International Journal Science and Technology
IJST Vol 4 No. 2 | July 2025 | ISSN: 2828-7223 (print), ISSN: 2828-7045 (online), Page 214-222

# Analysis of Design Change Management in a Construction Project at Jl. Duta Permai 2 No. 6, Pondok Indah: Case of Owner Mr. Patrick

**Muhammad Malik Abdul Jabbar[1], Era Agita Kabdiyono[2*]**
[1,2]Department Civil Engineering, Faculty Technic and Informatic, Dian Nusantara University, Indonesia

**Article History**
Received : June 4, 2025
Revised : July 14, 2025
Accepted : July 17, 2025
Published : July 29, 2025

**Corresponding author*:**
Era.agita.k@dosen.undira.ac.id

**Cite This Article:**
Muhammad Malik Abdul Jabbar, & Era Agita Kabdiyono. (2025). Analysis of Design Change Management in a Construction Project at Jl. Duta Permai 2 No. 6, Pondok Indah: Case of Owner Mr. Patrick. *International Journal Science and Technology*, *4*(2), 214–222.

**DOI:**
https://doi.org/10.56127/ijst.v4i2.2289

**Abstract:** Design changes in construction projects often pose significant challenges, impacting the cost, quality, and timeline of the projects. This study aims to analyze the management of design changes in a construction project located at Jl. Duta Permai 2 No. 6, Pondok Indah, with a focus on identifying the causes, the management strategies implemented, and their overall impact on the project. The research employs a qualitative descriptive method, collecting data through interviews, observations, and analysis of relevant documents. The findings indicate that the primary factors causing design changes include regulatory changes, owner requests, and technical constraints that arise during construction execution. The management strategies applied by the project team, while systematic, still face challenges in communication that can hinder decision-making. The results reveal that poorly managed design changes can lead to project delays and cost increases of up to 20%. This study recommends enhancing communication among stakeholders and providing training on change management to minimize the impacts of design changes in the future. Through this analysis, it is expected to provide insights and references for project managers and future researchers in managing design changes more effectively

**Keywords**: design changes, project management, cost, quality, time, construction.

## INTRODUCTION

Design changes in construction projects are a frequent and unavoidable phenomenon. These changes can stem from the project owner's needs, technical considerations, field conditions that deviate from the initial plan, and efficiency concerns. While this is commonplace in project implementation, design changes can be crucial because they can lead to discrepancies between plans and implementation. If not managed properly, these changes can lead to conflict between the parties involved, increase the risk of delays, and increase project costs.

## RESEARCH METHOD

The preparation of a Cost Budget Plan (RAB) plays a crucial role in the success of a construction project. A comparison reveals significant differences between the old RAB calculations and those based on the 2025 Work Unit Price Analysis (AHSP).

In the old RAB, cost components were often calculated using a simplified approach or outdated pricing data, resulting in incomplete coverage of labor, material, and equipment coefficients. This resulted in the budget appearing lower, potentially leading to cost overruns during project implementation.

Meanwhile, the RAB calculation using the 2025 AHSP complies with the latest regulations from the Ministry of Public Works and Public Housing. Unit prices are derived from official analyses that consider labor productivity, material requirements, equipment usage, overhead and profit factors. Therefore, the resulting budget is more realistic and aligns with current market conditions.

**Table 1.** Grand Recap of Initial RAB

| No | WORK ITEM | TOTAL |
|---|---|---|
| I | PREPARATORY WORK | 228.000.000.00 |
| II | STRUCTURAL WORK | 2.173.497.629.00 |
| III | ARCHITECTURAL WORK | 2.170.797.519.42 |
| IV | MEP WORK | 890.093.322.50 |
| | **SUB TOTAL 1** | **5.462.388.470.92** |
| | **IMPLEMENTATION SERVICES 10%** | **546.238.847.09** |
| | **GRAND TOTAL** | **6.008.627.318.01** |
| | **ROUNDING** | **6.008.627.000.00** |

