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LCC (LIFE CYCLE COST) Analysis On Septic Tank Alternative Types (Case Study Of Housing Pt Baruga Asrinusa Balithai Land Area Phase II, Makassar, Indonesia)

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ABSTRACT

In the planning concept for the housing project, PT Baruga Asri, the Blaithai area, still uses a modular septic tank and is still conventional. Meanwhile, there are alternative choices for the type of Septic tank as a fecal treatment facility which are widely available in the market. The research method uses primary data, with sources of RAB, and Makassar City Work Unit Price Analysis. As well as secondary research methods with sources, from relevant books, and important data about the project such as price lists and wages. It can be concluded that among all Balithai Land housing developments by following the RAB reference for Bukit Baruga Asrinusa housing in the Balithai Land area and AHSP (Work Unit Price Analysis) Makassar city, sanitation work items are one of the work items that can be broken down in terms of the costs involved. also eat up a large budget, even though there are actual work items that cost more. And there was a difference in sanitation work items between the main design and alternative designs of Rp. 148,718.00 and there was 1 alternative design that was raised to replace the existing design currently used, namely by replacing the use of Septic Tank buis concrete Ø80 (4 stacks 2.0 m high) + Cover + Infiltration + 2.5" ventilation pipe with a septic tank with bio capacity of 3-5 0 people. Thus saving the cost of the Bukit Baruga Asrinusa housing development project in the Balithai Land area phase 2. From Rp. 7,025,788.31 to Rp. 6,877,070 ,15.

Keywords: *Septic Tank, Life Cycle, Cost*

INTRODUCTION

The city of Makassar in the construction of housing, both luxury, simple and very simple types, is quite rapid every year, one of the companies engaged in the housing sector is PT Baruga Asri with Balithai Land Area Clusters in the 2nd development stage in order to achieve goals, company management must be able to avoid a which can be detrimental to the company itself, for that we need relevant information and strategies that are good for the environment and take action. The company must pay attention to the price policy that must be applied, the location of the housing, and the costs incurred to build the housing. The company needs to analyze its operational activities related to the company's position. Revenue and operational costs are two things that determine the size of the profit that will be obtained by a company. In general, companies will try to increase revenue costs incurred. Likewise with housing

developers who are engaged in the provision of houses, where in their operational activities to obtain the expected profit, appropriate policies must be taken in managing excessive budget values. In the planning concept for the housing project of PT Baruga Asri, the Blaithai Land area still uses a modular and still conventional Septic Tank type. While there are many types of septic tanks as a sewage treatment plant, they are widely available. on the market. Besides that, the construction of each housing requires a concept whereby each residential building unit has a Septic Tank that can preserve nature with the concept of building an environmentally friendly building (green building). The concept of good and healthy housing or the concept of green building results in the creation of good water quality for the surrounding environment. Septic tanks are a form of waste treatment whose presence in a residential building is mandatory and is commonly used in Indonesia and is recommended as a safe technology option if certain requirements are met. The work of bacteria in carrying out adequate waste treatment in Septic Tanks is very dependent on the correct operation and maintenance carried out by the household concerned.

LITELATURE REVIEW

Septic Tank

A septic tank is one of the fittings in a building where its function is as a dirty water (wastewater) treatment plant, especially from latrines or toilets. Therefore the design of a building must be equipped with a wastewater treatment plant, if this dirty water installation is not considered the result will be pollution for the environment, dirty and disgusting for the surrounding houses. Applications in the field form of septic tanks of various shapes and types, but in an idealized form and parts of the sewage system.

Cost Planning

Cost planning for a project is a financial forecast that is the basis for controlling project costs as well as the project's cash flow. The development of this is a function of cost estimation, budget, cash flow, cost control, and profit for the project (Chandra, et al., 2003). Construction cost estimation provides a specific primary indication of the total cost of a construction project. Cost estimates are used to reach a contract price according to the agreement between the project owner and the contractor, determine the budget, and simultaneously control project costs.

Life Cycle Cost

Life Cycle Cost is the cost required from the beginning of the construction period, maintenance and maintenance of building components during the life of the building, as well as demolition costs after the building's use period is over. Here are some definitions of Life Cycle Cost from the perspective of several sources.

METHOD

Location and Time of Research

In this study, the authors conducted research by taking locations in the Bukit Baruga Asrinusa Housing Complex, Balithai Land Area, Makassar City, Manggala District, Antang Village, JL Dr. Leimena. The head office of PT. BARUGA ASRINUSA

DEVELOPMENT, as a development company domiciled on Jl Raya Baruga. In this case the research time that the author will do is from January 2021 to April 2021.

Types and sources of data

The type of data obtained can be classified into two types of primary data, namely data obtained directly from field observations and interviews with various related parties, such as data on field physical conditions, important project data (scheduling, work items, RAB , project resources), secondary data, namely data obtained indirectly, such as the results of previous research, from relevant books, and important data about the project such as price lists of wages, tools and materials. In addition, interviews were also conducted with project implementers regarding the stages of work implementation

Research Data

There are two kinds of data in research, namely qualitative data and quantitative data. Qualitative data is data expressed in the form of words, sentences, and pictures. Meanwhile, quantitative data is data in the form of numbers or quantitative data that is numbered. The data needed to conduct this research are: Budget Plan (RAB), AHSP costs for Makassar city in 2020 Direct view of work items Bestek drawings.

