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Green construction application of the vida view apartment project in Makassar

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Abstract. As a developing country, Indonesia has a very rapid infrastructure development which causes the number of construction projects to increase. Green Construction is a reference for construction projects to keep paying attention to environmental sustainability that is attempted by PT. PP (Persero) Tbk. in the construction project of Makassar Vida view Apartment. The Green Construction Assessment (MAGC) model is an assessment standard developed by Ervianto from the Green Contractor Assessment Sheet and GREENSHIP V 1.0. This assessment model was developed in order to know the role of the contractor in applying green construction to the project being handled. This study aims to find out what the application and how much is achieved from PT. PP (Persero) Tbk. in implementing Green construction based on the Green Construction Assessment Model (MAGC). As a result, the Vida View Makassar Apartment Project by PT. PP (Persero) Tbk. has implemented Green Construction in its construction process where this is evidenced by the implementation of 7 aspects of Green Construction by the Green Construction (MAGC) Assessment Model. From the results of the study, Green Construction Value (NGC) data was obtained at 15.83 from a maximum value of 21.92 which is 72.22% of the maximum value. The biggest achievement of NGC for projects in Indonesia is 15.47 and it can be concluded that the achievements achieved by PT. PP (Persero) Tbk. already good at implementing Green Construction.

1. Introduction

The Green Construction Definition is a planning and implementation of a construction process based on contract documents to minimize the negative impact of the construction process on the environment so that a balance between environmental capabilities and human life needs for present and future generations. Green Construction concept is a concept that popular in the field of construction construction in response to global warming. The Green Construction Assessment Model is developed based on documents that study Green Construction, such as: (a) Green Contractor Assessment Sheet documents developed by P.T. Housing Development (Persero) Tbk. in 2008 and, (b) the GREENSHIP Version 1.0 rating system developed by GBCI which was published in 2010, which is related to the construction process. Development is based on the Green Construction hierarchy which is divided into Green Construction aspects, factors and indicators [1].

Indonesia, as a developing and developing country, has a blueprint for the construction sector as a grand design and grand strategy called the Indonesian Construction 2030. In this document it is stated that Indonesian construction must be oriented not to contribute to environmental damage but instead become a pioneer of improvement and improving the environmental quality of all Indonesian persada habitats, which are inhabited by humans and all other creatures in a symbiotic mutualism. One of the

3oposed agendas is to carry out sustainable promotion programs for material savings and reduction of waste (waste material) as well as ease of maintenance of post-construction buildings [2].

The benefits of Green Construction include two things, namely environmental benefits and economic benefits:

- The first benefit is energy savings, energy consumption in the construction sector is high, so it is necessary to reduce energy consumption.
- The second benefit is saving water, construction work requires considerable water resources, if the construction process is not managed properly / carelessly it will have an impact on environmental inefficiencies and disasters.
- The third benefit is the control of solid, liquid and gas waste. Three things done are reduce, reuse, and recycle.

One of the developments in Indonesia, especially the construction of Vida View Makassar Apartment by PT. PP (Persero) Tbk. Which in this case holds the PioneerGreenConstruction in Indonesia is a good object to be used as a research target. This is evidenced by the role of PT PP (Persero) Tbk being one of the Corporate Founders who established the Green Building Council Indonesia (GBCI).

2. The research methodology

The research method used is evaluative descriptive research method, in which this study only describes the facts found in the field without making changes to each of the research variables. The subject of the research is the Vida View Makassar Apartment project by PT. PP (Persero) Tbk. where the speaker is General Superintendent on the project. The flow of this research starts from the study of literature, then continued with a preliminary survey on apartment projects to find general data and personal data from the resource person. Then by using the Green Construction Assessment Model to collect primary data by conducting direct interviews with resource persons followed by direct observation. Data analysis consisted of calculating Green Construction Indicator Value (NIGC), Green Construction Factor Value (NFGC), Green Construction Aspect Value (NAGC) and results. end of the Green Construction Value (NGC) based on 7 aspects of MAGC. Assessments at the indicator level are formulated based on their priorities (figure 1). An indicator that has not been implemented has zero value, while the indicator that has been implemented is worth 1. Furthermore, an indicator included in priority I is given a weight of 56% and if included in priority II is given a weight of 44%. In detail the indicator values are shown in equation 1.

