SUMMARY

Jackson Bernath Simanjuntak., Departement of Civil Engineering, Engineering Faculty, Brawijaya University, December 2016, *The Effects of Vertical Reinforcement Configurations to Ductility and Stiffness of Shear Wall Subjected to Cyclic (Quasi-Static) Loading*, Acadaemic Supervisor: Ari Wibowo, ST, MT, Ph.D and Dr.Eng Ming Narto Wijaya ST, MT, M.sc

Indonesia is the country with the intensity of volcanic and tectonic earthquakes are quite active, therefore we need structures that can survive during earthquake. Shear wall is a wall structure which is applied to retain moments, shear and axial. Application of concrete shear walls using a large cost but with the configuration of the vertical reinforcement and further analysis so we can plan a shear wall with lower cost but with the same quality and strong or even larger compared with a normal shear wall configuration. Viewed from the civil engineering study, we need for further research for configuration of the vertical reinforcement in terms of various aspects of construction. Aspects of the construction in question are the strength capacity of the structure of the shear wall, constituent materials, analysis of shear walls, ductility of shear wall, and stiffness of shear walls.

In this research, modeling, manufacture and test of cyclic loading on three specimens by using the main material such as cement, water, coarse aggregate and fine aggregate for quality design of 20 MPa and reinforcing plain ∅8 for foundation and shear walls with vertical reinforcement ratio of shear wall 2.44% and 5.54% of the horizontal reinforcement ratio. The first shear wall is the distance between the vertical bars of 50 mm. A second sliding wall with the distance between the vertical bars of 40 mm. The third shear wall that is the distance between the vertical bars of 30 mm. For each specimen have the distance between the horizontal reinforcement 150 mm with tow specimen of 800 mm, width 400 mm and 80 mm thick. Imposition of axial given 5% of the design capacity of the test specimen. Imposition of a given form of lateral cyclic loading. Data obtained in the form of % drift deviation, load each % drift deviation, bending and shear displacement, concrete compressive strength and tensile strength of steel.

Design and theoretical results show that the closer distance between the vertical bars, the greater the moment and lateral load capacity as well as ductility and stiffness. In the field of research due to various conditions, the specimen with the distance between the vertical bars of 50 mm (middle space reinforcement 65mm) has a lateral load of 6780 kg, $\mu_{peak\ load}$ = 1.645, $\mu_{Simp\ max\ load}$ = 2.742 and $K_{tangential}$ = 678.154 kg / mm also K_{secant} = 464.829 kg / mm. The specimen with the distance between the vertical bars of 40 mm (middle space reinforcement 105mm) has a lateral load 7650 kg, $\mu_{peak\ load}$ = 1.137, $\mu_{Simp\ max\ load}$ = 2.274 and $K_{tangential}$ = 583.658 kg / mm also K_{secant} = 434.98 kg / mm. The specimen with the distance between the vertical bars of 30 mm (middle space reinforcement 165mm) has a lateral load of 6782 kg, $\mu_{peak\ load}$ = 1.959, $\mu_{Simp\ max\ load}$ = 3,919 and $K_{tangential}$ = 1090.178 kg / mm and K_{secant} = 553.678 kg / mm.

Keyword: Shear Wall, Cyclic Loading, % Drift, Ductility, Stiffness.