Comparison Analysis of Unit Prices for Reinforced Concrete Column Work using the 2022 Indonesian National Standard (Sni) Method and Field Data (An Empirical Study On the Construction Project of the National Land Agency Building in Banjarbaru)

Hendra Cahyadi[1*], Gusti Maysarah[2], Abdurrahman[3]

[1,2,3] Faculty of Engineering, Islamic University of Kalimantan MAB Banjarmasin, Adyaksa Street, No. 2 Banjarmasin, Indonesia

***Email:** irarizqonroyan@gmail.com

Abstract

In construction management, there are various stages of problems in terms of managing the project budget, so it is necessary to have a design or estimation of the project budget by analyzing construction costs. Currently, service providers tend not to fully calculate unit price analysis based on SNI analysis but rather on their own analysis or previous experience in completing construction work. Based on this, it is necessary to compare unit price analysis between the SNI method and field data. This study aims to determine the unit prices in the field and compare the price differences between the SNI 2022 method and field data in the National Land Agency Building Construction Project in Banjarbaru. The results of this analysis show that the price based on SNI 2022 analysis is Rp368,900,072.55, while the price based on field observations is IDR 269,231,757.50. Based on the analysis results of both methods, the cost difference between the SNI 2022 analysis and the actual field conditions for the National Land Agency Building Construction Project in Banjarbaru is IDR 99,668,315.02.

Keywords

Budget Plan, SNI 2022, Field Data

Introduction

Along with the growth of the human population, it also implies that the need for structures that support life is increasingly developing. This is indicated by the consistent increase in demand. Because of this, it is very possible that the cost of construction work will increase, making it necessary to establish limits or references to determine the cost of the work.

Like the construction project of the National Land Agency Building in Banjarbaru, this project incurred pre-tax costs amounting to IDR 7,435,799,280.17. Out of these costs, IDR 1,715,432,645 was allocated for reinforced concrete structure work with concrete quality K-225, or approximately

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23%. The column work incurred costs of IDR 368,900,072.55, or about 21% of the reinforced concrete structure costs for K-225 quality.

This project uses unit price analysis based on the 2022 Indonesian National Standard (SNI). One of the tasks that consume a lot of cost is the reinforced concrete structure work. Therefore, it is necessary to analyze the unit prices for reinforced concrete work, particularly for the column work. The fundamental principle of the Indonesian National Standard (SNI) method is that the coefficients for materials and labor wages are predetermined to estimate the prices or costs needed to determine the unit prices for building work. Therefore, the composition of materials and labor for a particular task is established, which is then multiplied by the market prices of materials and wages.

Currently, service providers commonly make offers based on analysis that do not entirely based on the Indonesian National Standard (SNI) analysis. They are likely to calculate unit prices based on their own analysis, drawing on previous experience in completing construction work, although they still reference the Indonesian National Standard (SNI) analysis. Based on the explanation above, a study was conducted about the unit price analysis of reinforced concrete work using the 2022 Indonesian National Standard (SNI) method and field observation method for the National Land Agency Building Construction Project in Banjarbaru.

The objectives to be achieved in this research are as follows:

1. To find out the unit price of reinforced concrete column work based on site conditions at the National Land Agency Building Construction Project in Banjarbaru.
2. To find out the comparison of unit prices for reinforced concrete column work between SNI 2022 standards and on-site conditions at the National Land Agency Building Construction Project in Banjarbaru.

Methodology

The project being observed is the construction of the National Land Agency building located on Jl. Banjar Barat in Banjarbaru. The research site location can be viewed in figure 1.

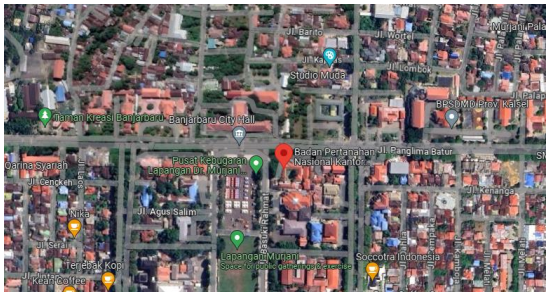

Figure 1. Research Location in The Project of Building Construction of National Land Agency

This research was conducted at the National Land Agency Building Construction Project in Banjarbaru over a period of 9 hours, starting from 08:00 to 12:00 and then continuing from 13:00 to 17:00.

Data collection is the method used to gather information. Data collection is necessary to find out the information needed to achieve research objectives. The collected data is divided into:

1. Primary data refers to information obtained directly from the National Land Agency Building Construction Project in Banjarbaru. This data results from interviews with several workers, foremen, and field supervisors, including material requirements, wages, and on-site work durations. Additionally, direct field observations involve observing reinforced concrete column work to measure the volume of work performed and the time taken for completion.
2. Secondary data refers to information already exist, obtained from relevant institutions. The data utilized includes working drawings, time schedules, Bill of Quantities (RAB), as well as guidelines for calculating unit prices for column work based on the 2022 Indonesian National Standard (SNI).

Results and Discussion

The field observation data from the National Land Agency Building Construction Project in Banjarbaru for the unit prices of reinforced concrete column work can be seen in Table 1 and 2.