**Table 2.** Grand Rekap RAB AHSP 2025

| No | WORK ITEM | TOTAL |
|---|---|---|
| I | PREPARATORY WORK | 252.000.000.00 |
| II | STRUCTURAL WORK | 2.647.090.000.00 |
| III | ARCHITECTURAL WORK | 3.590.110.000.00 |
| IV | MEP WORK | 1.269.249.000.00 |
| | **SUB TOTAL 1** | **7.758.449.000.00** |
| | **IMPLEMENTATION SERVICES 10%** | **775.844.900.00** |
| | **GRAND TOTAL** | **8.534.293.900.00** |
| | **ROUNDING** | **8.534.294.000.00** |

The comparison between the initial 2022 Budget Plan (RAB) and the RAB calculated based on the 2025 AHSP shows a significant increase in the budget value. In the initial 2022 RAB, the total project budget was recorded at IDR 6,008,627,000.00, which included preparatory work, structure, architecture, and mechanical, electrical, and plumbing (MEP). Meanwhile, in the calculation using the 2025 AHSP, the total budget increased to IDR 8,534,294,000.00. Thus, there is a cost difference of IDR 2,525,667,000.00 or an increase

of approximately 42.03% from the initial budget. This cost increase was not only caused by adjustments to material prices, labor wages, and equipment requirements according to the latest market conditions, but also influenced by design changes in 2025 that increased the volume of work in several items, particularly in structural, architectural, and MEP work. These design changes have direct implications for the need for greater costs and have the potential to affect the project implementation time due to the increased scope of work.

The design differences that occurred in the house project on Jl. Duta Permai 2 No. 6, Pondok Indah, directly impacted changes in the volume of work. In the old design, the volume of work was arranged based on a simpler initial floor plan with standard room functions, while the new design includes a number of revisions that increase the scope of work in several structural, architectural, and MEP sections. A comparison of changes in the volume of work between the old and new designs can be seen in the following table:

**Table 3.** Comparison of Work Volume Change Description

| Work Item | Old Design | New Design | Change Description |
|---|---|---|---|
| Structural Work | The structural volume follows the original plan, without additions to the void and roof areas. | The volume increased due to the closing of the void to become a master bedroom, the addition of a balcony, and the change of the roof to a concrete slab. | Additional concrete, reinforcement and formwork work |
| | One-way sloping roof with limited slope | Two-way sloping roof and additional roof function as storage | Addition of cover structure, drainage, and waterproofing work |
| Architectural Work | Standard room: terrace, master bedroom, wardrobe, no additional balcony | Addition of new spaces: living room, gym, balcony, as well as changes to the layout of the powder room and toilet. | The volume of work on walls, floor finishing, ceilings, and doors/windows has increased. |
| | Simple layout: master bedroom, study room, wardrobe master | Significant changes: woman/man wardrobe, gym, new study room, and living room | The volume of interior work increased on partitions, fixed furniture, and finishing. |
| Mep Work | Simple installation, without special space for the water system | Addition of utility space on the 1st floor (ground tank, balancing tank, pump room) and adjustment of the electrical system | The volume of pipe, pump and cable work increased |

The table above shows that the work volume for the new design increased in almost all aspects. Structural work increased due to changes in room function and the transition to a new roof system, while architectural work increased due to the addition of new, more complex spaces. For MEP work, installation volume increased significantly due to the need for additional utilities on the first floor. The following is the total volume difference between the old and new designs.

**Table 4.** Total Volume Comparison

| No | Description | Total Volume (Old Design) | Total Volume (New Design) |
|---|---|---|---|
| I | Preparatory Work | 9 | 9 |
| II | Structural Work | 48220.92 | 48772.86 |
| III | Architectural Work | 13648.07 | 22569.89 |
| IV | Mep Work | 932 | 1118 |
| GRAND TOTAL | | 62810 | 72469.75 |

Based on the table above, it is known that the initial total volume of 62,810 increased to 72,469.8, resulting in a difference of 9,659.8, or an increase of approximately 15.38%. This increase was largely driven by changes in spatial function, which directly impacted the architectural work and MEP systems.

