COMPARATIVE ANALYSIS OF BUILDING COST BUDGET PLANS USING SNI AND BOW METHODS

Taufik Safi'i Abdullah, Suryo Handoyo, Erni Mulyandari
Universitas Tunas Pembangunan, Indonesia
Email: taufikabdullah02@gmail.com, suryo.handoyo@lecture.utp.ac.id,
erni.mulyandari@lecture.utp.ac.id

ABSTRACT

Building budget design (RAB) is a way to calculate the costs that will be required from a building and with this cost the building can be realized as planned. In Indonesia, there are methods for planning the unit cost price of project budgets, namely BOW (Burgelijke Openbare Werken) and SNI (Regulation of The Ministry of Public Works and Housing Republic Indonesia Number 1 of 2022 concerning Guidelines for Preparing Estimated Costs of Construction Work in the Field of Public Works and Public Housing) where the SNI method is an adjustment and renewal of the BOW analysis which is an analysis of the legacy of the Dutch Government which contains a labor-intensive and conventional work system. However, the reality in the field is that the BOW method is still widely used for building construction work because the coefficient used is greater than using the SNI method so that it is possible to get a greater profit. This study aims to find out the RAB of the SNI and BOW methods and then find out the difference to be an alternative reference in planning construction costs with the SNI and BOW methods and add insight. In the calculation of the budget plan for concrete work costs for the construction of the UPN Veteran Yogyakarta Integrated Research Laboratory Building using 2 methods, the SNI method was obtained at Rp 9,659,059,280.45 while using the BOW method at Rp 14,474,237,708.85. The difference between the SNI and BOW method budget plans is Rp 4,815,178,428.39.

Keyword: RAB, SNI, BOW

INTRODUCTION

The Construction Project of the Integrated Research Laboratory Building of Universitas Pembangunan Nasional Veteran Yogyakarta has a building height of 34.32 meters with a total of 6 floors consisting of the ground floor, 1st floor, 2nd floor, 3rd floor, 4th floor, and 5th floor which has a building area of 7200 m2. The project is planned to be completed in August 2023. The location of this project is located on Jl. Padjajaran (SWK) No 104, Condongcatur, Depok District, Sleman Regency, Special Region of Yogyakarta, 55281. Building budget design (RAB) is a way to calculate the costs that will be required from a building and with this cost the building can be realized as planned (Romadhona et al., 2021). The draft building cost budget is very necessary considering the very large and extensive building that must be calculated very carefully and diligently to minimize errors in cost calculations (Juansyah et al., 2017). SNI is an update of the BOW analysis (*Burgerlijke Openbare Werken*) 1921, in other words, SNI analysis is an updated BOW analysis. Qadir, (2022) said SNI analysis is issued by the Center for

Settlement Research and Development. The costing system using SNI analysis is almost the same as the calculation system using BOW analysis (Widiasanti, 2013). The fundamental principle of the SNI method is that a list of material coefficients and labor wages has been determined to analyze the price or cost needed to make the price of a unit of building work. In 2022, the Indonesian National Standard (SNI) is updated again with the Regulation of the Minister of Public Works and Public Housing of the Republic of Indonesia Number 1 of 2022 concerning Guidelines for Preparing Estimated Costs of Construction Work in the Field of Public Works and Public Housing (Nasautama & Sitompul, 2022; Sarasanty, 2023). BOW stands for *Burgerlijke Openbare Werken*, which is an analysis system for calculating building construction costs established by Dir BOW dated February 28, 1921, number 5372 during the Dutch government (Sutirto, 2013). BOW analysis can only be carried out construction processes that use labor-intensive systems or work systems that use a lot of labor manually, which means only for simple building work even though in fact in some parts of Indonesia the construction project of shophouses as high as 4 floors is still mostly done manually labor-intensive (Ni'mah, 2022). At this time, labor-intensive systems are rarely applied because they already use heavy equipment to complete them and only use limited labor (Pujantara, 2014; Rasuna, 2019). In fact, in the field there is a difference in a cost calculation between the SNI and BOW methods, so to find out whether the building cost budget plan uses the SNI method with BOW there is a difference in price and calculation, this study was conducted to find out the difference in detail between the two methods.

The purpose of the research used as this final project is to find out the results of the RAB for concrete work with the SNI method. Knowing the results of RAB concrete work with the BOW method. Knowing the difference in RAB for concrete work with SNI and BOW methods.

