

Calculation of the Budget Plan for the ASN 2 Apartment Building Construction Project

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Abstract

Construction project for the development of apartment buildings for the State Civil Apparatus (ASN2) is located in North Penajam Paser Regency and Kutai Kartanegara Regency, the main location of the National Capital City (IKN) in Sepaku, North Penajam Paser, which plays an important role in infrastructure development and connectivity. The location of the ASN 2 apartment complex project in Sepaku Village, North Penajam Paser Regency, is located at the intersection of Jl. Wonosari and Jl. Sepaku. To the north is Nusantara Hospital, to the south are Sepaku residents' homes, and to the east and west are swampy areas. The planning work for the construction of the Penajam Paser Utara ASN apartment complex uses the 2024 Volume 2 Work Unit Price Calculation (PHSP) and serves to determine the total costs required based on an analysis of the unit price for each type of work using the Volume 2 PHSP. The planning work for the construction of the Penajam Paser Utara ASN apartment building shows that the cost of installing red brick walls is cheaper than white brick walls. Wall construction using white bricks only costs Rp. 468,000. 000.00, while using red bricks requires a cost of Rp. 527,000,000.00, making the use of white brick walls more cost-efficient.

Keywords: Construction Project, Infrastructure, PHSP

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INTRODUCTION

The ASN2 Civil Servant Apartment Construction Project is located in North Penajam Paser Regency and Kutai Kartanegara Regency, the main location of the IKN in Sepaku. North Penajam Paser plays an important role in infrastructure development and connectivity, contributing to economic growth and social progress. In the implementation of the ASN2 apartment construction project (), careful planning is the key to achieving optimal results. One crucial aspect of project planning is the preparation of a budget plan (RAB), which serves as a tool to control and manage the costs required during the construction phase. (Restu, 2023)

In carrying out this work, it is necessary to provide assistance by placing expert supervisors in the field according to the needs and complexity of the work. Technical supervision by a supervisory consultant is one of the adequate efforts to carry out guidance, supervision, and control of the quality of construction and to strive to provide quality infrastructure (Ekawidiyanti, 2021).

In carrying out a construction project, a construction company needs to implement important strategies to gain profits in working on a construction project, one of which is by creating a Budget Plan (RAB) (Cahyono, 2003).

In this study, the author plans the budget required to build the ASN2 apartment complex. The budget planning is carried out by calculating the planned volume, followed by calculating the unit price of the work, and ending with finding the Budget Plan (RAB) (Firmanrahajo, 2001).

Therefore, the author wants to know the cost budget for the ASN2 apartment construction project. This is what prompted the author to conduct research with the title "Calculation of the cost budget plan for the ASN 2 apartment construction project."

RESEARCH METHOD

This research method was carried out on the ASN 2 Apartment Construction Project in Sepaku Village, North Penajam Paser Regency, located on the border of Jl. Wonosari and Jl. Sepaku with boundaries in the form of Nusantara Hospital to the north, residential areas to the south, and swamps to the east and west. The research took place from August 8 to 17, 2024, and included field surveys, data collection, data analysis, and RAB calculations. The data used consisted of primary data in the form of RAB, AHSP, project documents, location maps, and working drawings, as well as secondary data in the form of interviews, observations, journals, books, and related literature. Data analysis was carried out in several stages, namely identification of work items, calculation of work volume, determination of unit prices based on the 2023 AHSP of the North Penajam Paser Regency DPUPR, preparation of the RAB, and preparation of a recapitulation to compare the results of the 2024 Work Unit Price calculations.

RESULTS AND DISCUSSION

The Budget Plan (RAB) is the total cost required for both labor and materials in a construction project, whether it be a house, building, bridge, or other structure. Calculating the RAB before carrying out construction work can reduce cost and labor overruns, allowing us to achieve maximum results at an efficient cost. This construction project uses the Unit Price Calculation for Construction Work (PHSP) Volume 2, 2024. The steps for calculating the RAB are as follows:

1. Creating work items and calculating work volumes
2. Create a list of unit prices for labor and materials
3. Create a work analysis for each work item
4. Prepare a cost budget plan

Items/Work Descriptions and Work Volumes to be carried out

Based on the analysis of the drawings for the ASN 2 apartment building construction project in Penajam Village, North Penajam Paser Regency, the work items were compiled. After obtaining the items or descriptions of the work to be carried out, the volume was calculated for each job according to the unit. The following is a summary of the volume calculations for the ASN2 apartment building construction project in Penajam Paser Utara Regency.

Table 1. Work Items/Descriptions and Work Volume for the Construction of ASN2 Apartment Buildings. Volume 2, Year 2024.