For structural work, the increase was relatively small, at around 1.14%, from 48,220.92 to 48,772.86. This is because design changes to the structure were limited to void closures, the addition of balconies, and minor adjustments to the stairs. This means there were no major changes to the building's main framework. In contrast to the structural work, architectural work experienced a significant increase of 65.34%, from 13,648.07 to 22,569.89. This increase was influenced by numerous room conversions, such as the conversion of a terrace into a living room, a master bedroom into bedroom 1, as well as the addition of a gym, a balcony, and an expansion of the powder room. These spatial changes

Based on a comparison of the old floor plan and the latest revised drawings, it can be concluded that design changes were made across nearly every floor of the building. A comparison of the design changes between the old and new drawings can be seen in the following table:dengan gambar revisi terbaru, dapat disimpulkan bahwa perubahan desain dilakukan secara menyeluruh hampir pada setiap lantai bangunan. Perbandingan perubahan desain antara gambar lama ke desain yang baru dapat dilihat pada tabel berikut :

**Table 5.** Comparison of Image Design Changes

| Floor | Old Design | New Design | Change Description |
|---|---|---|---|
| 1st Floor | Area storage & powder room | Groundtank, balancing tank, pump room | The function of the room changes for water utility needs |
| | Area pooldeck | Pooldeck (level raised) | The floor level is raised to accommodate the pool design. |
| | Pooldeck stairs | Bedroom 1 | The function of the stairs is changed into a bedroom |
| | Terrace | Living room | The outdoor area turns into a family room. |
| | Master bedroom | Bedroom 1 | Changes in the function of the main bedroom |
| | Toilet master bedroom | Master toilet (layout changed) | Changes in toilet layout |
| 2nd Floor | Tangga maintenance pooldeck | Powder room | The stairs were converted into a small toilet. |
| | Powder room & void | Powder room (more spacious) | Space is expanded and voids are removed |
| | Wardrobe master | Gym | Function of changing room to sports |
| | Wardrobe stair access | Gym | Access area converted into a gym |
| | Wardrobe | Balkon | Change of function to outdoor space |
| | Main stairs 1–3 floors | Main stairs 1–2nd floor | The staircase design was revised, connecting only two floors. |
| | Void | Master bedroom | Void converted into master bedroom |
| | Study room | Wardrobe woman | The study function has changed into a clothes storage space. |
| 3rd Floor | Dak | Stairs 2nd–3rd Floor | The roof functions as vertical circulation |
| | Gym | Toilet master | The function of the sports room has changed to a bathroom. |
| | Bedroom 1 | Wardrobe man & study room | The bedroom function is changed into a wardrobe & work space |
| Roof | Dak as D-F 3-5 | Storage | The roof functions as a storage space |
| Floor | The roof slopes to the right | Roof sloping to the right & left | Roof design revised for visual balance |

## RESULT AND DISCUSSION

From the analysis of the previous sub-chapter, it can be seen that the initial 2022 Budget Plan (RAB) and the RAB calculated using the 2025 AHSP indicate an increase in

costs. In the initial RAB, the total budget was recorded at Rp 6,008,627,000.00, while the calculation using the 2025 AHSP resulted in a value of Rp 8,534,294,000.00. Therefore, There was a difference of Rp 2,525,667,000.00, or an increase of approximately 42.03% from the initial budget. This increase was driven by two main factors: adjustments to material, labor, and equipment prices to reflect current market conditions, and design changes that increased the volume of work on the structure, architecture, and MEP.

