Abstract: Precast concrete is a printing method in the mechanization component factory or workshop. Precast panels as an alternative than the use of conventional wall because of the use of the facade using material precast panels will accelerate the progress of work, but the Project Apartment at by using the material precast panels as wall facade still find delays that will do the analysis of delay in the installation of precast panels in the project M-Town Signature Summarecon Serpong in order to determine the dominant factor that caused the delay. By using quantitative descriptive method, through a questionnaire based on 30 respondents of data results of the questionnaire will be tested instrument using SPSS and analyzed based on PMBOK. With this method in getting the main indicators are the greatest factors in the Project Apartment at Summarecon Serpong. From the results of this analysis were found several dominant factors that will trigger a response delay and also create risks to overcome delays and improve performance in terms of time.

Keywords: Implementation, precast walls, projects, analysis, risk, time.

1. Introduction

Background-based

Precast concrete is a building material that has been chosen by experts of the structure. The amount of concrete due to the use of concrete made from materials that are easy to obtain, processed, treated, molded, are relatively inexpensive and have high compressive strength.

Along with the development, as the engineer is required to be faster in the implementation of the construction of a building. To answer that, we need a building material has advantages and benefits of which can match the needs, technical specifications and strength, as well as the implementation of rapid construction and environmentally friendly than the existing building materials over the years. Wall panels are one of the technological developments in the field of precast concrete.

This construction method can greatly reduce the total time of the project since the construction of precast elements prepared, while other jobs as it is also implemented. Through this plan is expected to result in the building by pressing a minimum construction costs and shorten the process so it can produce economical buildings with good quality. But not many are using facade of precast panel this would trigger delays and there are some risk factors that can trigger this delay.

Planning the construction of apartment project is consisting of 38 floors using precast concrete system for the facade. With good planning method is expected to complete the development work in accordance with the expected time.

2. Identification of problems

Based on the above, it can be made an identification problem as follows:

a. The problems that may occur in work precast panel store building projects

b. The risks that can lead to delays in the work of precast panel on the project multi-story buildings.

3. Formulation of the problem

Based on the identification of the problems above, it can be prepared a formulation of the problem, namely:

a. Identifying problems and obstacles and constraints that occur when implementation job precast panels.

b. Tackling the causes of the most dominant risk that triggered the delay to work precast panels.

4. Research Objectives

Purposes of this study are as follows:

a. To identify possible risks that will occur as early as possible, so as to know how to manage the risks well.

b. Finding alternative solutions and business acceleration in the use facades for of high rise building using precast panels.

5. Research Benefits

A benefit of the research is to reduce the barriers that may occur during the process of production, delivery and install which resulted in a delay in the work schedule.
6. Restrictions and Problems Scope of
   Limitations the problem in this research is formulated as follows:
   a. Work precast panel which analyzed only in the Project Apartment at
   b. Enterprises acceleration is used to achieve the target of completion and that affected how

7. Literature
7.1. Facade (Surface Outer Wall)
   Use of the facade that is often used in the construction of multi-storey building in recent years is as follows:
   1. The facade wall plaster
   2. facade of natural granite
   3. natural stone facade andesite
   4. Aluminum Composite Panel
   5. Glass / curtain wall
   6. GRC panel
   7. precast Concrete Panel

7.2. Precast Concrete
   Precast concrete resulting from the production process in which the different manufacturing locations with the location of the elements will be used. Opponent of precast concrete is cast in place or cast-in-situ, where production processes take place in the element will be placed (Wulfram I. Ervianto, 2006).
   Precast concrete is a method of printing components mechanization in the factory or workshop to give time hardening and gain strength before installation.

7.3. Precast Concrete Elements
   The types of precast concrete elements as mentioned above. Factors to be considered in producing concrete elements precast is:
   a. Number of modules produced
   b. type and module variations
   c. weight of each module
   d. Dimensions module

7.4. Implementation Method Precast Concrete
   In this method of implementation, there are several stages, including:
   1. Production Process
   2. Delivery Process
   3. Installation Process

7.5. Factor Delay Project
   1. delays related to material
   2. delays related workforce
   3. delays associated equipment
   4. Planning incompatible
   5. weak control project time

7.6. Systems project time management
   The understanding of project time management is the process of plan, organize and control the project schedule activities. Time management is included in the process that will be required for completion of a project make sure the time. Time management system centered on walking or absence of planning and scheduling projects. Where in planning the and scheduling have been provided specific guidelines to the complete project activities more quickly and efficiently (Clough and Scars, 1991).