RESEARCH METHODS

The location of this final project research was carried out in the Construction of the Integrated Research Laboratory Building of the University of National Development of Veteran Yogyakarta, precisely on Jl. Padjajaran (SWK) No 104, Condongcatur, Depok District, Sleman Regency, Special Region of Yogyakarta, 5528 can be seen in Figure 1 below :

Figure 1. Project Location
Sumber : Google Maps, 2023

Data Sources

The data in this study used secondary data. According to Sugiyono (2018: 456), secondary data is a data source that does not directly provide data to data collectors, for example through other people or through documents. In this study, the secondary data sources are in accordance with the Manpower Law, books, journals, articles related to research topics regarding the internal control system over payroll systems and procedures in an effort to support labor cost efficiency. Data obtained from literature studies with journals and interviews with workers or staff of the contracting company. Secondary data obtained include (Umum & Rakyat, 2022):

a. Working Drawings.
b. List of wages and materials prices applicable in Yogyakarta for 2021-2022 (Yogyakarta Mayor Regulation Number 59 of 2022 concerning Unit Price Standards for Goods and Construction for Fiscal Year 2023 and Yogyakarta Mayor Regulation Number 70 of 2021 concerning Service Price Standards for the Yogyakarta City Government in 2022).
c. SNI Analysis (PUPR Ministerial Regulation Number 1 of 2022 concerning Guidelines for Preparing Cost Estimates for Construction Work in the Field of Public Works and Housing).
d. BOW Analysis (Book by J A Mukomoko entitled Basics of Building Cost Budgeting and Book by A Soedradjat Sastraatmadja entitled Budget Analysis of Implementation Costs).

The type of research carried out is research that is a case study activity. The researcher conducted a case study on the UPN Veteran Yogyakarta Integrated Research Laboratory building construction project to examine construction costs, in this case the author analyzed and recalculated the budget plan for the construction cost of the UPN Veteran Yogyakarta Integrated Research Laboratory building using 2 methods, namely the SNI method and the BOW method (Putra et al., 2022).

The research stage begins with the formulation of the problem containing the problems to be discussed according to the title of the researcher, the literature review contains related research and theories related to the title of the researcher Wolfswinkel et al., (2013), data collection contains the data obtained by the researcher used to conduct research, volume calculation to find out the volume of work to be used in the calculation of RAB, RAB analysis of SNI and BOW methods contains calculations and RAB results of SNI and BOW methods, conclusions and suggestions containing the final results of the research and suggestions related to the research. For more details can be seen in Figure 2 below :
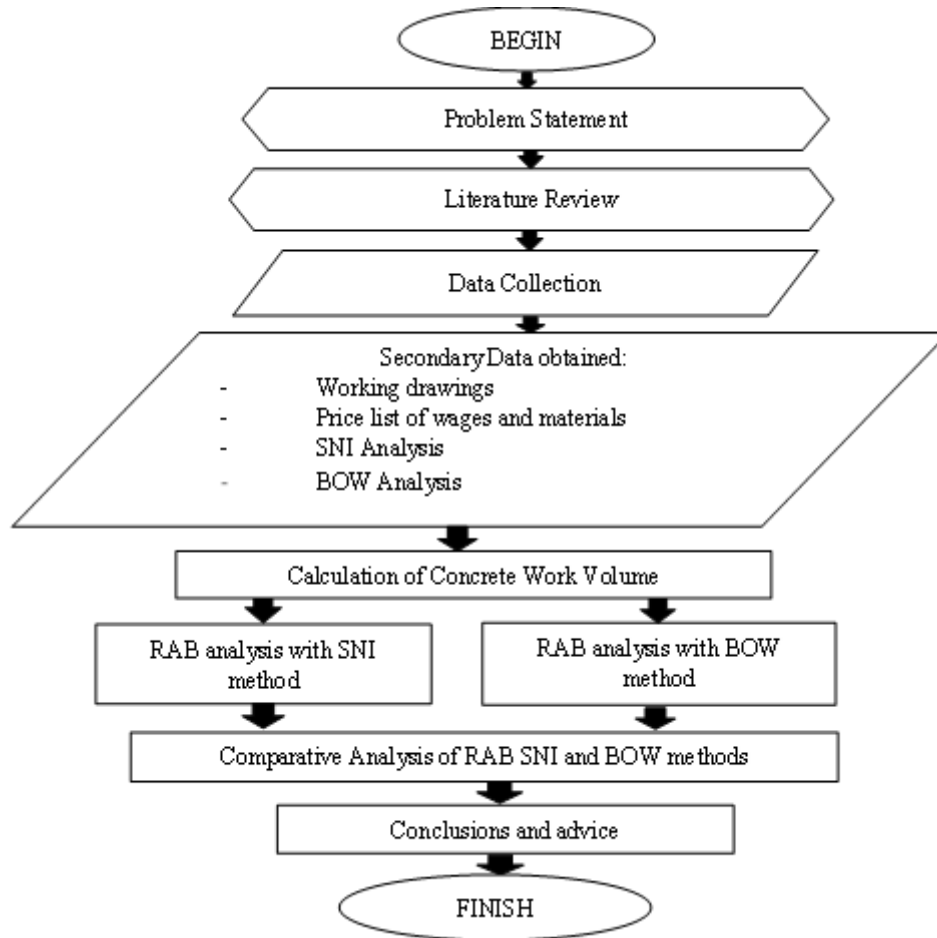
Figure 2. Research Flow Chart.

