

EVALUATION OF FACTORS AFFECTING DELAY IN UJUNG MENTENG FLAT HOUSING PROJECT WORK

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ABSTRACT

Economic growth in DKI Jakarta has driven significant infrastructure development, from buildings to public transportation, which play a vital role in people's lives. Smooth development will have a big impact, while delays in construction projects can result in losses and conflicts due to deviations from the set schedule and quality. This forces construction companies to develop rapidly and demands effective strategies to overcome problems that cause delays. For example, the Ujung Menteng Flats project which started on December 4, 2019 and aims to target low-income people in Jakarta, experienced a deviation of -0.271% from the plan, which triggered research on the factors causing this delay. Research using the correlation test method shows several main factors causing delays in the Ujung Menteng Flats construction project, including Cost, Tools, Labor, Management, Weather, and Pandemic factors, with a significant correlation level. Cost is the most dominant factor. The study recommends improving financial planning and management to reduce delays and complete projects on budget, as well as improving project management and the availability of tools and labor.

Keywords: Flats, Costs, Labor.

INTRODUCTION

Economic growth in DKI Jakarta has driven significant infrastructure development, from buildings to public transportation, which play a vital role in people's lives. Smooth development will have a big impact, while delays in construction projects can result in losses and conflicts due to deviations from the set schedule and quality. This forces construction companies to develop quickly and demands effective strategies to overcome problems that cause delays. For example, the Ujung Menteng Flats project which started on December 4, 2019 and aims to target low-income people in Jakarta, experienced a deviation of -0.271% from the plan, which triggered research on the factors causing this delay.

METHODS

This study uses a Likert attitude scale to measure and assess attitudes towards social objects, including pro and con, positive and negative, and agree and disagree attitudes.

Table 1. Scores

Angka	Makna Kualitatif
1	Jarang terjadi
2	Tidak jarang terjadi
3	Kadang-kadang terjadi
4	Tidak Sering Terjadi
5	Sering terjadi

This study combines qualitative and quantitative methods by analyzing perception data from questionnaires given to field implementer respondents in the Ujung Menteng Flats Development project. Qualitative data is processed into quantitative data to determine the ranking of the main factors of delay using IBM SPSS Statistic software version 22. The hypothesis is tested with a significance level of 10%, where the potential decision error is 5% based on the p-value.

Table 2. Hypothesis Indicators

FAKTOR	INDIKATOR
X ₁	Terdapat hubungan signifikan antara pandemi terhadap penyebab keterlambatan
X ₂	Terdapat hubungan signifikan antara pembebasan lahan terhadap penyebab keterlambatan
X ₃	Terdapat hubungan signifikan antara biaya terhadap penyebab keterlambatan
X ₄	Terdapat hubungan signifikan antara tenaga kerja terhadap penyebab keterlambatan
X ₅	Terdapat hubungan signifikan antara material terhadap penyebab keterlambatan
X ₆	Terdapat hubungan signifikan antara cuaca terhadap penyebab keterlambatan
X ₇	Terdapat hubungan signifikan antara koordinasi terhadap penyebab keterlambatan
X ₈	Terdapat hubungan signifikan antara perizinan birokrasi terhadap penyebab keterlambatan
X ₉	Terdapat hubungan signifikan antara alat bantu terhadap penyebab keterlambatan
X ₁₀	Terdapat hubungan signifikan antara manajemen terhadap penyebab keterlambatan

Data processing in this study was carried out with several processes to obtain accurate results. The dependent variable (Y) and the independent variable (X) are two variables involved in this investigation. The independent variables (X) are pandemic, land, cost, labor, material, weather, coordination, permits, tools and management while the dependent variable (Y) is the delay in the construction project. Each variable will be defined operationally to facilitate the analysis process. Operational definition is the description of one research variable into detailed indicators.

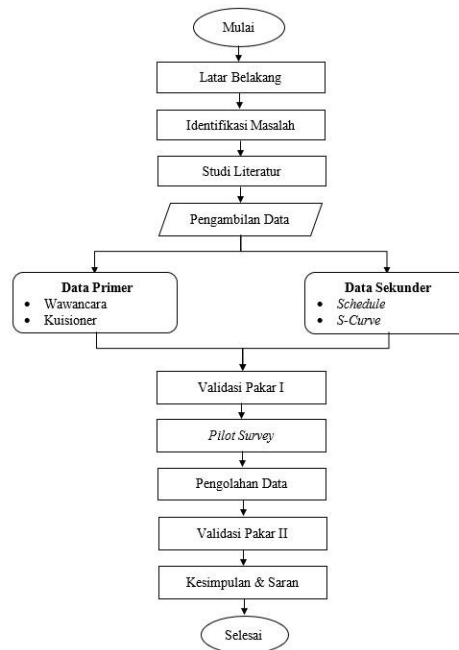


Figure 1. Research Flow Diagram

RESULTS AND DISCUSSION

In the initial stage, variables and factors related to project delays were taken from journals and interviews at the Rusun BKT Ujung Menteng project, East Jakarta. This data was then compiled and validated by three construction management experts recommended by the supervisor, including two from consultants and one from the contractor, all of whom have a Construction Management Expert Certificate of at least SKA Madya.

