ANALYSIS OF CONSTRUCTION MATERIAL WASTE IN A RESIDENTIAL HOUSING PROJECT

(Case Study: Rolling Hills Residence Karawang)

UNDERGRADUATE THESIS

Submitted as one of the requirements to obtain

Sarjana Teknik

By:

Kemal Taufiqul Hakim

022202000022

FACULTY OF ENGINEERING

CIVIL ENGINEERING STUDY PROGRAM

CIKARANG

OCTOBER 2023

TURNITIN

ANALYSIS OF CONSTRUCTION MATERIAL WASTE IN RESIDENTIAL HOUSING PROJECTS (Case Study: Rolling Hills Karawang Residence)

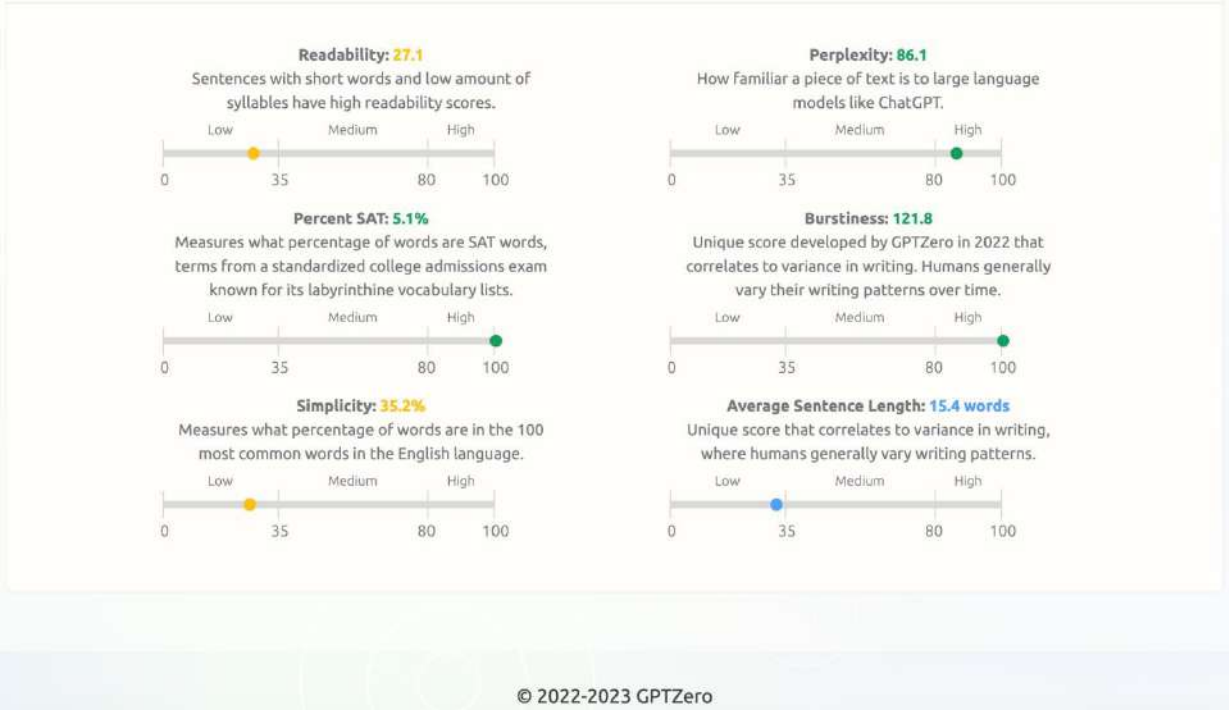
ORIGINALITY REPORT

20%	13%	12%	6%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	M A Asad, U L Rusdi, A Rosmariani, H Suharman, A Evi, O Yulio. "Type and Quantity of the Residual Construction Material of Low-rise Building Construction in Makassar", IOP Conference Series: Materials Science and Engineering, 2020 Publication	4%
2	I.G.A.I. Mas Pertiwi, A.A. Putri Indrayanti, K. Wiwin Andayani, I. Wayan Intara, W. Sri Kristinayanti, Evin Yudhi Setyono. "Construction Project Plan Waste Management Model", 2018 International Conference on Applied Science and Technology (iCAST), 2018 Publication	1%
3	www.researchgate.net Internet Source	1%
4	core.ac.uk Internet Source	1%

