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COMPARATIVE ANALYSIS OF CONVENTIONAL AND PLATES FLOOR PLATE FLOOR AREA BONDEK PIM 3 BASEMENT PROJECT AND COST PERFORMANCE AGAINST TIME

GIRSANG, HAMONANGAN
Faculty of Engineering
University of Mercu Buana, Indonesia
hamongirsang@gmail.com

KHALID, IHSAN
Faculty of Engineering
University of Mercu Buana, Indonesia
Ihsankhalid248@gmail.com

ABSTRACT

Work on the project floor Pondok Indah Mall 3 using plates bondek on basementnya area. Here I want to compare the effectiveness of the cost and time, why the owner and the contractor chose to use a plate bondek the basement area. This study aims to determine the differences of the two methods in terms of cost and time of work on the basement floor plates only at Pondok Indah Mall 3 project. Techniques of data collection using interviews and direct observations and combined with literature studies. Processing data using analytical methods of unit price (AHSP). The results of this research review time and cost. Observed work item is a work in basement slab. From this research work price obtained slab bondek system more expensive Rp 1,179,138,501 compared with the conventional method, in which the total price of the floor slab work bondek system is Rp 61,546,996,028, while the conventional method seberar Rp 60,367,857,526 As for the floor turnaround times bondek system requires 378 days, while the floor of conventional systems require 504 days.

Keywords :AHSP, Floor Plates, Bondek, Conventional.

INTRODUCTION

Plate (slab) is a horizontal structural elements that serve to channel dead load and live load to the supporting frame of the vertical structure of a system. The elements of the supporting horizontal plate to distribute the loads are beam and drop the panel resting on the columns of the building. The thickness of the floor plate is determined by:

1. Large load thereon which will be borne by the floor plate.
2. Stretch width or distance between the supporting beams.
3. Construction materials and floor plate.

Floor plate should be planned: a rigid, flat, straight and spirit level (having the same height and not tilted). The thickness of the floor plate is determined by: the load that must be supported, large allowable deflection, wide stretch or the distance between the support beams, and materials of construction of the floor plate.

In this paper, we will discuss the particular floor plates in basement. Because in my opinion, the work of the floor slab in the basement is the main work and critical work on a building site. Jobs slab in the basement in a building project is also a time consuming task and considerable expense. Jobs slab in the basement will be used as a car park which resulted in a very heavy burden ditimbulkanya. Therefore, the floor slab should be designed to sustain the heavy burden caused by cars parked there, and this work should be properly supervised and maintained properly in terms of both quality and time of implementation.

In the work of the floor slab in the basement, there are many methods of workmanship. For in the basement there are two methods of workmanship slab.

1. Conventional floor plate
2. Bondek floor plate

In the PIM project 3, in the basement selected using bondek plate. In this case I would compare the effectiveness in terms of cost and time for bondek floor plate and conventional floor plates, so the authors are interested in analyzing the title menganalisi comparison of conventional floor plate and the floor slab in the basement bondek 3 PIM project on the performance of cost and time.

Formulation of the problem

Based on the background already dikemukaan earlier, the subject matter of this study is

1. What is the difference in cost between the floor slabs and floor slabs conventional bondek?
2. What is the difference in time between the floor slabs and floor slabs conventional bondek?
3. What caused the difference between the floor slabs and plates lantaikonvensional bondek it?

Research Overview

The purpose of this research is:

1. Knowing the difference in costs to be incurred when using the floor plate and floor system bondek conventional system for the basement area.
2. Knowing the time difference when using a floor system and floor bondek conventional system for the basement area.
3. Knowing what factors are causing the difference between the methods bondek floor and the working methods of conventional floor.

Review of Literature

Pelat floor is the floor of the horizontal structure that receives burden lies on the ground directly, is a structural component of demarcation between levels one level to another. The floor slab supported by a drop panels and beams resting on the columns of the building. The thickness of the slab is determined by:

1. Large deflection desired.
2. The width of the stretch or the distance between the supporting beams.
3. Raw materials and slab construction.