In terms of work volume, there was a quite significant increase. The initial total volume of 62,810 increased to 72,469.8, resulting in a difference of 9,659.8 or an increase of approximately 15.38%. If looked at more specifically, structural work only increased slightly by 1.14% (from 48,220.92 to 48,772.86) because design changes were limited to void closures, the addition of balconies, and stair revisions. In contrast, architectural work experienced a significant increase of 65.34% (from 13,648.07 to 22,569.89). This increase was mainly due to changes in room functions, such as the terrace being converted into a living room, the addition of a gym, a balcony, and an expansion of the powder room. Meanwhile, MEP work increased by 19.95% (from 932 to 1,118), which was triggered by the addition of new utility rooms on the 1st floor (ground tank, balancing tank, pump room) which required additional pipe and pump installations.

Several key factors contributed to the design changes in this project. The first was regulatory changes, requiring adjustments to the initial design to comply with the latest standards and regulations. The second factor stemmed from the project owner's request for adjustments to the space's functionality and building quality to better suit the residents' needs. Furthermore, unforeseen technical challenges, such as existing conditions and the need for additional utilities, necessitated revisions to the initial plan.

To address these changes, the project team implemented a systematic approach to change management. Each proposed change was first analyzed for its necessity, impact, and alternative solutions. However, challenges remained, particularly in coordination and communication between the parties involved, including the owner, consultant, and contractor. This situation sometimes led to differing perceptions, which delayed decision-making.

The resulting design changes had direct implications for the project's cost and completion time. Cost-wise, the additional structural, architectural, and MEP work significantly increased the budget requirements compared to the initial plan. Time-wise, the project experienced delays due to additional work and coordination processes that

required schedule readjustments. Therefore, it can be concluded that the change management was effective in accommodating new requirements, but still resulted in increased costs and delayed project completion..

## CONCLUSION

Based on the results of the analysis and discussion that has been carried out on the residential construction project belonging to Mr. Patrick in Pondok Indah, the following conclusions can be drawn:

1. Based on the analysis, the design changes in this project were driven by several key factors. First, regulatory changes required design adjustments to comply with the latest standards. Second, the project owner requested adjustments to the room's functionality and improved building quality to better meet the residents' needs. Third, unforeseen technical constraints in the field, such as existing conditions and the need for additional utilities, necessitated revisions to the initial planning.
2. Implemented Change Management. The project team addressed these changes by implementing systematic change management. Each proposed change was first analyzed in terms of its needs, impact, and alternative solutions. However, in practice, challenges still arose, particularly in coordination and communication between the parties involved, such as the owner, consultant, and contractor. The lack of communication alignment sometimes slowed decision-making. Nevertheless, the change management strategy implemented remained quite effective in accommodating new needs, although not yet fully optimal.
3. 3. Impact on Time and Cost. Design changes significantly increased costs and delayed the project. Cost-wise, the initial Budget Plan (RAB) of Rp 6,008,627,000.00 increased to Rp 8,534,294,000.00, a 42.03% increase in the total cost, or Rp 2,525,667,000.00. This increase was largely driven by a 65.34% increase in the volume of architectural work and a 19.95% increase in MEP work. Time-wise, the project, originally targeted for completion in 720 calendar days (2023–2025), had to be extended to 2026 due to the increased scope of work and re-coordination process. Thus, while the design changes successfully accommodated the owner's new needs, the consequences were increased costs and delayed project completion..

## REFERENCES


Adinda, A. (2023). Analisis Perbandingan Biaya Dengan Metode AHSP, BOW, Dan Lapangan (Redesain Islamic Center Lampung Tengah) Doctoral dissertation, Universitas Muhammadiyah Metro).

Alizar, Ir. (2023). *Pedoman penulisan tugas akhir/skripsi*. Program Studi Teknik Sipil, Fakultas Teknik dan Informatika, Universitas Dian Nusantara.

Badan Standardisasi Nasional. (2014). *SNI ISO 21500:2014 – Panduan manajemen proyek*. Jakarta: BSN.