| No | Work Description | Volume | Unit |
|------------|---|---------------|----------------|
| I | 2 | 3 | 4 |
| A | PRELIMINARY WORK | | |
| I | PREPARATORY WORK | | |
| 1 | Demolition Work | 1 | LS |
| 2 | Installation of <i>Bouwplank</i> | 1 | LS |
| 3 | Provision of electricity and water for work | 1.0 | LS |
| | | | |
| II | LAND WORK | | |
| 1 | Digging 1 m ³ of ordinary soil to a depth of 2 m | 120.45 | m ³ |
| 2 | Backfilling 1 m ³ of excavated soil, ordinary soil to a depth of 1 m | 40.15 | M ³ |
| 3 | Compaction of clay soil | 12.00 | Dump |
| 4 | Backfilling 1 m ³ with backfill sand | 1.6 | m |
| | | | |
| III | RED BRICK WALL WORK | | |
| 1 | Installation of 1 m ³ red brick wall , mix ratio 1SP : 8PP | 224.30 | m |
| 2 | Procurement and installation of bamboo stakes Ø 10 cm, 2 m deep | 24.00 | Fruit |
| | | | |
| IV | CONCRETE WORK | | |
| 1 | Underfloor concrete slab | 1.6 | M ³ |
| No | Work Description | Volume | Unit |
| I | 2 | 3 | 4 |
| 2 | <i>Footplate</i> | | |
| | -Concrete | 10.55 | M ³ |
| | -Reinforcement | 1,258.04 | Kg |
| | -Formwork | 16.00 | m ² |
| 3 | Ring Beam / 20 / 40 | | |
| | - Concrete | 0.93 | M ³ |
| | - Reinforcement | 178.30 | Kg |
| | - Formwork | 5.80 | m ² |
| 4 | Support beams | | |
| | - Concrete | 15.25 | M ³ |
| | - Reinforcement | 769.35 | Kg |
| | - Formwork | 16.59 | m ² |
| 5 | Leuning Pillar | | |
| | - Concrete | 0.29 | M ³ |
| | - Reinforcement | 110.59 | Kg |
| | - Formwork | 6.48 | m ² |
| 6 | Road Slab | | |
| | - Concrete | 10.13 | M ³ |
| | - Reinforcement | 1,073.36 | Kg |

| | | | |
|-----------|--|---------------|----------------|
| | - Bondek | 46.04 | m ² |
| No | Work Description | Volume | Unit |
| 1 | 2 | 3 | 4 |
| 7 | Stepping Plate | | |
| | - Concrete | 2.71 | M ³ |
| | - Reinforcement | 188.90 | Kg |
| | - Formwork | 11.63 | m ² |
| 8 | Ramp | | |
| | - Concrete | 8.40 | M ³ |
| 9 | WF 400 | | |
| | - Reinforcement | 2,640.00 | Kg |
| 10 | UNP 400 | | |
| | - Reinforcement | 384.00 | Kg |
| 11 | Galvanized Pipe | | |
| | - Ironing | 50 | M |
| | | | |
| V | WALL INSTALLATION AND PLASTERING WORK | | |
| 1 | Installation of 1 m ² of red brick wall (5x11x22) cm, thickness ½ stone mixture 1SP: 8PP | 33.60 | m |
| 2 | Installation of 1 m ² plastering 1SP : 8PP thickness 15 mm | 112.23 | m ² |
| 3 | Installation of 1 m ² of plaster | 112.23 | m ² |
| | | | |
| VI | PAINTING WORK | | |
| No | Work Description | Volume | Unit |
| 1 | 2 | 3 | 4 |
| 1 | Painting 1 m ² of new wall (1 coat of plaster, 1 coat of primer, 2 coats of topcoat) <i>Exterior</i> equivalent to <i>Mowilex</i> | 119.43 | m ² |

(Source: Author 2024)

Unit Price Calculation for Work (PHSP)

Unit prices for the ASN2 apartment complex construction project in Penajam Village, Penajam Paser Utara Regency, based on the Standard Unit Prices for Materials and Construction Labor in Penajam Paser Utara. The following is a summary of the unit prices used in the ASN2 apartment complex construction project in Penajam Village, Penajam Paser Utara Regency.

Table 2. Unit Prices for the Construction of ASN2 Apartment Complex in Penajam Village, Penajam Paser Utara Regency. Volume 2 , 2024.

| NO | WORK ITEM | UNIT | TOTAL PRICE (IDR) |
|-----------|---|------------|--------------------------|
| 1 | 2 | 3 | 4 |
| I | PREPARATORY WORK | | |
| 1 | Measurement and installation of 1 m' <i>Bouwplank</i> | M | 3,000,000.00 |
| 2 | Demolition work | Ls | 20,000,000.00 |
| NO | ITEM OF WORK | SAT | TOTAL PRICE (IDR) |
| 1 | 2 | 3 | 4 |
| II | LAND WORK | | |
| 1 | Digging 1 m ³ of ordinary soil to a depth of 2 m | m | 90,812.93 |

