

**PERENCANAAN STRUKTUR BAJA GEDUNG AULA DAN RESTO PGSD
UNIVERSITAS JEMBER BERDASARKAN SNI 1727:2020 dan SNI
1729:2020**

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Dosen Pembimbing

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ABSTRAK

Redesain struktur atas Gedung Aula dan Resto PGSD Universitas Jember dengan bentang bebas transversal 12,00 m dilakukan dengan mengonversi material beton bertulang menjadi baja struktural BJ-41. Langkah ini bertujuan mereduksi berat seismik efektif bangunan (W) untuk meminimalkan gaya geser dasar gempa (V) di wilayah Kabupaten Jember. Perencanaan dimodelkan dengan ETABS 18 menggunakan metode LRFD (SNI 1729:2020) dan Sistem Rangka Pemikul Momen Khusus (SRPMK, SNI 7860:2020). Analisis beban gempa menggunakan respons spektrum dinamis (SNI 1726:2019) pada Kelas Situs Tanah Sedang (SD) ($S_{DS} = 0,0300g$, $S_{D1} = 0,0480g$). Hasil analisis membuktikan seluruh profil aman terhadap batas kekuatan dan layan. Dimensi terpilih adalah balok utama WF 488×300×11×18, balok longitudinal WF 350×175×7×11, balok anak WF 250×125×6×9, Kolom Lantai 1 WF 600×300×12×25, dan Kolom Lantai 2 WF 440×300×11×18. Kriteria *Strong Column Weak Beam* (SCWB) terpenuhi dengan rasio kapasitas kolom-balok minimum 1,92 ($>1,00$). Sambungan kaku tipe pelat ujung diperpanjang baut (Tipe 4E dan 8E) terbukti aman dan daktil.

Kata Kunci: Redesain Baja, SRPMK, Strong Column Weak Beam (SCWB), LRFD, Sambungan Terpraktualifikasi.

**Structural Steel Design of the PGSD Auditorium and Restaurant Building at
the University of Jember Based on SNI 1727:2020 and SNI 1729:2020**

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ABSTRACT

The superstructure of the PGSD Auditorium and Restaurant at the University of Jember, featuring a 12.00-meter clear transversal span, was redesigned from reinforced concrete to BJ-41 structural steel. This conversion aims to reduce the effective seismic weight (W) to minimize the earthquake base shear force (V) in the seismically active Jember Regency. The structure was modeled in ETABS 18 applying the LRFD method (SNI 1729:2020) and the Special Moment Resisting Frame System (SMRF / SRPMK, SNI 7860:2020). Dynamic response spectrum analysis (SNI 1726:2019) was executed for Medium Soil site class (SD) ($S_{DS} = 0.0300g$, $S_{D1} = 0.0480g$). The results confirm all steel profiles satisfy ultimate limit states and serviceability requirements. Selected profiles consist of WF 488×300×11×18 for main beams, WF 350×175×7×11 for longitudinal beams, WF 250×125×6×9 for secondary beams, WF 600×300×12×25 for 1st-floor columns, and WF 440×300×11×18 for 2nd-floor columns. SRPMK requirements are fully satisfied with a minimum column-to-beam flexural capacity ratio of 1.92 (>1.00). Bolted extended end-plate moment connections (Types 4E and 8E) are verified to be structurally safe and ductile.

Keywords: *Steel Redesign, SMRF / SRPMK, Strong Column Weak Beam (SCWB), LRFD, Prequalified Connection.*