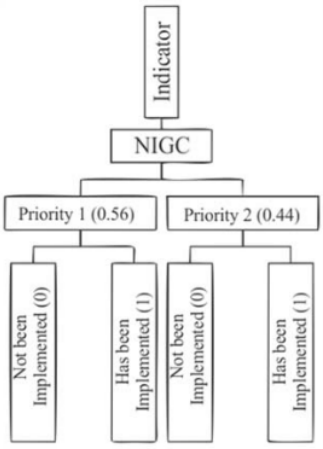

Figure 1. Indicator level assessment

Indicator value (NI) can be calculated based on the following mathematical notation:

$$\text{NIGC} = (Iii{=}0\ atau 1\ .\ \text{BP}kk{=}0{,}4\ atau\ 0{,}6) \quad (1)$$

$$\text{Total NIGC} = \sum_{i=1}^{j} \text{NIGCi} \quad (2)$$

NIGC is a Green Construction Indicator Value. I is the respondent's answer (i is worth 1 if it has been implemented and 0 if it has not been implemented). BP is Priority Weight, k is 0.56 for priority I and 0.44 for priority II (weight value can be seen in figure 4). Total NIGC is the Green Construction Indicator Value in each factor. i is the number of Green Construction Indicator Value. NFGC can be calculated based on equation 3 [3]. NFGC is a Green Building Factor Value. i is the number of Green Construction factors. Total NIGC is the Green Construction Indicator Value in every factor. BFGC is the Green Construction Factor Weight (weight value seen in figure 5). Total NFGC is a Green Building Factor Value of every aspect. i is the number of Green Construction factors.

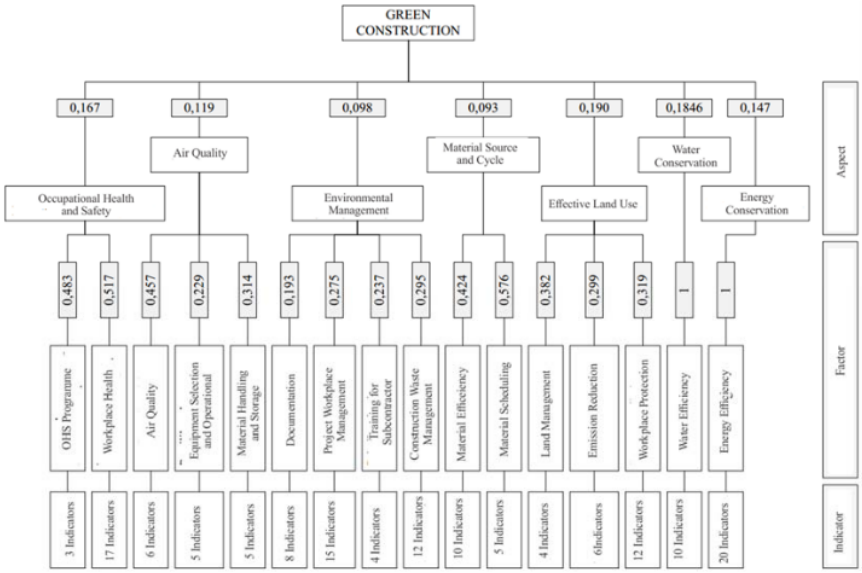

Figure 2. Weight aspects and green construction factors in the assessment model

3. Result and discussion

The assessment of the application of green construction was carried out on the Vida View Makassar Apartment project by PT. PP (Persero) Tbk. From the results obtained for the Green Construction Indicator Value (NIGC), the contractor has implemented almost the entire indicator, except for indicators that are on the construction stage air quality factor [4, 5, 6]. As a pioneer of Green Construction, PT. PP (Persero) Tbk. has a Green Contractor Assessment Sheet as a guideline in implementing green construction in the construction process, but on the Green Contractor Assessment Sheet there are no aspects related to air quality, so it can be seen in the implementation of contractors in the field that do not pay attention to air quality at the construction stage. For Green Construction Factor Value (NFGC), the contractor gets maximum results on construction project planning and scheduling factors, health work environment construction phase, and project environmental management, and gets a value close to the maximum for other factors except the construction stage air quality factor.

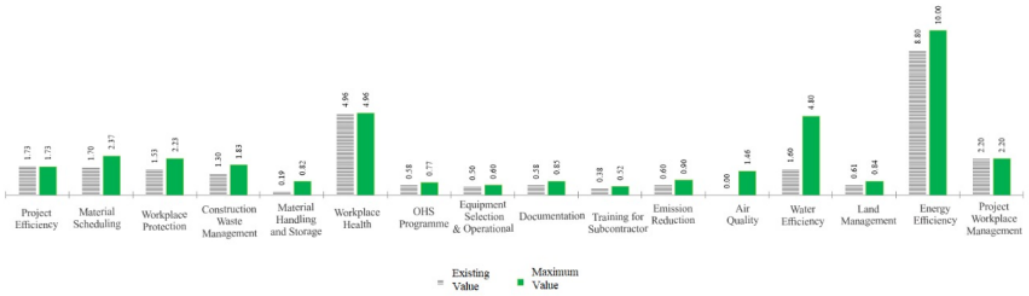

Figure 3. Stem diagram of achievement of green construction factor value (NFGC) vida view Makassar apartment project by PT. PP (PERSERO) Tbk.