| | | | |
|------------|--|----------------|----------------------------|
| 2 | Backfilling 1 m ³ of excavated soil, ordinary soil to a depth of 1 m | | 24,602.96 |
| 3 | Backfilling 1 m ³ with backfill sand | m ³ | 323,673.55 |
| 4 | 1 m ³ Fill soil | Dump | 550,000.00 |
| III | RED BRICK WALL CONSTRUCTION WORK | | |
| 1 | Installation of 1 m ³ of red brick wall with mixed stone 1SP: 8PP | m | 978,922.14 |
| 2 | Procurement and installation of bamboo stakes Ø 10 cm, 2 m deep | Piece | 35,594.64 |
| IV | CONCRETE WORK | | |
| 1 | Underfloor Concrete Slab | M ³ | 911,117.19 |
| 2 | <i>Footplate</i> | | |
| | - Concrete | M ³ | 1,129,266.51 |
| | - Reinforcement | Kg | 18,123.59 |
| | - Formwork | m ² | 183,899.38 |
| 3 | Ring Beam /20/40 | | |
| | - Concrete | M ³ | 1,129,266.51 |
| | - Reinforcement | Kg | 18,123.59 |
| | - Formwork | m ² | 370,031.46 |
| NO | JOB ITEM | UNIT | QUANTITY PRICE (Rp) |
| I | 2 | 3 | 4 |
| 4 | Support Beam | | |
| | - Concrete | M ³ | 1,129,266.51 |
| | - Reinforcement | Kg | 18,123.59 |
| | - Formwork | m ² | 370,031.46 |
| 5 | Leuning Pillar | | |
| | - Concrete | M ³ | 1,129,266.51 |
| | - Reinforcement | Kg | 18,123.59 |
| | - Formwork | m ² | 370,031.46 |
| 6 | Road Slabs | | |
| | - Concrete | M ³ | 1,129,266.51 |
| | - Reinforcement | Kg | 18,123.59 |
| | - Bondek | m ² | - |
| 7 | Stepping Plate | | |
| | - Concrete | M ³ | 1,129,266.51 |
| | - Reinforcement | Kg | 18,123.59 |
| | - Formwork | m ² | 338,531.46 |
| 8 | Ramp | | |
| | - Concrete | M ³ | 1,129,266.51 |
| 9 | WF 400 | | |
| | - Reinforcement | Kg | 32,894.00 |
| NO | WORK ITEM | UNIT | TOTAL PRICE (Rp) |
| I | 2 | 3 | 4 |
| 10 | UNP 400 | | |
| | - Ironing | Kg | 32,894.00 |
| 11 | Galvanized Pipe | | |
| | - Reinforcement | M ³ | 32,894.00 |
| V | WALL INSTALLATION AND PLASTERING WORK | | |
| 1 | Installation of 1 m ² of red brick wall (5x11x22) cm thick ½ stone mixture 1SP: 8PP | m ² | 115,667.88 |
| 2 | Installation of 1 m ² plastering 1SP : 8PP thickness 15 mm | m ² | 62,018.52 |

| | | | |
|-----------|--|----------------|-----------|
| 3 | Installation of 1 m ² of plaster | m ² | 37,341.93 |
| VI | PAINTING WORK | | |
| 1 | Painting 1 m ² of new wall (1 coat of plaster, 1 coat of primer, 2 coats of topcoat) <i>Exterior</i> equivalent to <i>Mowilex</i> | m | 49,248.90 |

(Source: *Unit Price of Work for Penajam Paser Utara Regency, Public Works and Spatial Planning Department, Volume 2, 2024*)

Cost Estimate Plan to be Implemented

The calculation of the Budget Cost Plan (RAB) is based on the volume of work multiplied by the unit price of the work.

Table 3. Budget Plan (RAB) for the Construction of ASN2 Apartment Buildings in Penajam Village, North Penajam Paser Regency. Volume 2, 2024.

| No | Description of Work | Volume | Unit | Unit Price (IDR) | Total Price (IDR) |
|------------|--|---------------|----------------|-------------------------|--------------------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| A | PRELIMINARY WORK | | | | |
| I | PREPARATORY WORK | | | | |
| 1 | Demolition Work | 1 | LS | 23,000,000.00 | 23,000,000.00 |
| 2 | Installation of <i>Bouwplank</i> | 1 | LS | 3,000,000.00 | 3,000,000.00 |
| 3 | Electricity and water supply | 1 | LS | 2,000,000.00 | 2,000,000.00 |
| | | | | SUB TOTAL | 28,000,000 |
| II | LAND WORK | | | | |
| 1 | Digging 1 m ³ of ordinary soil to a depth of 2 m | 120.45 | m ³ | 90,812.93 | 10,938,416.82 |
| 2 | Backfilling of 1 m ³ of excavated soil, ordinary soil 1 m deep | 40.15 | m ³ | 24,602.92 | 987,808.78 |
| 3 | Soil fill | 12.00 | Dump | 550,000.00 | 6,600,000.00 |
| 4 | Filling 1 m ³ with fill sand | 1.6 | m ³ | 323,673.55 | 517,877.68 |
| | | | | SUB TOTAL | 19,044,103.27 |
| III | RED BRICK WALL CONSTRUCTION | | | | |
| No | Work Description | Volume | Sat | Unit Price (IDR) | Total Price (IDR) |
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | Installation of 1 m ² of red brick wall with mixed stone ISP: 8PP | 224.30 | m | 978,922.14 | 219,570,279.04 |
| 2 | Procurement and installation of bamboo piles Ø 10 cm, 2 m deep | 24 | Fruit | 35,594.64 | 854,271.34 |
| | | | | SUB TOTAL | 220,424,550.38 |
| IV | CONCRETE WORK | | | | |
| 1 | Underfloor concrete slab | 1.60 | M ³ | 911,117.19 | 1,457,787.51 |
| 2 | <i>Footplate</i> | | | | |
| | -Concrete | 10.55 | M ³ | 1,129,266.51 | 11,913,761.69 |
| | -Reinforcement | 1,258.04 | kg | 18,123.59 | 22,800,271.97 |
| | -Formwork | 16.00 | m ² | 183,899.38 | 2,942,390.08 |
| 3 | Ring Beam / 20 / 40 | | | | |
| | - Concrete | 0.93 | M ³ | 1,129,266.51 | 1,047,959.32 |
| | - Ironing | 178.30 | kg | 18,123.59 | 3,231,476.41 |
| | - Formwork | 5.80 | m ² | 370,031.46 | 2,146,182.45 |
| 4 | Support Beam | | | | |
| | - Concrete | 15.25 | M ³ | 1,129,266.51 | 17,216,797.22 |
| | - Reinforcement | 769.35 | kg | 18,123.59 | 13,943,393.14 |
| | - Formwork | 16.59 | m ² | 370,031.46 | 6,138,821.87 |
| 5 | Leuning Pole | | | | |

