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COMPARISON OF COST ESTIMATION BETWEEN SNI AND AHSP METHODS IN RIGID PAVEMENT PROJECT

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Abstrack

Construction Cost Analysis is a method of calculating the unit price of construction work, which is described in the multiplication of building material indexes, work wages, and work equipment with prices of building materials, work wage standards, work equipment rental prices to complete construction work units. Analysis of construction costs used by the Batu Bara District Government in carrying out the construction of facilities and infrastructure is an analysis of the construction costs of the Indonesian National Standard (SNI), Work Unit Price Analysis (AHSP) in the field of Public Works.

The method in preparing this final assignment is a descriptive method with a quantitative approach, the purpose of the descriptive method means to describe the conditions that occur in the present or ongoing, while the quantitative approach is an approach that is carried out by recording and analyzing the data of research results accurately using calculations statistics. From the research results, the estimated cost of the rigid road pavement project in Dusun I Simpang Dolok Village using the SNI method is Rp. 557,628,000.00 (Five Hundred Fifty Seven Million Six Hundred Twenty Eight Thousand Rupiahs, while the estimated cost of the rigid road pavement project in Dusun I Simpang Dolok Village using the AHSP method is Rp. 528,340,000.00 (Five Hundred Two Tens of Eight Million Three Hundred Forty Thousand Rupiah) Dominant Components which cause differences in Estimated Project Costs in Cleaning and leveling locations / preparation of road bodies, sand dumping, formwork and iron assembly.

Keywords: SNI Method, AHSP Method, Roadwork Analysis, Rigid Pavement

A. Introduction

Construction Cost Analysis is a method of calculating the unit price of construction work, which is described in the multiplication of building material indexes, work wages, and work equipment with prices of building materials, work wage standards, work equipment rental prices to complete construction work units.

Analysis of construction costs used by the Batu Bara District Government in carrying out the construction of facilities and infrastructure is an analysis of the construction costs of the Indonesian National Standard (SNI), Work Unit Price Analysis (AHSP) in the field of Public Works.