Figure 4. Achievement of the green construction factor value (NFGC) vida view Makassar apartment project by PT. PP (PERSERO) Tbk.

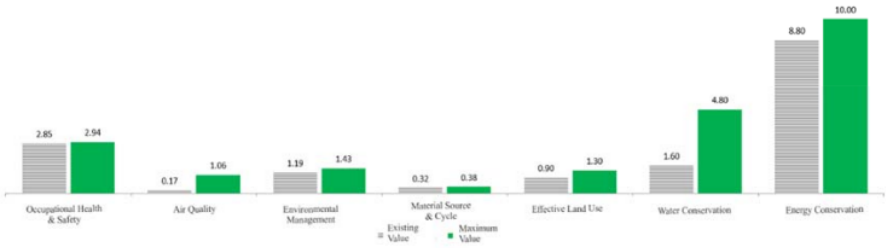

Figure 5. Stem diagram of achievement of green construction aspect value (NAGC) of vida view Makassar apartment project by PT. PP (PERSERO) Tbk.

After obtaining the Green Construction Factor Value (NFGC), the Green Construction Aspect Value (NAGC) will be obtained. Based on the results we have obtained, we can see that the aspects of occupational health and safety and energy conservation have almost perfect values, following other aspects with values that are close to meaning. As for the air quality aspect, the contractor obtained a fairly low value [4, 5, 6].

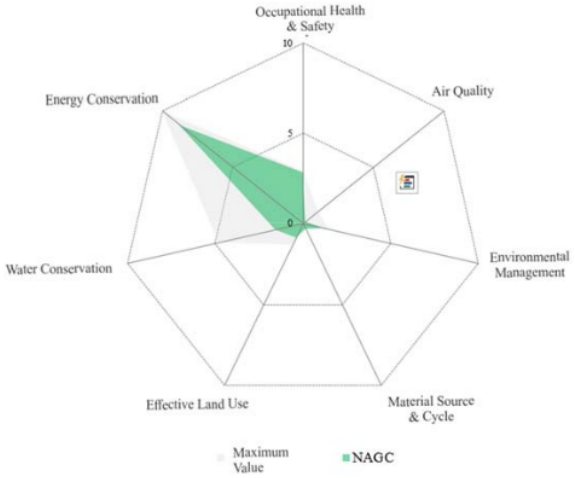

Figure 6. Achievements of aspect green construction value (NAGC) vida view Makassar apartment project by PT. PP (PERSERO) Tbk.

The final value shows the results of the overall implementation of Greenconstruction on the Vida View Makassar Apartment project, namely the Green Construction Value (NGC) of 15.83. Of the total 142 indicators of GreenConstruction implementation, 102 indicators have been implemented in the construction process while 40 other indicators have not been implemented. The maximum GreenConstruction value in MAGC is equal to 21.92, while the existing NGC in the project results in 15.83 where the value is 72.22% of the maximum value so that it can be said that PT. PP is good enough to implement GreenConstruction in the Vida View Makassar Apartment project. However, it still needs to be improved, especially in the aspect of air quality [3].

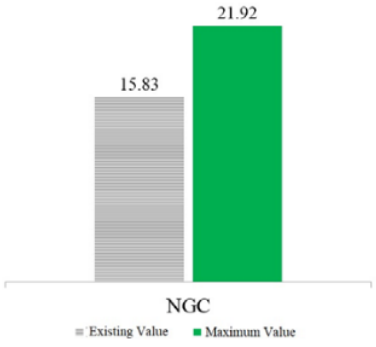

Figure 7. Green construction value achievement diagram (NGC)

4. Conclusion

From the results of the assessment of the implementation of green construction based on the assessment, the Green Construction Assessment Model found that the construction activity at the Vida View Makassar Apartment project was good at applying green construction because the NGC existence was close to the maximum value (NGCIdeal) and the best NGCT. This is evidenced by the implementation of 7 aspects of GreenConstruction by the Green Construction Assessment Model (MAGC), but from the results obtained by PT. PP (Persero) Tbk. less attention to aspects of Air Quality so it needs to be improved in the future. And for PT. PP (Persero) Tbk. who successfully implemented 72.22% of the Green Construction Assessment Model (MAGC) can be concluded that PT. PP (Persero) Tbk. Has been good in implementing Green Construction.

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