

Vol. 1, No. 1, July 2024, 19 – 34 P-ISSN: XXXX-XXXX and E-ISSN: XXXX-XXXX https://jurnal.imat.ac.id/index.php/dynamics

COMPARATIVE ANALYSIS OF COST BUDGET PLAN CALCULATIONS USING BUILDING INFORMATION MODELING (BIM) AND CONVENTIONAL METHODS ON THE BRI BANK BUILDING CONSTRUCTION PROJECT IN MEDAN

Suranto^a, Nurmaidah^b, Arya Prio Pamungkas^b

^aInstitut Modern Architecture dan Teknologi, Deli Serdang, Indonesia, email: suranto@imat.ac.id ^bCivil Engineering Study Program, Faculty of Engineering, Universitas Medan Area, Indonesia, email: nurmaidah@staff.uma.ac.id

Article Info:

ABSTRACT

This research aims to analyze the comparison of work volume calculations and cost budget plans for the BRI Bank building construction project in Medan using the Building Information Modeling (BIM) method and conventional methods. The data used in this research is building volume data that was planned by redesign using Autodesk Revit. This data includes building technical data, such as building area, number of floors and volume of work. The research results show that using the BIM method with Autodesk Revit can produce more accurate work volume calculations compared to conventional methods. This has an impact on calculating the cost budget plan which is also more accurate. In addition, the BIM method has been proven to be able to increase efficiency and effectiveness in managing construction projects, especially in terms of coordination between disciplines, reducing design errors, as well as optimizing costs and time for project implementation. The results of the comparative analysis carried out turned out that the cost budget plan for implementing the BIM method was Rp. 2,976,607,161 while the total cost using the conventional method.

Key Words: Cost budged plan, Building Information Modeling, construction efficiency

ABSTRAK

Penelitian ini bertujuan untuk menganalisis perbandingan perhitungan volume pekerjaan dan rencana anggaran biaya pada proyek pembangunan gedung Bank BRI di Medan dengan menggunakan metode Building Information Modeling (BIM) dan metode konvensional. Data yang digunakan dalam penelitian ini adalah data volume bangunan yang direncanakan dengan mendesain ulang menggunakan Autodesk Revit. Data tersebut mencakup data teknis gedung, seperti luas bangunan, jumlah lantai, dan volume pekerjaan. Hasil penelitian menunjukkan bahwa penggunaan metode BIM dengan Autodesk Revit dapat menghasilkan perhitungan volume pekerjaan yang lebih akurat dibandingkan dengan metode konvensional. Hal ini berdampak pada perhitungan rencana anggaran biaya yang juga lebih akurat. Selain itu, metode BIM terbukti mampu meningkatkan efisiensi dan efektivitas dalam pengelolaan proyek konstruksi, khususnya dalam hal koordinasi antar disiplin ilmu, pengurangan kesalahan desain, serta optimasi biaya dan waktu pelaksanaan proyek. Hasil analisis perbandingan yang dilakukan ternyata rencana anggaran biaya (RAB) penerapan metode BIM sebesar Rp. 2.976.607.161 sedangkan biaya total dengan metode konvensional sebesar Rp. 3.280.583.049. Perhitungan RAB dengan metode BIM lebih kecil 9,27% dibandingkan dengan metode konvensional.

Kata Kunci: Rencana Anggaran Biaya, Building Information Modeling, efisiensi konstruksi

Copyright © 2024 LPPM-IMAT This open access article is distributed under a Creative Commons Attribution (CC-BY-NC-SA) 4.0 International license.

19 Comparative Analysis of Cost Budget Plan Calculations Using Building Information Modeling (BIM) and Conventional Methods on The BRI Bank Building Construction Project in Medan

1. INTRODUCTION

Infrastructure development, including buildings and roads, is one of the main indicators of a region's economic development. In Indonesia, the construction sector continues to experience significant growth in line with the increasing public need for adequate infrastructure. However, this rapid development also brings new challenges, namely the increasing complexity of projects that must be managed more effectively and efficiently. One widely adopted solution to overcome this challenge is the use of Building Information Modeling (BIM).

BIM is an approach that integrates technology and communication in the design and construction process, enabling better and more efficient project management. With BIM, the planning, design and construction processes become more integrated, which in turn can improve the quality of the final result and reduce project duration and costs. According to Eastman et al. (2008), the use of BIM can provide various benefits such as increasing interdisciplinary coordination, reducing design errors, and optimizing costs and project implementation time.

Autodesk Revit is one software that implements BIM effectively. Revit allows the creation of comprehensive and detailed 3D models, covering various aspects of a construction project, from architecture, structure, to mechanical, electrical, and plumbing (MEP) systems. The use of Revit in construction projects has been proven to increase efficiency and accuracy in calculating work volumes and cost budgets.

In Indonesia, the application of BIM is still relatively new and has not been widely applied to building projects. This research aims to fill this gap by optimizing the calculation of work volume and cost budget for the BRI Bank building construction project on Jl. Sisingamangaraja, Medan, uses the BIM method with the help of the Autodesk Revit program. Through this research, it is hoped that a clearer picture can be obtained regarding the advantages and challenges of implementing BIM in Indonesia.

Eastman (2008) shows that BIM succeeded in reducing project costs by up to 9.27% on the Georgia State University building construction project in the United States compared to conventional methods. Apart from that, another study by Marizan (2019) in Malaysia showed that the use of BIM in the Sukajadi Community Health Center planning project in Prabumulih City could increase project efficiency by up to 15%.

Another study by Migilinskas et al. (2013) in Lithuania also found that applying BIM to the Vilnius Shopping Center shopping center construction project could reduce project completion time by 20% and project costs by up to 10% compared to traditional methods. In China, research by Li et al. (2014) showed that BIM helped in improving collaboration between project teams on the construction of office buildings in Shanghai, which ultimately reduced the risk of delays and improved construction quality.

With this background, this research is focused on analyzing the comparison of work volume calculations and cost budgets for the BRI Bank building construction project in Medan with the application of BIM using Autodesk Revit and conventional methods. It is hoped that the results of this research can become a reference and benchmark for construction practitioners in Indonesia in adopting BIM technology to increase the efficiency and effectiveness of their projects.

2. DATA AND METHODS

2.1. Research Data

The data used in this research is the planned building volume data obtained by redesigning withAutodesk Revit.This data is data related to building technical data and project structures obtained directly at the BRI Bank Building Construction project location on Jl. Sisingamangaraja No. 241 Gg. Indrajid Kel. Sudirejo-II District. Medan City.

Data collection was obtained from the BRI Bank building construction contractor, the data obtained was in the form of: Drawings and structural data as well as structural cost budgets.

The following project data obtained is as follows:

- Structure Type: Multi-storey Building
- Contract Value: Rp. 18,000,000,000,-
- Building Area: 568 m²

- Number of Floors: 4 Floors
- Building Height: 19.50 m
- Borepile and Pilecap Structure
- Column Structure
- Beam Structure
- Floor Plate Structure
- Stair Structure

2.2. Research Methods

RESEARCH FLOW DIAGRAM



Figure 1. Research Flow Chart

3. RESULTS AND DISCUSSION

3.1. Foundation

1) Borepile and Pilecap Plans

*Autodesk Revit*will save all information in one place. For this matter, if changes are made to certain areas, it will change the entire model. For example, when you want to change an object in a 3D model, the plan appearance, cost budget plan, and so on will change.

²¹ Comparative Analysis of Cost Budget Plan Calculations Using Building Information Modeling (BIM) and Conventional Methods on The BRI Bank Building Construction Project in Medan



Figure 2. Foundation and Pilecap

Figure 2 shows the bore pile and pile cap floor plan modeling for the BRI Bank Building construction project using Autodesk Revit.

2) 3D Modeling of Foundations

After modeling the borepile and pilecap according to the points determined on the borepile and pilecap plan.



Figure 3. 3D Modeling of Foundations

Figure 3 shows the 3D modeling of the foundation, then the results of the 3D modeling are checked again so that the modeling really matches the results of the plans made by the consultant.

3) Details of Reinforcement and Foundation Pieces

Next, modeling is carried out for the reinforcement in the borepile and pilecap.



Figure 4. Foundation Reinforcement Details

Figure 4 shows the modeling of foundation reinforcement, then a picture of the foundation section is shown as shown in Figure 5.



Figure 5. Foundation Cut

4) Schedules Foundation

Schedules is a feature on *Autodesk Revit* which works to find out the types of components used in building models, for example to find out foundations, columns and others. In the schedule table, we can arrange it according to our needs and can create formulas, filters and calculations.

