

INTISARI

Indonesia merupakan negara kepulauan dengan risiko gempa bumi yang tinggi. Gempa bumi seperti yang terjadi di Yogyakarta (2006) merupakan kasus gempa bumi yang menelan banyak korban jiwa akibat reruntuhan bangunan. Oleh karena itu evaluasi terhadap gedung yang telah dibangun dengan standar yang dapat dipertanggungjawabkan diperlukan. Gedung yang ditinjau dalam penelitian ini adalah gedung pendidikan (asrama mahasiswa) 3 lantai dengan struktur beton bertulang. Gedung tersebut didesain menggunakan SNI 2847 2013 yang termasuk SNI lama. Peraturan SNI terbaru yaitu SNI 2847 2019 berfokus pada proses desain gedung, sedangkan pada gedung asrama tersebut termasuk gedung yang sudah dibangun dan lebih berfokus pada aturan evaluasi dari pada aturan desain.

Evaluasi gedung pendidikan kategori risiko IV merujuk pada ASCE 41-17 (ASCE, 2017) diawali dengan *tier 1* dan diakhiri dengan *tier 2* menggunakan kala ulang gempa 475 tahun dan target level kinerja *Immediate Occupancy*. *Tier 1* terdiri dari evaluasi pendekatan dari *drift ratio*, tegangan geser, tegangan guling dan dilanjutkan dengan proses evaluasi singkat terhadap parameter-parameter yang ada di ASCE 41-17 (ASCE, 2017). *Tier 2* berupa prosedur *deficiency-based evaluation and retrofit* berisi prosedur tentang perhitungan *demand capacity ratio* (DCR) setiap komponen struktur dengan pemodelan numeris.

Evaluasi *tier 1* berdasarkan ASCE 41-17 (ASCE, 2017) menghasilkan beberapa defisiensi pada beberapa parameter. Berdasarkan defisiensi *tier 1* maka diperlukan evaluasi *tier 2* menggunakan dinamik linier respon spektrum. Evaluasi *tier 2* juga mengalami defisiensi pada elemen struktur seperti balok dan kolom sehingga diperlukan evaluasi lebih lanjut pada penelitian lain atau perbaikan pada elemen-elemen yang mengalami defisiensi.

Kata Kunci: ASCE 41-17, evaluasi gedung, kala ulang gempa, level kinerja

ABSTRACT

Indonesia is an island country with high risk of earthquakes. Earthquakes such as those that occurred in Yogyakarta (2006) is one from many earthquakes case that claimed many lives due to the ruins of buildings. Therefore, an evaluation of the building that has been built with an accountable standard is required. The building reviewed in this study is a 3-storey educational building (student dormitory) with a reinforced concrete structure. That building was designed using SNI 2847 2013 which is included in the old SNI. The latest SNI regulation, SNI 2847 2019 focuses on the building design process, while that buildings have been built and focuses more on evaluation rules than design rules.

Evaluation of risk category IV educational buildings refers to ASCE 41-17 (ASCE, 2017) start with tier 1 and end with tier 2 using an earthquake return period of 475 years and the target performance level of Immediate Occupancy. Tier 1 consists of evaluating the approach of drift ratio, shear stress, overturning stress and followed by a brief evaluation process of the parameters in ASCE 41-1 (ASCE, 2017). Tier 2 is a deficiency-based evaluation and retrofit procedure containing procedures for calculating the demand capacity ratio (DCR) for each structural component using numerical modelling.

Tier 1 evaluation based on ASCE 41-17 (ASCE, 2017) resulted in some deficiencies in several parameters. Based on the deficiency of tier 1, it is necessary to evaluate tier 2 using a linear dynamic response spectrum. Tier 2 evaluation also resulted some deficiencies in structural elements such as beams and columns so that further evaluation was needed in other studies or improvements to elements that were deficient.

Keywords: *ASCE 41-17, building evaluation, return period of earthquake, performance level*