Table 3. Expert Data

No	Pakar	Profesi	Pendidikan	Pengalaman
1	Pakar 1	Kontraktor	S1	25 tahun
2	Pakar 2	Konsultan MK	S2	20 tahun
3	Pakar 3	Konsultan MK	S1	25 tahun

The research variables are arranged in a specific format to facilitate validation by experts, who will provide responses of agreement or disagreement to the 30 variables. After validation by experts is complete, a questionnaire trial is conducted on predetermined respondents. Of the 30 variables proposed, three of them—Citizens' Protest (X5), Price Difference (X6), and Joint Committee (X7)—are not approved by the experts, leaving 27 valid variables. The researcher will then conduct a questionnaire trial on three respondents. This pilot survey was submitted to several respondents, as shown in table 4 below.

Table 4. Respondent Data for Pilot Survey

No	Responden	Profesi	Pendidikan	Pengalaman
1	R1	Project Manager	S1	17 tahun
2	R2	Manajemen Konstruksi	S1	15 tahun
3	R3	Manajemen Konstruksi	S1	19 tahun

The questionnaire distributed in the second stage was validated by experts and refined to improve its clarity. In the third stage, the questionnaire was distributed to respondents who worked in the BKT Ujung Menteng flats development project, East Jakarta and met certain criteria. In this study, sampling was carried out using the non-probability method and purposive sampling technique, namely selecting individuals who met certain criteria and understood the problems that occurred. The number of samples set was 55, determined using the solvin formula.

$$n = \frac{N}{1 + N(e)^2} = \frac{55}{1 + 55 (0.01)^2} = 54,69 \approx 55 \text{ Responden}$$

Respondents' education, consists of various educations, as in the table below.

Table 5. Respondents' Education Profile

Pendidikan Responden	Jumlah
Sarjana	22
D3	16
SMK	17
Jumlah	55

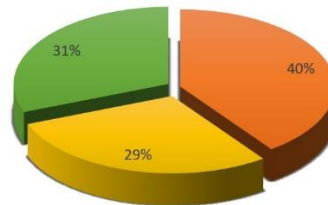


Figure 2. Respondents' Education Profile

For the respondents' positions as shown or described in table 6, below:

Table 6. Respondents' Positions

No	Jabatan	Umur (Tahun)	Bobot (%)	Pendidikan	Jumlah
1	Project Manajer (PM)	57	2	S2	1
2	Site Engineer Manager	53	2	S1	1
3	Site Operasional Manager	55	2	S1	1
4	Site Administrasi Manager	47	2	S1	1
5	Kevangan	48	2	D3	1
6	Administrasi Keuangan	35-42	7	D3	4
7	Chief Mechanic	43-55	4	S1	2
8	Mechanic	30-40	7	SMK-D3	4
9	Chief Quality Supervisor	36	2	S1	1
10	Quality Supervisor	36	6	D3-S1	3
11	Chief Site Engineer	45	2	S1	1
12	Site Engineer Structure	35-45	7	D3-S1	4
13	Site Engineer Arsitektur	38	2	S1	1
14	Site Engineer MEP	42	2	D3	1
15	Chief Drafter	42	2	S1	1
16	Bar Bending Schedule	25	2	SMK	1
17	Quality Assurance Manager	48	2	S1	1
18	HSE Manager	42	2	S1	1
19	HSE Officer	32	2	D3	1
20	Inspector K3	27-37	11	SMK-D3	6
21	Chief Quantity Surveyor	48	2	S1	1
22	Quantity Surveyor	32-40	11	SMK-D3	6
23	Project Administration	25-36	7	D3	4
24	Chief Logistic	47	2	D3	1
25	Logistic Officer	35-40	11	SMK-D3	6
Total Responden					55