Pelat floor is a part of three-dimensional solid structure that has area and volume to surface area is straight, flat and the thickness is much smaller than the other dimensions of the horizontal structure. Plate structure can be modeled with a 3-dimensional elements in length, width, and thickness. The function of the floor plate is to accept the existing load on top of it, be it a live load and dead load which will be distributed to other structures. Floor plate is a component of a structure consisting of concrete reinforced by steel reinforcement with transverse and longitudinal positions are tied up with wire bendrat, and is reinforced by the drop panel or beam and retained by the column. As for the size of the diameter of reinforcement, distance between reinforcement, additional reinforcement position depends on the form of plates,

Floor Plate Structure Methods in Buildings

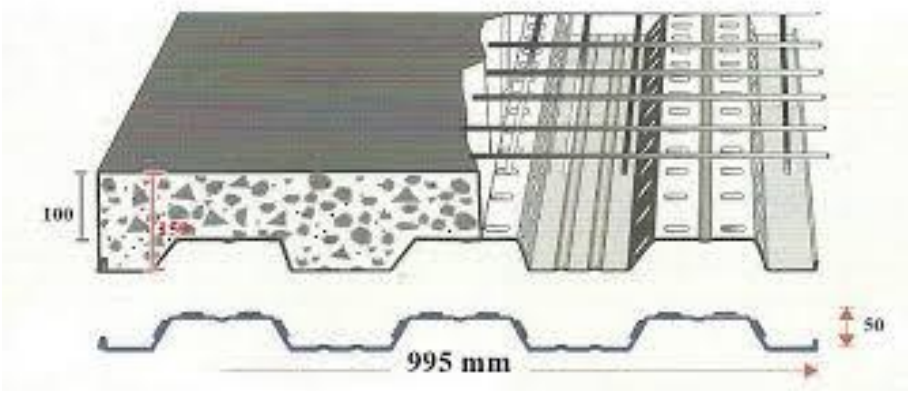
1. Conventional methods

That process is done on the spot, using plywood formwork scaffolding scaffolding. This is the way that is still fairly archaic and takes a lot of time and cost, so many vying to get the latest innovations and to get a fast time and cost.

2. methods Bondek

That is bottom reinforcement method by replacing the plate is replaced by bondek, with the hope of being able to save reinforcement and bekesting underneath. Reinforcement above can be made in the form of bars or can be replaced with iron wiremesh so much faster in the installation.

Figure 1: Details bondek plate



Source: Data processed the author, 2019

Financing Floor Plates

Calculation of costs slab covers the cost of materials, cost of tools, labor costs are taken from Labor Unit Price Analysis floor plates, and other costs that are likely caused by the work floor plate. Calculation of financing the floor slab must be properly addressed, since the work floor plate is a critical job and a job that causes waste material. Among the waste material is plywood material, and iron. Cost of waste material resulting from work plywood formwork when casting the floor plate. Formwork costs usually range between 35% to 60% or more than the overall cost of construction of concrete structures. But unlike the case when the formwork using bondek plate system.

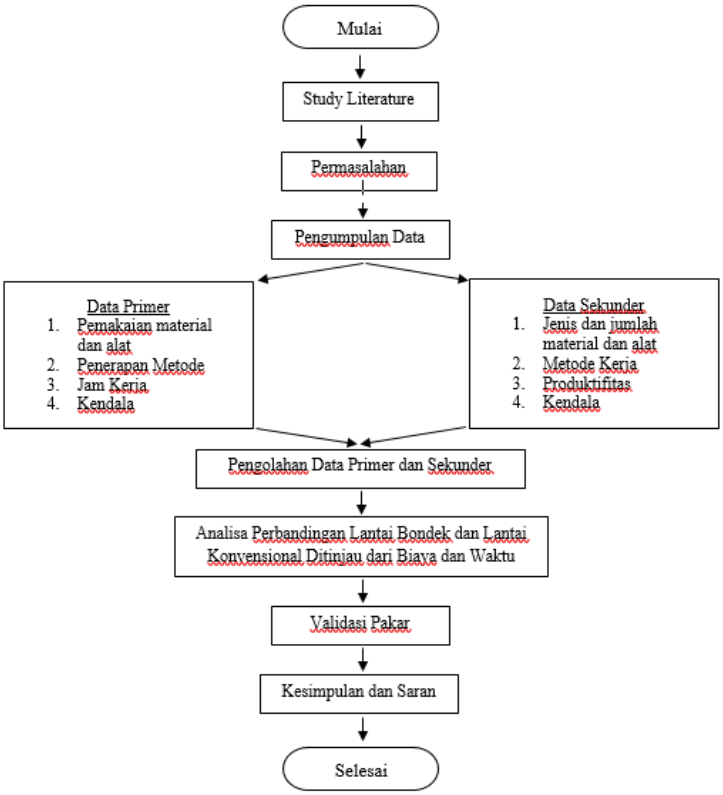
Time Performance of Construction Projects

