



**CONTROLLING CONSTRUCTION MATERIAL
PROCUREMENT USING THE MATERIAL REQUIREMENT
PLANNING (MRP) METHOD IN THE FOX LOGGER
OFFICE PROJECT - JAKARTA**

UNDERGRADUATE THESIS

Submitted as one of the requirements to obtain

Sarjana Teknik

By:

Keivylarza Sweethania Puspita

022201900006

**FACULTY OF ENGINEERING
CIVIL ENGINEERING STUDY PROGRAM
CIKARANG**

MARCH, 2023

**CONTROLLING CONSTRUCTION MATERIAL
PROCUREMENT USING THE MATERIAL REQUIREMENT
PLANNING (MRP) METHOD IN THE FOX LOGGER
OFFICE PROJECT - JAKARTA**

By

Keivylarza Sweethania Puspita

022201900006

Approved by:



Dr. Ir. Eddy Triyanto Sudj atmiko, S.T.,

M.T.

Thesis Advisor



Dr. Ir. B. M. A. S. Anaconda Bangkara,

M.T., M.SM.

Head of Study Program Civil Engineering

ADVISOR APPROVAL FOR JOURNAL/INSTITUTION'S REPOSITORY

As an academic community member of the President's University, I, the undersigned:

Advisor Name : Dr. Eddy Triyanto Sudjatmiko

Employee ID number : 20190900816

Study program : Civil Engineering

Faculty : Engineering

Declare the following thesis :

Title of thesis : Controlling Construction Material Procurement Using The Material Requirement Planning (MRP) Method In The Fox Logger Office Project - Jakarta

Thesis author : Keivylarza Sweethania Puspita

Student ID number : 022201900006

Will be published in journal / institution's repository

Cikarang, February 2023

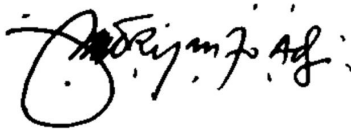


Dr. Ir. Eddy Triyanto Sudjatmiko, S.T., MT

PANEL OF EXAMINER'S APPROVAL

The Panel of Examiners declares that the undergraduate thesis entitled **Controlling Construction Material Procurement Using The Material Requirement Planning (MRP) In The Fox Logger Office Project-Jakarta** that was submitted by Keivylarza Sweethania Puspita majoring in Civil Engineering from the Faculty of Engineering was assessed and approved to have passed the Oral Examination on March 29, 2023.

Panel of Examiners



Riyanto Adji, ST, M.MSi.

Chair



Dr.Ir.B.M.A.S Anaconda Bangkara, M.T.,M.SM.

Member

STATEMENT OF ORIGINALITY

In my capacity as an active student of President University and as the author of the thesis/final project/business plan stated below:

Name : Keivylarza Sweethania Puspita

Student ID number : 022201900006

Study Program : Civil Engineering

Faculty : Engineering

I hereby declare that my thesis/final project/business plan entitled "**Controlling Construction Material Procurement Using The Material Requirement Planning (MRP) Method In The Fox Logger Office Project - Jakarta**" to the best of my knowledge and belief, is an original piece of work based on sound academic principles. If there is any plagiarism detected in this thesis/final project/business plan, I am willing to be personally responsible for the consequences of these acts of plagiarism and will accept the sanctions against these acts in accordance with the rules and policies of President University.

I also hereby declare that this work, either in whole or in part, has not been submitted to another university to obtain a degree.

Cikarang, February 2023

A handwritten signature in black ink, appearing to read 'Keivylarza P.' with a stylized flourish at the end.

Keivylarza Sweethania P.

SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST

As an academic community member of the President's University, I, the undersigned:

Name : Keivylarza Sweethania Puspita

Student ID number : 022201900006

Study program : Civil Engineering

For the purpose of development of science and technology, certify, and approve to give President University a non-exclusive royalty-free right upon my final report with the title :

Controlling Construction Material Procurement Using The Material Requirement Planning
(MRP) Method In The Fox Logger Office Project

With this non-exclusive royalty-free right, President University is entitled to converse, to convert, to manage in a database, to maintain, and to publish my final report. There are to be done with the obligation from President University to mention my name as the copyright owner of my final report.

This statement I made in truth.

Cikarang, Februari 2023



Keivylarza Sweethania P.