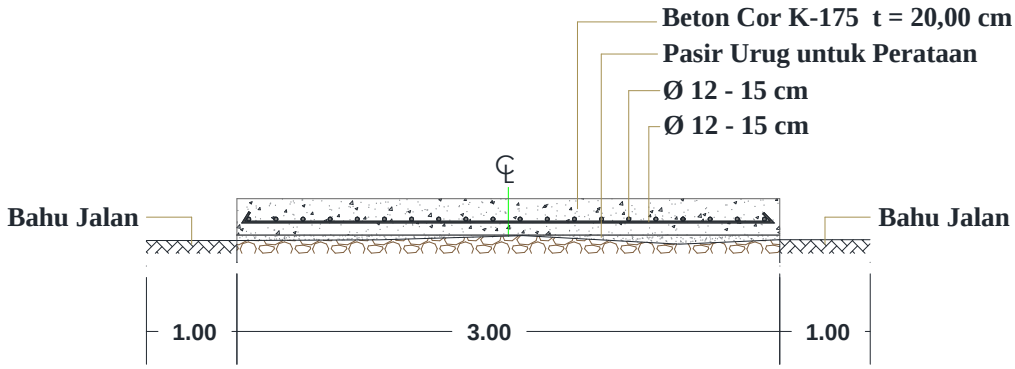
B. Method

The method in preparing this final assignment is a descriptive method with a quantitative approach, the purpose of the descriptive method means to describe the conditions that occur in the present or ongoing, while the quantitative approach is an approach that is carried out by recording and analyzing the data of research results accurately using calculations statistics. The object of the comparison of estimated costs is to analyze the work unit price using the SNI method in 2010, the AHSP in the field of Cipta Karya in 2016. The research design in this paper is as follows: Literature Study is done by studying the problems that will be discussed in this paper, Consultation is intended as a question and answer process with parties related to the topic of this writing, Observations carried out in this study are basic unit price (HSD) surveys in Batu Barayang Regency, which will then be used as a basis in determining the unit price magnitude, The analysis carried out in the form of a comparison or comparison of the use of different metamethods in calculating the estimated cost of work on rigid Road Pavement projects in Hamlet I, Simpang Dolok Village, Kab. Coal, Primary data needed in this study are labor wage unit prices, material/material unit prices, work equipment unit prices, work quantity list, Secondary data needed for this writing is a work plan drawing, a 2010 SNI Analysis list, a 2016 Cipta Karya AHSP Analysis list, After obtaining the required data, the next step

is processing data, at the data processing stage, calculate the work quantity list, calculate the base unit price list according to the unit price needed in the analyzes used, calculate the unit price of work by using the SNI method, calculate estimated cost of work by using the unit price of the SNI method, calculating the work unit price using the AHSP method, calculating the cost of work using the work unit price of the AHSP method, getting a comparison of the cost of the work unit price, knowing the difference in estimated work costs for each method used, knowing components that become differences and similarities in the preparation of the work unit price.

C. Research Finding

Known data's plan for the work of the Road Rigid Pavement:



Picture 1. Typical Job Plan

Length of Road Plans : 475 m1
Width of Preparation of Road Agency : 5.00 m1
The width of the road plan : 3.00 m1
Road Thickness Plan : 0.20 m1

Job Quantity List:
Cleaning and Leveling Location / Preparation of Road Bodies
Volume = Length x Width
= 475.00 m1x 5.00m1
= 2,375.00 m2

Backfill sand paste for leveling
Volume = Length x Width x Thickness
= 475.00 m1 x 5.00 m1 x 0.05 m1
= 71.25 m3

Formwork
Volume = Length x Thickness x Amount
= 475.00 m1 x 0.20 m1 x 2 Sides
= 23.75 m2

Bond Breaker
Volume = Length x (Thickness + Width + Thickness)
= 475.00 m1 x (0.20 m1 + 3.00 m1 + 0.20 m1)
= 475.00 m1 x 3.40 m1
= 1,615.00 m2

Iron Assembly
Longitudinal Reinforcement
Iron Size = 9.00 mm1 = 0.009 m1
Iron Weight = 0.4994 kg / m1
Iron Length = 475.00 m1
Sengkang = 0.15 m1

$$\text{Amount of Iron} = \frac{\text{Width Plan}}{\text{Sengkang}}$$

$$= \frac{30{,}00\ m^1}{0{,}15\ m^1}$$

$$= 20.00$$

Volume = Iron Length x Iron Weight x Amount
= 475.00 m1x 0.4994 kg / m1 x 20.00

= 4,743.97 Kg

Cross Reinforcement
Iron Diameter = 9.00 mm = 0.009 m1
Iron Weight = 0.4994 kg / m1
Iron Length = 3.00 m1
Sengkang = 0.15 m1

Amount of iron = $\frac{\text{475,00 m}^1}{\text{0,15m}^1}$
= 3167,00

Volume = Iron Length x Iron Weight x Amount
= 3.00 m1x 0.4994 kg / m1 x 3167.00
= 4,744.47 Kg

Iron Assembly All Quantity
Volume = Lengthening Reinforcement + Cross Section
= 4,743.97 Kg + 4,744.47 Kg
= 9,488.43 Kg

Cast concrete
Volume = Length x Width x Thickness
= 475.00 m1 x 3.00 m1 x 0.20 m1
= 285.00 m3
The list of work quantities for rigid road pavement work in Hamlet I of Simpang Dolok Village is summarized in table 1

Table 1 List of Job Quantities

No	URAIAN PEKERJAAN	VOLUME	SATUAN
1	2	3	4
1	Pembersihan dan perataan lokasi/Penyiapan Badan Jalan	2,375.00	M2
2	Sisip Urugan Pasir untuk perataan	71.25	M3
3	Bekisting	190.00	M2
4	Pemasangan Plastik	1,615.00	M2
5	Pembesian	9,488.43	Kg
6	Beton Cor	285.00	M3