Make a schedule for implementation of construction projects is central in planning and execution of the work the contractor, the contractor as the party responsible for implementing projects detailed planning and scheduling as well as have an obligation to complete the project in accordance with a predetermined time period. The Contractor shall prepare a detailed work in a variety of ways, either by experience projects that have previously dealt with new methods or different and usually scheduling was based solely on intuition alone, But for projects larger, complex and unusual handle, a method of scheduling need to be done in a way that is more specific and systematic because many of the activities involved and intertwined in the execution of the project. Scheduling is a result of planning and requires practice and experience of a planner. Of construction activities then the contractor generally draw up a project schedule based on various methods. One of them is the critical path method. The critical path is the path that has a series of components of activity, with the total amount and the longest time period showed the fastest project completion. Then the critical path is crucial for the implementation of the project. Because of the critical path is located activities if its implementation is delayed, would result in delay in the overall project. Thus, control of project time on activities that constitute the critical path is very important.

RESEARCH METHODOLOGY

To achieve the objectives of this research, the study is divided into several stages, including:

Figure 2. Flowchart of research



Source: Processed Data Writer, 2019

Writing method

The method of writing is a natural way to get data with specific uses and purposes. In general, the data obtained from a writing used to solve a problem, understand and anticipate problems. That the data obtained in writing is accurate, then this chapter will explain the method of writing used during the writing of this progress. In accordance with the background of writing and formulation of the problem to be achieved then the required primary data and secondary data. Primary data is data obtained in the field directly in the form of interviews or discussions with relevant parties such as the Project Coordinator / Project Manager, Construction Manager, QC Manager and Site Manager, while secondary data is data obtained from sources that already exist such as Data Bill of Quantity,

Place and Time of Writing

The writing is done at Pondok Indah Mall Project 3, which is the main contractor of the project, namely. Total Bangun Persada Tbk Jo PT. Berca Buana Sakti, and the time of the writing was done in August 2019 until January 2020.

Population and Writing Instrument

Population is the object of writing. The population of this paper is the entire staff of employees working at PT. Total Bangun Persada Tbk Jo PT. Berca Buana Sakti play Project

contractor in Pondok Indah Mall 3, Jakarta. Writing instrument is a tool that is selected and used by the authors in their activities to collect data for these activities to be systematic and easy. For data collection in this study by Workers Unit Price Analysis (AHSP).

Final Preparation Schedule

Here is the schedule for the preparation of the final project.

Table 1. Results of Test Validity and Reliability

No	Uraian	Waktu Pengamatan																					
		Agustus				September				Oktober				November				Desember				Januari			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Penentuan Topik																								
2	Identifikasi Masalah																								
3	Studi Literatur																								
4	Survey Lokasi																								
5	Metode Penelitian																								
6	Seminar Proposal																								
7	Pengumpulan Data																								
8	Analisa Data																								
9	Penyusunan Laporan																								
10	Sidang Akhir																								

Source: Processed Data Writer, 2019

RESULTS AND DISCUSSION

Writing data collection is done by using data from the PIM project 3 as a reference to calculate the Unit Price Analysis Workers in each item workmanship floor plates. As for the use of a reference to the Schedule Time plan of the project, the coefficient of candy PUPR, and also conducted a survey and asked questions to the supervisor, site manager, foreman along with builders, and then from those results compare to find the length of the work in this study.

Cost Comparison Results

For a cost comparison here the author divides into two methods, the cost of using bondek and the cost of using conventional methods.