TURNITIN

CONTROLLING CONSTRUCTION MATERIAL DELIVERY USING THE MATERIAL REQUIREMENT PLANNING (MRP) METHOD IN THE FOX LOGGER OFFICE PROJECT - JAKARTA

ORIGINALITY REPORT

7 %	5 %	2 %	4 %
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.coursehero.com Internet Source	1 %
2	Submitted to HELP UNIVERSITY Student Paper	1 %
3	salshaflorest.com Internet Source	1 %
4	Submitted to School of Business and Management ITB Student Paper	<1 %
5	www.stayindo.com Internet Source	<1 %
6	Submitted to JMC Academy Student Paper	<1 %
7	kits360.com Internet Source	<1 %
8	moam.info Internet Source	<1 %

GPTZero

Stats

Average Perplexity Score: 197.393



A document's perplexity is a measurement of the randomness of the text

Burstiness Score: 246.295



A document's burstiness is a measurement of the variation in perplexity

Your sentence with the highest perplexity, "Storage costs will be eliminate", has a perplexity of: 1249

ABSTRACT

The size of the land area affects the course of the project. An example is the Fox Logger Office construction project which has a small land area of 196.43 m². Many obstacles arose due to these conditions, one of which was that there was no material storage in the project area. If a project does not have space to store materials, it will result in all materials being unable to be stored in the project area. In other words, with the remaining space, there is only a little material that can be stored or material that will be used immediately. Therefore, the project manager usually works around this by renting a warehouse outside the project area. However, renting a warehouse means additional costs are incurred during the material procurement process. In a project, an unexpected cost increase certainly disappoints some parties. Therefore, in this study, the authors try to reduce the additional costs of renting a material warehouse. Storage costs will be eliminated by making a very detailed material ordering schedule according to the needs of each job. This research will be assisted by the Material Requirement Planning method using the Fixed Period Requirement and Lot-for-Lot calculation technique. This method is beneficial for reducing material inventory costs in Fox Logger Office construction projects. After calculation and comparison, the writer saved IDR 36,000,000 on holding costs using Lot-for-Lot technique. Therefore the authors highly recommend using a material management system with the MRP method if the conditions in the project are similar to the Fox Logger Office project.

Keywords: Material Management, Material Requirement Planning, *Lot-sizing*, Lot-for-Lot, Fixed Period Requirement

ACKNOWLEDGEMENT

Praise and gratitude are extended to the presence of Allah S.W.T. because by His grace the author was able to complete this thesis with the title “CONTROLLING CONSTRUCTION MATERIAL PROCUREMENT USING THE MATERIAL REQUIREMENT PLANNING (MRP) METHOD IN THE FOX LOGGER OFFICE PROJECT – JAKARTA” which was completed smoothly and on time. To fulfill the academic requirements of the Civil Engineering Study Program at President University.

First of all, the author would like to express the deepest gratitude to all parties who have helped and supported the author for this paper to be completed. The author would like to thanks:

1. My parents and my family who always provide moral support and material.
2. Mr. Eddy Triyanto Sudjarmiko and Mr. Anggoro Wisaksono as the final project supervisor who provide assistance, direction, motivation and support.
3. All Civil Engineering President University lectures who have guided and taught us very useful knowledge.
4. To all my support system, Jogie Nikodemus, Farrel Ferdinand, Salma Azzahra, Intan Amalia, Fachry Priambodo, and Destian Arby who always care and help the author since day one at Civil Engineering President University.
5. Mr. Surya Wijaya as Project Manager at PT. Inti Desain Enjiniring who helped the author completing this paper.
6. All Classmate from Civil Engineering President University batch 2019 for the journey, experience, and new family for the author.
7. Keivylarza Sweethania, thank you for all the hard work and stay alive after many obstacles that come. Thank you for believing in yourself.

Cikarang, February 2023



Keivylarza Sweethania P.