The percentage data of positions from respondents who filled out the questionnaire showed that each position of Project Manager, Site Engineer Manager, Site Operations Manager, Site Administration Manager, Finance, Chief Mechanic, Chief Quality Supervisor, Quality Supervisor 1, Quality Supervisor 2, Chief Site Engineer, Site Engineer Architecture, Chief Drafter, Bar Bending Schedule, Quality Assurance Manager, HSE Manager, HSE Officer, Chief Quantity Surveyor, and Chief Logistics had a percentage of 2.43%. Financial Administration and Structural Site Engineer each had 4.87%. Mechanic and Logistics had the highest percentage of 9.75%. K3 Inspector had 7.12%, while Quantity Surveyor had 4.86%, and Project Administration 9.75%. The validated data and pilot survey were then compiled into a questionnaire and distributed to 55 respondents. After checking and confirming the number and completion of the questionnaire answers, the data was tabulated into Excel to facilitate the calculation. Validity test is used to assess the suitability of items in the study with a significance level of 0.05 (5%) or 0.01 (1%), where an item is considered valid if it has a significant correlation with the total score. Validity is determined by comparing the calculated r value of the Pearson Correlation method with the table r value. An item is considered valid if the calculated r value is greater than the table r at a significance level of 0.05, with 55 respondents and a table r value of 0.266. To find the reliability value, refer to the validation

results, which are 27 variables. The tool is considered reliable if it produces consistent measurements for repeated measurements. Therefore, to determine the consistency of the measuring instrument, it is used to test reliability using the cronbachs' alpha method which is available as follows:

1) Cronbach Alpha value ≥ 0.6 indicates that the research questionnaire is reliable.

2) Cronbach Alpha value ≤ 0.6 indicates that the research questionnaire is not reliable.

The following table shows the results of the reliability test data with the SPSS program:

Table 7. Reliability Test Results

Reliability Statistics	
Cronbach's Alpha	N of Items
.945	27

The results of the reliability test indicate that the research questionnaire is reliable because the Cronbach Alpha value of this study is $0.945 > 0.6$, so these variables will be further analyzed to determine whether there is sufficient correlation between the initial variables. Before the data is processed using the research model, a normality test is carried out after the validity and reliability tests. The normality test ensures that the data is normally distributed, which is a requirement for the use of parametric statistics. Data is considered normal if the Asymp. Sig. (2-tailed) value in the SPSS output is greater than 0.05. The results of the normality test show the Asymp. Sig. (2-tailed) values of 0.200 and 0.088, both of which are greater than 0.05, so the data is considered normally distributed and suitable for use in research. The correlation test is used to measure the relationship between the independent variables and the dependent variables, with r table for a sample of 55 and a significance of 0.05 of 0.266. The results of the correlation test show that all factors have a correlation value greater than r table. Factors with a very strong relationship ($>80\%$) are the pandemic (85.5%), labor (94.8%), materials (90%), weather (89.9%), coordination (94.8%), and tools (90%). Cost factors (67.2%) and management (70.1%) show a strong relationship. All of these results were obtained using SPSS Version 22. To verify the correlation results, the researcher used the F Test. With 27 variables and 55 respondents, the F table value used was 1.84. The calculation results with SPSS showed an F value of 895.228, which is greater than 1.84, so the hypothesis is accepted and these factors are proven to have an effect on the delay in the BKT Ujung Menteng flats construction project, East Jakarta. In the t test, the t table with a value of 2.052 was used as a comparison. As a result, six factors have a significant influence on project delays, namely:

- 1) Pandemic (t count 2.242, significant 0.030)
- 2) Cost (t count 10.113, significant 0.000)
- 3) Labor (t count 5.895, significant 0.000)
- 4) Weather (t count 4.598, significant 0.000)
- 5) Tools (t count 7.861, significant 0.000)
- 6) Management (t count 4.913, significant 0.000)
- 7) Licensing Factor does not have a significant effect because t count (0.760) $<$ t table (2.052)
- 8) Cost Factor t count value of $10.113 > 2.052$, with a significant of $.000 < 0.05$
- 9) The Tools Factor has a t value of $7.861 > 2.052$ with a significant value of $.000 < 0.05$
- 10) The Labor Factor has a t-value of $5.895 > 2.052$, with a significant value of $.000 < 0.05$
- 11) The Management Factor has a t-value of $4.913 > 2.052$, with a significant value of $.000 < 0.05$
- 12) The Weather Factor has a t-value of $4.598 > 2.052$, with a significant value of $.000 < 0.05$
- 13) The Pandemic Factor has a t-value of $2.242 > 2.052$, with a significant value of $.030 < 0.05$

CONCLUSIONS

Research using the correlation test method shows several main factors causing delays in the Ujung Menteng Flats construction project, including Cost, Tools, Labor, Management, Weather, and Pandemic factors, with a significant correlation level. Cost is the most dominant factor. The study recommends improving financial planning and management to reduce delays and complete the project on budget, as well as improving project management and the availability of tools and labor.