R 🗖 Autode	esik Revit 2019 - Sci	bedule: S	chedule Structure	d Foundation						+ 1
<schedule foundation="" structural=""></schedule>										
		c	D		r (G	н	1	1	ĸ
Family	Type	Cap Bef	Pile Cap Volume	Cost Pile Cap	Bieys Plie Cap	Pietungh	Pile Diameter	Pile Volume	Cost flore Pie	Bays Pile
Pie Cap TB1	BO x 50 x80cm	PORT	0.51 m²	2229.554	1.141.532	13.00	40 cm	1.63.9/*	141620.00	1.867.098
Pile Cap 191	80 x 80 x80cm	PCR1	0.51 m²	2,229,554	1.141.532	13.m	40 cm	143.64	143.620.00	1.807.000
Phile Cap. TB1	80 x 80 x80cm	PORt	0.51 #*	2.229.554	1,141,532	13.m	40 cm	1.03 eff	143,620,20	1.867.860
Pile Cap. TB1	80 x 80 x80cm	PCR1	0.51 m²	2,229,554	1.141.532	13.00	80 cm	1.03 #*	143 600 00	1.867,080
File Cap TBT	80 x 80 x80cm	PORT	0.51 m²	2,229,554	1,141,532	13.m	40 (01)	1.63 #	141,620.00	1.807.000
Pile Cap 191	80 x 80 x80um	PCR1	0.55 m²	2,229,554	1.141.532	13 m	40 cm	1.03 m	141-620-00	1.807.000
He Cap TB1	80 x 80 x80cm	PORT	0.51 m²	2.229,554	1,141,532	13 m	40 cm	1.63.44	143,620-00	1,867,000
Pile Cap. TB1	80 x 80 x80cm	PCRE	0.51 m²	2,229,554	1.141.532	10.m	40 cm	1.03.67	143.620.00	1,867,060
Pile Cap 181.8			4.10 m²		0.132,253	104 41				54,906,480
Pie Cap 182	80 x 180 x 80cm	PCR2	1.15.02	2,449,006	2,822,280	26.01	#0.cm	3.27 m²	143.620.00	3,734,120
Pile Cap T82	80 x 180 x 80cm	PCR2	1.15+2	2,449,896	2,622,260	26 m	40 cm	3.27 m²	143.620.00	3,734,120
Pile Cap. 182	80 x 100 x 60cm	POR	1.15 m²	2,449,896	2,822,280	26 m	40 cm	327 ef	143,620.00	3,734,120
Plin Cap. TE2	80 a 180 x 80cm	PCRE	1.15 m ²	2,449,996	2,822,780	26 m	40 (24)	3.27 m	141430-00	3,734,120
Pile Cap. TB2.4		1000	4.61 m²		11,289,121	164 m	A 10.000	Concerne and	10	14,936,480
Pile Cap TEG	170 x 180 x 80cm	PORT	245 m²	2,209,985	5.556.919	36 m	40 cm	4.90 m²	143.820.00	5.001,180
Frie Cap. TED	170 s 180 x 80cm	PORI	2.45 m²	2,209,985	5,556,918		40 cm	4 90 m ⁴	143,620.00	5.601,180
Prie Cap 183	170 s 180 x 80cm	PCRI	2.45 m ²	2,209,983	5.556.918	39 m	#0 cm	A 90 m ²	143,620.00	5.601.180
Ple Cap TR3	170 s 180 x 80cm	PORT	2.45m²	2,209,983	6.556.918	- 39 m	40 om	4.90 m ^a	143,620.00	5,601,180
Pie Cap. TB3: 4			9.7% m [*]		22,227,674	150-m				22,404,720
Hile Cap. TE4	180 × 180 × 80cm	PORE.	2.59.11	2,209,963	5.883,790	52 m	40.0%	6.53.64	143,620.00	7,400,240
Plie Cap TD4	160 + 180 x 80cm	PCRI	2.59 m²	2,209,983	5,883,790	52 m	#0 cm	6.53 ef	143.620.00	T.468.240
Ple Cap 164	180 a 180 x 800m	PORE	2.59 #7	2,209,963	1.881,796	52 m	40 011	6.53 m²	141,620,00	7,468,240
Pile Cap. 184	180 ± 180 ± 80cm	PCRE	2.59 #*	2,200,963	5,883,796	52 m	40 cm	6.53 m ²	143.620.00	7,408,240
Pile Cap. TB4 4			- 10.32 m ^e		23,535,184	208 m				29,872,000
Phie Cap. T65	200 s 180 x 100um	PCR5.	4.65 m²	2,649,757	11,464,003	65 m	A0 (2H)	8.10.07	143,620.00	9.335.300
Pile Cap 185	260 x 180 x 100cm	PORS	4.68 m²	2,649,757	11,464,803	66 m	40 cm	8.10.44	143,620.90	8,335,300
Pie Cap T85	200 s 180 x 100cm	PCRS	4.08.02	2,849,757	11,404,863	65 m	\$0 cm	8.16 m ²	143,620.50	9,395,300
Pile Cap. 785	265 s 180 x 100cm	PORS	4.68 m²	2.449.757	11,464,863	65 m	AG cm	8.16 m²	141620.00	9,335,300
Pier Cap. 185. 4			18.72 m²		45,859,451	200 m	1			37.341.200
Grandtolat 24			47.58 m ⁴		117,049,682	632 m				110,401,640

Figure 6. Foundation Schedules display

Figure 6 displays the foundation schedule resulting from Autodesk Revit modeling. This schedule contains the item name, volume, size, cost, and total cost.

²³ Comparative Analysis of Cost Budget Plan Calculations Using Building Information Modeling (BIM) and Conventional Methods on The BRI Bank Building Construction Project in Medan

3.2. Column Structure

1) Column Plan

The columns in the BRI Bank Building project are divided into several types, namely:

- Column K1 55x55 cm
- Column K2 55x55 cm
- Column K3 35x55 cm
- Column K4 40x40 cm

Figure 7 shows the floor plan modeling of the ground floor columns in the BRI Bank Building construction project using Autodesk Revit.



Figure 7. Ground Floor Columns

2) 3D Modeling of Column Structures

Next, 3D modeling of the column structure is carried out according to the points determined on the ground floor column plan.



Figure 8. 3D Modeling of Column Structures

Figure 8 shows the 3D modeling of the column, then the results of the 3D modeling are checked again so that the modeling really matches the planning results made by the consultant.

3) Details of Reinforcement and Column Structure Pieces

Then after the column structure modeling is complete and it is checked whether it complies with the specified dimensions. So, proceed with reinforcement modeling.



Figure 9. Column Structure Reinforcement Modeling

Figure 9 shows the 3D modeling of column structure reinforcement. Reinforcement must be done according to the planned column types, namely types K1, K2, K3 and K4.



Figure 10. Column Structure Cut

Figure 10 shows the cuts and reinforcement in the column structure.

4) Schedules Column

Schedules on the completed column structure work.