7.7. Time Management Aspects
   Basic used on a time management system that is operational planning and scheduling in line with the duration of the project has been set. In this case the scheduling is used to control the activities of the project each day. Aspects of time management itself is a process that each successive one another.

7.8. Standardization of Time Management
   Time management was said to have been executed, when each of the contracting company carrying out every aspect of time management.
   1. Determining project scheduling
   2. Monitoring (Measuring and Making Progress Report Project)
   3. Comparing with Project Progress Schedule (Analysis)
   4. Planning and Implementing Measures Correction (Corrective Action)
   5. Update Project Scheduling (Operational Update Schedule)

7.9. Project Implementation Risks
   Risks to own a lot of sense from a variety of viewpoints. Risk is event we did not expect but it occurs naturally and this is a challenge that must be faced by the construction of the service as a high-risk businesses (Nasrul, 2015).
   Risk is an event or condition that is not certain, that the event could have an impact on project objectives include scope, schedule, cost, and quality (PMBOK, 2008).

7.10. Risk management
   Management is a typical process, which consists of the action planner, organizing, agitation or
implementation, and control, which is performed to determine and achieve the goals that have been established through human resources and other resources (Ismael, 2013).

Project risk management includes the process of conducting risk management planning, identification, analysis, response planning, and monitoring and controlling project. Project risk management objective is to increase the probability and impact of positive events and reduce the likelihood and impact of something that is detrimental to the project (PMBOK: 2008).

The purpose of the analysis and risk management is to help avoid failure and give an idea of what happens when development is done was not in accordance with the plan (I Nyoman Norken 1, I Nyoman Yudha Astana 1, 2012).

7.11. Stages in Risk Management

Risk management is an approach taken towards risk is to understand, identify and evaluate the risks of a project. Then consider what to do about the impact and possible transfer of risk to others or reduce the risk. Risk management is all a series of activities related to the risk of planning (planning), assessment, handling and monitoring the risk.


The risk of an activity utilization of land resources is characterized by the following factors:
1) Event risk (indicating the negative impact that may occur on the project)
2) Probability of risk occurrence
3) Severity adverse effects /impact/ negative consequences of risk will occur

According (PMBOK, 2008), an approach that was developed using two criteria that are important to measure risk:
1) Likelihood, is the possibility (probability) of an undesired event.
2) Impact , is the level of influence or effect size (Impact) in other activities, if undesirable events occurred.

Measurement of risk probability:

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<td>Rare, only in certain circumstances</td>
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<td>2</td>
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<td>3</td>
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Measurement of impact risk:

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<td>1</td>
<td>Does not apply to schedule project</td>
</tr>
<tr>
<td>2</td>
<td>Small</td>
<td>2</td>
<td>There was delay in schedule of the project &lt;0.2%</td>
</tr>
<tr>
<td>3</td>
<td>Average</td>
<td>3</td>
<td>There was delay in schedule projects 0.3% - 0.9%</td>
</tr>
<tr>
<td>4</td>
<td>Big</td>
<td>4</td>
<td>There was delay in schedule of the project 1% - 1.9%</td>
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<tr>
<td>5</td>
<td>Very large</td>
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<td>There was delay in the project schedule &gt; 2% / project stalled</td>
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<table>
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<td>0.1</td>
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From various sources on the above, it can be graphed comparison between the probabilities of the impact as follows:

Figure 2.1 Probability Impact Matrix
Source: http://industrialaudit.com/risk-mitigation/

From the picture above it can be concluded formula to find the risk index is as follows:

\[ R = P \times I \]

Where:

- \( R \) = Index risk
- \( P \) = Likelihood (Probability) and risk of loss
- \( I \) = degree of impact and risk of loss

by the matrix then range value to rank the risk is:

a. Low risk: 0.01 to 0.05
b. Moderate risk: from 0.06 to 0.14  
c. High risk: from 0.18 to 0.72

7.13. Thinking Framework

Based on the review of the literature that has been written to the writer that there are 3 aspect trigger delays that cause delays in the work of precast panels in Apartment Development Project Apartment at Summarecon Serpong among which the production, delivery and installation