GPTZero


Readability: 27.1
Sentences with short words and low amount of syllables have high readability scores.
Low
Medium
High
0
35
80
100
Perplexity: 86.1
How familiar a piece of text is to large language models like ChatGPT.
Low
Medium
High
0
35
80
100
Percent SAT: 5.1%
Measures what percentage of words are SAT words, terms from a standardized college admissions exam known for its labyrinthine vocabulary lists.
Low
Medium
High
0
35
80
100
Burstiness: 121.8
Unique score developed by GPTZero in 2022 that correlates to variance in writing. Humans generally vary their writing patterns over time.
Low
Medium
High
0
35
80
100
Simplicity: 35.2%
Measures what percentage of words are in the 100 most common words in the English language.
Low
Medium
High
0
35
80
100
Average Sentence Length: 15.4 words
Unique score that correlates to variance in writing, where humans generally vary writing patterns.
Low
Medium
High
0
35
80
100
© 2022-2023 GPTZero

ACKNOWLEDGMENTS

Words cannot express my gratitude to my final project supervisor, Prof. Ir. Ika Bali, M. Eng., Ph. D., for her invaluable patience and feedback. His guidance helped me through all the research and writing of this final project report. Additionally, this endeavour would not have been possible without Mr. Kukuh Fajar Rifandi, Mr. Christian Palilingan, and all of the team members of Rolling Hills Karawang, who have provided all the knowledge of project management and helped me complete this thesis.

I am also grateful to my family, especially my parents, Dede Purnama Maulid and Dewi Ampuh Kusnadi, for giving birth to me in the first place and supporting me spiritually throughout my life.

Lastly, I would be remiss in not mentioning my best friends, especially Maulida Pitria. Their belief in me has kept my spirits and motivation high during this process. Thanks should also go to the librarians and previous researchers who impacted and inspired me.

Cikarang, October 2023

Kemal Taufiqul Hakim

ABSTRACT

Waste is an activity in a project that does not produce value, such as material waste, energy waste, or time waste. Material waste weighs heavily on construction costs. Therefore, material waste must be minimized. This research aims to find out: the types of materials that are mostly waste; the most dominant factors causing waste; and a type of prevention of material waste that is often carried out on the construction project at Rolling Hills Karawang Residence. The data in this research was obtained through a survey using an online questionnaire via Google Form with sources from workers from four contractors on the construction project at Rolling Hills Karawang Residence. After the data is obtained, data processing is carried out so that the research objectives are met. Apart from that, the data was processed using descriptive statistical methods and non-parametric tests (Kendall's W) as a means of validating the analysis results. The results of the analysis show that the types of materials that experience a lot of waste is wood formwork. The dominant factors that cause material waste is workers. Types of preventing material waste that are often carried out is: minimizing the occurrence of design changes.