TABLE OF CONTENTS

CONTROLLING CONSTRUCTION MATERIAL PROCUREMENT USING THE MATERIAL REQUIREMENT PLANNING (MRP) METHOD IN THE FOX LOGGER OFFICE PROJECT - JAKARTA	I
ADVISOR APPROVAL FOR JOURNAL/INSTITUTION'S REPOSITORY	II
PANEL OF EXAMINER'S APPROVAL	III
STATEMENT OF ORIGINALITY	IV
SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST	V
TURNITIN	VI
GPTZERO	VII
.....	VII
ABSTRACT	VIII
ACKNOWLEDGEMENT	IX
TABLE OF CONTENTS	X
LIST OF FIGURES	XII
LIST OF TABLES	XIII
CHAPTER 1	1
INTRODUCTION	1
1.1 BACKGROUND	1
1.2 PROBLEM STATEMENT	3
1.3 RESEARCH PROBLEM	3
1.4 RESEARCH OBJECTIVE	3
1.5 RESEARCH LIMITATIONS	4
CHAPTER 2	5
LITERATURE REVIEW	5
2.1 CONSTRUCTION PROJECT	5
2.2 PROJECT PLANNING	7
2.3 CONSTRUCTION PROJECT EFFECTIVENESS	7
2.4 MATERIAL MANAGEMENT	8
2.5 INVENTORY CONTROL	8
2.6 MATERIAL REQUIREMENT PLANNING	10
2.7 TIME SCHEDULE	13
2.8 RELEVANT PREVIOUS RESEARCH	15
CHAPTER 3	16
RESEARCH METHODOLOGY	16
3.1 RESEARCH METHODS	16
3.2 DATA COLLECTION	16
3.3 DATA ANALYSIS	16
3.4 RESEARCH FLOWCHART	17
CHAPTER 4	18
RESEARCH RESULT AND DISCUSSION	18
4.1 PROJECT OVERVIEW	18
4.1.1 Project General Details	19

4.1.2	Project Locations	19
4.2	PROJECT CONDITIONS & PROBLEMS	21
4.2.1	Conditions.....	21
4.2.2	Problems	25
4.3	PROCUREMENT OF CONSTRUCTION MATERIALS	26
4.3.1	Steel Bar Procurement	26
4.4	DATA COLLECTION & PROCESSING	27
4.4.1	List of Material Requirements for The Fox Logger Office Project	27
4.4.2	Project Schedule	28
4.4.3	Ordering Cost	29
4.4.4	Holding Cost.....	30
4.4.5	Procurement Cost by Contractor.....	31
4.5	DATA PROCESSING USING THE MRP METHOD.....	32
4.5.1	Lot Sizing Using Fixed Period Requirement (FPR)	32
4.5.1.1	Monthly Material Requirement List	32
4.5.1.2	Material Procurement Using FRP Technique	33
4.5.2	Lot Sizing Using Lot-For-Lot (LFL)	35
4.5.2.1	List of Rebar Material Requirement Per-Floor	35
4.5.2.2	Material Procurement Using LFL Technique	36
4.6	DISCUSSION	39
CHAPTER 5.....		43
CONCLUSION & RECOMMENDATION.....		43
5.1	CONCLUSIONS.....	43
5.2	RECOMMENDATIONS.....	43
REFERENCES.....		44

LIST OF FIGURES

Figure 1. Fox Logger Office Façade	18
Figure 2. Project Location (Source : Google Earth).....	19
Figure 3. Project Location (Source : Google Maps).....	20
Figure 4. Project conditions during the ground floor construction	21
Figure 5. Materials placement when the stuff just unloaded from the truck.....	22
Figure 6. Limited workspace conditions due to material stacking.....	23
Figure 7. Concrete pump operated from unideal locations (outside project area)	24
Figure 8. Mixing truck placement outside the project area due to insufficient space	25

LIST OF TABLES

Table 1. Relevant Previous Research	15
Table 2. Problem & Solutions	26
Table 3. List of Rebar Material Requirements	28
Table 4. Project Schedule	29
Table 5. Ordering Cost	29
Table 6. Holding Cost.....	30
Table 7. Additional cost for holding cost	31
Table 8. Procurement Cost (Project)	31
Table 9. Monthly Material Requirement List.....	33
Table 10. Material Procurement Using FPR Technique.....	34
Table 11. Procurement Cost Using FPR.....	34
Table 12. List of Rebar Material Requirements Per-Floor	36
Table 13. Material Procurement Using LFL Technique.....	37
Table 14. Material Purchase Per-Floor.....	38
Table 15. LFL Procurement Cost	39
Table 16. Procurement Cost Comparison.....	40
Table 17. Actual Project Schedule	41