| No | Work Description | Volume | Sat | Unit Price (IDR) | Total Price (IDR) |
|-----------|---|----------|----------------|------------------|-----------------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| | - Concrete | 0.29 | M ³ | 1,129,266.51 | 325,228.76 |
| | - Reinforcement | 110.59 | kg | 18,123.59 | 2,004,324.34 |
| | - Formwork | 6.48 | m ² | 370,031.46 | 2,397,803.84 |
| 6 | Road Slabs | | | | |
| | - Concrete | 10.13 | M ³ | 1,129,266.51 | 11,436,872.44 |
| | - Reinforcement | 1,073.36 | kg | 18,123.59 | 19,453,103.00 |
| | - Bondek | 46.04 | m ² | - | - |
| 7 | Stepping Plate | | | | |
| | - Concrete | 2.71 | M ³ | 1,129,266.51 | 3,060,312.24 |
| | - Reinforcement | 188.90 | kg | 18,123.59 | 3,423,591.93 |
| | - Formwork | 11.63 | M ² | 338,531.46 | 3,935,428.18 |
| 8 | Ramp | | | | |
| | - Concrete | 8.40 | M ³ | 1,129,266.51 | 9,485,838.69 |
| 9 | WF 400 | | | | |
| | - Reinforcement | 2,640.00 | Kg | 32,894.00 | 86,840,160.00 |
| 10 | UNP 400 | | | | |
| | - Reinforcement | 384.00 | Kg | 32,894.00 | 12,631,296.00 |
| 11 | Galvanized Pipe | | | | |
| | - Reinforcement | 50 | M | 32,894.00 | 1,644,700.00 |
| | | | | SUB TOTAL | 239,477,501.08 |
| No | Description of Work | Volume | Sat | Unit Price (IDR) | Total Price (IDR) |
| 1 | 2 | 3 | 4 | 5 | 6 |
| V | WALL INSTALLATION AND PLASTERING WORK | | | | |
| 1 | Installation of 1 m ² of red brick wall (5x11x22) cm, thickness ½ stone mixture ISP : 8PP | 33.60 | m | 115,667.88 | 3,886,440.60 |
| 2 | Installation of 1 m ² plastering ISP: 8PP thickness 15 mm | 112.23 | m ² | 62,018.52 | 6,960,338.82 |
| 3 | Installation of 1 m ² of plaster | 112.23 | m ² | 37,341.93 | 4,190,884.24 |
| | | | | SUB TOTAL | 15,037,663.66 |
| VI | PAINTING WORK | | | | |
| 1 | Painting 1 m ² of new wall (1 coat of plaster, 1 coat of primer , 2 coats of topcoat) <i>Exterior</i> equivalent to <i>Mowilex</i> | 119.43 | m ² | 49,248.90 | 5,881,796.47 |
| | | | | SUB TOTAL | 5,881,796.47 |
| | | | | TOTAL | 527,865,614.86 |

(Source: Author, 2024)

Summary of the 2024 Budget Plan (RAB)

A summary is the sum of each sub-item of work, which is then totaled to obtain the total cost of the work.

Table 4.4. Summary of the Budget Plan (RAB) for the Construction of ASN2 Apartment Buildings in Penajam Village, Penajam Paser Utara Regency. Volume 2, 2024.

| No | Work Description | Quantity Price (IDR) |
|-----|---------------------|----------------------|
| 1 | 2 | 3 |
| I | Preparation Work | 28,000,000.00 |
| II | Land Work | 19,044,103.27 |
| III | Red Brick Wall Work | 220,424,550.38 |

| | | |
|----|---------------------------------------|-----------------------|
| IV | Concrete Work | 239,477,501.08 |
| V | Wall Installation and Plastering Work | 15,037,663.66 |
| VI | Painting Work | 5,881,796.47 |
| | TOTAL | 527,865,614.86 |
| | ROUNDED | 527,800,000.00 |

IN WORDS = five hundred twenty-seven million eight hundred thousand rupiah

(Source: Author, 2024)

Item / Description of Work and Volume of Work to be Performed

Based on the analysis of the drawings for the construction of the ASN2 apartment complex in Penajam Village, Penajam Paser Utara Regency, the work items were compiled. After obtaining the items or descriptions of the work to be carried out, the volume calculations were then performed for each work item according to the units. The following is a recapitulation of the volume calculations for the ASN2 apartment complex construction project in Penajam Village, Penajam Paser Utara Regency.

