

# REDESIGN STRUKTUR GEDUNG TEKNIK INFORMATIKA DAN LINGKUNGAN POLITEKNIK NEGERI CILACAP

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## ABSTRACT

*Politeknik Negeri Cilacap (PNC) is a state university at The District of Cilacap, Central Java. Politeknik Negeri Cilacap plans to build The Informatics and Environmental Engineering Building as a student activity centre, to cater the need of classrooms, learning facilities, and academic services. Planning the upper structure of building consisting a steel roof frame, slab floors, beams, columns, shear walls, and the piles foundation as support for the lower structure. The structure was analyzed by SAP2000 software of 22.0.0 version to help analyze the reaction of internal forces in the building structure. Roof structure planning refers to SNI 1729-2020 Spesifikasi Untuk Bangunan Gedung Baja Struktural, while reinforced concrete building structure planning refers to SNI 2847-2019 Tata Cara Perhitungan Struktur Beton Struktural untuk Bangunan Gedung. The analyzed loads include dead loads, live loads, wind loads and earthquake loads. 5 floors building is planned with concrete quality  $f'c = 29,05$  MPa, longitudinal reinforcement quality  $f_y = 400$  MPa, and stirrup reinforcement  $f_{yt} = 240$  MPa. Based on the results of the structural analysis that carried out, a truss design was obtained with an IWF 200.100.7.10 steel profile. The thickness of the slab from the ground floor to the 5<sup>th</sup> floor is 140 mm with D13 – 250 reinforcement bar. Main beam using D25 flexural reinforcement and Ø12 stirrups. Secondary beam using D16 flexural reinforcement and Ø10 stirrups. Sloof using D25 flexural reinforcement and Ø10 stirrups. Column using D16 flexural reinforcement and Ø10 stirrups. The shear wall's thick is 200 mm with D19 – 200 mm longitudinal reinforcement and 2D13 – 200 stirrups reinforcement. In the pile foundation for columns and shear walls, dimensions of  $40 \times 40$  cm<sup>2</sup> with a depth of 20 m are obtained.*

**Keywords:** *SAP2000, Reinforced Concrete Structure, Roof of Steel, Pile Foundation*

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