A B C D E F Farmy Type Basic Lever Top Top Lever Top		-									
A B C D E F Farryty Type Basis Level Top Lowet Landar Dataset 150 cm 0.07 M. Concretite-Rectanguiate/Column 15 s 30 cm Landar Dataset Landar Dataset 1800 cm 0.07 M. Concretite-Rectanguiate/Column HCI 35 s 85 cm Landar Dataset Landar Dataset Landar Dataset Landar Dataset 1800 cm 0.73 M. Concretite-Rectanguiate/Column HCI 35 s 85 cm Landar Dataset Landar Dataset Landar Dataset Landar Dataset 1800 cm 0.73 M. Concretite-Rectanguiate/Column HCI 35 s 85 cm Landar Dataset Landar Dataset Landar Dataset Landar Dataset Landar Dataset 1800 cm 0.73 M. Concretite-Siguate-Column HCI 36 s 85 cm Landar Dataset Landar Dataset Landar Dataset 1800 cm 0.011 M. Concretite-Siguate-Column HCI 40 s 4	<schedule column="" structural=""></schedule>										
Fairty Type Base Level Top Level Langeh Voterse M_Concrete-Rectanguist-Column 15.x.30 cm Lanta Dasar Linta Dasar 160 cm 0.07 M_Concrete-Rectanguist-Column 15.x.30 cm Lanta Dasar Lanta Dasar 160 cm 0.07 M_Concrete-Rectanguist-Column 13.x.85 cm Lanta Dasar Lanta 1 380 cm 0.07 M_Concrete-Rectanguist-Column K3 35.x.85 cm Lanta Dasar Lanta 1 380 cm 0.75 M_Concrete-Rectanguist-Column K3 35.x.85 cm Lanta Dasar Lanta 1 380 cm 0.75 M_Concrete-Rectanguist-Column K3 35.x.85 cm Lanta Dasar Lanta 1 380 cm 0.73 M_Concrete-Rectanguist-Column K4 40.40 cm Lanta Dasar Lanta 1 380 cm 0.73 M_Concrete-Square-Column K4 40.40 cm Lanta Dasar Lanta 1 380 cm 0.81 M_Concrete-Square-Column K4 40.40 cm Lanta Dasar Lanta 1 380 cm 0.81 M_Concrete-Square-Column K4 40.40 cm Lanta Dasar <t< th=""><th>6</th><th>н</th></t<>	6	н									
M. Concrete Rectangular-Column 15 x 30 cm Lantar Desar Lantar Datar 160 cm 0.07 M. Concrete Rectangular-Column 15 x 30 cm Lantar Dasar 160 cm 0.07 M. Concrete Rectangular-Column 15 x 30 cm Lantar Dasar Lantar Dasar 160 cm 0.07 M. Concrete Rectangular-Column K3 35 x 35 cm Lantar Dasar Lantar 1 380 cm 0.73 M. Concrete Rectangular-Column K3 35 x 35 cm Lantar Dasar Lantar 1 380 cm 0.73 M. Concrete Rectangular-Column K3 35 x 35 cm Lantar Dasar Lantar 1 380 cm 0.73 M. Concrete-Rectangular-Column K3 35 x 55 cm Lantar Dasar Lantar 1 380 cm 0.73 M. Concrete-Rectangular-Column K4 40 x 40 cm Lantar Dasar Lantar 1 380 cm 0.73 M. Concrete-Square-Column K4 40 x 40 cm Lantar Dasar Lantar 1 380 cm 0.614 M. Concrete-Square-Column K4 40 x 40 cm Lantar Dasar Lantar 1 380 cm 0.611 M. Concrete-Square-Column K4 40 x 40 cm </th <th>Cost</th> <th>Juman</th>	Cost	Juman									
M_Concrete-Rectangular-Column K3 55 85 cm Lanta Dasar Lanta 1 380 cm 0.07 / M_Concrete-Rectangular-Column K3 35 55 cm Lanta Dasar Lanta 1 380 cm 0.73 / M_Concrete-Rectangular-Column K3 35 55 cm Lanta Dasar Lanta 1 380 cm 0.73 / M_Concrete-Rectangular-Column K3 35 55 cm Lanta Dasar Lanta 1 380 cm 0.73 / M_Concrete-Rectangular-Column K3 35 55 cm Lanta Dasar Lanta 1 380 cm 0.73 / M_Concrete-Rectangular-Column K3 35 55 cm Lanta Dasar Lanta 1 380 cm 0.73 / M_Concrete-Rectangular-Column K3 35 55 cm Lanta Dasar Lanta 1 380 cm 0.73 / M_Concrete-Rectangular-Column K4 40 40 cm Lanta Dasar Lanta 1 380 cm 0.61 / M_Concrete-Rectangular-Column K4 40 40 cm Lanta Dasar Lanta 1 380 cm 0.61 / M_Concrete-Restangular-Column K4 40 40 cm Lanta Dasar Lanta 1 380 cm 0.61 / M_Concrete-Restangular-Column K4 40 40 cm Lanta Dasar Lanta 1 380 cm 0.61 / M_Concrete-Square-Column K4 40 40 cm Lanta Dasar Lanta 1 380 cm 0.61 / M_Concrete-Square-Column K4 40 40 cm Lanta Dasar Lanta 1 380 cm 0.61 / M_Concrete-Square-Column K4 40 1 40 cm Lanta Dasar Lanta 1 380 cm 0.61 / M_Concrete-Square-Column K4 40 1 40 cm Lanta Dasar Lanta 1 380 cm 0.61 / M_Concrete-Square-Column K4 40 1 40 cm Lanta Dasar Lanta 1 380 cm 0.61 / M_Concrete-Square-Column K4 40 1 40 cm Lanta Dasar Lanta 1 380 cm 0.61 / M_Concrete-Square-Column K4 40 1 40 cm Lanta Dasar Lanta 1 380 cm 0.61 / M_Concrete-Square-Column K1 55 c5 cm Lanta Dasar Lanta 1 380 cm 1.55 / M_Concrete-Square-Column K1 55 c5 cm Lanta Dasar Lanta 1 380 cm 1.55 / M_Concrete-Square-Column K1 55 c5 cm Lanta Dasar Lanta 1 380 cm 1.55 / M_Concrete-Square-Column K1 55 c5 cm Lanta Dasar Lanta 1 380 cm 1.55 / M_Concrete-Square-Column K1 55 c5 cm Lanta Dasar Lanta 1 380 cm 1.55 / M_Concrete-Square-Column K1 55 c5 cm Lanta Dasar Lanta 1 380 cm 1.55 / M_Concrete-Square-Column K1 55 c5 cm Lanta Dasar Lanta 1 380 cm 1.55 / M_Concrete-Square-Column K1 55 c5 cm Lanta Dasar Lanta 1 380 cm 1.55 / M_Concrete-Square-Column K1 55 c5 cm Lanta Dasar Lanta 1 380 cm 1.55 / M_Concrete-Square-Column K1 55 c5 cm	3,960.550	286.64									
M. Concrete-Rectangular-Column K3 35 x 55 cm. Letter Desart Lanter 1 380 cm. 0.733 M. Concrete-Rectangular-Column K3 35 x 55 cm. Letter Desart Lanter 1 380 cm. 0.753 M. Concrete-Rectangular-Column K3 35 x 55 cm. Lanter Desart Lanter 1 380 cm. 0.753 M. Concrete-Rectangular-Column K3 35 x 55 cm. Lanter Desart Lanter 1 380 cm. 0.753 M. Concrete-Rectangular-Column K3 35 x 55 cm. Lanter Desart Lanter 1 380 cm. 0.753 M. Concrete-Rectangular-Column K4 40 x 40 cm. Lanter Desart Lanter 1 380 cm. 0.753 M. Concrete-Square-Column K4 40 x 40 cm. Lanter Desart Lanter 1 380 cm. 0.851 M. Concrete-Square-Column K4 40 x 40 cm. Lanter Desart Lanter 1 380 cm. 0.851 M. Concrete-Square-Column K4 40 x 40 cm. Lanter Desart Lanter 1 380 cm. 0.851 M. Concrete-Square-Column K4 40 x 40 cm. Lanter Desart Lanter 1 380 cm. 0.851 M. Concrete-Square-Column K4 40 x 40 cm. Lanter Desart Lanter 1 380 cm. 0.851 M. Concrete-Square-Column K4 40 x 40 cm. Lanter Desart Lanter 1 380 cm. 0.851 M. Concrete-Square-Column K4 40 x 40 cm. Lanter Desart Lanter 1 380 cm. 0.651 M. Concrete-Square-Column K4 40 x 40 cm. Lanter Desart Lanter 1 380 cm. 0.651 M. Concrete-Square-Column K4 40 x 40 cm. Lanter Desart Lanter 1 380 cm. 0.651 M. Concrete-Square-Column K4 10 x 40 cm. Lanter Desart Lanter 1 380 cm. 0.651 M. Concrete-Square-Column K1 55 x 55 cm. Lanter Desart Lanter 1 380 cm. 1.551 M. Concrete-Square-Column K1 55 x 55 cm. Lanter Desart Lanter 1 380 cm. 1.551 M. Concrete-Square-Column K1 55 x 55 cm. Lanter Desart Lanter 1 380 cm. 1.551 M. Concrete-Square-Column K1 55 x 55 cm. Lanter Desart Lanter 1 380 cm. 1.551 M. Concrete-Square-Column K1 55 x 55 cm. Lanter Desart Lanter 1 380 cm. 1.551 M. Concrete-Square-Column K1 55 x 55 cm. Lanter Desart Lanter 1 380 cm. 1.551 M. Concrete-Square-Column K1 55 x 55 cm. Lanter Desart Lanter 1 380 cm. 1.551 M. Concrete-Square-Column K1 55 x 55 cm. Lanter Desart Lanter 1 380 cm. 1.551 M. Concrete-Square-Column K1 55 x 55 cm. Lanter Desart Lanter 1 380 cm. 1.551 M. Concrete-Squa	P 3.960,550	286,60									
M_Concente-Rectangular-Column Kci 35 x 85 cm Lantia Dasar Lantia 1 380 cm 0 73 0 M_Concente-Rectangular-Column Kci 35 x 85 cm Lantia Dasar Lantia 1 380 cm 0 73 0 M_Concente-Rectangular-Column Kci 35 x 85 cm Lantia Dasar Lantia 1 380 cm 0 73 0 M_Concente-Rectangular-Column Kci 35 x 85 cm Lantia Dasar Lantia 1 380 cm 0 73 0 M_Concente-Rectangular-Column Kci 35 x 85 cm Lantia Dasar Lantia 1 380 cm 0 73 0 M_Concente-Rectangular-Column Kci 35 x 85 cm Lantia Dasar Lantia 1 380 cm 0 73 0 M_Concente-Rectangular-Column Kci 35 x 85 cm Lantia Dasar Lantia 1 380 cm 0 61 0 M_Concente-Restangular-Column Kci 40 x 40 cm Lantia Dasar Lantia 1 380 cm 0 61 0 M_Concente-Square-Column Kci 40 x 40 cm Lantia Dasar Lantia 1 380 cm 0 61 0 M_Concente-Square-Column Kci 40 x 40 cm Lantia Dasar Lantia 1 380 cm 0 61 0 M_Concente-Square-Column Kci 40 x 40 cm Lantia Dasar Lantia 1 380 cm 0 61 0 M_Concente-Square-Column Kci 40 x 40 cm Lantia Dasar Lantia 1 380 cm 0 61 0 M_Concente-Square-Column Kci 40 x 40 cm Lantia Dasar Lantia 1 380 cm 0 61 0 M_Concente-Square-Column Kci 55 x 55 cm Lantia Dasar Lantia 1 380 cm 0 61 1 M_Concente-Square-Column Kci 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1 15 1 M_Concente-Square-Column Kci 1 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1 15 1 M_Concente-Square-Column Kci 1 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1 15 1 M_Concente-Square-Column Kci 1 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1 15 1 M_Concente-Square-Column Kci 1 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1 15 1 M_Concente-Square-Column Kci 1 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1 15 1 M_Concente-Square-Column Kci 1 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1 15 1 M_Concente-Square-Column Kci 1 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1 15 1 M_Concente-Square-Column Kci 1 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1 15 1 M_Concente-Square-Column Kci 1 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1 15 1 M_Concente-Square-Column Kci 1 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1 15 1 M_Concente-Square-Column Kci 1 55 x 55 cm Lantia Dasar Lantia	4,569,719	3,342.74									
M. Concrete-Reclangular-Column K3. 35 x 85 cm. Lantes Desar Lantes 1. 380 cm. 0. 73 M. Concrete-Reclangular-Column K3. 35 x 85 cm. Lantes Desar Lantes 1. 380 cm. 0. 73 M. Concrete-Reclangular-Column K3. 35 x 85 cm. Lantes Desar Lantes 1. 380 cm. 0. 73 M. Concrete-Reclangular-Column K4. 40 x 40 cm. Lantes Desar Lantes 1. 380 cm. 0. 81 M. Concrete-Square-Column K4. 40 x 40 cm. Lantes Desar Lantes 1. 380 cm. 0. 81 M. Concrete-Square-Column K4. 40 x 40 cm. Lantes Desar Lantes 1. 380 cm. 0. 81 M. Concrete-Square-Column K4. 40 x 40 cm. Lantes Desar Lantes 1. 380 cm. 0. 81 M. Concrete-Square-Column K4. 40 x 40 cm. Lantes Desar Lantes 1. 380 cm. 0. 81 M. Concrete-Square-Column K4. 40 x 40 cm. Lantes Desar Lantes 1. 380 cm. 0. 81 M. Concrete-Square-Column K4. 40 x 40 cm. Lantes Desar Lantes 1. 380 cm. 0. 61 M. Concrete-Square-Column K4. 40 x 40 cm. Lantes Desar Lantes 1. 380 cm. 0. 61 M. Concrete-Square-Column K4. 40 x 40 cm. Lantes Desar Lantes 1. 380 cm. 0. 61 M. Concrete-Square-Column K4. 40 x 40 cm. Lantes Desar Lantes 1. 380 cm. 0. 61 M. Concrete-Square-Column K4. 40 x 40 cm. Lantes Desar Lantes 1. 380 cm. 0. 61 M. Concrete-Square-Column K4. 55 x 55 cm. Lantes Desar Lantes 1. 380 cm. 0. 61 M. Concrete-Square-Column K1. 55 x 55 cm. Lantes Desar Lantes 1. 380 cm. 1. 155 M. Concrete-Square-Column K1. 55 x 55 cm. Lantes Desar Lantes 1. 380 cm. 1. 155 M. Concrete-Square-Column K1. 55 x 55 cm. Lantes Desar Lantes 1. 380 cm. 1. 155 M. Concrete-Square-Column K1. 55 x 55 cm. Lantes Desar Lantes 1. 380 cm. 1. 155 M. Concrete-Square-Column K1. 55 x 55 cm. Lantes Desar Lantes 1. 380 cm. 1. 155 M. Concrete-Square-Column K1. 55 x 55 cm. Lantes Desar Lantes 1. 380 cm. 1. 155 M. Concrete-Square-Column K1. 55 x 55 cm. Lantes Desar Lantes 1. 380 cm. 1. 155 M. Concrete-Square-Column K1. 55 x 55 cm. Lantes Desar Lantes 1. 380 cm. 1. 155 M. Concrete-Square-Column K2. 55 x 55 cm. Lantes Desar Lantes 1. 380 cm. 1. 155 M. Concrete-Square-Column K2. 55 x 55 cm. Lantes Desar Lantes 1. 380 cm. 1. 155 M. Concrete-Square-Column K2. 55 x 55 cm.	4.569,719	3,342,74									
