

INTISARI

Salah satu struktur beton bertulang yang berfungsi sebagai fasilitas pendidikan, yaitu Gedung D Fakultas Geografi, dibangun pada tahun 2011 dengan rencana awal memiliki enam lantai. Namun, akibat keterbatasan anggaran, gedung tersebut saat ini hanya terdiri dari tiga lantai. Mengingat peningkatan jumlah mahasiswa, pengelola berencana melanjutkan pembangunan sesuai rencana awal. Penelitian ini bertujuan untuk mengevaluasi kinerja seismik Gedung D berdasarkan standar terbaru serta mengusulkan perkuatan struktur menggunakan bracing dan shear panel damper (SPD). Analisis dilakukan dengan metode *nonlinear static procedure (pushover)*.

Hasil analisis *pushover* menunjukkan bahwa perkuatan dengan *Bracing* dan SPD secara signifikan meningkatkan kapasitas geser dasar (*base shear*), kekakuan lateral, dan kemampuan deformasi struktur. Struktur tanpa perkuatan tidak memenuhi kriteria penerimaan global maupun kriteria penerimaan untuk *deformation-controlled* dan *force-controlled* pada level kinerja *Immediate Occupancy* (BSE-1E) dan *Life Safety* (BSE-2E). Setelah perkuatan, gedung memenuhi kriteria penerimaan global *drift ratio* untuk kedua level kinerja tersebut, meskipun beberapa elemen masih belum memenuhi kriteria penerimaan *deformation-controlled* dan *force-controlled*. Secara keseluruhan, perkuatan dengan *Bracing* dan SPD meningkatkan kekuatan dan kinerja global struktur, sehingga menjadikan gedung lebih aman terhadap beban gempa.

Kata kunci: *Nonlinear static procedur*, evaluasi seismik, *Shear panel damper*.

ABSTRACT

One of the reinforced concrete structures serving as an educational facility, namely Building D of the Faculty of Geography, was constructed in 2011 with an initial plan to have six stories. However, due to budget constraints, the building currently consists of only three stories. Considering the increasing number of students, the management plans to continue construction according to the original design. This study aims to evaluate the seismic performance of Building D based on the latest standards and propose structural strengthening using bracing and shear panel dampers (SPD). The analysis was conducted using the *nonlinear static procedure (pushover)*.

The *pushover* analysis results indicate that strengthening with bracing and SPD significantly enhances the base shear capacity, lateral stiffness, and deformation capacity of the structure. The non-reinforced structure does not meet the global acceptance criteria or the acceptance criteria for *deformation-controlled* and *force-controlled* elements at the *Immediate Occupancy* (BSE-1E) and *Life Safety* (BSE-2E) performance levels. After strengthening, the building satisfies the global *drift ratio* acceptance criteria for both performance levels, although some elements still do not meet the acceptance criteria for *deformation-controlled* and *force-controlled* components. Overall, strengthening with bracing and SPD improves the structural strength and global performance, making the building safer against seismic loads.

Keywords: Nonlinear Static Procedure, Seismic Evaluation, Shear Panel Damper.