PC.16 is 20470.7 kN, 23253.85 kN, 19962,62 kN. PC.18 is 23029.54 kN, 25552.36 kN, 22901,74 kN and PC.21 is 26867.79 kN, 30824.39 kN, 26505,33 kN. For the settlement calculation is starting from manual, bentley, and allpile. Single pile is 32.9 mm, 29.8 mm, 25,9 mm. PC.2 is 62 mm, 56.3 mm, 64,9 mm. PC.3 is 85.9 mm, 80 mm, 80,2 mm. PC.4 is 91.9 mm, 75.4 mm, 89,7 mm. PC.6 is 91.9 mm, 71.4 mm, 84,9 mm. PC.12 is 114.3 mm, 90.4 mm, 109,3 mm. PC.16 is 132.9 mm, 96.6 mm, 128,3 mm. PC.18 is 114.3 mm, 96.4 mm, 101,3 mm. PC.21 is 114.3 mm, 101.4 mm, 112,9 mm.

Key words : *Axial bearing capacity; Lateral bearing capacity; Settlement; Driven pile*

¹⁾ Student of Civil Engineering Faculty UNISSULA

²⁾ Lecture of Civil Engineering Faculty UNISSULA