ABSTRACT

FEASIBILITY ANALYSIS OF STRUCTURAL WORK OF BUILDING E OF ENGINEERING FACULTY OF LAMPUNG UNIVERSITY AGAINST THE ADDITION OF TWO STORY LOAD AND SEISMIC LOAD

By

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Building E of Civil Engineering, Faculty of Engineering, University of Lampung is a lecture building which built in 1995. Building E consists of 2 asymmetrical storie with reinforced concrete as the frame system and cyclops as the structure bottom. Furthermore, this building will be planned to added two more stories to meet the need of more classrooms and the need of the bearing capacity of the foundation to be able to bear the addition loads. On the other hand, adding more stories to the existing structure can prevent the use of green open spaces and reduce construction cost.

In this study, the building of E Civil Engineering will be analyzed with addition of two more stories load and seismic load. The study aims to evaluate the strength of the existing column structure and foundation against the working load and also to estimate the need of required existing reinforcement that suit to bear the constraints. The evaluation of the structure is carried out using the response spectrum method with a structure analysis program.

The results of the structural analysis show that the bearing capacity of the existing foundation is safe against the additional load of two stories, so that the structure can be increased to four-story building. The deviation between levels that occurred on the 1st floor to the 3rd floor in the X direction and Y direction has exceeded the allowable limit deviation. Viewed from structural strength of the existing column on the 1st and 2nd story, it is not enough in bending moment, so it is recommended that the existing column had to strengthened immediately. Based on the result from strengthened column, K2 experienced an increase in flexural capacity of 102.83% for FRP installation and 133.78% for concrete jacketing.

Key words: evaluation, column structure, load change

ABSTRAK

ANALISIS KELAYAKAN STRUKTUR GEDUNG E FT UNILA TERHADAP PENAMBAHAN BEBAN DUA LANTAI DAN BEBAN GEMPA

Oleh

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Gedung E Teknik Sipil Fakultas Teknik Universitas Lampung merupakan gedung perkuliahan yang telah dibangun tahun 1995. Gedung E terdiri dari 2 lantai tidak simetris dengan menggunakan sistem rangka beton bertulang dan struktur bawah menggunakan fondasi sumuran. Selanjutnya gedung ini akan direncanakan penambahan dua lantai untuk kebutuhan ruang kelas serta daya dukung fondasi diharapkan mampu menahan beban tambahan. Disisi lain, penambahan lantai pada struktur eksisting dapat mencegah penggunaan ruang terbuka hijau dan efisiensi biaya konstruksi.

Dalam penelitian ini, gedung E Teknik Sipil akan dianalisis terhadap penambahan beban dua lantai dan beban gempa. Hal ini bertujuan untuk mengevaluasi kekuatan struktur kolom dan fondasi eksisting terhadap beban yang bekerja. Serta memperkirakan kebutuhan perkuatan struktur eksisting yang sesuai dengan kendala. Evaluasi struktur dilakukan dengan metode respon spektrum menggunakan bantuan *structure analysis program*.

Hasil analisis struktur menunjukkan bahwa daya dukung fondasi eksisting aman terhadap penambahan beban dua lantai, sehingga struktur dapat ditingkatkan menjadi empat lantai. Nilai simpangan antar tingkat yang terjadi di lantai 1 sampai dengan lantai 3 pada arah X dan arah Y telah melampaui simpangan batas izin. Ditinjau dari kekuatan struktur kolom eksisting pada lantai 1 dan lantai 2 sudah tidak kuat terhadap lentur dan geser, sehingga diusulkan perkuatan struktur pada kolom eksisting. Hasil penelitian kolom setelah diperkuat, kolom K2 mengalami peningkatan kapasitas lentur sebesar 102,83% terhadap pemasangan FRP dan 133,78% terhadap *concrete jacketing*.

Kata kunci: evaluasi, struktur kolom, perubahan beban