M. Concrete-Rectanguiar-Column K3 35 x 55 cm. Lunta Unisar Lunta 1 380 cm. 0 73 M. Concrete-Rectanguiar-Column K3 35 x 55 cm. Lunta Unisar Lunta 1 380 cm. 0 73 M. Concrete-Rectanguiar-Column K4 40 x 40 cm. Lunta Unisar Lunta 1 380 cm. 0 81 M. Concrete-Square-Column K4 40 x 40 cm. Lunta Unisar Lunta 1 380 cm. 0 81 M. Concrete-Square-Column K4 40 x 40 cm. Lunta Unisar Lunta 1 380 cm. 0 81 M. Concrete-Square-Column K4 40 x 40 cm. Lunta Unisar Lunta 1 380 cm. 0 81 M. Concrete-Square-Column K4 40 x 40 cm. Lunta Unisar Lunta 1 380 cm. 0 81 M. Concrete-Square-Column K4 40 x 40 cm. Lunta Unisar Lunta 1 380 cm. 0 81 M. Concrete-Square-Column K4 40 x 40 cm. Lunta Unisar Lunta 1 380 cm. 0 81 M. Concrete-Square-Column K4 40 x 40 cm. Lunta Unisar Lunta 1 380 cm. 0 61 M. Concrete-Square-Column K4 40 x 40 cm. Lunta Unisar Lunta 1 380 cm. 0 61 M. Concrete-Square-Column K4 40 x 40 cm. Lunta Unisar Lunta 1 380 cm. 0 61 M. Concrete-Square-Column K1 55 x 55 cm. Lunta Unisar Lunta 1 380 cm. 1 15 M. Concrete-Square-Column (K1) 55 x 55 cm. Lunta Unisar Lunta 1 380 cm. 1 15 M. Concrete-Square-Column (K1) 55 x 55 cm. Lunta Unisar Lunta 1 380 cm. 1 15 M. Concrete-Square-Column (K1) 55 x 55 cm. Lunta Unisar Lunta 1 380 cm. 1 15 M. Concrete-Square-Column (K1) 55 x 55 cm. Lunta Unisar Lunta 1 380 cm. 1 15 M. Concrete-Square-Column (K1) 55 x 55 cm. Lunta Unisar Lunta 1 380 cm. 1 15 M. Concrete-Square-Column (K1) 55 x 55 cm. Lunta Unisar Lunta 1 380 cm. 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm. Lunta Disar Lunta 1 380 cm. 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm. Lunta Disar Lunta 1 380 cm. 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm. Lunta Disar Lunta 1 380 cm. 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm. Lunta Disar Lunta 1 380 cm. 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm. Lunta Disar Lunta 1 380 cm. 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm. Lunta Disar Lunta 1 380 cm. 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm. Lunta Disar Lunta 1	4,569,719	3,342.74									
M. Concrete-Rectangiae-Column IC3 35: 55 cm Lantai Desar Lantai 1 380 cm 0.733 M. Concrete-Square-Column IC3 35: 55 cm Lantai Desar Lantai 1 380 cm 0.733 M. Concrete-Square-Column IC4 40: 40 cm Lantai Desar Lantai 1 380 cm 0.733 M. Concrete-Square-Column IC4 40: 40 cm Lantai Desar Lantai 1 380 cm 0.811 M. Concrete-Square-Column IC4 40: 40 cm Lantai Desar Lantai 1 380 cm 0.811 M. Concrete-Square-Column IC4 40: 40 cm Lantai Desar Lantai 1 380 cm 0.811 M. Concrete-Square-Column IC4 40: 40 cm Lantai Desar Lantai 1 380 cm 0.811 M. Concrete-Square-Column IC4 40: 40 cm Lantai Desar Lantai 1 380 cm 0.811 M. Concrete-Square-Column IC41 55: x55 cm Lantai Desar Lantai 1 380 cm 1.155 M. Concrete-Square-Column IC11 55: x55 cm Lantai Desar Lantai 1 380 cm 1.155 M. Concrete-Square-Column IC11 55: x55	4.569,719	3.342.74									
M. Concrete-Square-Column H43 35 x 55 cm Lanta Dissar Lanta 1 380 cm 0 73 M. Concrete-Square-Column H4 40 x 40 cm Lanta Dissar Lanta 1 380 cm 0 61 M. Concrete-Square Column H4 40 x 40 cm Lanta Dissar Lanta 1 380 cm 0 61 M. Concrete-Square Column H4 40 x 40 cm Lanta Dissar Lanta 1 380 cm 0 61 M. Concrete-Square Column H4 40 x 40 cm Lanta Dissar Lanta 1 380 cm 0 61 M. Concrete-Square Column H4 40 x 40 cm Lanta Dissar Lanta 1 380 cm 0 61 M. Concrete-Square Column H4 40 x 40 cm Lanta Dissar Lanta 1 380 cm 0 61 M. Concrete-Square Column H4 40 x 40 cm Lanta Dissar Lanta 1 380 cm 0 61 M. Concrete-Square Column H4 40 x 40 cm Lanta Dissar Lanta 1 380 cm 0 61 M. Concrete-Square Column H4 40 x 40 cm Lanta Dissar Lanta 1 380 cm 0 61 M. Concrete-Square Column H4 55 x 55 cm Lanta Dissar Lanta 1 380 cm 1 15 M. Concrete-Square Column H1 55 x 55 cm Lanta Dissar Lanta 1 380 cm 1 15 M. Concrete-Square Column H1 55 x 55 cm Lanta Dissar Lanta 1 380 cm 1 15 M. Concrete-Square Column H1 55 x 55 cm Lanta Dissar Lanta 1 380 cm 1 15 M. Concrete-Square Column H1 55 x 55 cm Lanta Dissar Lanta 1 380 cm 1 15 M. Concrete-Square Column H1 55 x 55 cm Lanta Dissar Lanta 1 380 cm 1 15 M. Concrete-Square Column H1 55 x 55 cm Lanta Dissar Lanta 1 380 cm 1 15 M. Concrete-Square Column H1 55 x 55 cm Lanta Dissar Lanta 1 380 cm 1 15 M. Concrete-Square Column H2 55 x 55 cm Lanta Dissar Lanta 1 380 cm 1 15 M. Concrete-Square Column H2 55 x 55 cm Lanta Dissar Lanta 1 380 cm 1 15 M. Concrete-Square Column H2 55 x 55 cm Lanta Dissar Lanta 1 380 cm 1 15 M. Concrete-Square Column H2 55 x 55 cm Lanta Dissar Lanta 1 380 cm 1 15 M. Concrete-Square Column H2 55 x 55 cm Lanta Dissar Lanta 1 380 cm 1 15 M. Concrete-Square Column H2 55 x 55 cm Lanta Dissar Lanta 1 380 cm 1 15 M. Concrete-Square Column H2 55 x 55 cm Lanta Dissar Lanta 1 380 cm 1 15 M. Concrete-Square Column H2 55 x 55 cm Lanta Dissar Lanta 1 380 cm 1 15 M. Concrete-Square Column H2 55 x 55 cm Lanta Dissar Lanta 1 380 cm 1 15 M. Concrete-Square Column H2 55 x 55 cm Lanta D	4,569,719	3,342,74									
M. Concrete/-Square-Column K4 40 x 40 cm Luntex Dessar Luntex 1 380 cm 0.011 M. Concrete/-Square-Column K4 40 x 40 cm Luntex Dessar Luntex 1 380 cm 0.011 M. Concrete/-Square-Column K4 40 x 40 cm Luntex Dessar Lantex 1 380 cm 0.011 M. Concrete/-Square-Column K4 40 x 40 cm Luntex Dessar Lantex 1 380 cm 0.011 M. Concrete/-Square-Column K4 40 x 40 cm Lantex Dessar Lantex 1 380 cm 0.011 M. Concrete/-Square-Column K4 40 x 40 cm Lantex Dessar Lantex 1 380 cm 0.611 M. Concrete/-Square-Column K4 40 x 40 cm Lantex Dessar Lantex 1 380 cm 0.611 M. Concrete/-Square-Column (K1) 55 x 55 cm Lantex Dessar Lantex 1 380 cm 1155 M. Concrete/-Square-Column (K1) 55 x 55 cm Lantex Dessar Lantex 1 380 cm 1155 M. Concrete/-Square-Column (K1) 55 x 55 cm Lantex Dessar Lantex 1 380 cm 1155 M. Concrete/-Square-Column (K2)	4,509,719	3,342.74									
M. Concents-Spaare Column K4 40 x 40 cm. Lanta Dissar Lanta 1 380 cm. 0.81 / M. Concetts-Spaare Column K4 40 x 40 cm. Lanta Dissar Lanta 1 380 cm. 0.81 / M. Concents-Spaare Column K4 40 x 40 cm. Lanta Dissar Lanta 1 380 cm. 0.81 / M. Concetts-Spaare Column K4 40 x 40 cm. Lanta Dissar Lanta 1 380 cm. 0.81 / M. Concetts-Spaare Column K4 40 x 40 cm. Lanta Dissar Lanta 1 380 cm. 0.81 / M. Concetts-Spaare Column K4 40 x 40 cm. Lanta Dissar Lanta 1 380 cm. 0.81 / M. Concetts-Spaare Column K4 40 x 40 cm. Lanta Dissar Lanta 1 380 cm. 0.81 / M. Concetts-Spaare Column K4 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K1) 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K1) 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K1) 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K1) 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K1) 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K1) 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K1) 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K2) 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K2) 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K2) 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K2) 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K2) 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K2) 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K2) 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K2) 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K2) 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K2) 55 x 55 cm. Lanta Dissar Lanta 1 380 cm. 1 15 / M. Concetts-Spaare Column (K2) 55 x 55 cm. Lanta Dissar Lanta	4.643,411	2,623.19									
M_Concrete/-Square-Column K4 40 x 40 cm Lantia Dasar Lantia 1 360 cm 0.611 M_Concrete/-Square-Column K4 40 x 40 cm Lantia Dasar Lantia 1 380 cm 0.611 M_Concrete/-Square-Column K4 40 x 40 cm Lantia Dasar Lantia 1 380 cm 0.611 M_Concrete/-Square-Column K1 40 x 40 cm Lantia Dasar Lantia 1 380 cm 0.611 M_Concrete/-Square-Column (K1) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.151 M_Concrete/-Square-Column (K1) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.151 M_Concrete/-Square-Column (K1) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.151 M_Concrete/-Square-Column (K1) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.151 M_Concrete/-Square-Column (K1) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.151 M_Concrete/-Square-Column (K1) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.151 M_Concrete/-Square-Column (K1) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.151 M_Concrete/-Square-Column (K1) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.151 M_Concrete/-Square-Column (K2) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.151 M_Concrete/-Square-Column (K2) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.155 M_Concrete/-Square-Column (K2) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.155 M_Concrete/-Square-Column (K2) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.155 M_Concrete/-Square-Column (K2) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.155 M_Concrete/-Square-Column (K2) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.155 M_Concrete/-Square-Column (K2) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.155 M_Concrete/-Square-Column (K2) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.155 M_Concrete/-Square-Column (K2) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.155 M_Concrete/-Square-Column (K2) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.155 M_Concrete/-Square-Column (K2) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.155 M_Concrete/-Square-Column (K2) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.155 M_Concrete/-Square-Column (K2) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.155 M_Concrete/-Square-Column (K2) 55 x 55 cm Lantia Dasar Lantia 1 380 cm 1.155 M_Concrete/-Square-Column	P 4,643,411	2,823,15									