RESULTS AND DISCUSSION
Building Cost Budget Plan Using SNI Method
        After obtaining an analysis of the unit price of work according to each type of work, the next step is to make a building cost budget plan by multiplying the unit price analysis of work by the volume of each work (Musyafa & Firdaus, 2023). To see the results and more details can be seen in Table 1 and Table 2 below

Table 1. Recapitulation of Unit Price Analysis of Work (SNI)

No	Work Items	Unit	Unit Price (Rp)
	SNI		
1	1 m³ Concrete Works	m³	Rp.1.123.603,50
2	1 kg Ironing Works	kg	Rp. 23.671,80
3	1m² Formwork for Concrete Tread Foundation	m²	Rp.418.873,62
4	1 m² Formwork Work for Concrete Sloof	m²	Rp. 460.027,37
5	1 m² Formwork Work for Concrete Columns	m²	Rp. 606.216,71
6	1 m² Formwork Work for Concrete Blocks	m²	Rp. 621.025,46
7	1 m² Formwork Work for Concrete Floor Plate	m²	Rp . 681.346,71

Tabel 2. RAB Metode SNI

No	Job Description	SNI	
		Total	
1	Pondasi Footplate & Pilecape	Rp	3.089.793.268,49
2	Pedestal Column	Rp	575.728.278,51
3	Sloof	Rp	1.425.187.072,34
4	Kolom	Rp	1.482.134.368,86
5	Beam	Rp	1.706.598.212,22
6	Floor Plate	Rp	1.379.618.080,03
Total of Work Cost		**Rp**	**9.659.059.280,45**

Building Cost Budget Plan Using BOW Method

Just like the building cost budget plan using the SNI method in the BOW method is also the same (Pangestu et al., 2023), but the analysis of the unit price of work multiplied by the volume of the type of work is an analysis that uses the BOW system which for more details can be seen in Table 3 and Table 4 below :

Table 3. Recapitulation of Unit Price Analysis of Work (BOW)

No	Work Items	Unit	Unit Price (Rp)
	BOW		
1	1 m^3 Concrete Works	m^3	Rp.1.430.175,00
2	1 kg Ironing Works	kg	Rp.43.149,70
3	1 m^2 Pekerjaan Bekisting	m^2	Rp.413.436,00
4	1 m^2 Bekisting Supporter Jobs	m^2	Rp. 386.657,00

Table 4. RAB BOW Method

No	Job Description	Bow	
		Total	
1	Pondasi Footplate & Pilecape	Rp	4.981.039.612,69
2	Pedestal Column	Rp	883.939.618,01
3	Sloof	Rp	2.184.066.836,68
4	Kolom	Rp	2.181.792.423,90
5	Beam	Rp	2.304.363.878,78
6	Floor Plate	Rp	1.939.035.338,78
Total work coast		**Rp**	**14.474.237.708,85**

The Difference in Building Cost Budget Plan Between SNI and BOW Methods

After obtaining the final results of the calculation of the building cost budget plan with SNI and BOW methods (Jangkung, 2023). Next is to compare the price difference of each sub-work and also the total overall cost of the case study building for more details can be seen in Table 5 and Figure 3 and Figure 4 below :

