SUMMARY

Kharimatul Aqli, *Department of Civil Engineering, Faculty of Engineering, University of Brawijaya, February 2018, The Effect of Onyx Stone Waste as Ssubstitute of Coarse Aggregate of Concrete Against Reinforced Concrete Beam Crack Pattern, Academic Supervisor:* Dr. Ir. Edhi Wahyuni S, MT *and* Dr. Ir. Wisnumurti, MT

Gravel is one of the concrete-forming materials with the largest volume requirement in the mixture of about 60% to 80% by volume of aggregate. The process of getting gravel and crushed rocks with the mining of the river causes erosion. Waste onyx fractions generated from large companies onyx craftsmen each day to reach 500 kg. Gamping residents to date have not processed onyx stone waste optimally, one alternative is to utilize waste onyx stone as a concrete aggregate. Structures of reinforced concrete are designed to meet safety and serviceability criteria. To meet these criteria need to know the behavior of reinforced concrete one of them is the pattern of cracks. When Onyx stone is used as a coarse aggregate in the manufacture of concrete applied to beams, it is necessary to examine the behavior of the beam crack pattern to determine the collapse of the beam.

In this research, two types of specimens beams are Normal Reinforced Concrete and Onyx Waste Reinforced Concrete. Research conducted with the manufacture of cylindrical test objects and reinforced concrete beams with dimensions of 0.15 x 0.25 x 2 meters. Testing compressive strength using compression machine. As well as bending tests with burdened gradually hinnga achieve a maskimum load. Next observation of crack pattern on reinforced concrete normal beam and reinforced concrete waste onyx beam. From result of observation done by non data analysis of descriptive statistic and statistical test of independent sample t-test.

The result of average test that was done by compressive strength of normal concrete was bigger than the average compressive strength of onyx waste concrete that is equal to 7.858%. The crack patterns of both Normal Reinforced Concrete beam and reinforced concrete waste onyx beams have a tendency for flexible cracking, and slight shear bending in the normal reinforced concrete beam and more shear bending cracks occur on the reinforced concrete waste onyx beam. The same number of crack tendencies between normal reinforced concrete beam blocks and reinforced concrete waste onyx is 9 front crack and 10 rear crack. The number of cracks propagates upward on the maximum crack of reinforced concrete waste onyx beam more with 10 cracks and for normal reinforced concrete beams 9 cracks. The normal reinforced concrete beam has tensile strength and more brittle than the reinforced concrete waste onyx beam. The bending collapse occurring tends to be the same ie under reinforced with marked cracks in the tensile region.

*Keywords**:** reinforced concrete beam, aggregate onyx stone waste, crack pattern.*