So it can be determined that the indicative factor causes are:
1. Variable X
   \[ X_{1A} = \text{Design} \quad X_2 = \text{Delivery} \]
   \[ X_{1B} = \text{Material} \quad X_3 = \text{Install} \]
   \[ X_{1C} = \text{working tool} \]
2. Y variable is delay the work of precast panels

8. Research Methodology

This research method contains a discussion of the methods used in this study. Additionally it contains a flowchart of the study along with a description of the stages of the design and operational model of this Final. The method used to carry out research analysis delay the work of precast panel is descriptive, analytical, is a descriptive analysis gives an overview on a particular problem, where already there is information on these issues, but not sufficient, so it requires a more detailed explanation by analyzing the factors that may be considered in determining the handling of the beginning. The results of this research through interviews respondents were already experts in the field, namely-led projects / project manager.

8.1. Data Collection Techniques

Data collection is done by collecting primary data, which is a way to collect data directly related to the respondent, without going through an intermediary or any other party, for example of a statistic agency or other data references. A questionnaire was used as a data collector. Sampling of this research using random sampling system whereby every individual in the population has the same chance of being elected to the sample. The data in this study is quantitative data, which is data that is collected and processed to find out how many of the factors that affect the job deploy delays precast panel in the implementation of the project.

There are two types of data used in the case study of this project, which is a type of primary data and secondary data. Data analysis technique is done by using quantitative descriptive method on secondary and primary data that have been obtained. Quantitative descriptive method of secondary data by analyzing secondary data obtained from the businesses studied, and through quantitative descriptive method of primary data, which is done interviews with respondents to identify the risks associated with construction risks for further structured risk response in the face of the risk of such construction.

9. Project Overview

Project data obtained by the author in working on this thesis, obtained from the collection of data used and by interviews with staff and project officers, sub con precast panels.

The picture of the project is as follows:

9.1. General Data Project
a. Project Name: M-Town Signature  
b. Developer: PT. Serpong Summarecon  
c. Project Location: Jalan Boulevard Gading Serpong  
d. Building Name: Apartment  
e. Building Function: Residential  
f. Land Area: 17471.54 m²  
g. Building Size:
   - Tower Galaxy: 29,818 m²
   - Tower Herald: 29,818 m²
   - Tower Imperial: 29,818 m²
   - Tower Jefferson: 29,818 m²
   - Podium: 5,245 m²
   Number of floors: 38 floors, one basement

9.2. Questionnaires and Respondents

This chapter describes the analysis and data processing questionnaire results Main has received a response from the respondent / project team on the ground to make the filling Questionnaire, From the
results of the questionnaire and test instrument using SPSS and analysis based on PMBOK to see the most dominant risk on the job Precast Panel in M-Town project Signature Summarecon Serpong.

9.3. Analysis of Respondents

By the acquisition of the data takes place during the research carried out, there is some data that can be presented ranging from the analysis of the respondents include the number of respondents who participated, types of respondents, respondents’ experience working, age, education, past, percentage of delays, the effect of the delay with the cost and the percentage experiencing delay.

Figure 4.1 Percentage of respondents who answered the questionnaire (Source: Results Sports Writer)

Figure 4.2 Percentage of respondents by age (Source: Results Sports Writer)

Figure 4.3 Percentage of respondents by gender (Source: Results Sports Writer)

Figure 4.4 Percentage of respondents by last education (Source: results Sports Writer)

Figure 4.5 Percentage of respondents by work experience (Source: results Sports Writer)
9.4. Analysis and Discussion

Management of research data is taken as a whole from the incoming data, as many as 30 respondents. But before taken the analysis of the overall data must first be data based on the work items that affect the delay of execution of project work which includes several categories / factors, namely production, including design, materials and tools, delivery and installation, so it would seem the main factors affecting the delay the completion of work precast panel on the project apartment Summarecon Serpong.

9.5. Validity

In this analysis stage, the first is to assess which variables were considered for inclusion in subsequent analyzes. In this test will test the validity, the validity test conducted to determine whether the instrument has the accuracy and validity of the questionnaire. The questionnaire considered valid if the item questionnaire was able to reveal something that will be measured.

According to Clough to determine whether or not Suite items to be used, it is necessary to test the significance or significance level of 0.05 (5%), which is considered valid if the research variables significantly correlated to the total score. In addition, the determination of the validity of the comparison is also determined by the count r Pearson Correlation method with the value of r table. If the item to total correlation coefficient> r table with df (0.05, n-2), declared invalid. The output explains the test results whether the data results of the questionnaire respondents' answers can be valid or not. The data say what is valid when the value of Item-Total Statistics bigger than r table.