Table 5. The difference between RAB SNI method and BOW method

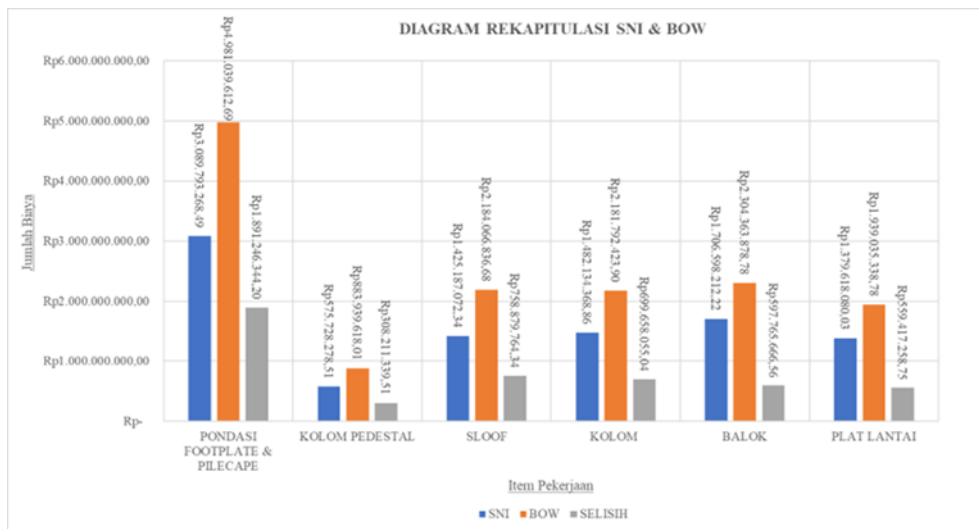| No	Job Description	Difference	
		Total	%
1	Pondasi Footplate & Pilecape	Rp 1.891.246.344,20	37,97
2	Pedestal Column	Rp 308.211.339,51	34,87
3	Sloof	Rp 758.879.764,34	34,75
4	Kolom	Rp 699.658.055,04	32,07
5	Beam	Rp 597.765.666,56	25,94
6	Floor Plate	Rp 559.417.258,75	28,85
	Jumlah Biaya Pekerjaan	**Total work coast**	**33,27**

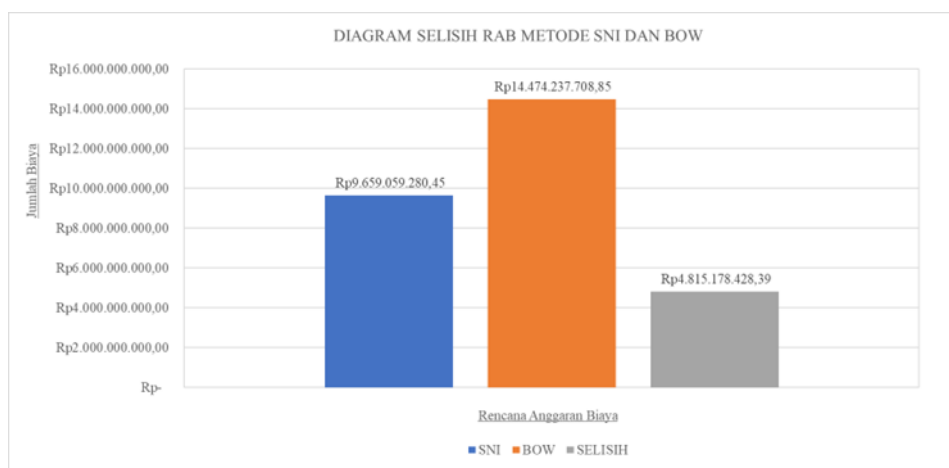**Figure 3. SNI and BOW Recaptulation Diagram**

Figure 4. RAB SNI and BOW Difference Diagram

CONCLUSION

Based on the results of research and discussions that have been carried out, it can be concluded that the amount of RAB for ground floor concrete work to the 1st floor face limit Construction of the Integrated Research Laboratory Building of the University of National Development Veteran Yogyakarta SNI method amounted to Rp

9,659,059,280.45. The amount of RAB for ground floor concrete work to the 1st floor face limit Construction of the Integrated Research Laboratory Building of Universitas Pembangunan Nasional Veteran Yogyakarta BOW method amounted to Rp 14,474,237,708.85. The difference in the RAB of concrete work budget plan for ground floor concrete work costs to the 1st floor face limit Construction of the Integrated Research Laboratory Building of Universitas Pembangunan Nasional Veteran Yogyakarta between the SNI and BOW methods, namely the BOW method is 33.27% more expensive (Rp 4,815,178,428.39) than the SNI method.

BIBLIOGRAFI

Jangkung, S. (2023). Perbandingan Estimasi Biaya Pekerjaan Dinding Bata Merah Dengan Bata Ringan. Universitas Tunas Pembangunan.