M. Concente-Square-Column K4 40 x 40 cm. Lainta Dasar Lanta 1 380 cm. 0.61. M. Concente-Square Column K4 40 x 40 cm. Lainta Dasar Lanta 1 380 cm. 0.61. M. Concente-Square Column K4 40 x 40 cm. Lainta Dasar Lainta 1 380 cm. 0.61. M. Concente-Square Column K1 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K1) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K1) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K1) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K1) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K1) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K1) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K1) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K1) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K2) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K2) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K2) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K2) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K2) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K2) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K2) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K2) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K2) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K2) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K2) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K2) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K2) 55 x 55 cm. Lainta Dasar Lainta 1 380 cm. 1.55. M. Concente-Square Column (K2) 55 x 55 cm. Lainta Dasar	4,643,411	2,823,19									
M_Concrete-Square-Column K4 40 x 40 cm Lantar Dasar Lantar 1 380 cm 0.61 M_Concrete-Square-Column K4 40 x 40 cm Lantar Dasar Lantar 1 380 cm 0.61 M_Concrete-Square-Column (K1) 55 x 55 cm Lantar Dasar Lantar 1 380 cm 0.61 M_Concrete-Square-Column (K1) 55 x 55 cm Lantar Dasar Lantar 1 380 cm 1.15 M_Concrete-Square-Column (K1) 55 x 55 cm Lantar Dasar Lantar 1 380 cm 1.15 M_Concrete-Square-Column (K1) 55 x 55 cm Lantar Dasar Lantar 1 380 cm 1.15 M_Concrete-Square-Column (K1) 55 x 55 cm Lantar Dasar Lantar 1 380 cm 1.15 M_Concrete-Square-Column (K1) 55 x 55 cm Lantar Dasar Lantar 1 380 cm 1.15 M_Concrete-Square-Column (K2) 55 x 55 cm Lantar Dasar Lantar 1 380 cm 1.15 M_Concrete-Square-Column (K2) 55 x 55 cm Lantar Dasar Lantar 1 380 cm 1.15 M_Concrete-Square-Column (K2) 55 x 55 cm	4.643.411	2,823,19									
M. Concrete-Square-Column K4 40 x 40 cm. Lunta Dasar Lanta 1 380 cm. 0.01. M. Concrete-Square-Column (x1) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x1) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x1) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x1) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x1) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x1) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x1) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. Lanta Dasar Lanta 1 380 cm. 115: M. Concrete-Square-Column (x2) 55 x 55 cm. La	P 4,643,411	2,823,19									
M. Concrete-Square-Column (K1) 55 x 55 cm Lunta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K1) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K1) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K1) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K1) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K1) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K1) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 55 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lanta: Desar Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lanta: 1 380 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm La	P 4,643,411	2,823,19									
M_Concrete-Square-Column (K1) 55 x 55 cm Luntai Dissar Lantai 1 380 cm 1 151 M_Concrete-Square-Column (K1) 55 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K1) 55 x 55 cm Luntai Dissar Lantai 1 380 cm 1 151 M_Concrete-Square-Column (K1) 55 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K1) 55 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 55 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 55 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 55 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 55 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 55 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 55 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 55 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 55 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 55 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 55 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 55 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 56 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 56 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 56 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 56 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 56 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 56 x 55 cm Luntai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 56 x 55 cm Lantai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 56 x 55 cm Lantai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 56 x 55 cm Lantai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-Column (K2) 56 x 55 cm Lantai Dissar Lantai 1 380 cm 1 155 M_Concrete-Square-	9 5,718,361	0.573.25									
M. Concrete-Square-Column (K1) 55 x 55 cm Luntei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K1) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K1) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantei Dissar Lantei 1 380 cm	P 5,718,361	6.573,25									
M. Concrete-Square-Column (K1) 55 x 55 cm Lanta Dasar Lanta 1 300 cm 1 15 1 M. Concrete-Square Column (K1) 55 x 55 cm Lanta Dasar Lanta 1 300 cm 1 15 1 M. Concrete-Square Column (K1) 55 x 55 cm Lanta Dasar Lanta 1 380 cm 1 15 1 M. Concrete-Square Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 380 cm 1 15 1 M. Concrete-Square Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 380 cm 1 15 1 M. Concrete-Square Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 380 cm 1 15 1 M. Concrete-Square Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 380 cm 1 15 1 M. Concrete-Square Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 380 cm 1 15 1 M. Concrete-Square Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 380 cm 1 15 1 M. Concrete-Square Column (K2) 56 x 55 cm Lanta Dasar Lanta 1 380 cm 1 15 1	P 5,718,301	6,573,25									
M. Concrete-Square-Column (K1) 55 x 55 cm Lanta Dasar Lanta 1 300 cm 1 155 M. Concrete-Square-Column (K1) 55 x 55 cm Lanta Dasar Lanta 1 300 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm Lanta 1 360 cm 1 155 M. Concrete-Square-Column (K2) 55 x 55 cm 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	P 5,718,361	0.573.25									
M_Concrete/-Square-Column (K1) 55 x 55 cm Luntar Dasar Lantar 1 380 cm 1 157. M_Concrete-Square-Column (K2) 55 x 55 cm Lantar Dasar Lantar 1 380 cm 1 157. M_Concrete-Square-Column (K2) 55 x 55 cm Lantar Dasar Lantar 1 380 cm 1 157. M_Concrete-Square-Column (K2) 55 x 55 cm Lantar Dasar Lantar 1 380 cm 1 157. M_Concrete-Square-Column (K2) 55 x 55 cm Lantar Dasar Lantar 1 380 cm 1 157. M_Concrete-Square-Column (K2) 55 x 55 cm Lantar Dasar Lantar 1 380 cm 1 157. M_Concrete-Square-Column (K2) 55 x 55 cm Lantar Dasar Lantar 1 380 cm 1 157.	P 5.718.361	0.573,25									
M. Concrete-Gourse-Colume (K2) 55 x 55 cm Lantas Dasar Lantas 1 350 cm 1 15 M. Concrete-Square-Column (K2) 55 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 55 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 55 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 55 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm Lantas Dasar Lantas 1 360 cm 1 15 / M. Concrete-Square-Column (K2) 56 x 55 cm 1 / M. Concrete-Square-Column (K2) 5	P 5,718,301	6,573,25									
M_Concrete-Square-Column (K2) 55 x 55 cm Lanta/ Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 360 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm Lanta Dasar Lanta 1 36 cm 1 15 M_Concrete-Square-Column (K2) 55 x 55 cm 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	P 4,760,771	5,472,50									
M_Concretel-Square-Column (K2) 55 x 55 cm Lantai Dasar Lantai 1 360 cm 1 15 x J. Concretel-Square-Column (K2) 55 x 55 cm Lantai Dasar Lantai 1 360 cm 1 15 x J. Concretel-Square-Column (K2) 5 x 55 cm Lantai Dasar Lantai 1 360 cm 1 15 x J. Concretel-Square-Column (K2) 5 x 55 cm Lantai Dasar Lantai 1 360 cm 1 15 x J. Concretel-Square-Column (K2) 5 x 55 cm Lantai Dasar Lantai 1 360 cm 1 15 x J. Concretel-Square-Column (K2) 5 x 55 cm Lantai Dasar Lantai 1 360 cm 1 15 x J. Concretel-Square-Column (K2) 5 x 55 cm Lantai Dasar Lantai 1 360 cm 1 15 x J. Concretel-Square-Column (K2) 5 x 55 cm Lantai Dasar Lantai 1 360 cm 1 15 x J. Concretel-Square-Column (K2) 5 x 55 cm Lantai Dasar Lantai 1 360 cm 1 15 x J. Concretel-Square-Column (K2) 5 x 55 cm Lantai Dasar Lantai 1 360 cm 1 15 x J. Concretel-Square-Column (K2) 5 x 55 cm Lantai Dasar Lantai 1 360 cm 1 15 x J. Concretel-Square-Column (K2) 5 x 55 cm Lantai Dasar Lantai 1 360 cm 1 15 x J. Concretel-Square-Column (K2) 5 x 55 cm Lantai Dasar Lantai 1 360 cm 1 15 x J. Concretel-Square-Column (K2) 5 x 55 cm Lantai Dasar Lantai 1 360 cm 1 15 x J. Concretel-Square-Column (K2) 5 x 55 cm Lantai Dasar Lantai 1 360 cm 1 15 x J. Concretel-Square-Column (K2) 5 x 55 cm 1 x	P 4,760,771	5,672.50									
A_Concrete-Square-Column (K2) 55 x 55 cm Lantai Datar Lantai 1 360 cm 1.15 A_Concrete-Square-Column (K2) 55 x 55 cm Lantai Datar Lantai 1 360 cm 1.15	P 4,760,771	5,472,50									
4 Consists Schutz (Chemin (C)) 85 x 55 cm Lasta Danar Lasta 1 383 cm 1 15	4,760,771	5,472,50									
Lanar Dinar 1991 1992 1992	4,760,771	5,472,50									
M_Concrete-Square-Column (K2) 55 x 55 cm Lantai Desar Lantai 1 380 cm 1.157	4,760,771	5,472.50									

