

INTISARI

Gempa bumi yang terjadi sering menimbulkan korban akibat keruntuhan dinding, karenanya dirasa perlu untuk memperkuat dinding menjadi lebih aman dan efisien. Perkuatan yang digunakan adalah *strapping band* dengan variasi ukuran (dibelah) dan pengujian beban statis satu arah dengan tinjauan lentur tegak lurus bidang dinding arah retak vertikal. Penelitian bertujuan untuk mengetahui pengaruh perkuatan *strapping band* terhadap kekakuan, kapasitas momen, kuat lentur, perilaku runtuh, dan kesesuaian aplikasi perkuatan berdasarkan wilayah Palu, Sulawesi Tengah.

Dinding dibuat sebanyak 16 buah, dengan rincian 4 buah tanpa plesteran, 3 buah dengan perkuatan plesteran saja, 3 buah diperkuat anyaman *strapping band* dan plesteran, 3 buah diperkuat anyaman *strapping band* lebar 7 mm (dibelah 2 bagian) dan plesteran, serta 3 buah diperkuat anyaman *strapping band* lebar 4,5 mm (dibelah 3 bagian) dan plesteran. Dimensi dinding tanpa plesteran yaitu $131 \times 23 \times 11 \text{ cm}^3$, sedangkan dinding dengan plesteran yaitu $135 \times 25 \times 15 \text{ cm}^3$. Pengujian lentur dinding dilakukan menurut ASTM E72-02, yaitu pembebanan 2 titik sampai dinding runtuh, kemudian dilakukan analisis terhadap parameter kekuatan yang ditentukan. Nilai kapasitas momen hasil pengujian dibandingkan dengan kapasitas momen hasil analisis ketahanan gempa berdasarkan wilayah Palu yang dilakukan dengan pemodelan menggunakan program SAP2000.

Berdasarkan hasil pengujian, penggunaan anyaman *strapping band* dibelah 2 dan 3 bagian cenderung menambah kapasitas momen, kuat lentur, dan kekakuan dinding yang masing-masing meningkat 11,39 % dan 15,06 % ; 11,46 % dan 15,15 % ; 13,59 %. Penggunaan *strapping band* dapat mencegah keruntuhan mendadak karena dinding masih mampu menahan beban setelah *initial crack*, kemudian juga dapat menghemat biaya Rp 43.250,00 untuk ukuran luas 1 m^2 dibandingkan dinding dengan perkuatan kawat kasa. Perilaku runtuh tiap variasi cenderung mengalami runtuh di tengah bentang.

Kata kunci: gempa, dinding, perkuatan, *strapping band* dibelah, arah retak vertikal

ABSTRACT

Indonesia lies at the confluence of 3 major plates in the world, hence an earthquake is potential to occur due to the shifting plates. When the earthquake occurs many people evacuate themselves from the building but got hit by the debris of masonry wall. Therefore reinforcement to the masonry wall is needed to enhance the safety of masonry wall itself. Masonry wall is retrofitting by strapping band with width variants and it tested using a static load testing with a review of the bending direction perpendicular masonry walls cracked vertical direction. The purposes of this experiment are to determine the effect of reinforcing strapping band to stiffness, moment capacity, flexural strength, cracked behavior, and suitability of retrofitting applications by area of Palu, Central Sulawesi.

The specimen are made a number of 16 units, consist of 4 units without plaster, 3 units retrofitted by plaster, 3 units retrofitted by plaster and strapping band with normal width, 3 units retrofitted by plaster and strapping band with width 7 mm (divide into 2 parts from normal width), and 3 units retrofitted by plaster and strapping band with width 4,5 mm (divide into 3 parts from normal width). The dimension of the specimen with and without plaster are $135 \times 25 \times 15 \text{ cm}^3$ and $131 \times 23 \times 11 \text{ cm}^3$. The testing method is conducted according to ASTM E72-02. The value of moment capacity based on the testing compared by the value of moment capacity based on earthquake analysis by area of Palu from SAP2000 running results.

According to the experiment, retrofitting the masonry wall with width variants strapping band are tend to enhance moment capacity, flexural strength, and stiffness of the masonry walls, which increased by 11,39 % and 15,06 % ; 11,46 % and 15,15 % ; 13,59 %. The use of strapping band could prevent the sudden collapse of the masonry walls because it withstand loads after the initial crack. The masonry wall which retrofitted by strapping band could save cost up to Rp 43.250,00. The cracked behavior of each variants are tend to collapse in the middle of span.

Keywords: earthquake, masonry wall, retrofitting, strapping band with width variants, vertical crack direction