

INTISARI

Pasal 16 Undang-Undang RI No. 28 Tahun 2002 menyatakan bahwa keandalan bangunan gedung harus memenuhi persyaratan keselamatan, kesehatan, kenyamanan, dan kemudahan sesuai fungsi yang ditetapkan. Dalam merencanakan gedung kantor, perlu meninjau aspek arsitektural, keamanan, biaya, kegunaan, struktur, dan jasa yang tersedia. Struktur baja memiliki kekuatan tarik dan tekan yang tinggi, membuatnya ringan dan ideal untuk bangunan, jembatan, dan rangka atap. Baja juga daktail dan elastis, sehingga cocok untuk daerah rawan gempa.

Studi kasus yang digunakan yaitu gedung perkantoran *Surya Group Office* di Jalan Lemponsari Raya G No. 154, Sleman, Yogyakarta. Gedung setinggi 38,5 meter ini memiliki 8 lantai fungsional, 1 *semibasement*, dan 1 lantai *rooftop*. Perancangan ulang menggunakan struktur baja SRPMK dengan konsep *LFRD* dan dibantu oleh perangkat lunak ETABS. Selain itu dilakukan pula pengecekan stabilitas dinding penahan tanah pada keadaan eksisting, serta dilakukan pula rencana penjadwalan pekerjaan proyek terhadap studi kasus tersebut.

Pada perancangan kolom digunakan profil baja IWF 800x300x14x26 dan IWF 588x300x12x20. Sedangkan untuk perancangan balok menggunakan profil baja IWF 450x200x9x14, 400x200x8x13, 350x175x7x11, dan 300x150x6,5x9 serta dilakukan pemodelan dengan perangkat lunak ETABS dan perhitungan manual dengan *Microsoft Excel*. Perhitungan dilakukan sesuai SNI 1729:2020 mengenai struktur baja SRPMK. Pembebanan disesuaikan dengan keadaan eksisting dan didapatkan hasil struktur baja mampu menahan seluruh beban yang diterima dengan nilai *PMM Ratio* <1. Pada perhitungan struktur bawah dilakukan analisis dinding penahan tanah eksisting dan didapat nilai stabilitas guling sebesar 2,332 dan stabilitas geser 2,482. Dilakukan rencana penjadwalan pekerjaan gedung tersebut dan didapatkan durasi total selama 146,08 hari.

Kata kunci: perancangan, struktur baja, SRPMK, dinding penahan tanah, penjadwalan.

ABSTRACT

Article 16 of the Law of the Republic of Indonesia No. 28 of 2002 states that the reliability of a building must meet the requirements of safety, health, comfort, and convenience according to its designated function. In designing an office building, it is necessary to consider architectural aspects, security, cost, utility, structure, and the services. Steel structures have high tensile and compressive strength, making them lightweight and ideal for buildings, bridges, and roof frames. Steel is also ductile and elastic, making it suitable for earthquake-prone areas.

The case study used is the Surya Group Office building located at Jalan Lemponsari Raya G No. 154, Sleman, Yogyakarta. This building stands 38.5 meters tall, with 8 functional floors, 1 semi-basement, and 1 rooftop floor. The redesign uses SMRF steel structures with the LRFD concept, using ETABS software. Additionally, the stability of the existing retaining walls was checked, and a project scheduling plan was created for this case study.

For the column design, IWF steel profiles 800x300x14x26 and 588x300x12x20 were used. For the beam design, IWF steel profiles 450x200x9x14, 400x200x8x13, 350x175x7x11, and 300x150x6.5x9 were used. The modeling was done using ETABS software and manual calculations with Microsoft Excel. The calculations were conducted in accordance with SNI 1729:2020 concerning SMRF steel structures. The loading was adjusted to the existing conditions, and the results showed that the steel structure could withstand all the loads with a PMM Ratio value of <1 . For the substructure calculations, an analysis of the existing retaining walls was conducted, resulting in a stability value against overturning of 2.332 and against sliding of 2.482. The project scheduling plan for the building showed a total duration of 146.08 days.

Keywords: design, steel structure, SMRF, retaining wall, scheduling.