COST AND TIME STUDY OF KNOCK DOWN FORMWORK

Final Project Report

in fulfillment of the requirement for the degree

Bachelor of Civil Engineering

by:
CHRISTIEN PRATIWI PALAYUKAN
Student ID Number : 131314916

INTERNATIONAL S1 PROGRAM
DEPARTMENT OF CIVIL ENGINEERING
FACULTY OF ENGINEERING
UNIVERSITAS ATMA JAYA YOGYAKARTA
YOGYAKARTA
2017

STATEMENT

I signed below stating that the final project with the title:

"COST AND TIME STUDY OF KNOCK DOWN FORMWORK"

It is the result of my own work and not a result of plagiarism of other people's work. Ideas, research data, and quotes directly or non-directly derived from the writings or ideas of others expressly provided in this Final Project. If it is proven later that this Final Project is the result of plagiarism, the graduation certificate that I received will be cancled and returned to Universitas Atma Jaya Yogyakarta.

Yogyakarta, 25 Juli 2017

Who made the remarks,

Christien Pratiwi Palayukan

APPROVAL

Final Project Report

COST AND TIME STUDY OF KNOCK DOWN FORMWORK

by :

CHRISTIEN PRATIWI PALAYUKAN

Student ID Number : 13 13 14916

has been approved by Supervisor,

Yogyakarta, .24/07/2017

Supervisor,

Ir. AY. Harijanto S., M.Eng., Ph.D

Department of Civil Engineering Chairman,

J.Januar Sudjati, S.T., M.T.

APPROVAL EXAMINER

Final Project Report

COST AND TIME STUDY OF KNOCK DOWN FORMWORK

by :

CHRISTIEN PRATIWI PALAYUKAN

Student ID Number : 13 13 14916

has been examined and approved by :

	Name	Signature	Date
Chairperson	: Ir. AY. Harijanto S., M.Eng., Ph.D	.....	24/07/2017
Member	: Ir. Peter F. Kaming, M.Eng., Ph.D	.....	25/07/2017
Member	: Ir. A. Koesmargono, MCM, Ph.D	.....	18/7/17

MOTTO

"For I the LORD your GOD keep hold of

your right hand; [I am the LORD], Who says

to you, 'Do not fear, I will help you.'

(Isaiah 41:13)

Delays are blessings.

Obstacles are intentional.

Destinies are personal and inevitable.

It's all connected and it's all necessary.

Trust this.

- Chantelle Agbro

I dedicated this Final Project to Jesus Christ and my Family

PREFACE

Thank you to my Lord Jesus, because of His blessings, this final project can be finished on time without any serious problem. The purpose of the final project with the title "Cost and Time Study of Knock Down Formwork" is to complete the requirement of undergraduate program (S-1) in International Civil Engineering Program, Department of Civil Engineering, Faculty of Engineering, Universitas Atma Jaya Yogyakarta. For the completion of this final project, I also would like to express my gratitute towards:

1. Prof. Ir. Yoyong Arfiadi, M.Eng., Ph.D as the Dean of Engineering Faculty of Universitas Atma Jaya Yogyakarta,
2. J. Januar Sudjati, S.T, M.T., as the head of Civil Engineering Department of Universitas Atma Jaya Yogyakarta,
3. Dr.Eng. Luky Handoko, S.T., M.Eng., as the Coordinator of International Civil Engineering Program,
4. Ir., AY. Harijanto Setiawan., M.Eng., Ph.D., as my supervisor for his advice and counseling. His constant support and advice have been invaluable,
5. All the lecturers and staffs in the Civil Engineering Department, especially in International Civil Engineering Program,
6. My Parents, Joni Palayukan S.H., M.H., and Rosalina Lolo Rumengan for the love, support, and advices to finish this final project,

7. My brother Romario Palayukan S.H., and my sister Mentari Palayukan S.H., for the love, support, advices, and money to finish this final project,
8. My friends, Diko, Dea, Brenna, Alpin, Harry, Yuli, Edwin, Itha and Ody who encouraging and hearten me whenever I felt down,
9. My Friends, Tio, Alvin, Rio, Andreas, Dede, Thoban, Jeje, Laras, Lia, Thea, Rikho, Ivan, and Yoan as the assistants of BPJ Laboratory for the hard working in these past 6 months,
10. My friends, Tina, Siti, Devada, Yessy, Heru, Sendy for encouraging me via group chat,
11. All my friends, seniors and juniors especially in the International Civil Engineering Program.

I realize, this report may be flawed. Therefore I accept any form of suggestion for further improvement. Thank you.

Yogyakarta, July 2017

Author

Christien Pratiwi Palayukan

(131314916)

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDIXES

ABSTRACT

COST AND TIME STUDY OF KNOCK DOWN FORMWORK, Christien Pratiwi Palayukan, Student ID Number 13.13.14916, 2017, Construction Management, International Civil Engineering Program, Civil Engineering Department, Faculty of Engineering, Universitas Atma Jaya Yogyakarta.

Formerly, formwork was only made by plywood and timber, also known as conventional system formwork. However, conventional formwork is considered inefficient in term of time and price. Not only takes long time to fabricate the formwork, but conventional formwork also result many wastes since conventional formwork can only be used for maximum two times. So this became an important issue in construction industry. Therefore, many of new formwork innovations came up to overcome this issues, one of the innovations is knock down formwork. Knock down formwork made of steel plate or specific plywood and hollow iron. However, there might be some engineers have lack information about knock down formwork. Therefore, it is needed to discuss about the cost and time of knock down formwork compare to conventional formwork. Furthermore, the engineer can choose which formwork is compatible for their project, by considering the cost and time aspects. In this case, knock down formwork was observed in Malioboro Park View Apartment project, while conventional formwork was observed in Kencana Shop and House project.

The data collection was done for on-going building project. The data collection was divided into two, time study and cost study. The data for time study of knock down and conventional formwork was done directly in construction site by measuring the duration to finish one formwork installation by using stopwatch with accuracy of 0.01 seconds. The data for cost study of knock down and conventional formwork was done directly in construction site by observe the amount of workers and materials used to finish one formwork installation. After that, those data were analyzed and calculated using some formula then finally got the productivity, workers and material coefficient, and the unit price.

Based on the time data analysis, knock down formwork is 11 minutes and 5 seconds faster than the conventional formwork for 1 m^2 formwork installation. Furthermore, based on the cost data analysis, knock down formwork is Rp.245,085 more expensive than conventional formwork. Based on the result obtained from the observation, the writer conclude that the knock down formwork is more efficient to use for high rise building rather than conventional formwork. Despite the expensive price, the formwork can be used for multiple times (more than 30 times) so it is still cheaper if compared to conventional formwork that only can be used maximum 2 times (depends on its condition). In time aspects, the installation of knock down formwork is also faster than the conventional formwork. Because the making of formwork is only done once and used continuously during the project construction.

Keywords : Knock down, conventional, formwork, time, cost.