1st International Conference on Multidisciplinary Engineering (ICoMdEn)
Advancing Engineering for Human Prosperity and Environment Sustainability
October 23-24, 2018, Lhokseumwe - Aceh, Indonesia.

e-ISSN 2656-7520

THE INFLUENCE OF MODIFIED CONCRETE IN LOFTVILLES CITY APARTMENT PROJECT IN SOUTH TANGERANG, BANTEN

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ABSTRACT

As one of major works in a construction project, reinforcing steel has to be carried out effectively and efficiently. Unfortunately, obstacles often occur on site, such as the massive spacer chair volume that demands higher cost and time to finish. To solve this problem, we would like to substituting the spacer chair with modified concrete construction that was first proposed by PT. PP (Persero). The result of this research proved that duration gap between those methods was 1 working day. This indicate that concrete modification is more effective than conventional spacer chair

KEY WORDS: Spacer Chair, modified concrete, effective

INTRODUCTION

Jobs demands with faster working time and better quality is the reason why innovation needed especially in construction area. As one of major works in a construction project, reinforcing steel has to be carried out effectively and efficiently. Unfortunately, obstacles often occur on site, such as the massive spacer chair volume that demands higher cost and time to finish. An innovation has been proposed to address this problem by substituting the spacer chair with modified concrete construction. Modified concrete is made from concrete that be mold and can use as conventional spacer chair. Spacer chair are functioned for hold back, so that the reinforcement is placed in the desired position. The use of modified concrete was first proposed by PT. PP (Persero) and applied in Loftvilles City Apartment Project, South Tangerang, Banten. This study was administered to compare the time efficiency of the use of conventional spacer chair and modified concrete.

Studies to improve Spacer chair are limited. Caprili, Salvatore, Valentini, Ascanio, & Luvarà in 2018 Are studied about A new generation of high-ductile Dual-Phase steel reinforcing bars. The result indicate Dual-Phase steels have good mechanical and durability performance but Production costs shall be limited allowing DP bars commercialization. In other Hands, Farhan, Sheikh, & Hadi, (2018) studied about Experimental Investigation on the Effect of Corrosion on the Bond Between Reinforcing Steel Bars and Fiber Reinforced Geopolymer Concrete. The test results showed that the addition of steel fibers in geopolymer concrete (fiber reinforced geopolymer concrete) significantly enhanced the bond strength of reinforcing steel bar. Also, in 2018 Palanisamy, Maheswaran, Selvarani, Kamal, & Venkatesh, 2018 studied about Ricinus communis – A green extract for the improvement of anti-corrosion and mechanical properties of reinforcing steel in concrete in chloride media. The result indicates that R. communis admixed concrete exhibited excellent mechanical and durability properties and Corrosion inhibitive mechanism has also been successfully proposed. All of previous studies are purpose new material to improve reinforcement. In this case we have different view in other hands to improve the reinforcement.

Fig. 1 Example of modified concrete

Howover the findings of this study are expected to support the use of modified concrete spacer chair innovation proposed by PT. PP (Persero) to be widely applied in other construction projects.

e-ISSN 2656-7520

RESULT AND DISCUSSION

Modified concrete is form of material that functions as reinforcement steel and decking concrete at the same time. This material is made of concrete with a ±4 cm thickness and ±5 cm width, and length that adjusts with the preferred floor plate. As shown in Fig. 1 There are two holes in this material intended for the placement of the upper and lower layers of floor plate steel construction. The production process starts from the preparation of molds. The mold is making from steel that can use many times as shown in Fig. 2

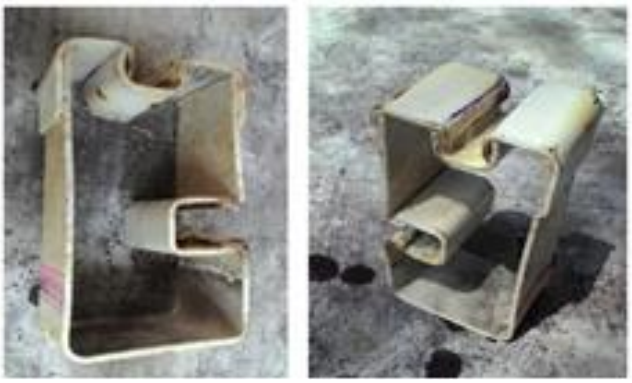

Fig. 2 Mold of modified concrete

The mold is then filled with concrete filling, and its surface is then flattened before the mold is removed. The modified concrete is let to sit and dry before it is stored in the warehouse. The application of the modified concrete is not far different from the application of conventional spacer chair starting from placing the concrete decking material and reinforcement steel within the intended space. The lower reinforcement steel plate from x direction is then put into the lower hole before it is then tied with the lower reinforcement steel plate from y direction. After that, the upper reinforcement steel plate from x direction is put into the upper hole and tied with the other reinforcement steel plate from y direction.

This study compared the work duration of conventional spacer chair application and the application of modified concrete. For comparison we applied the traditional spacer chair with modified concrete to build one floor to support floor plate reinforcement. In this case we measure about the work duration in floor 17th to 21th. The work duration was measured from observations and interview to person in charge for every type of work, resulting in the average, minimal and maximal duration of work time. Seen from the duration of each work, conventional reinforcement steel could be finished within average 19.1 hours at most, or less than 3 working days. Whereas, the modified concrete reinforcement steel could be done within average 13.8 hours at most, or less than 2 working days. The duration gap between those methods was 1 working day.

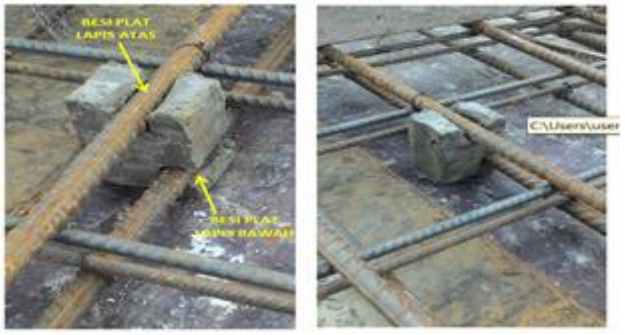

Fig. 3 Installation of modified concrete

This result showed that the application of modified concrete took shorter time. Application of this method to all projects will significantly cut off the working duration.

Seen from the materials, the conventional spacer chair is made of pieces of iron cut as needed. The cutting process leaves much material waste size of the raw materials might not match the intended size. On the other hand, the modified concrete is made using molds which leave lesser amount of material waste. In addition, the necessity can be easily predicted as the volume can be measured precisely, making it possible to accurately measure the required amount of raw material.

CONCLUSION

Modified concrete as spacer chair are make from concrete but has same function with conventional spacer chair. As alternative substitute for spacer chair in reinforcement bar work, modified concrete produced by PT PP. (Persero) is an outstanding innovation as the use of modified concrete makes the working duration shorter. Further studies are need to investigate the cost efficiency in the production of the modified concrete.

ACKNOWLEDGEMENTS

We would like to Thank you to Project Manager of Loftvilles City Apartment Project in South Tangerang, Banten who allowed us take some data to conduct this research. And we would like to thank you to all support who help us make this research published.

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e-ISSN 2656-7520

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