Table 1 Analysis of Material Usage for Concrete Column Structures in the National Land Agency Building Construction Project in Banjarbaru

Material Analysis	Unit	Price Per Unit (IDR)	Total Price (IDR)
Iron Screw D16	7.385 kg	9.329,67	68.900.122,19
Iron Screw D12	72,891 kg	10.515,70	766.499,962
Iron Screw D10	377,21 kg	10.683,76	4.029.999,742
Plain Iron Ø8	6.973,2 kg	9.871,79	79.879.792,95
Plywood 3 mm	310 sheets	42.250,00	21.758.750,00
Beam 4/6 cm	515 m^3	28.200,00	14.607.600,00
Nail 5/8 cm	196,824 kg	18.500,00	3.132.864,00
Formwork oil	106,912 liter	6.500,00	694.928,00
Bindrat wire	562,302 kg	20.500,00	11.527.191,00
Concrete K-225	64,27 m^3	920.000,00	59.128.400,00
Galam wood	944 trees	6.000	5.664.000,00
Total Price			250.847.757,50

Table 2 Analysis of Labor Costs for Concrete Column Structures in the National Land Agency Building Construction Project in Banjarbaru

Wage Analysis	Unit	Unit Price (IDR)	Total Prices (IDR)
Worker	32 People/Day	117.000,00	3.744.000,00
Bricklayer	10 People/Day	120.000,00	1.200.000,00

Carpenter	22 People/Day	120.000,00	2.640.000,00
Blacksmith	22 People/Day	120.000,00	2.640.000,00
Foreman	32 People/Day	125.000,00	4.000.000,00
Foreman	32 People/Day	130.000,00	4.160.000,00
Total Price			18.384.000,00

From the calculation above, the unit price for reinforced concrete column work per cubic meter is as follows:
= Total cost of materials + Total cost of labor
= IDR 269.231.757,5

The cost calculation data based on the 2022 *SNI* analysis for the National Land Agency Building Construction Project in Banjarbaru, regarding the unit prices for reinforced concrete column work, can be seen in Table 3.

Table 3 Unit Price Recapitulation Using *SNI* 2013

Job Description	Volume	Unit Price (IDR)	Total Price (IDR)
Floor 1 (Ready Mix)			
Column 40/40 cm	42,24	4.797.467,52	202.645.028,20
Column 30/30 cm	0,81	5.753.312,18	4.660.182,87
Column 25/25 cm	0,28	5.916.158,52	1.663.919,50
Column 15/15 cm	1,82	5.349.534,87	9.749.527,30
Column 15/25 cm	0,68	5.086.734,89	3.433.546,05
Column 9/9 cm	1,68	7.815.562,70	13.104.353,98
Floor 2 (Ready Mix)			
Column 40/40 cm	3,52	4.797.467,52	16.887.085,68
Column 30/30 cm	13,82	5.753.312,18	79.482.007,79
Column 25/25 cm	2,53	5.916.158,22	14.975.275,50
Column 15/15 cm	1,82	5.349.534,87	9.749.527,30
Column 15/25 cm	0,68	5.086.734,89	3.433.546,05
Column 9/9 cm	1,17	7.815.562,70	9.116.072,33
Total Price			368.900.072,55

From the previous calculations, the unit prices for column work based on the 2022 SNI analysis and field data for the National Land Agency Building Construction Project in Banjarbaru have been obtained. To clearly compare the two methods, the results are presented in picture 2.

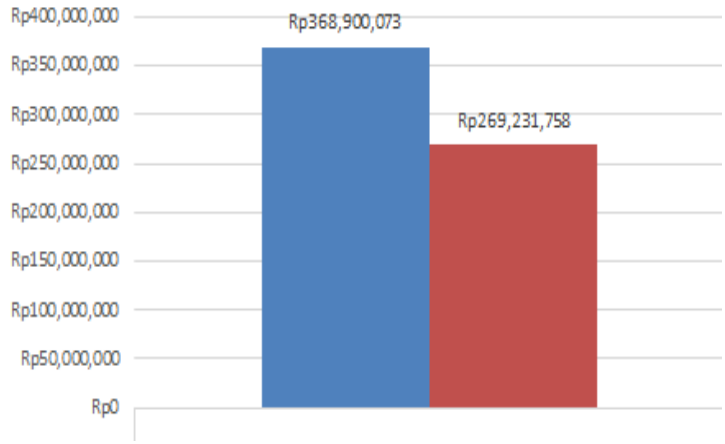

Figure 2. Comparison Graph of Price Unit of Column Occupation

The chart above shows a comparison of column work costs in the National Land Agency project, indicating that the budget cost according to the 2022 *SNI* analysis is higher than the field prices. Based on these results, it can be explained that the *SNI* price analysis in preparing the Budget Plan (RAB) using the 2022 *SNI* analysis method includes a list of established material, labor, and equipment coefficients. These coefficients are then used as unit prices for the work listed in the Budget Plan.

There are several factors that could explain why the *SNI* 2022 analysis yields higher costs compared to field analysis. One of them is the leftover material analysis. In the *SNI* 2022 analysis, material requirements are rounded up to standard market units typically sold in the market. Meanwhile, field analysis only calculates the material needed on-site without converting it into standard market units typically sold.

Conclusion

1. The total cost for 1 cubic meter of reinforced concrete column work using field methods in the construction project of the National Land Agency office in Banjarbaru is IDR 269,231,757.5.
2. The price difference comparison for 1 cubic meter of column work using SNI 2022, which is IDR 368,900,072.55, and field prices, which are IDR 269,231,757.5, results in a difference of IDR 99,668,315.02.

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