Basic Unit Price List

Price of Wages Unit

The unit price of wages is obtained by conducting an interview survey with the chairman of the Board of Governors of the Association of Indonesian Construction Entrepreneurs (GAPEKSINDO) District Coal, for wage unit prices Rigid road Pavement work in Hamlet I of Simpang Dolok Village is seen in Table 2

Table 2 List of Labor Wage Unit Prices

NO	URAIAN HARGA UPAH	Harga Survey	
		Harga	Satuan
1	2	3	4
1	Pekerja	85,000.00	Orang/hari
2	Mandor	120,000.00	Oh
3	Tukang	105,000.00	Oh
4	Tukang Batu	105,000.00	Oh
5	Tukang Kayu	115,000.00	Oh
6	Tukang Besi	117,000.00	Oh
7	Kepala Tukang	130,000.00	Oh
8	Jaga Malam	85,000.00	Oh

Source: Survey interview with the chairman of GAPEKSINDO Kab. Batubara

Material Unit Prices

Based on the survey results a list of material unit prices on CV. Aqila Lestari which is a business entity engaged in general trade, a list of unit price of material for rigid pavement work in Dusun I of Simpang Dolok Village as shown in table 3 is obtained.

Table 3. Results of Material Unit Price Survey

NO	URAIAN HARGA BAHAN	Harga Survey	
		Harga	Satuan
1	2	3	4
1	Pasir Urug	200,000.00	C.d.
2	Semen Portland	52,000.00	Zak
3	Pasir Beton	250,000.00	C.d
4	Batu Pecah 2/3	285,000.00	ton
5	Besi Beton Polos Ø10mm	85,000.00	Btg
6	Kawat Beton	22,000.00	Kg
7	Kayu Sembarang (kayu Kelas III)	5,150,000.00	m3
8	Paku Biasa	22,000.00	Kg
9	Minyak Bekisting	7,500.00	Ltr
10	Plastik cor	5,000.00	m1
11	Air	300,000.00	m3
12	Alat Bantu	42,000.00	Set

Source: Survey interview with Director of CV. Aqila Lestari

*Assumption

The price of the material includes the cost of shipping and loading and

unloading until the location of the rigid pavement work in Dusun I Desa Simpang Dolok

1 C.d = 1 Colt Diesel = 4.00 m3
Semen 1 zak = 40 Kg
Broken rock density = 1.45 tons / m3
Iron length 1 rod = 10 m1
Iron weight Ø10 mm = 0.8878 Kg / m1

In connection with the existence of several units of non-standard materials, then the unit price mentioned above needs to be converted to a standard unit in accordance with the assumption in the assumption, the list of unit price of materials is described in table 4

Table 4 Material Unit Price List

NO	URAIAN HARGA BAHAN	Harga Survey		Konversi Harga	
		Harga	Satuan	Harga	Satuan
1	2	3	4	5	6
1	Pasir Urug	200,000.00	C.d	57,142.86	M3
2	Semen Portland	52,000.00	Zak	1,300.00	Kg
3	Pasir Beton	250,000.00	C.d	71,428.57	M3
4	Batu Pecah 2/3	285,000.00	ton	413,250.00	M3
5	Besi Beton Polos Ø10mm	85,000.00	Btg	13,787.51	Kg
6	Kawat Beton	22,000.00	Kg	22,000.00	Kg
7	Kayu Sembarang (kayu Kelas III)	5,150,000.00	m3	5,150,000.00	M3
8	Paku Biasa	22,000.00	Kg	22,000.00	Kg
9	Minyak Bekisting	7,500.00	Ltr	7,500.00	Ltr
10	Plastik cor	5,000.00	m1	5,000.00	M2
11	Air	300,000.00	m3	300.00	Ltr
12	Alat Bantu	42,000.00	Set	42,000.00	Set