Doloi, H. (2012). Cost overruns and failure in project management: Understanding the roles of key stakeholders in construction projects. *Journal of Construction Engineering and Management, 138*(11), 1367–1378.

Hwang, B. G., & Ng, W. J. (2013). Project management knowledge and skills for green construction: What do project managers need to know? *International Journal of Project Management, 31*(3), 350–361.

Iwawo, A. M., Dundu, A. K., & Pratasis, P. A. (2024). Analisis Perbandingan Rencana Anggaran Biaya Kontraktor Dengan Perhitungan Biaya Berdasarkan AHSP Permen PUPR No. 1 Tahun 2022 Pada Proyek Pembagunan Rumdis Kodim 1302 Minahasa. TEKNO, 22(88), 1089-1098.

Kementerian Pekerjaan Umum dan Perumahan Rakyat. (2021). *Peraturan tentang perubahan desain proyek konstruksi*. Jakarta: Kementerian PUPR.

Kerzner, H. (2017). *Project management: A systems approach to planning, scheduling, and controlling* (12th ed.). Hoboken, NJ: John Wiley & Sons.

Kotter, J. P. (1996). *Leading change*. Boston, MA: Harvard Business Review Press.

Lewin, K. (1951). *Field theory in social science*. New York, NY: Harper & Row.

Ode, A. T. La, Syarif, M., Purnama, H., Masdina, Latupeirissa, J. E., Gusty, S., Putri, T. S., Latif, F., Dzakir, L. O., Wiriantari, F., & Pagoray, G. L. (2023). Manajemen Proyek Konstruksi (M. N. La Ola, Ed.). CV. Tohar Media.

Project Management Institute. (2021). *A guide to the project management body of knowledge (PMBOK® Guide)* (7th ed.). Newtown Square, PA: Project Management Institute.

PMI. (2017). *A guide to the project management body of knowledge (PMBOK® Guide)* (6th ed.). Newtown Square, PA: Project Management Institute.

Rachman, M. (2020). Analisis pengaruh perubahan desain terhadap biaya dan waktu proyek konstruksi: Studi kasus di Jakarta. *Jurnal Teknik Sipil, 12*(3), 45–60.

Santosa, B., & Pramono, R. (2019). Analisis manajemen risiko pada proyek konstruksi gedung bertingkat di Surabaya. Jurnal Manajemen Konstruksi, 7(2), 88–96.

Sari, P., & Nugroho, A. (2021). Pengaruh perubahan desain terhadap biaya dan waktu pada proyek pembangunan gedung perkantoran. Jurnal Teknik Sipil dan Arsitektur, 10(1), 55–64.

Smith, N. J. (2014). *Managing risk in projects*. London: Routledge.

Susanti, R., & Prasetyo, A. (2018). Analisis keterlambatan proyek konstruksi ditinjau dari faktor manajemen waktu. Jurnal Teknik Sipil dan Perencanaan, 20(2), 75–84.

Turner, J. R. (1999). *The handbook of project-based management*. New York, NY: McGraw-Hill.

Yuliana, D. (2021). Evaluasi manajemen biaya pada proyek konstruksi gedung bertingkat. Jurnal Rekayasa Konstruksi, 7(1), 25–33.

Yunus, A. I., Ulfiyati, Y., Mulyati, E., Priana, E. S., Roring, H. S. D., Junaed, I. W. R., Yuliana, A., Zayu, W. P., Ghozali, Z., Stighfarrinata Rizky, Safitri, F. A., Sandi, E. A., Wantouw, F., & Syarif, H. U. (2024). Manajemen Proyek (M. G. Indrawan,

Wideman, M. (2002). *Project and program risk management: A guide to managing project risks and opportunities*. Newtown Square, PA: Project Management Institute.

Wijaya, H. (2019). Manajemen risiko pada proyek konstruksi gedung bertingkat. Jurnal Teknik Sipil dan Lingkungan, 7(2), 101–110.