Table 5. Work Items/Descriptions and Work Volumes for the ASN2 Apartment Complex Construction Project in Penajam Village, Penajam Paser Utara Regency, 2023.

| No | Work Description | Volume | Unit |
|------------|---|---------------|----------------|
| <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> |
| A | PRELIMINARY WORK | | |
| I | PREPARATORY WORK | | |
| 1 | Demolition Work | 1.00 | LS |
| 2 | Installation of <i>Bouwplank</i> | 1 | LS |
| 3 | Provision of electricity and water for work | 1.0 | LS |
| | | | |
| II | LAND WORK | | |
| 1 | Digging 1 m ³ of ordinary soil to a depth of 2 m | 120.45 | m ³ |
| 2 | Backfilling 1 m ³ of excavated soil, ordinary soil to a depth of 1 m | 40.15 | M ³ |
| 3 | Compaction of clay soil | 12.00 | M ³ |
| 4 | Backfilling 1 m ³ with backfill sand | 1.6 | M ³ |
| | | | |
| III | WHITE BRICK WALL WORK | | |
| No | Work Description | Volume | Unit |
| <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> |
| 1 | Procurement and installation of 1 m <i>minipile</i> / 400 x 400 mm box (<i>Drop Hammer</i>) | 312 | M |
| | | | |
| IV | CONCRETE WORK | | |
| 1 | Underfloor concrete slab | 1.6 | M ³ |
| 2 | <i>Footplate</i> | | |
| | -Concrete | 10.55 | M ³ |
| | -Reinforcement | 1,258.04 | Kg |
| | -Formwork | 16.00 | m ² |
| 3 | Ring Beam / 20 / 40 | | |
| | - Concrete | 0.93 | M ³ |
| | - Reinforcement | 178.30 | kg |
| | - Formwork | 5.80 | m ² |
| 4 | Support beams | | |

| | | | |
|-----------|--|---------------|----------------|
| | - Concrete | 15.25 | M ³ |
| | - Reinforcement | 769.35 | Kg |
| | - Formwork | 16.59 | m ² |
| 5 | Leuning Pillar | | |
| | - Concrete | 0.29 | M ³ |
| | - Reinforcement | 110.59 | Kg |
| | - Formwork | 6.48 | m ² |
| No | Work Description | Volume | Unit |
| 1 | 2 | 3 | 4 |
| 6 | Road Slabs | | |
| | - Concrete | 10.13 | M ³ |
| | - Reinforcement | 1,073.36 | Kg |
| | - Bondek | 46.04 | m ² |
| 7 | Stepping Plate | | |
| | - Concrete | 2.71 | M ³ |
| | - Reinforcement | 188.90 | Kg |
| | - Formwork | 11.63 | m ² |
| 8 | Ramp | | |
| | - Concrete | 8.40 | M ³ |
| 9 | WF 400 | | |
| | - Reinforcement | 2,640.00 | Kg |
| 10 | UNP 400 | | |
| | - Reinforcement | 384.00 | Kg |
| 11 | Galvanized Pipe | | |
| | - Reinforcement | 50 | M |
| V | WALL INSTALLATION AND PLASTERING WORK | | |
| 1 | Installation of 1 m ² of white brick wall (5x11x22) cm, thickness ½ stone mixture 1SP: 8PP | 33.60 | M ² |
| No | Work Description | Volume | Unit |
| 1 | 2 | 3 | 4 |
| 2 | Installation of 1 m ² plaster 1SP: 8PP thickness 15 mm | 112.23 | m ² |
| 3 | Installation of 1 m ² of plaster | 112.23 | m ² |
| VI | PAINTING WORK | | |
| 1 | Painting 1 m ² of new wall (1 coat of plaster, 1 coat of primer, 2 coats of topcoat) <i>Exterior</i> equivalent to <i>Mowilex</i> | 119.43 | m ² |

(Source: Author, 2024)

List of Unit Prices for Labor and Materials based on the Public Works and Spatial Planning Department of Penajam Paser Utara Regency.

The unit price list used as a reference in preparing the Budget Plan (RAB) is the "2023 Standard Unit Prices for Construction Materials and Labor in Penajam Paser Utara Regency."

Table 6. Standard Unit Prices for Labor, Materials, and Equipment in Penajam Paser Utara Regency. 2023.

| No | Description | Unit | Unit Price |
|-----------|--------------------|-------------|-------------------|
| 1 | 2 | 3 | 4 |
| I | WAGES | | |
| 1 | Worker | OH | 100,317.00 |
| No | Description | Unit | Unit Price |
| 1 | 2 | 3 | 4 |
| 2 | Mason | OH | 130,410.00 |
| 3 | Carpenter | OH | 130,410.00 |