REFERENCES

- Achmad, F. A., & Rumbyarso, Y. P. A. (2023). Analisis Struktur Slab On Pile terhadap Kontrol Lendutan pada Proyek Jalan Tol Kataraja. *Jurnal Pendidikan Tambusai*, 7(2), 13457-13467.
- Abdillah, S. R., Zulfikar, S., & Prima, Y. (2023). PENGARUH LIMBAH CANGKANG KERANG SEBAGAI SUBSTITUSI AGREGAT HALUS TERHADAP KUAT TEKAN BETON. *Jurnal Sipil Krisna*, 9(1), 39-48.
- Achmad, F. A., & Rumbyarso, Y. P. A. (2024). Analisis Penjadwalan Proyek Klinik Spesialis Mata & Tht Ayani Dengan Pert & Cpm. *International Journal Of Multi Science*, 4(01), 1-8.
- Arga Rumbyarso, Y. P. (2024). Buku Ajar Struktur Beton Prestress.
- Abidin, Z., & Rumbyarso, Y. P. A. (2024). PCI-Analyzed Administrative Way Damage. *Larisa Teknik Sipil*, 1(1), 8-14.
- Arga Rumbyarso, Y. P. (2024). Kinerja Struktur Gedung Office 36 Lantai: Analisis History dan Pushover.
- Arga Rumbyarso, Y. P. (2021). Pengukuran Kinerja Perusahaan PT. Ritra Cargo Indonesia Menggunakan Balanced Scorecard.
- Darmiyanti, L., Prima, Y., & Aldianto, M. A. (2023). Analisis Borepile Menggunakan Metode Meyyerhoff dan Reese Wright. *Jurnal Sipil Krisna*, 9(1), 27-38.
- Gamaliel, B., & Rumbyarso, Y. P. A. (2022). PELATIHAN DESIGN GAMBAR DENGAN APLIKASI AUTOCAD 2D UNTUK SISWA/I SMK YAPPA DEPOK. *KRIDA CENDEKIA*, 1(09).
- Prima, Y., & Pribadi, G. (2023). Penggunaan Program Plaxis Dalam Studi Penelitian Perkuatan Geotextile Pada Kestabilan Lereng Buatan. *Jurnal Sipil Krisna*, 9(1), 22-26.
- Pribadi, G., & Rumbyarso, Y. P. A. (2023). Analisis Profil Atap Baja WF dengan Metode LRFD Menggunakan SAP 2000 dan Idea StatiCa. *Jurnal Teknik Industri Terintegrasi (JUTIN)*, 6(4), 1543-1559.
- Pribadi, G., & Rumbyarso, Y. P. A. (2023). Analisis Perbandingan Daya Dukung dan Penurunan Pondasi Tiang Bor Dengan Perhitungan Manual dan Software ALLPILE. *Jurnal TESLINK: Teknik Sipil Dan Lingkungan*, 5(2), 16-20.
- Pribadi, G., Rumbyarso, Y. P. A., & Sakti, E. M. S. (2023). Pelatihan Merancang Gambar Dengan Aplikasi Autocad untuk Pembekalan Siswa SMK dalam Memasuki Dunia Kerja. *Media Abdimas*, 2(2), 52-56.
- Prima, Y., & Darmiyanti, L. (2023). Analisis Kinerja Struktur Gedung Rusun TNI AU Halim Perdanakusuma Dengan Menggunakan Metode Pushover Analysis. *Jurnal Sipil Krisna*, 9(2), 26-35.
- Rumbyarso, Y. P. A. (2023). Re-planning of Concrete Structures in the Ngoro Dormitory Project in Surabaya. *Journal of Applied Science, Engineering, Technology, and Education*, 5(1), 15-24.