Juansyah, Y., Oktarina, D., & Zulfiqar, M. (2017). Analisis Perbandingan Rencana Anggaran Biaya Bangunan Menggunakan Metode Sni Dan Bow (Studi Kasus: Rencana Anggaran Biaya Bangunan Gedung Kwarda Pramuka Lampung). Jurnal Rekayasa, Teknologi, Dan Sains, 1(1).

Musyafa, A., & Firdaus, I. A. S. (2023). Perbandingan Estimasi Biaya Pekerjaan Dinding Bata Merah, Bata Ringan, Batako Dan M Panel: Indonesia. Ajie (Asian Journal Of Innovation And Entrepreneurship), 1–4.

Nasautama, S. S., & Sitompul, M. (2022). Analisis Kebutuhan Tulangan Dan Tulangan Sisa (Waste) Pada Pekerjaan Struktur Kolom, Balok Dan Pelat Lantai Pada Proyek Pembangunan Pasar Baru Kabupaten Mandailing Natal. Portal: Jurnal Teknik Sipil, 14(2), 75–82.

Ni'mah, H. (2022). Analisis Biaya, Waktu Dan Kekuatan Bekisting Perancah Kombinasi Kayu Galam Dan Tie Rod Pada Jembatan Box Culvert Sungai Hanau Cs Kabupaten Tanah Bumbu. Universitas Islam Kalimantan Mab.

Pangestu, R. P., Manurung, E. H., & Hutagaol, K. (2023). Analysis Of The Budget Plan For The Construction Of Freja House Bsd Mass Buildings Using The Bow, Sni 2008 & 2021 Ahsp Methods. Indonesian Journal Of Applied And Industrial Sciences (Esa), 2(2), 245–256.

Pujantara, R. (2014). Struktur Beton Bertulang Dalam Perspektif Fleksibilitas Bentuk Dan Arsitektur Plastis Pada Rancangan Dekonstruksi. Forum Bangunan, 12(2), 68–72.

Putra, D. S., Selo, S., & Fauziati, S. (2022). Evaluasi Domain Manajemen Spbe Pemerintah Kota Yogyakarta Berdasarkan Peraturan Menteri Pan-Rb Nomor 59 Tahun 2020. Jiko (Jurnal Informatika Dan Komputer), 5(1), 54–61.

Qadir, M. (2022). Analisa Perbandingan Estimasi Anggaran Biaya Antara Metode Ahsp Sni 2016 Dengan Metode Perhitungan Kontraktor (Studi Kasus Proyek Canal Wall Strengthening Sorowako Kabupaten Luwu Timur). Journal Of Applied Civil And Environmental Engineering, 2(1), 62–70.

Rasuna, T. Y. (2019). Analisa Perbandingan Rencana Anggaran Biaya Pembangunan Mall Widuri Dengan Menggunakan Metode Bow, Sni 2008 Dan Ahsp 2016. Skripsi. Medan: Universitas Muhammadiyah Sumatera Utara.

Romadhona, S., Kurniawan, F., & Tistogondo, J. (2021). Project Scheduling Analysis Using The Precedence Diagram Method (Pdm) Case Study: Surabaya€™ S City Outer East Ring Road Construction Project (Segment 1). International Journal Of Engineering, Science And Information Technology, 1(2), 53–61.

Sarasanty, D. (2023). Pelatihan Pembuatan Rab Kegiatan Prasarana Secara Sederhana Sesuai Permen Pupr No. 1 Tahun 2022. Jurnal Edukasi Pengabdian Masyarakat, 2(3), 195–205.

Sutirto, S. (2013). Analisa Koefisien Biaya Pekerjaan Pembesihan Dan Cetakan Beton Sesuai Penerapan Rencana Anggaran Pelaksanaan. Jurnal Teknik Pengairan: Journal Of Water Resources Engineering, 4(2).

Umum, K. P., & Rakyat, P. (2022). Peraturan Menteri Pupr Nomor 1 Tahun 2022 Tentang Pedoman Penyusunan Perkiraan Biaya Pekerjaan Konstruksi. Jakarta: Kementerian Pekerjaan Umum Dan Perumahan Rakyat.

Widiasanti, I. (2013). Kajian Efektivitas Mekanisme Sertifikasi Tenaga Ahli Melalui Unit Sertifikasi Tenaga Kerja Lembaga Pengembangan Jasa Konstruksi.

Wolfswinkel, J. F., Furtmueller, E., & Wilderom, C. P. M. (2013). Using Grounded Theory As A Method For Rigorously Reviewing Literature. European Journal Of Information Systems, 22(1), 45–55.