| | | | |
|----------------------|---|----------------|-------------------|
| 4 | Ironworker | OH | 130,410.00 |
| 5 | Painter | OH | 130,410.00 |
| 6 | Digger | OH | 130,410.00 |
| 7 | Foreman | OH | 137,431.00 |
| 8 | Foreman | OH | 160,510.00 |
| 9 | Heavy Equipment Operator | OH | 130,410.00 |
| 10 | Heavy Equipment Operator Assistant | OH | 100,317.00 |
| II MATERIALS | | | |
| 1 | Split Stone (quarry-Work Site) | M ³ | 349,000.00 |
| 2 | Sand (quarry-Work Site) | M ³ | 290,000.00 |
| 3 | Padas Soil (quarry-Work Site) | M ³ | 123,000.00 |
| 4 | Cerucuk Petung Bamboo Ø 10 cm | M | 10,000.00 |
| 5 | Medium B Galvanized Pipe Ø ½ length 6 m | Trunk | 150,000 |
| 6 | IWF Steel | Kg | 18,600.00 |
| 7 | UNP steel | Kg | 16,900.00 |
| 8 | Wire / Bendrat | Kg | 20,000.00 |
| 9 | Red Bricks | Piece | 850.00 |
| No | Description | Unit | Unit Price |
| 1 | 2 | 3 | 4 |
| 10 | Portland Cement | Kg | 1,375.00 |
| 11 | Concrete strength fc' 31.2 MPa (K 350) Ready Mix | M ³ | 1,059,290.00 |
| 12 | Primer (exterior wall paint) equivalent to Mowilex | Kg | 64,000.00 |
| 13 | Topcoat (exterior wall paint) equivalent to Mowilex | Kg | 132,000.00 |
| 14 | Wall Putty | Kg | 25,000.00 |
| 15 | Water | Liter | 16.73 |
| 16 | Sengon Wood 5/7 | M ³ | 3,125,000.00 |
| 17 | 2.5 cm nails | Kg | 23,500.00 |
| 18 | Meranti wood (board) | M ³ | 6,500,000.00 |
| 19 | Sand | M ³ | 430,000.00 |
| 20 | Concrete Sand | M ³ | 430,000.00 |
| 21 | Concrete Aggregate | M ³ | 325,000.00 |
| III EQUIPMENT | | | |
| 1 | Brushes 2 | Piece | 15,000.00 |
| 2 | Concrete vibrator | Hour | 85,714.29 |
| 3 | 0.3 m ³ capacity mixer | Hour | 10,682.15 |
| 4 | Excavator | Hours | 612,547.83 |
| No | Description | Unit | Unit Price |
| 1 | 2 | 3 | 4 |
| 5 | Diesel Pile Driver | Hour | 144,892.18 |

(Source: Standard Unit Prices for Labor, Materials, and Equipment in Penajam Paser Utara Regency, Public Works and Spatial Planning Agency , 2023)

Unit Price of Work

Unit prices for the construction of ASN2 apartment buildings in Penajam Village, Penajam Paser Utara Regency, based on the Standard Unit Prices for Materials and Labor in Construction in Penajam Paser Utara Regency. The following is a summary of the unit prices used in the construction of ASN2 apartment buildings in Penajam Village, Penajam Paser Utara Regency.

Table 7. Unit Prices for ASN2 Apartment Construction Work in Penajam Village, North Penajam Paser Regency, 2023.

| NO | WORK ITEM | UNIT | TOTAL PRICE (IDR) |
|------------|--|----------------|--------------------------|
| <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> |
| I | PREPARATORY WORK | | |
| 1 | Measurement and installation of 1 m' <i>Bouwplank</i> | M | 3,000,000.00 |
| 2 | Demolition work | Ls | 20,000,000.00 |
| II | LAND WORK | | |
| 1 | Digging 1 m ³ of ordinary soil to a depth of 2 m | m | 112,134.00 |
| NO | WORK ITEM | UNIT | TOTAL PRICE (IDR) |
| <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> |
| 2 | Backfilling 1 m ³ of excavated soil, ordinary soil 1 m deep | M ³ | 66,911.00 |
| 3 | Backfilling 1 m ³ with backfill sand | m | 436,655.00 |
| 4 | 1 m ³ Fill soil | Dump | 550,000.00 |
| III | WHITE BRICK WALL CONSTRUCTION | | |
| 1 | Procurement and installation of 1 m <i>minipiles</i> / 400 x 400 mm boxes (<i>Drop Hammer</i>) | M | 503,504.76 |
| IV | CONCRETE WORK | | |
| 1 | Underfloor Concrete Slab | M ³ | 911,117.19 |
| 2 | <i>Footplate</i> | | |
| | - Concrete | M ³ | 1,129,266.51 |
| | - Reinforcement | Kg | 18,123.59 |
| | - Formwork | m ² | 183,899.38 |
| 3 | Ring Beam /20/40 | | |
| | - Concrete | M ³ | 1,129,266.51 |
| | - Reinforcement | Kg | 18,123.59 |
| | - Formwork | m ² | 370,031.46 |
| 4 | Support beams | | |
| | - Concrete | M ³ | 1,129,266.51 |
| | - Reinforcement | Kg | 18,123.59 |
| NO | WORK ITEM | UNIT | TOTAL PRICE (Rp) |
| <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> |
| | - Formwork | M ² | 370,031.46 |
| 5 | Leuning Pillar | | |
| | - Concrete | M ³ | 1,129,266.51 |
| | - Reinforcement | Kg | 18,123.59 |
| | - Formwork | m ² | 370,031.46 |
| 6 | Road Slabs | | |
| | - Concrete | M ³ | 1,129,266.51 |
| | - Reinforcement | Kg | 18,123.59 |
| | - Bondek | m ² | - |
| 7 | Stepping Plate | | |
| | - Concrete | M ³ | 1,129,266.51 |
| | - Reinforcement | Kg | 18,123.59 |
| | - Formwork | m ² | 338,531.46 |
| 8 | Ramp | | |
| | - Concrete | M ³ | 1,129,266.51 |
| 9 | WF 400 | | |
| | - Ironing | Kg | 32,894.00 |
| 10 | UNP 400 | | |
| | - Reinforcement | Kg | 32,894.00 |

| | | | |
|-----------|---|----------------|----------------------------|
| 11 | Galvanized Pipe | | |
| NO | WORK ITEM | UNIT | QUANTITY PRICE (Rp) |
| <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> |
| | - Reinforcement | M' | 32,894.00 |
| V | WALL INSTALLATION AND PLASTERING WORK | | |
| 1 | Installation of 1 m ² of white brick wall (5x11x22) cm thick ½ stone mixture 1SP : 8PP | m | 115,667.88 |
| 2 | Installation of 1 m ² plastering 1SP : 8PP thickness 15 mm | m ² | 62,018.52 |
| 3 | Installation of 1 m ² of plaster | m ² | 37,341.93 |
| VI | PAINTING WORK | | |
| 1 | Painting 1 m ² of new wall (1 coat of plaster, 1 coat of primer, 2 coats of topcoat) <i>Exterior equivalent to Mowilex</i> | m | 49,248.90 |