Figure 11.Column Structure Schedules Display

25 | Comparative Analysis of Cost Budget Plan Calculations Using Building Information Modeling (BIM) and Conventional Methods on The BRI Bank Building Construction Project in Medan

Figure 11 displays the column structure schedule resulting from Autodesk Revit modeling. This schedule contains the item name, volume, size, cost, and total cost.

3.3. Beam Structure

1) Beam Plan



Figure 12. Beam Plan

Figure 12 shows the modeling of the beam structure plan for the BRI Bank Building construction project using Autodesk Revit.

2) 3D Modeling of Beam Structures

Next, 3D modeling of the beam structure is carried out according to the points determined on the structural plan.



Figure 13. 3D Modeling of Beam Structures

Figure 13 shows the overall beam structure starting from the ground floor to the roof floor.

3) Details of Reinforcement and Cutting of Beam Structures

The following is a detailed view of the reinforcement and cuts in one type of beam.



Figure 14. Reinforcement of G1 Beam Structure

Figure 14 modeling of G1 beam structural reinforcement. In the process of modeling reinforcement in beam structures, field reinforcement and support reinforcement must be taken into account. So that there are no mistakes in reinforcing the beam structure.



Figure 15. G1 Beam Structure Section (a) Support Reinforcement (b) Field Reinforcement

Figure 15 shows a section of beam G1 and the reinforcement in the beam.

4) Schedules Beam Structures

Display schedules on the completed beam structure.

²⁷ Comparative Analysis of Cost Budget Plan Calculations Using Building Information Modeling (BIM) and Conventional Methods on The BRI Bank Building Construction Project in Medan