FINDING AND DISCUSSION

From the results of the Breakdown Cost Model for the housing development of PT Baruga Asrinusa in the Balithai Land area stage 2, 5 work items that have high costs are obtained, namely (In Rp):

- Wall installation work 14,774,776.49
- Wall finishing work 15,262,979.61
- Roofing work 12,118,220.30
- Concrete structure work 9,854,600.84
- Sanitation work 7,025,788.31

Design Alternatives

Based on the RAB and other supporting data, the authors made changes by selecting and replacing work items (Septic Tank buis concrete Ø80 (4 stacks 2.0 m high) + Cover + Infiltration + 2.5" ventilation pipe) using an alternative design (Bio Septic Tank biotech with a capacity of 3-5 people) so that new items are obtained which are later expected to have a significant effect on the price of the Bukit Baruga Asri Nusa Housing project in the Balithai Land area phase 2. It is known that the Bio Septic Tank has a capacity of 3-5 people at a price = Rp. 1,914,520, 00. By removing the control box fitting bricks 30 x 30 cm at a price = slightly minimizing the amount of the budget for making sanitation in Bukit Baruga Asrinusa housing, Balithai Land area phase 2.

Figure 1. *Septic Tank* Concrete &convensional

Figure 2. Bio *Septic Tank*

From the results of calculating the sanitation work after making changes to the Septic Tank item and removing the control tub, it can be reduced by the total difference = IDR 376,812.54. 4.2 Calculation of Life cycle cost This study uses Life Cycle Cost analysis, which is the calculation of Life Cycle Cost based on building materials according to the BI interest rate (Bank Indonesia) with a value of 7%. Example of calculating life cycle cost with an interest rate of 7%. ¬ Cost of Buis Concrete p.s PV = F ( ) F, i, n p.s PV = (1 + 7%)2 = IDR 400,000 x 0.8734 = IDR 349,360 ¬ Cost of conventional septic tanks p.s PV = F ( ) F, i, n p.s PV = (1 + 7%)2 = IDR 400,000 x 0.8734 = IDR 349,360 ¬ Cost of Bio septic tank p.s PV = F ( ) F, i, n p.s PV = (1 + 7%)1 = IDR 130,000 x 0.8734 = IDR 121,498.

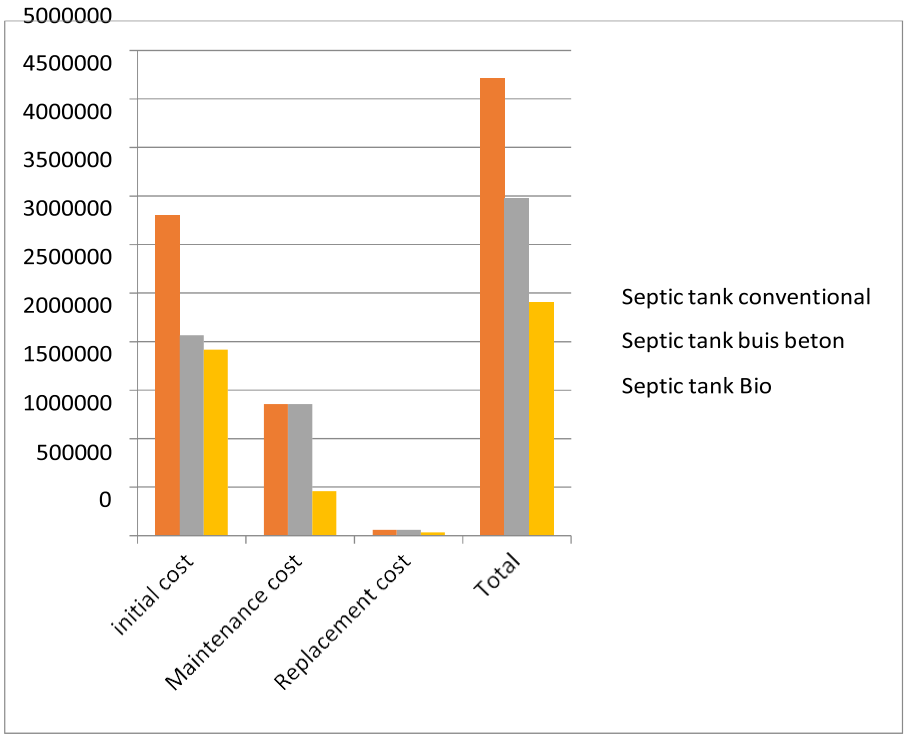

Figure 3. Graph of the total number of LCC septic tanks

From Figure 3, the conversion to the LCC graph shows reduced results at low cost in the use of biotech septic tanks for 10 years. In this result, a recommendation for an alternative design of work items with the Green building concept, namely the Biotech septic tank, will be raised. With the emergence of this alternative design, it is hoped that it will create new design opportunities that can minimize the cost of future project development.

CONCLUSION

Based on a series of analyzes from the phase 2 of the Bukit Baruga Asrinusa Housing Development project in the Balithai Land Area, it can be concluded that the analysis that among all Balithai Land housing developments follows the RAB reference for Bukit Baruga Asrinusa housing in the Balithai Land Area and AHSP (Work Unit Price Analysis) Makassar city, then sanitation work items are one of the work items that can be broken down in terms of costs which also eat up a large budget, even though there are actually work items that cost more. There was a difference in sanitation work items between the main design and alternative designs of Rp. 148,718.00 and there was 1 alternative design that was raised to replace the existing design currently used, namely by replacing the use of Septic Tank buis concrete Ø80 (4 stacks 2.0 m high) + Cover + Infiltration + 2.5" ventilation pipe with Septic Tank bio capacity of 3-5 0 people. Thus saving the cost of the Bukit Baruga Asrinusa Housing development project in the Balithai Land area phase 2. From Rp. 7,025,788.31 to Rp. 6,877,070, 15.

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