(Source: Unit Price of Work for Penajam Paser Utara Regency, Public Works and Spatial Planning Department Year 2023)

Cost Budget Plan to be implemented

The Cost Estimate (RAB) calculation is based on the volume of work multiplied by the unit price of the work.

Table 8. Budget Plan (RAB) Construction of ASN2 apartment buildings in Penajam village, North Penajam Paser Regency Year 2023.

| No | Work Description | Volume | Unit | Unit Price (IDR) | Total Price (IDR) |
|------------|---|---------------|----------------|-------------------------|--------------------------|
| <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> | <i>6</i> |
| A | PRELIMINARY WORK | | | | |
| I | PREPARATORY WORK | | | | |
| 1 | Demolition Work | 1 | LS | 23,000,000.00 | 23,000,000.00 |
| 2 | Installation of <i>Bouwplank</i> | 1 | LS | 3,000,000.00 | 3,000,000.00 |
| 3 | Electricity and water supply | 1 | LS | 2,000,000.00 | 2,000,000.00 |
| | | | | SUB TOTAL | 28,000,000 |
| II | LAND WORK | | | | |
| 1 | Digging 1 m ³ of ordinary soil to a depth of 2 m | 120.45 | m ³ | 112,134.00 | 13,506,540.30 |
| 2 | Backfilling of 1 m ³ of excavated soil, ordinary soil 1 m deep | 40.15 | m ³ | 66,911.00 | 2,686,476.65 |
| 3 | Soil excavation | 12.00 | Dump | 550,000.00 | 6,600,000 |
| 4 | Filling 1 m ³ with fill sand | 1.6 | m ³ | 436,655.00 | 698,648.00 |
| | | | | SUB TOTAL | 23,491,664.95 |
| III | WHITE BRICK WALL WORK | | | | |
| 1 | Procurement and installation of 1 m <i>minipile</i> / 400 x 400 mm box (<i>Drop Hammer</i>) | 312 | M | 503,504.76 | 157,093,485.12 |
| No | Job Description | Volume | Sat | Unit Price (IDR) | Total Price (IDR) |
| <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> | <i>6</i> |
| | | | | SUB TOTAL | 157,093,485.12 |
| IV | CONCRETE WORK | | | | |
| 1 | Underfloor concrete slab | 1.60 | M ³ | 911,117.19 | 1,457,787.51 |
| 2 | <i>Footplate</i> | | | | |
| | -Concrete | 10.55 | M ³ | 1,129,266.51 | 11,913,761.69 |
| | -Reinforcement | 1,258.04 | kg | 18,123.59 | 22,800,271.97 |
| | -Formwork | 16.00 | m ² | 183,899.38 | 2,942,390.08 |
| 3 | Ring Beam / 20 / 40 | | | | |
| | - Concrete | 0.93 | M ³ | 1,129,266.51 | 1,047,959.32 |
| | - Reinforcement | 178.30 | kg | 18,123.59 | 3,231,476.41 |

| | | | | | |
|-----------|--|---------------|----------------|-------------------------|--------------------------|
| | - Formwork | 5.80 | m ² | 370,031.46 | 2,146,182.45 |
| 4 | Support Beam | | | | |
| | - Concrete | 15.25 | M ³ | 1,129,266.51 | 17,216,797.22 |
| | - Reinforcement | 769.35 | kg | 18,123.59 | 13,943,393.14 |
| | - Formwork | 16.59 | m ² | 370,031.46 | 6,138,821.87 |
| 5 | Leuning Pillar | | | | |
| | - Concrete | 0.29 | M ³ | 1,129,266.51 | 325,228.76 |
| | - Reinforcement | 110.59 | kg | 18,123.59 | 2,004,324.34 |
| | - Formwork | 6.48 | m ² | 370,031.46 | 2,397,803.84 |
| 6 | Road Plate | | | | |
| No | Description of Work | Volume | Sat | Unit Price (IDR) | Total Price (IDR) |
| 1 | 2 | 3 | 4 | 5 | 6 |
| | - Concrete | 10.13 | M ³ | 1,129,266.51 | 11,436,872.44 |
| | - Reinforcement | 1,073.36 | kg | 18,123.59 | 19,453,103.00 |
| | - Bondek | 46.04 | m ² | - | - |
| 7 | Stepping Plate | | | | |
| | - Concrete | 2.71 | M ³ | 1,129,266.51 | 3,060,312.24 |
| | - Reinforcement | 188.90 | kg | 18,123.59 | 3,423,591.93 |
| | - Formwork | 11.63 | m ² | 338,531.46 | 3,935,428.18 |
| 8 | Ramp | | | | |
| | - Concrete | 8.40 | M ³ | 1,129,266.51 | 9,485,838.69 |
| 9 | WF 400 | | | | |
| | - Reinforcement | 2,640.00 | Kg | 32,894.00 | 86,840,160.00 |
| 10 | UNP 400 | | | | |
| | - Reinforcement | 384.00 | Kg | 32,894.00 | 12,631,296.00 |
| 11 | Galvanized Pipe | | | | |
| | - Reinforcement | 50 | M | 32,894.00 | 1,644,700.00 |
| | | | | SUB TOTAL | 239,477,501.08 |
| V | WALL INSTALLATION AND PLASTERING WORK | | | | |
| 1 | Installation of 1 m ² of white brick wall (5x11x22) cm, thickness ½ stone mixture 1SP : 8PP | 33.60 | m | 115,667.88 | 3,886,440.60 |
| No | Work Description | Volume | Sat | Unit Price (IDR) | Total Price (IDR) |
| 1 | 2 | 3 | 4 | 5 | 6 |
| 2 | Installation of 1 m ² plaster 1SP: 8PP thickness 15 mm | 112.23 | m ² | 62,018.52 | 6,960,338.82 |
| 3 | Installation of 1 m ² plaster | 112.23 | m ² | 37,341.93 | 4,190,884.24 |
| | | | | SUB TOTAL | 15,037,663.66 |
| VI | PAINTING WORK | | | | |
| 1 | Painting 1 m ² of new wall (1 coat of plaster, 1 coat of primer, 2 coats of topcoat) <i>Exterior</i> equivalent to <i>Mowilex</i> | 119.43 | m ² | 49,248.90 | 5,881,796.47 |
| | | | | SUB TOTAL | 5,881,796.47 |
| | | | | TOTAL | 468,982,111.28 |