Sar 20 Keesharuhan Balok - Kolum 🖓	115 Kower CK, Diana	4. 5.7 30 LL 1	197	343 8.41.2	5-7 3D Lt. 3	GF 3D LE 3 CT		
	~Sche	dule Structural I	Balok-					
A	. 65	c	0					
Pamily	-Cyase	Reference Level	1. Hogth	Volume	Cost	Jumlah		
M. Conternate Residentialer Reserve The Reserve RA	16 - 40	Landard Channel	277	0.11 m ²	4 100 1070	444 200		
Concepts Rectangular Plaam Tie Plaam Ph	10 at 40 and	Latertal Chroner	277	0.11 m²	4 196 979	444 200		
A Contrata Bactannular Plaam Tis Plaam PA	16 x 40 cm	A peritori Discour	150.000	0.05 cm ²	4 356 575	234 173		
Goncrete-Rectangular Beam Tie Beam B7	15 x 50 cm	Lantai Danar	73 cm	0.05 m ²	4,160,246	101 367		
& Concrete-Rectangular Beam, Tie Beam 67	16 x 58 cm	Lantai Dasar	156 cm	0.09 m ⁴	4,168,246	588.261		
A Concrete Rectangular Beam. Tie Beam 67	15 x 50 cm	Lantal Owner	176 cm	0 13 m ⁴	4.168.246	558.401		
d_Concrete-Rectangular Beam Tie Beam B7	15 x 59 cm	Lantai Dasar	53 cm	0.03 m ²	4.160.246	120.205		
M_Concrete-Rectangular Deam Tie Deam 07	16 x 50 cm	Lantai Oanar	64 cm	0.04 m ⁴	4,160,246	169.244		
d_Concrete-Rectangular Deam. Tie Beam 07	15 x 50 cm	Lantai Danar	166 5 100	0.10.m*	4,100.246	429.466		
A_Concrete-Rectangular Beam. Tie Beam 87	15 s 50 cm	Lantai Danar	120 em	0.11 m*	4,160,246	499.823		
#_Concrete-Restangular Beam. Tie Beam 84	20 s 40 cm	Lantas Chanar	32936 0.075	43.2218 +114	3,822,886	1,028,703		
M_Concrete Restangular Beam. The Beam Bd	20 a 40 am	Lanta: Dasar	36d sm	63 526 em ^a	3,822,366	901.877		
A_Concrete Plantangular Beam Tie Beam B4	20 a 40 em	Laniai Desar	268 ores	0.13 m ²	3,822,966	488,693		
Concrete Nectorgular Beam. Tie Beam 84	20 m 40 arm	6. atribati Elarumi	283 800	O OB 111*	3,622,968	2811,133		
&_Concrate Plactangular Baam. Tie Baam B4	20 × 40 cm	Larrist Coust	268 em	(0, 13 etc ²)	3,622,966	463,761		
M_Concrete-Rectangular Beam. Tie Beam 84	20 × 40 cm	Lantai Danar	258 cm	0.13 m ²	3,622,966	453.757		
M_Concrete-Rectangular Beam. Tie Beam 84	20 x 40 cm	Lantai Owear	258 cm	0.13 m²	3.622.956	453,757		
M_Concrete-Rectangular Beam. Tie Beam B4	20 x 40 cm	Lantai Oazai	258 cm	0.13 m ^a	3.622.986	453,757		
M_Concrete-Rectangular Deam. Tie Beam D3	25 x 40 cm	Lantai Dasar	258.cm	0.16 m ⁴	3,512,364	565,465		
M_Concrete-Rectangular Deam Tie Deam D1	25 x 50 cm	Lantai Dasar	800.cm	0.96 m ^a	3,246.043	3,124,316		
M_Concrete-Rectangular Deam. Tie Deam D1	25 x 50 cm	Lantai Diesar	600 cm	0.73 m ^a	3,246.043	2,374,400		
M_Concrete Rectangular Beam. Tie Beam B1	25 x 50 cm	Lantai Dasai	000 cm	0.5% 0.5	3,246,042	3.128,316		
Concrete Rectangular Beam. Tre Beam B1	30 x 50 cm	Lantai Danar	800 cm	D.68 m [*]	3,244,043	2 143,200		
Concrete Rectangular Beam The Bleam 81	26 x 50 cm	Lantas Danar	. 900 em	0.73 m*	3,246,043	2,374,490		
A_Conside Restangular Beam. Tie Beam P02	30 a 60 am	Lantai Dasar	295 sm	0.44 m*	3,646,200	1,648,791		
A_Concrete Restangular Beam. Tie Beam PG2	30 to 50 ares	6. serekaar Clammaar	29H. em	0.44 m*	3,846,200	1,848,761		
Concrete Plectangular Beam. Tie Beam FG2	30 0 50 0100	Lairreat Classar	295.011	0.44 m²	3,545,200	1,688,761		
A Contrate-Rectangular Beam: Tie Beam FG2	30 4 50 1111	Lantai Desar	201 em	0.44 711	3,645,200	1.568.791		
d_Concrete-Rectangular Beam Tie Beam PG2	30 x 50 cm	Lantai Dasar	378 em	0.63 m ⁴	3.545.200	1,687,815		
Concrete-Rectangular Beam. Tie Beam FG2	30 A 50 CH1	Luntai Dasar	300 cm	0.53 mm	3.545.200	1,007.019		
Concrete-Rectangular Deam. Tie Deam FG2	30 x 50 cm	Lantal Deser	315 cm	0.47 m*	3.545.200	1.675.107		
Concrete Rectangular Deam. Tie Deam FG2	30 x 50 cm	Cantal Country	315-CM	10.47 mm	3.545.200	1.676.107		
A Concepto Proclampidar Board, Tis Board PG2	30 = 60 ===	Larrian Chanar	270 800	0.44.00	3 5 4 5 300	1.436.806		
a Concrete Restancear Pears, Date 179	202 10 1022 0000	A section Changes	40.000	0.00.00*	3 886 856	265 607		
Concrete Rectangular Beach Batch OB	30 × 50 +	Lordon Change	58 0.00	11 4111 1117	37. millio. 1710-04	337, 184		
Concrete Restangular Beam. Tie Beam FG1	30 s 70 sets	Lardat Datar	870 am	*ees # & #	3,646,200	10.0434,5244		
d_Concrete Rectargeter Beam Tie Beam PG1	30 a FO em	Larrise Genuse	670 mm	9.4.9 mil	3,646,2600	4,960,008		
M. Concrete Rectangislar Beam. Tie Beam FG1	20 × 20 cm	Laritai Conse	689-cm	7 + 9 702	3,545.990	5,052,540		
A Concrete Reclanguar Beam Tie Beam FOT	30 × 70 cm	Lardar Danar	- 620 - cm	1.30 m²	3.548.300	4.910.000		
A Conceste flucturentar flucare Tie Buare FG1	30 x 70 cm	Landar Danar	620 cm	3 30 107	3 545 200	4 6 10 8 8 9		
A Concrete Rectangular Beam, Tie Beam FG1	30 x 70 cm	Luctoi Ono av	620 cm	1.30 m?	3,546,200	4.615.050		
d Concrete Rectangular Meam. Tie Beam P121	30 x.70 days	Lierytian Chiestale	800 cm	19.3818 4447	3.54% 289	-8-611 D. MID-D		
A_Concrete Reclargular Ream Tie Beam PCI1	380 m 70 sizes	Larvier Danas	al20 arm	3.30 m ²	3,845,200	3.810.850		
A Concrete Restangular Beam. Tie Ream PG1	no a ro am	Lantas Daisar	620 am	3.30 m/	3 646 200	4 816 850		
A Concrete Hectanguar Deam, Tie Beam FG1	00 x 70 cm	Lactine Consider	6320 1771	3,00 /07	3.545.200	4 6 15 650		
A Concrete Restangelar Deam. The Deam FG1	30 × 70 vm	Lorder Dener	BOD orn	3 312 1007	3.545.200	4.610.850		
A Concerns Partarigular Bears. The Bears POT	363 m FQ com	Larmai Canar	10270	8.786 eres	B. B. A.K. DOD	4.835.851		
A Concrete Rectangular Beam Tie Beam FG1	50 x 20 cm	Larstai Danar	630 cm	4.24 m²	3.545.200	4.636.962		
Concrete Rectangular Beam. The Beam FD1	39 × 79 cm	Larita Cidoar	81255 C/m	9.30.00*	3.5-45.200	4.615.050		
Concrete Restangular Meann Tin Beam FCI1	30 A TO SH	Lorder Danae	HERD STATE	3 4 3 100	3.54% 200	N-D402.8-88		
A Concepto Destance for Dears The Dears FG1	30 0 70 876	Lardar Charger	560 078	1 4 3 494	3 646 200	6.062.644		
A Concrete Rectangeter Deam Tie Deam FOI	303 x 713 com	Lincolnic Changes	4120 cm	1 1 1 10	3 545 200	6,104,034		
d Cuncrete Rectangular Beam. Tie Beam FCD	30 × 70 cm	Levia Dener	820 6.00	3.72. 117	3.545.200	4.104.834		
al Consenta Rasslargadar Bears: Tia Bears FG1	Old as TO serve	Larrisi Danas	820	3.72 ees*	19 N.A.H. 2704D	10, 1014, 1014		
d Concrete Rectangular Beam Tie Beam FG4	30 v 70 cm	Larital Danar	280 2111	9.47 100	3.545.000	6,011,444		
M_Concore-Hectangaler Deam. The Deam PG4	20 X 20 CW	Lavitai Danar	780 cm	3 4 7 107	.0,545,200	5.211.444		

Figure 16. Beam Structure Schedules Display

Figure 16 displays the beam structure schedule resulting from Autodesk Revit modeling. This schedule contains the item name, volume, size, cost, and total cost.

3.4. Floor Plate Structure

1) Floor Plate Plan

The floor plate structure itself has a thickness of 12 cm.



Figure 17. Floor Plate Plan

Figure 17 shows the modeling of the floor plate structure plan for the BRI Bank Building construction project using Autodesk Revit.

2) 3D Modeling of Floor Plate Structures

Next, 3D modeling of the floor plate structure is carried out according to the points determined on the structural plan.



Figure 18. 3D Modeling of Floor Plate Structures

Figure 18 shows the 3D modeling of the floor plate structure, then the 3D modeling results are checked again so that the modeling really matches the planning results made by the consultant.

3) Floor Plate Reinforcement Details

The reinforcement in this floor plate is in accordance with the planned reinforcement.



Figure 19. Reinforcement of Floor Plate Structures

Figure 19 modeling of the floor plate structure. The process of modeling reinforcement in beam structures must pay attention to dimensions because this will have an impact on the costs incurred.

4) Schedules Floor Plate Structure

Display schedules on the finished floor plate and modeled via Autodesk Revit.

²⁹ Comparative Analysis of Cost Budget Plan Calculations Using Building Information Modeling (BIM) and Conventional Methods on The BRI Bank Building Construction Project in Medan

🕤 3D Keseluruhan B	lalok - Kolom	3D Kolom Lt. D	asar 💮 30	1L1 @	3D Lt. 2	🕞 3D Lt. 3	🗔 Sch
			<schedule< th=""><th>Floor></th><th></th><th></th><th></th></schedule<>	Floor>			
A	В	C	D	E	F	G	н
Family and Type	Level	Area	Function	Structural Material	Volume	Cost	Jumlah
Floor: Generic 120mm	Lantai Dasar	638 m#	Interior	K250	64.53 m*	4.006,572	258,551,687
Lantai Dasar: 1			-	24 - XX	64.53 m ^a		258,551,687
Floor: Generic 120mm	Lantai 1	472 m²	Interior	K250	56.65 m*	4,006,572	226,988,430
Floor: Generic 200mm	Lantai 1	25 m²	Interior	K250	5.09 m ^a	4,591,346	23,346,994
Lantai 1.2					61.74 m ⁴		250,335,425
Floor: Generic 120mm	Lantai 2	425 m ^a	Interior	K250	50.98 m*	4,006,572	204,254,796
Floor: Generic 200mm	Lantai 2	25 m²	Interior	K250	5.09 m*	4,591,346	23,346,994
Lantai 2-2					56.06 m ^a		227.601.791
Floor: Generic 120mm	Lantai 3	451 m ^a	Interior	K250	54.16 m*	4,006,572	217,008,917
Lantai 3: 1					54.16 m ^a		217,008,917
Floor: Generic 120mm	Dak Atap	221 m [±]	Interior	K250	26.50 m ⁴	4,006,572	106,177,964
Dak Atap: 1					26.50 m*		106, 177, 964
Grand total: 7					263.00 m ^a		1,059,675,783

Figure 20. Display Schedules for Floor Plate Structure

Figure 20 displays the plate structure schedules resulting from Autodesk Revit modeling. This schedule contains the item name, volume, size, cost, and total cost.

3.5. Stair Structure

1) Stair Structure Plan

Stair structure modeling in Autodesk Revit, stairs are not included in the structural tools but are included in the architectural tools.



Figure 21. Stair Structure Plan

Figure 21 shows the modeling of the stair structure plan for the BRI Bank Building construction project using Autodesk Revit.

2) 3D Modeling of Stair Structures

Next, 3D modeling of the stair structure is carried out according to the points determined on the structural plan.



Figure 22. 3D Modeling of Stair Structures

Figure 22 shows the 3D modeling of the stair structure, then the results of the 3D modeling are checked again so that the modeling really matches the results of the plans made by the consultant.