D. Discussion

Estimation of SNI Method Work Costs After obtaining the price of the work unit using the SNI method, the Estimated Work Cost is calculated

Table 5. Estimated Costs Using SNI Analysis Calculation Methods

NO	URAIAN PEKERJAAN	VOLUME		ANALISA	@ HARGA (Rp)	JUMLAH HARGA (Rp)
1	Pembersihan dan perataan lokasi/Penyiapan Badan Jalan	2,375.00	m2	I - 8	14,500.00	34,437,500.00
2	Sisip Urugan Pasir untuk perataan	71.25	m3	II-1	95,871.43	6,830,839.29
3	Bekisting.	190.00	m2	VII-28. a	130,496.67	24,794,366.67
4	Pemasangan Plastik	1,615.00	m2	Taksir	5,000.00	8,075,000.00
5	Pembesian	9,488.43	kg	VII-25	16,671.89	158,190,092.68
6	Beton Cor	285.00	m3	VII - 13	1,141,403.93	325,300,119.64
	JUMLAH					557,627,918.28
	PEMBULATAN					557,628,000.00
Terbilang : Lima Ratus Lima Puluh Tujuh Juta Enam Ratus Dua Puluh Delapan Ribu Rupiah						

Estimated Work Costs for the AHSP Method After obtaining the price of the work unit using the AHSP method, it is calculated Estimated Cost of Work table 6

Table 6 Estimated Costs using the AHSP Analysis Calculation method

NO	URAIAN PEKERJAAN	VOLUME		ANALISA	@ HARGA (Rp)	JUMLAH HARGA (Rp)
1	Pembersihan dan perataan lokasi/Penyiapan Badan Jalan	2,375.00	m2	A.2.2.1.9.	14,500.00	34,437,500.00
2	Sisip Urugan Pasir untuk perataan	71.25	m3	A.2.3.1.11.	95,271.43	6,788,089.29
3	Bekisting.	190.00	m2	A.4.1.1.20.a	151,716.67	28,826,167.30
4	Pemasangan Plastik	1,615.00	m2	Taksir	5,000.00	8,075,000.00
5	Pembesian	9,488.43	kg	A.4.1.1.17.	16,671.89	158,190,092.68
6	Beton Cor	285.00	m3	A.4.1.1.5.	1,024,642.21	292,023,031.07
	JUMLAH					528,339,880.34
	PEMBULATAN					528,340,000.00
Terbilang : Lima Ratus Dua Puluh Delapan Juta Tiga Ratus Empat Puluh Ribu Rupiah						

Comparison of unit prices per work item between the SNI method, the AHSP method can be seen in Table 7

Table 7 Comparison of unit prices for each work item between the SNI method, the AHSP method.

No	URAIAN PEKERJAAN	HARGA SATUAN SNI (Rp)	HARGA SATUAN AHSP (Rp)
1	2	3	4
1	Pembersihan dan perataan lokasi/Penyiapan Badan Jalan	14,500.00	14,500.00
2	Urugan Pasir	95,871.43	95,271.43
3	Bekisting.	130,496.67	151,716.67
4	Pemasangan Plastik	5,000.00	5,000.00
5	Pembesian	16,671.89	16,671.89
6	Beton Cor	1,141,403.93	1,024,642.21

E. Conclusion

From the calculations and discussions above, several conclusions are given as follows: The estimated cost of rigid road pavement projects in Simpang Dolok Village by using the SNI method is Rp. 557,628,000.00 (Five Hundred Fifty Seven Million Six Hundred Twenty Eight Thousand Rupiah), The estimated cost of the rigid road pavement project in Dusun I Simpang Dolok Village by using the AHSP method is Rp. 528,340,000.00 (Five Hundred Twenty Eight Million Three Hundred Forty Thousand Rupiah).

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