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IDENTIFICATION OF IMPORTANT FACTORS IMPLEMENTATION OF GREEN CONSTRUCTION SPECIFICATIONS

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ABSTRACT

Green specification constitute is one important element in green construction. Important factor in the specification of sustainability buildings will be a priority for all stakeholders in creating sustainability-oriented development on green construction. The research was conducted in the city of Surabaya and surrounding areas with the involvement of stakeholders as the study population. The purpose of this study was to identify and prove an important factor in the implementation of sustainability building specifications on construction projects. Factors studied by a combination of literature and the results of past research includes five factors: (1) engineering and environmentally friendly techniques, (2) reliability and quality specifications, (3) leadership and responsibility, (4) stakeholder engagement, (5) regulations / standards. Data was collected through surveys and interviews using a Likert scale questionnaire instrument. Data analysis includes analysis of respondent description, validity and reliability of the test instrument and factor analysis using SPSS software. Results of the study indicated that the involvement of the stakeholders to be the most important factor, while the other four factors are important factors in the success of realizing green construction specifications

Key words : construction, green, specification

INTRODUCTION

The concept of environmental care in creating a discourse of green construction or sustainable building is the way professional contractors in the era of globalization. Green construction is identical to the concept of sustainability, namely global awareness for environmental issues, socio-economic, poverty, efficiency, and health concerns in the future (Erviyanto, 2013). Green construction is a continuous movement that expects the creation of development in the field of construction from planning, implementation, and use of environmentally friendly construction products, efficient use of energy and resources, as well as low cost. Green construction movement is also synonymous with sustainability that emphasizes a balance between short-term gains against long-term risk, the current establishment that does not jeopardize the health, safety, and welfare of the future (Coliver et al., 2009 ; Huda, 2013)

Construction Services is a service company that is unique and specific. This is because the construction work can involve huge resources and stakeholders are many and varied. On the other hand, the construction work should be done in a holistic synergy and project cycle. The project cycle can begin gradually knows of the existence of the idea of the idea, feasibility studies, planning, engineering, tendering, implementation, operation and maintenance (Erviyanto, 2013 ; Victor *et al.*, 2013) . In the execution of the construction work is considered that the construction work can consume considerable energy and resources. Thus, the construction work can also provide the social, environmental, cultural and economic greater. Therefore, implementation of the concept of green construction is a necessity in the world of construction (Sukamta, 2009).

To realize green construction in Indonesia, it is necessary to environmentally friendly building specifications that must be understood by all stakeholders involved directly or indirectly to the implementation of the development process (Erviyanto, 2013). Because the paradigm of green construction is eco-friendly development concept is relatively new entry in Indonesia, many stakeholders that should be assumed not to understand the broad meaning of the green construction. Besides, it is considered quite a number of stakeholders who do not understand the factors that influence the implementation of green construction (Harimurti, 2008).

In connection with the description of the background to these problems, the research related to the identification of important factors that support the implementation of green construction is very necessary. Because of this kind of research is still very rarely done and the results of this study can be expected to provide positive information for stakeholders in the world of construction so as to help accelerate the development of the movement toward green construction in Indonesia.

METHOD

The research method is a survey and interview questionnaire (Likert Scale). The object of research is the construction industry stakeholders in the city of Surabaya and surrounding areas. Respondents are the owners of both public and private projects, service providers (contractors and consultants or), subcontractors, and suppliers. Factors examined in accordance with the references and previous studies consisted of 5 variables and 20 indicators (Am et al., 2010). These variables are; engineering and green construction technology, reliability and quality specifications, leadership and responsibility, stakeholder engagement, and regulations /standards. Data analysis includes descriptive analysis, test validity, reliability testing and factor analysis using SPSS software.

RESULTS AND DISCUSSION

The number of questionnaires were distributed to the respondents in this study were 100 questionnaires. Questionnaires distributed to the owners of private projects / government, contractors, consultants, sub-contractors, M & E, suppliers. Of the total questionnaires returned 62 questionnaires distributed, 60 deserves to be analyzed while the second questionnaire was not feasible in the analysis. The detailed data are presented in Table 1 below.

Table 1
The number of questionnaires distributed and returned

No	Respondents	Number of Questionnaires		
		Distributed	Back	Analyzed
1	Private Project Owners	13	8	8
2	Government Project Owners	7	4	2
3	Contractors	20	15	15
4	Consultants	17	10	10
5	Subcontractors	16	9	9
6	M & E	12	6	6
7	Suppliers	15	10	10
Total		100	62	60

Source: Primary data processed

The collected answers obtained from respondents, obtained a description of the characteristics of the respondents, as shown in Table 2 below. From the results of this study indicate that most respondents had male gender which is 70%, were in the age group > 30

years is as much as 43%; and have a High School level of educational achievement that is equal to 48.3%. most of the respondents were in the age group (> 30 years) of the productive age group for the work, and not have to have a high level of education that is by the end of High School education.