From the result of analysis could 7 variables value Item-Total Correlation is less than the value of r table, it can be said if the variables X1, X2, X3, X5, X6, X7 and X8 are invalid and can be eliminated.

9.6. Test Reliability

To determine consistency measuring instrument, namely whether the measuring instrument is reliable and consistent for repeated measurements, then used a reliability test in which the provisions are as follows:

a. If alpha > 0.90, then the perfect reliability or trustworthy

b. If alpha between 0.70 to 0, 90 the high reliability

c. If alpha between 0.50 to 0.70 so the reliability of moderate

d. If alpha <0.50 then the low reliability

9.7. Frequency Analysis Risk

From a validity test frequency of risk there are 38 indicators of risk (variable X) that pass the validity test, using a scale of values of impact (consequences) of risk determined by the PMBOK.

9.8. Impact Analysis of Risk

From test the validity of the risk impact there are 41 indicators of risk (variable X) that pass the validity test, using a scale of values of impact (consequences) of risk determined by the PMBOK.

9.9. Matrix and Risk Mapping

After calculation of risk values (FR) and is based on diagram Probability Impact Matrix of risk is determined by the PMBOK and can be seen in Chapter II.

From the analysis it can be concluded if the dominant risk factors occur and a major impact on job execution time performance precast panel M-
Town project Signature Summarecon Serpong is a risk indicator X_{34}, X_{41}, X_{35}, X_{14}, and X_{4}.

### 4.10. Calculation of Risk Analysis

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<td>0230</td>
<td>0059</td>
<td>21</td>
<td>MR</td>
<td></td>
<td></td>
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<tr>
<td>35</td>
<td>X_{39}</td>
<td>0300</td>
<td>0262</td>
<td>0079</td>
<td>13</td>
<td>MR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>X_{40}</td>
<td>0252</td>
<td>0230</td>
<td>0058</td>
<td>22</td>
<td>MR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>X_{41}</td>
<td>0420</td>
<td>0347</td>
<td>0146</td>
<td>2</td>
<td>HR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>X_{42}</td>
<td>0300</td>
<td>0253</td>
<td>0076</td>
<td>14</td>
<td>MR</td>
<td></td>
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<tr>
<td>39</td>
<td>X_{43}</td>
<td>0300</td>
<td>0302</td>
<td>0091</td>
<td>11</td>
<td>MR</td>
<td></td>
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</tr>
<tr>
<td>40</td>
<td>X_{44}</td>
<td>0287</td>
<td>0332</td>
<td>0095</td>
<td>9</td>
<td>MR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>X_{45}</td>
<td>0187</td>
<td>0227</td>
<td>0042</td>
<td>29</td>
<td>MR</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

HR: High Risk  
MR: Medium Risk  
LW: Low Risk

**Table 4:17 Risk factors dominant**

<table>
<thead>
<tr>
<th>variable</th>
<th>Indicator Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>x_{34}</td>
<td>Man power installed less</td>
</tr>
<tr>
<td>x_{41}</td>
<td>the use of working tools that are not up to job categories: Implementation</td>
</tr>
<tr>
<td>x_{35}</td>
<td>the level of activity tower crane</td>
</tr>
<tr>
<td>X_{14}</td>
<td>Number of prints (table / bed) less</td>
</tr>
<tr>
<td>x_{4}</td>
<td>Engineering less</td>
</tr>
</tbody>
</table>

### 10. Response Risk

Based on the results of the analysis to determine the dominant factors that affect high to delay work precast panel on the project apartment at Summarecon Serpong. Based on the results of data processing are valid, encountered 5 delay factor of filling the questionnaire that was filled out by the contractors and sub-con working precast panel on the project. The dominant factor influencing project delays construction namely:

1. Man power installed less  
2. Use of instruments of labor is not the maximum  
3. Level of activity tower crane  
4. Number of prints (table / bed) less  
5. Engineering less  

Inhibiting factors in the implementation of precast panels should be as early as possible are identified so as to enable the next similar work to avoid delays in finding a solution to some of the factors above.