- Rumbyarso, Y. P. A. (2023). Penyuluhan Komposisi Campuran Beton untuk Jalan Tol. *Journal of Social Work and Empowerment*, 2(3), 137-144.
- Rumbyarso, Y. P. A. (2022). Analisis Perkuatan Rangka Atap Baja pada Bangunan Gedung Heritage 1921 Menggunakan Software SAP 2000. *Jurnal Teknik Indonesia*, 1(1), 1-8.
- Rumbyarso, Y. P. A., & Pribadi, G. (2023). Analisis Stabilitas Lereng dengan Metode Bishop pada Proyek Geotechnical Investigation Jalur Transportasi Pelabuhan Batubara Marangkayu Kabupaten Kutai Kartanegara. *JURNAL KRIDATAMA SAINS DAN TEKNOLOGI*, 5(02), 562-577.
- Rumbyarso, Y., Chusna, N., & Khumaidi, A. (2022). Dissolved Oxygen Prediction of the Ciliwung River using Artificial Neural Networks, Support Vector Machine, and Streeter-Phelps. *Jurnal Ilmiah Merpati (Menara Penelitian Akademika Teknologi Informasi)*, 10(3), 180-190.
- Rumbyarso, Y. P. A., & Pribadi, G. (2022). Penyuluhan Tentang Pentingnya Sebuah Kontruksi Bagunan Rumah Yang Baik Serta Tahan Gempa. *Krida Cendekia*, 1(08).
- Rumbyarso, Y. P. A. (2021). PERENCANAAN STRUKTUR BANGUNAN ATAS (UPPER STRUCTURE) GEDUNG STIE BANK BPD JATENG KOTA SEMARANG. *TEKNOKRIS*, 24(1), 1-7.
- Rumbyarso, Y. P. A. (2023). PERHITUNGAN PRODUKTIVITAS PERALATAN BERAT PADA PROYEK JALAN TOL SEMARANG–DEMAK SEKSI 1C KM 35+ 400 SAMPAI DENGAN 36+ 400. *Mechonversio: Mechanical Engineering Journal*, 6(2), 34-39.
- Rumbyarso, Y. P. A., & Ulum, R. B. (2021). Analisis Pengaruh Penggunaan Cangkang Telur Bebek Ras Petelur Sebagai Filler Pada Campuran Aspal Beton. *Jurnal Teknologika*, 11(2), 115-124.
- Rumbyarso, Y. P. A. (2022). Analysis Of Compressive Strength Of Concrete By Using Slag Circum As A Concrete Aggregate Mix. *International Journal Of Multi Science*, 2(12), 35-46.
- Rumbyarso, Y. P. A., & Pribadi, G. (2024). Analysis of Landslide Handling With Mini Pile Reinforcement Using Plaxis Software on The “X” Toll Road Project. *Jurnal Teknik Industri Terintegrasi (JUTIN)*, 7(2), 801-810.
- Rumbyarso, Y. P. A., Pribadi, G., & Achmad, F. A. (2023). PENGENALAN DASAR–DASAR PENGOLAHAN DATA PADA SMK PGRI 4 JAKARTA MENGGUNAKAN APLIKASI SPSS. *KRIDA CENDEKIA*, 2(02).
- Rinjoko, N. F., Rumbyarso, Y. P. A., & Darmiyanti, L. (2024). THE EFFECT OF GRANITE WASTE AS A FINE AGGREGATE SUBSTITUTION IN ASPHALT CONCRETE BINDER COURSE. *INTERNATIONAL JOURNAL OF MULTI SCIENCE*, 4(02), 56-62.
- Rumbyarso, Y. P. A., & Fariqi, A. (2024). Learning Obstacle On Integral (Antiderivative) Material In Didactic Situation Theory. *Larisa Teknik Sipil*, 1(1), 1-7.
- Rumbyarso, Y. P. A. (2024). Analisis Perbandingan Kinerja Struktur Tahan Gempa Pada Wilayah Berbeda Dengan Metode Respon Spektrum (Studi Kasus: Apartemen 19 Lantai). *Pasak: Jurnal Teknik Sipil dan Bangunan*, 1(2), 69-72.
- Saifulloh, R., Rumbyarso, Y. P. A., & Sukadi, S. (2024). Analisis Pengaruh Penggunaan Limbah Cangkang Siput Pada Campuran Asphalt Concrete-Wearing Course (AC-WC). *Madani: Jurnal Ilmiah Multidisiplin*, 2(8), 202-216.
- Taqwa, I., Rumbyarso, Y. P. A., & Darmiyanti, L. (2024). ANALYSIS OF LIGHTWEIGHT BRICK WASTE FOR PARTIAL SUBSTITUTION OF FINE AGGREGATE ON CONCRETE COMPRESSIVE STRENGTH. *INTERNATIONAL JOURNAL OF MULTI SCIENCE*, 4(02), 34-41

Wahyudi, T., Rumbyarso, Y. P. A., & Siagian, B. M. (2024). THE EFFECT OF FISH BONE POWDER WASTE AS A FINE AGGREGATE SUBSTITUTION IN ASPHALT CONCRETE WEARING COURSE PAVEMENT. *INTERNATIONAL JOURNAL OF MULTI SCIENCE*, 4(02), 63-69.

Yonas, P. Infrastruktur Pembaharu Silica Fume in Asphalt Concrete-Wearing Course.