3) Reinforcement of Stair Structures

The process of reinforcing the stair structure must be made yourself because there are some reinforcements that are not provided in the Autodesk Revit libraries. Therefore, the modeling of the stair structure must be depicted directly.



Figure 23. Reinforcement of Stair Structures

Figure 23 shows the 3D modeling of the stair structure reinforcement, then the 3D modeling was checked again so that the modeling really complies with the planning results made by the consultant.

4) Schedules Stair Structure

Following are the results of the completed staircase structure modeling which are then displayed in the form of schedules in Autodesk Revit.

³¹ Comparative Analysis of Cost Budget Plan Calculations Using Building Information Modeling (BIM) and Conventional Methods on The BRI Bank Building Construction Project in Medan

😡 30 Kolom U	t. Dasiar 🛛 🤇) ID LL 1	Q 3D	11.2	0 10 LL 3	ų.	5	checkule S	tructural Col	unn I	🗌 Schedule Str	uctural Balck	E Sched	ule Roor	Stair Sc
						<st< th=""><th>air Sch</th><th>edule></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></st<>	air Sch	edule>							
A	В	c	D	E	F	G	н	L.	- J	ж	L	N	N	0	p
Family	Base Level	TopLevel	Total Anak Tangga	T. Anak Tangga I	L. Azək Tangga	L. Tangga	P. Bordes	L Bordes	Tehai Bordes	Vol. Ecodes	Vol. Plat Tangga	Vol. Anak Tangga	Volume Total	Cost.	Jumlah Harga
Cast-In-Place Stair	r Lantai Deser	Lartai 1	22	17.3 cm	30 cm	115 cm	150 cm	240 cm	30 cm	1.08 m ⁴	0.62 m²	1.65 m²	2.36 m²	4,538,403	12.699.444
Cast-In-Place Stair	Lantai Dasar	Lantai 1	22	17.3 cm	30 cm	115 cm	150 cm	240 cm	30 cm	1.08 m ⁴	0.62 m*	1.66 m ²	2.36 m ⁴	4,538,403	10,699,444
Lantai Dasar 2		9	2			9	<u>9</u> 3			2	3 3		4.72 m ²		21,398,888
Cast-In-Place Star	Latta 1	Lavtai 2	22	17.3.cm	30 cm	115 cm	150 cm	240 cm	30 cm	1.03 m ⁸	0.62 m²	0.65 m ⁴	2.36 m ⁴	4,538,403	10,699,444
Cast-In-Place Star	Larta 1	Lantai 2	77	17.3 cm	30 cm	115 cm	150 cm	240 cm	30 cm	1.08 m ²	0.62 m ⁴	8.66 m ⁴	2.36 m ³	4,538,403	10.699.444
Larta 1:2													472 m		21,316,888
Cast-In-Place Stair	Lantai 2	Lantai 3	22	17.3 cm	30 cm	115 cm	150 cm	240 cm	30 cm	1.08 m ⁴	0.62 #	1.66 m ³	2.36 m ⁴	4,538,403	11.699.444
Cast-In-Place Star	Lantai 2	Lartai 3	22	17.3 cm	30 cm	115 cm	150 cm	240 cm	30 cm	1.08 m ⁴	0.62 m²	0.66 m [#]	2.36 m ⁴	4,538,403	10,699,444
Larta 2.2			ii.				100 a an						4.72 m ²		21,398,888
Cast-In-Place Stair	Lantai 3	Dak Atap	22	17.3 cm	30 cm	115 cm	150 cm	240 cm	30 cm	1.08 m²	0.62 m ^a	1.66 at	2.36 m ⁴	4,538,403	10,699,444
Lantai 3, 1 Grand total: 7							1.0000000	1990		10000			2.36 m ⁴ 16 50 m ⁴		10,599,444 74,895,107

Figure 24. Stair Structure Schedules Display

Figure 24 displays the ladder structure schedule resulting from Autodesk Revit modeling. This schedule contains the item name, volume, size, cost, and total cost.

3.6. Whole Structure Modeling

The following is the modeling of the entire structure that has been completed using Autodesk Revit.



Figure 25. 3D Modeling of Entire Structure

Figure 25 shows the 3D modeling the entire structure that has been completed is carried out via Autodesk Revit, then the completed 3D modeling is checked again so that the modeling really matches the planning results made by the consultant.

3.7. Cost and Volume Budget Using Autodesk Revit

The following are the results of evaluating budget plan calculations for structural work by calculating volume and costs, as can be seen in Table. 1 and Table. 2 below.

Structure	Volume (m ³)						
Structure	Revit	BoQ Consultant					
Bore Pile	832 m	832 m					
Pile Cap	47.58	46.14					
Column	82.93	87.02					
Beam	300.30	345.44					
Platform	263.00	295.45					
Ladder	16.50	18.06					

Table 1. Volume Structure Using Autodesk Revit

Table 1 shows the differences in structural volume calculations using *Autodesk Revit* smaller, namely 16.50 m3 when compared to the consultant's calculation, namely 18.06 m³. *Autodesk Revit* has advantages in the volume calculation process, namely a very short time and faster than conventional. Because when modeling is created, the volume of the modeling will automatically be calculated. If there is a change in size or dimensions in the modeling, then you only need to change the elements according to the changes, then the volume will automatically change.

Structure	Cost Budget (Rp)					
Structure —	Revit	Consultant				
Bore Pile	119,491,840	119,491,840				
Pile Cap	112,043,682	108.774.911				
Column	416,682,155	437,705,937				
Beam	1,193,817,594	1,351,732,370				
Platform	1,059,675,783	1,190,805,539				
Ladder	74,896,107	81,963,560				
Grand Total	2,976,607,161	3,290,474,157				

Table 2. Budget Cost Structure Using Autodesk Revit

Table 2 shows that the cost budget plan calculation occurred in optimization due to differences due to differences in structural volume calculations using Autodesk Revit, which is equal to Rp. 2,976,607,161,-while the total costs previously calculated by the planning consultant using conventional methods were Rp. 3,280,583,049,-.

Using Autodesk Revit can also minimize the occurrence of errors due to data input errors. However, Autodesk Revit also has weaknesses that need to be considered, such as the ability to use the application when modeling and requiring qualified technological devices. At the time of modeling, you also have to really pay attention, that is, the model must really match the plans that have been made previously so that there are no differences in terms of structure, dimensions and volume.

4. CONCLUSION

Based on the results of the cost budget plan comparative analysis for the structural work for the construction of the BRI Bank Building on Jl. Sisingamangaraja No. 241 Gg. Indrajid Kel. Sudirejo-II District. Medan City, it can be concluded that the RAB calculation using Autodesk Revit results in a total cost of Rp. 2,976,607,161,- while the total costs previously calculated by the planning consultant using conventional methods were Rp. 3,280,583,049,- Evaluation carried out using Autodesk Revit can optimize costs that are 9.27% smaller than the total costs calculated conventionally.

³³ Comparative Analysis of Cost Budget Plan Calculations Using Building Information Modeling (BIM) and Conventional Methods on The BRI Bank Building Construction Project in Medan

5. ACKNOWLEDGMENTS

On this occasion, we would like to thank BRI and planning consultants for the opportunity to access this research data.

6. REFERENCES

Abdi, M. Z. (2017). Revit untuk desain bangunan. Bandung: Modular.

- Berlian, C. A., Adhi, R. P., Hidayat, A., & Nugroho, H. (2016). Perbandingan efisiensi waktu, biaya dan sumber daya manusia antara metode Building Information Modeling (BIM) dan konvensional (Studi Kasus: Perencanaan Gedung 20 Lantai). Jurnal Karya Teknik Sipil, 5(2), 220–229.
- Eastman, C. (2008). BIM handbook: A guide to building information modeling for owners, managers, designers, engineers and contractors (1st ed.). Hoboken, NJ: John Wiley.
- Juansyah, Y., Hamidah, N., Utomo, Y. I., & Lubis, A. 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), 1-5.
- Kementerian Pekerjaan Umum dan Perumahan Rakyat. (2016). Peraturan Menteri Pekerjaan Umum dan Perumahan Rakyat Nomor 28 Tahun 2016 tentang Analisis Harga Satuan Pekerjaan Bidang Pekerjaan Umum. Bagian 4 Bidang Cipta Karya. Jakarta: JDIH Kementerian PUPR.
- Kementerian Pekerjaan Umum dan Perumahan Rakyat. (2018). Peraturan Menteri Pekerjaan Umum dan Perumahan Rakyat Nomor 22 Tahun 2018 tentang Pembangunan Gedung Negara. Jakarta: JDIH Kementerian PUPR.
- Laorent, D. (2019). Analisa quantity take-off dengan menggunakan Autodesk Revit. *Dimensi Utama Teknik Sipil*, 6(1), 1-8.
- Li, H., Guo, H., Skitmore, M., & Huang, T. (2014). Research and application of Building Information Modeling (BIM) in the architecture, engineering and construction (AEC) industry: A review and directions for future research. *Automation in Construction*, 31, 64-77.
- Marizan, Y. (2019). Studi literatur tentang penggunaan software Autodesk Revit (Studi Kasus Perencanaan Puskesmas Sukajadi Kota Prabumulih). *Jurnal Ilmiah Beering's*, 6(1), 15-26.
- Migilinskas, D., Popov, V., Juocevicius, V., & Ustinovichius, L. (2013). The benefits, obstacles and problems of practical BIM implementation. *Procedia Engineering*, 57, 767-774.
- Nugroho, A. (2009). Perancangan aplikasi rencana anggaran biaya. Jurnal Informatika, 10(1), 10-18.