Table 2: Cost of Plate Work Flooring Systems Bondek

DESCRIPTION	PRICE
Direct Cost	Rp. 46,808,150,069
indirect Cost	Rp. 7.514 billion
SPF 3%	Rp. 1629664502
Margin of 10%	Rp. 5595181457
TOTAL PRICE	**Rp. 61,546,996,028**

Source : Processed Data Writer, 2019

Table 3: Cost of Conventional System Works Floor Plates

DESCRIPTION	PRICE
Direct Cost	Rp. 43,455,427,649
indirect Cost	Rp. 9.826 billion
SPF 3%	Rp. 1598442829
Margin of 10%	Rp. 5485987048
TOTAL PRICE	**Rp. 60,367,857,526**

Source : Processed Data Writer, 2019

Table 4: Comparison of Costs Between Bondek Method and Conventional Methods

NO	ITEM PEKERJAAN	VOLUME BASEMENT	HARGA /M2		TOTAL HARGA	
			BONDEK	KONVENSIONAL	BONDEK	KONVENSIONAL
1	Pasang Bekisting	62.435,43	Rp 159.125	Rp 145.658	Rp 9.935.033.819	Rp 9.094.213.619
2	Pembesian	62.435,43	Rp 211.292	Rp 211.292	Rp 13.192.106.876	Rp 13.192.106.876
3	Pengecoran	62.435,43	Rp 362.086	Rp 321.854	Rp 22.606.995.107	Rp 20.095.092.887
4	Curing Beton	62.435,43	Rp 10.895	Rp 10.895	Rp 680.234.010	Rp 680.234.010
5	Bongkar Bekisting	62.435,43	Rp 6.307	Rp 6.307	Rp 393.780.257	Rp 393.780.257
	TOTAL HARGA		**Rp 749.705**	**Rp 696.006**	**Rp 46.808.150.069**	**Rp 43.455.427.649**
TOTAL HARGA DIRECT COST					**Rp 46.808.150.069**	**Rp 43.455.427.649**
TOTAL HARGA INDIRECT COST					**Rp 7.514.000.000**	**Rp 9.826.000.000**
SPF					**Rp 1.629.664.502**	**Rp 1.598.442.829**
MARGIN 10%					**Rp 5.595.181.457**	**Rp 5.487.987.048**
TOTAL HARGA					**Rp 61.546.996.028**	**Rp 60.367.857.526**

Source : Processed Data Writer, 2019

Results Comparison of Time

For a comparison of the time here I take the data from the project Pondok Indah Mall 3 as a reference to calculate the time of the comparison, by seeking to know the productivity and the coefficient of workers for each item of work, and take a reference where the work the longest with the same number of people with jobs in project Pondok Indah Mall 3.

Table 5: Working Time Recap Floor Plates

NO	WORK AREA	METHOD BONDEK	CONVENTIONAL METHODS
1	basement 3	126 Day	168 Day
2	basement 2	126 Day	168 Day
3	basement 1	126 Day	168 Day
TOTAL		378 Day	504 Day

Source : Processed Data Writer, 2019

CONCLUSION

Based on the research that has been done, using the comparison time and expense items can be concluded that:

1. Cost
   The difference between the slab system with plate slab bondek conventional system in the basement area of Rp 1,179,138,501. These include the prices of materials, wages and tools.
2. Time
   The time difference between the floor slab system implementation bondek with plate slab conventional system with the same number of workers is as much as 126 days.
3. Factors that cause the difference between the floor slab and the floor slab system bondek conventional system is
   a) Work slab system bondek faster because work pembesiannya faster and especially to work the formwork is much faster than with slab conventional system because the formwork slab bondek just stay put at the site tampa there are a lot of cuts in the area of web casting is not as formwork slab conventional which cuts directly playwoodnya do diarea casting. It mempengruhi formwork work productivity per square meter.
   b) Costs incurred bondek slab system is more expensive due to the floor slab system bondek, require bondek permanently and permanent, are not removed after the concrete dries, whereas for conventional plates playwoodnya can be used 3 to 4 times that lead to savings for perancahnya.

Suggestion

As for suggestions that can be considered as follows:

1. Slab conventional systems produce 20% more waste than conventional floor plate in terms of formwork due bondek system is permanent, while conventional, bekistingnya reopen after concrete setting.
2. Bondek slab systems are well suited to accelerate work on the building project structure / building.

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