### 11. Conclusion & Recommendation

#### 11.1. Conclusion

Based on a series of studies then can be concluded in this study that from the analysis and discussion in Chapter IV, Retrieved 5 dominant risk causing delays in the implementation of the work of precast panel construction projects apartment at Summarecon Serpong based on analysis of PMBOK is as beikut:

1. X_{34}: Man power installed less  
   job categories: Implementation  
2. X_{41}: The use of work tools that are not up to job categories: Implementation  
3. X_{35}: The level of activity tower crane  
   job categories: Implementation  
4. X_{14}: Number of prints (table / bed) less  
   job categories: Production  
5. X_{4}: Engineering a less  
   job categories: Production

After analyzing the predominant risk is the author identifies the factors that can trigger this delay is as follows:

1. X_{34}: Man power is less install  
   Incompatibility wage price / her disloyal so that workers can easy after payday is not returned to the project due to get the job wage price is greater
2. X_{41}: The use of work tools that are not up to
   a. not run well maintenance which should be
      regularly carried out so create damages the
      tool
   b. is always forced to use a work tool that is
      not supposed to be in use the grounds to
      allow for quicker work, but the results are
      not optimal
3. X_{35}: the level of activity tower crane
   Coordination of field that is not going well, so
   there cases in tower crane
4. X_{14}: Number of prints(table/bed)less
   Because the apartment project at Summarecon
   Serpong, a project first so that the availability of
   table / bed still adjusting
5. X_{4}: Engineering less
   Too pressing budget, thereby reducing the
   overhead

Data above is PMBOK analysis result data with
the results of 60% of the biggest delays in the
implementation while 40% at the time of production.
Given the above results is the result of analysis of the
respondent and PMBOK analysis, the author tries to
compare with actualization in the field by an
interview with the project manager of the project-
related delays in this work by comparing the man
power that other problems arise that cause a domino
effect.

Enterprises acceleration is done in this project
are to:

1. If the party sub-contractors are not able to bring
   in workers’ settlement work will be taken over
   by main contractors and cutting progress to
   sub-contractors associated
2. Feeding schedules conveyance of material
   using a tower crane on morning from 09.00 -
   11:00 and dinner from at 21:00 to 22:00 and
   allowing transport of material precast panels at
   recess with the records have been coordinated
   with related parties (SM, SPV and operator TC)
3. Request the addition of table / bed to sub-
   contractors in accordance with the needs of
   precast panels this project so in September has
   the added table / bed as much as 35 units with
   brand Weckenmann.
4. Addition engineering (from sub-contractors)

11.2. Suggestions
As for suggestions that can be given in this study
are as follows:
1. The Importance prepared a risk analysis of a
   particular job precast panel before they began
   its work in this (risk assessment).
2. After getting the results of this study are
   expected to be a reference to the contractor (PT.
   Wijaya Kusuma Contactors) and subcon
   precast panels (PT. Rekagunatek Persada) to
cope with the risks that occur on the job precast
panels on the implementation of the Project
Apartement at Summarecon Serpong.
3. It is expected that in the future will do more
research on the dominant factors to the delay.

7. References
Evaluasi Penggunaan Beton Precast di
Proyek Konstruksi. Retrieved from Jurnal
Karya Teknik Sipil Universitas Diponegoro:
ejournal-s1.undip.ac.id/index.php/kts
Risiko Pada Proyek Konstruksi di
Pemerintah Kab Jembrana. Jurnal Ilmiah
Teknik Sipil.
Management. Canada: John Willey & Sons
Inc.
Konstruksi Ditinjau dari Sisi Manajemen
Waktu Institut Teknologi Padang. Jurnal
Momentum, 17(1), 50-54.
Manajemen Risiko Pada Proyek
Pembangunan Infrastruktur agunan Gedung
Bertingkat. Jurnal Desain Konstruksi,
Universitas Gunadarma.

Project Management Body of Knowledge (PMBOK

Makalah Studi Kasus. Studi Kegagalan
Struktur Precast Pada Beberapa Bangunan
Tingkat Rendah Akan Kebat Gempa Padang
September 2009.

Nafiri. Yogyakarta.


Konstruksi. Fakultas Teknik Sipil
Universitas Diponegoro Semarang.

Wirabakti, D. M., Abdullah, R., & Maddepunggeng,
A. (2014). Jurnal Konstruksi. Studi Faktor-
Faktor Keterlambatan Proyek Konstruksi
Bangunan Gedung.

Pelaksanaan Dinding Precast dengan
Dinding Konvensional Ditinjau dari Sefi
Waktu dan Biaya. Retrieved from Jurnal
Konstruksi.