Keywords: material waste, housing project, construction management

TABLE OF CONTENT

STATEMENT OF ORIGINALITY ..... **I**

ANALYSIS OF CONSTRUCTION MATERIAL WASTE IN A RESIDENTIAL HOUSING PROJECT ..... **II**

PANEL OF EXAMINERS' APPROVAL ..... **III**

ADVISOR APPROVAL FOR JOURNAL/INSTITUTION'S REPOSITORY ..... **IV**

SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST ..... **V**

TURNITIN ..... **VI**

GPTZERO ..... **VII**

ACKNOWLEDGMENTS ..... **VIII**

ABSTRACT ..... **IX**

TABLE OF CONTENT ..... **X**

LIST OF FIGURES ..... **XIII**

LIST OF TABLES ..... **XIV**

CHAPTER 1 INTRODUCTION **1**

1.1. BACKGROUND 1

1.2. RESEARCH QUESTION 2

1.3. OBJECTIVES 2

1.4. SCOPE AND LIMITATIONS 2

CHAPTER 2 LITERATURE REVIEW **3**

2.1. PROJECT 3

2.1.1. Definitions of Project *3*

2.1.2. Types of Construction Projects *3*

2.2. PROJECT MANAGEMENT 4
2.3. MATERIAL 5
2.4. MATERIAL WASTE 5
2.5. CAUSING FACTORS OF MATERIAL WASTE 9
2.6. PREVENTION OF MATERIAL WASTE 11
2.7. FINDINGS FROM PREVIOUS STUDIES 11
2.7.1. Research about "Construction Waste pada proyek-proyek konstruksi" (case study in Daerah Istimewa Yogyakarta) *11*
2.7.2. Research about "Pengendalian Waste Material" (case study in Makassar building projects) *12*
2.7.3. Research about "Penerapan Metode Lean Project Management dalam merencanakan proyek konstruksi" (case study in construction of mantos building phase III) *12*
2.8. GAP OR LIMITATION 12
CHAPTER 3 RESEARCH METHODOLOGY 13
3.1. RESEARCH LOCATION 13
3.2. METHOD OF COLLECTING DATA 14
3.3. POPULATION AND SAMPLE 14
3.3.1. Population *14*
3.3.2. Sample *14*
3.4. DATA COLLECTION TECHNIQUES 14
3.4.1. Primary Data *14*
3.4.2. Secondary Data *15*
3.5. RESEARCH VARIABLE 15
3.6. DATA ANALYSIS TECHNIQUE 15
3.6.1. Descriptive Statistical Method *15*
3.6.2 The Non-Parametric Kendall's w Test *15*
3.7. RESEARCH INSTRUMENT 15
3.8. RESEARCH SCHEME 22
CHAPTER 4 ANALYSIS AND RESULTS 23
4.1. RESPONDENT PROFILE 23

4.1.1. Respondent's Age *23*
4.1.2. Gender *24*
4.1.3. Level of Education *24*
4.1.4. Occupation *25*
4.1.5. Work Experience *26*
4.2. MATERIAL WASTE 26
4.2.1. Calculation *27*
4.2.2. The Non-Parametric Kendall's W Test *28*
4.3. FACTORS CAUSING MATERIAL WASTE 28
4.3.1. Calculation *28*
4.3.2. The Non-Parametric Kendall's W Test *30*
4.4. PREVENTING MATERIAL WASTE 30
4.4.1 Calculation *30*
4.4.2. The Non-Parametric Kendall's W Test *32*
CHAPTER 5 CONCLUSION AND RECOMMENDATION 33
5.1. CONCLUSION 33
5.2. RECOMMENDATION 33
REFERENCE 35
APPENDIX 35

LIST OF FIGURES

Figure 2.1 Bricks (example of site storage material waste) 7
Figure 2.2 Wood Formwork (example of fixing material waste) 8
Figure 2.3 Concrete (example of negligence material waste) 10
Figure 3.1 Research Map Location 14
Figure 3.2 Research Flowchart 22
Figure 4.1 Non-Parametric Kendall's W Test 28
Figure 4.2 Non-Parametric Kendall's W Test 29
Figure 4.3 Non-Parametric Kendall's W Test 31

LIST OF TABLES

Table 3.1 Respondent's Data Question 18
Table 3.2 Types of Material Waste Question 18
Table 3.3 Causing Material Waste Question 19
Table 3.4 Prevention Material Waste Question 21
Table 4.1 Respondent's Age 23
Table 4.2 Gender 24
Table 4.3 Level of Education 25
Table 4.4 Occupation 24
Table 4.5 Work Experience 26
Table 4.6 Types of Material Waste 27
Table 4.7 Factors Causing Material Waste 29
Table 4.8 Preventing Material Waste 30