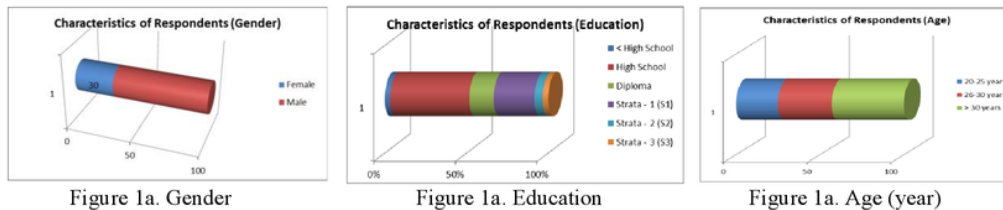


Figure 1, Characteristic of Respondents
Source : Primary data processed

Based on the above results it can be concluded that the involvement of stakeholders becomes the most important factor, while the other four factors, namely engineering and green construction technology, reliability and quality specifications, leadership and responsibility, regulations / standards is an important factor in realizing the success of green building specifications (see Figure 2). From the above results it can be seen that the Stakeholder Engagement is the most important factor in the implementation of green construction specifications in the fourth construction project although other factors are also an important factor in realizing the success of green construction specifications.

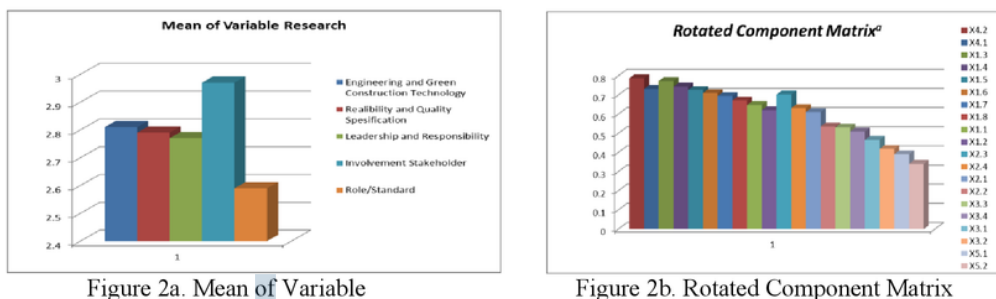


Figure 2. Result of Mean of Variable and Factor Analysis
Source : Primary data processed

So the translation of the five major factors have been summarized as follows:

1). Involvement of Stakeholders

Stakeholders in a construction project are some groups or individuals, include project owners, planner, consultants, inspector consultants, contractors, banks, supplier and other. Stakeholders have a great influence in the implementation of green construction specifications and can affect or be affected by the achievement of the goals of green construction projects. There is a natural tendency of stakeholder groups to try to influence the conditions in the success of green construction projects. Duties and responsibilities of stakeholders affect each stage of the construction process to produce green construction, where the greater the strength of the stakeholders, the greater the influence on the success of the green construction projects. The role and contributions made by stakeholders to achieve green construction success depends

on how the project manager can bring together the expectations of all stakeholders involved in the process of construction projects.

2). Engineering and Green Construction Technology

Application of green construction technologies at the planning stage can be through several design energy-efficient construction, where building systems that are designed to reduce the wasteful use of energy, water, electricity for lighting, HVAC and materials used during construction. In addition, various new breakthrough in the world of construction has also introduced a variety of structural materials that are currently using waste as one of its components, such as the use of fly ash, silica fume in concrete ready-mix concrete and prepress. The method also introduces the implementation of construction materials that reduce the world's reliance on the use of construction wood material as a scaffold. The concept of eco-friendly building also seeks to reduce waste energy. Sustainable development has four ecological principles, namely: (a) the use of natural raw materials is not faster than nature can form a successor; (b) creating a system that uses renewable energy as much as possible; (c) allow by-product that can be eaten or produced for other materials; (d) improve the functional adaptation and biological diversity.

3). Reliability and Quality Specifications

The foundation of any construction project is rooted in the concept and design stage. Stage concept is actually one of the major steps in the project life cycle, as it has the greatest impact on cost and performance. In designing the optimal green construction, the goal is to minimize the total environmental impact associated with all stages of the life cycle of the construction project. Therefore we need in-depth feasibility study, and one important aspect is the feasibility study of the environmental impact assessment (EIA). Through the EIA study is expected to provide contribution to the construction process-oriented environment, which began pre-construction, construction and post-construction process. Specifications buildings always vary from one building to another, never even repeated identically. In addition, a building material is very complex, consisting of many materials and components where each variable produces a wide range of materials and components of the planning decision. Each outcome of planning decisions can affect every stage of the life cycle such as the stage of implementation, operation and maintenance of buildings oriented to minimize the environmental impacts that might occur.

4). Leadership & Responsibility

Leadership requires how the leader - the leader of the construction services industry, both of which are involved directly or indirectly in the implementation of development to prepare a range of values, the direction, the results of the performance of a company, creating a learning environment towards green construction. The main focus of which is shown in how an organization's leaders to communicate and disseminate the values and clearly the concept of green construction and high performance expectations laid on the need for all stakeholders to participate and realize the green construction. It also includes the responsibility of the organization to the public and how the practice of an organization towards its sustainable development ..

5). Regulations / Standards

As a result of the increased interest in the concept of green construction and its application, a number of national organizations / international has developed standards, codes and rating systems that enable government regulators, building professionals and consumers embrace green construction with confidence. In some cases, the code is written so that local governments can adopt it as a rule to reduce the local environmental impact of buildings.

Regulations/standards applicable in Indonesia, for example; some regulations on Environmental Impact Assessment Study (AMDAL) of the Ministry of Environment and Greenship standard of Green Building Council of Indonesia (GBCI)

CONCLUSION

The study concluded that there are five important factors in the implementation of green building specifications: (1) technology and environmentally friendly techniques, (2) reliability and quality specifications, (3) leadership and responsibility, (4) stakeholder engagement, (5) regulations / standards. The involvement of stakeholders is the most important factor, while the other four factors are important factors in the success of realizing green construction specifications.

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