(Source: Author, 2024)

Summary of the 2023 Budget Plan (RAB)

A summary is the sum of each sub-item of work, which is then totaled to obtain the total cost of the work.

Table 9. Summary of the Budget Plan (RAB) for the Construction of ASN2 Apartment Buildings in Penajam Village, Penajam Paser Utara District, 2023.

| No | Work Description | Quantity Price (IDR) |
|----|------------------|----------------------|
| 1 | 2 | 3 |

| | | |
|---|---------------------------------------|-----------------------|
| I | Preparation Work | 28,000,000.00 |
| II | Land Work | 23,491,664.95 |
| III | Red Brick Wall Work | 157,093,485.12 |
| IV | Concrete Work | 239,477,501.08 |
| V | Wall Installation and Plastering Work | 15,037,663.66 |
| VI | Painting Work | 5,881,796.47 |
| | TOTAL | 468,982,111.28 |
| | ROUNDED | 468,900,000.00 |
| <i>IN WORDS = four hundred sixty-eight million nine hundred thousand rupiah</i> | | |

(Source: Author, 2024)

Summary of the Cost Budget Plan (RAB) Using Red Brick Walls and White Brick Walls

Summary of Differences in the Budget Cost Plan (RAB) Using Red Brick Walls and White Brick Walls

Table 10. Summary of the Budget Cost Plan (RAB) Using Red Brick Walls and White Brick Walls.

| No | Description of Work | Total Cost of Red Brick Walls (IDR) | Total Cost of White Brick Wall (IDR) |
|--|---------------------------------------|-------------------------------------|--------------------------------------|
| 1 | 2 | 3 | |
| I | Preparation Work | 28,000,000 | 28,000,000.00 |
| II | Land Work | 19,044,103.27 | 23,491,664.95 |
| III | White Brick Wall Work | 220,424,550.38 | 157,093,485.12 |
| IV | Concrete Work | 239,477,501.08 | 239,477,501.08 |
| V | Wall Installation and Plastering Work | 15,037,663.66 | 15,037,663.66 |
| VI | Painting Work | 5,881,796.47 | 5,881,796.47 |
| | TOTAL | 527,865,614.86 | 468,982,111.28 |
| | ROUNDED | 527,800,000.00 | 468,900,000.00 |
| <i>NOTE: The Cost Estimate Plan (RAB) for white brick walls is less than the Cost Estimate Plan (RAB) for red brick walls.</i> | | | |

(Source: Author, 2024)

CONCLUSION

From this thesis, it can be concluded that

1. Work Unit prices for the ASN2 apartment complex construction project in Penajam village, North Penajam Paser Regency, based on the Standard Unit Prices for Materials and Construction Labor in North Penajam Paser. The following is a summary of the unit prices used in the ASN2 apartment complex construction project in Penajam village, North Penajam Paser Regency. Preparation Work Rp. 28,000,000.00, Earthwork Rp. 19,044,103.27, Red Brick Wall Work Rp. 220,424,550.38, Concrete Work: IDR 239,477,501.08, Wall Installation and Plastering Work: IDR 15,037,663.66, Painting Work: IDR 5,881,796.47. Total budget expenditure : Rp. 527,865,614.86, rounded to Rp. 527,800,000.00 (= five hundred twenty-seven million eight hundred thousand rupiah).
2. The construction planning work for the Penajam Paser Utara ASN apartment building shows that the cost of installing red brick walls with white bricks is cheaper than using red bricks. The cost of building walls using white bricks is only , which costs Rp. 468,000,000.00, while using red

bricks costs Rp. 527,000,000.00. Therefore, using white bricks is more cost-efficient.

The time required for wall installation is faster when using white bricks than red bricks. Red bricks require 20 days for a wall volume of 136m², while white bricks require 4 days with the same number of workers, namely 10 workers.

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