TESIS

KAPASITAS GESER BALOK BETON BERTULANG BERPENAMPANG BUJUR SANGKAR YANG DIROTASI 22,5^{O}

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ABSTRAK

Formula teoritis perhitungan kapasitas geser pada beberapa peraturan beton (*SNI 2847- 2013 dan ACI 318-14*) hanya berupa perhitungan kapasitas geser untuk beban satu arah (uniaksial) saja, padahal komponen struktur juga mengalami geser dua arah (biaksial) melalui kombinasi pembebanan vertikal dan horizontal. Berdasarkan hal tersebut dilakukan studi eksperimental untuk meneliti kapasitas geser biaksial balok beton bertulang berpenampang bujur sangkar yang dirotasi 22,5^{o} sehingga beban vertikal merupakan resultan gaya geser biaksial dengan sampel sembilan buah benda uji serta variasi rasio tulangan lentur sebesar 1,62%, 2,46%, 3,49% selanjutnya variasi pemakaian tulangan sengkang baik tanpa sengkang maupun pakai sengkang dengan jarak 100mm dan 200mm. Hasil studi eksperimental menunjukan peningkatan kapasitas geser beton bertulang akibat penambahan rasio tulangan lentur dan pemakaian sengkang. Selanjutnya nilai teoritis kapasitas geser beton berdasarkan *SNI 2847-2013* dan rumus teoritis yang diajukan oleh *Tanini, dkk* untuk pengembangan rumus *ACI 318-14* cukup aman untuk menghitung kapasitas geser biaksial beton untuk balok yang dirotasi 22,5^{o}, serta perbandingan pola keruntuhan geser hasil eksperimental ini dengan eksperimental *Tanini,dkk* menunjukan polanya sama, dimana potensi keruntuhan geser pada balok dengan sengkang lebih kecil dari balok tanpa sengkang.

Kata kunci : *kapasitas geser biaksial, rotasi 22,5^{o} , tulangan lentur, tulangan sengkang.*

ABSTRACT

The theoretical formula of shear capacity calculation in some concrete codes (SNI 2847-2013 and ACI 318-14) only takes the form of shear capacity calculation for one-way axial load (uniaxial), even though structural components also subjected two-way axial loads (biaxial) through a combination of vertical loading and horizontal. Based on that, an experimental was carried out to study the biaxial shear capacity of reinforced concrete square beams rotating 22.5^{o} so that the vertical load is the resultant of the biaxial shear force with a sample of nine specimens and a variation of the flexural reinforcement ratio of 1.62%, 2.46 %, 3.49% further variations in the use of stirrup reinforcement either without stirrups or use stirrups with a distance of 100mm and 200mm. The results of experimental studies show an increase in shear capacity of reinforced concrete due to the addition of the ratio of flexural reinforcement and the use of stirrups. Furthermore, the theoretical value of concrete shear capacity based on SNI 2847-2013 code and the theoretical formula proposed by Tanini, et al. For the development of the ACI 318-14 code formula is safe enough to calculate the concrete biaxial shear capacity for rotated beams of 22.5^{o}, as well as the comparison of experimental shear failure patterns. this is with the experimental Tanini, et al. showing the same pattern, where the potential for shear failure in the beam with stirrup is smaller than the beam without stirrup.

Keywords: biaxial shear capacity, 22.5^{o} rotation, flexural reinforcement, stirrup reinforcement.