

## ABSTRAK

Pembangunan gedung pada lahan terbatas mendorong pemanfaatan ruang secara vertikal, salah satunya melalui pembangunan semi-basement. Perencanaan struktur semi-basement memerlukan analisis yang tepat terhadap ketebalan pelat dan kapasitas daya dukung tanah agar struktur mampu menahan beban secara aman dan efisien. Penelitian ini bertujuan untuk menganalisis ketebalan pelat semi-basement serta mengevaluasi kapasitas daya dukung tanah pada pembangunan Gedung SMP Sinar Harapan di Kabupaten Lumajang. Data yang digunakan berupa gambar perencanaan struktur (Detail Engineering Design/DED) dan data hasil uji sondir (Cone Penetration Test/CPT) untuk mengetahui karakteristik tanah di lokasi penelitian. Analisis struktur dilakukan menggunakan perangkat lunak SAP2000 untuk memperoleh distribusi gaya dalam, momen lentur, serta lendutan pada pelat. Hasil analisis menunjukkan bahwa pelat semi-basement dengan sistem pelat dua arah berukuran 5 m × 5 m dan tebal 120 mm mampu menahan beban terfaktor sebesar 4,144 kN/m<sup>2</sup> dengan momen rencana 4,766 kNm/m. Hasil kontrol lendutan menunjukkan nilai 16,331 mm yang masih lebih kecil dari batas izin L/240 sebesar 20,833 mm. Analisis geoteknik menunjukkan daya dukung tanah izin sebesar 840,75 kPa dengan faktor keamanan 3,18 sehingga dinyatakan aman dalam menahan beban struktur.

**Kata Kunci:** Beton; Pelat; Pondasi Rakit; Struktur

## **ABSTRACT**

*Building construction on limited land encourages vertical space utilization, one of which is through the construction of semi-basements. Semi-basement structure planning requires accurate analysis of slab thickness and soil bearing capacity so that the structure can withstand loads safely and efficiently. This study aims to analyze the thickness of the semi-basement slab and evaluate the soil bearing capacity in the construction of the Sinar Harapan Junior High School building in Lumajang Regency. The data used consist of structural design drawings (Detail Engineering Design/DED) and Cone Penetration Test (CPT) results to determine the soil characteristics at the study site. Structural analysis was performed using SAP2000 software to obtain the internal force distribution, bending moment, and slab deflection. The analysis results showed that the semi-basement slab with a 5 m × 5 m two-way slab system and a thickness of 120 mm was able to withstand a factored load of 4.144 kN/m<sup>2</sup> with a design moment of 4.766 kNm/m. The deflection control results showed a value of 16.331 mm, which is still smaller than the allowable limit of L/240 of 20.833 mm. Geotechnical analysis showed an allowable soil bearing capacity of 840.75 kPa with a safety factor of 3.18, indicating that it is safe in withstanding structural loads.*

**Keywords:** Concrete; Slab; Foundation; Frame; Structure.