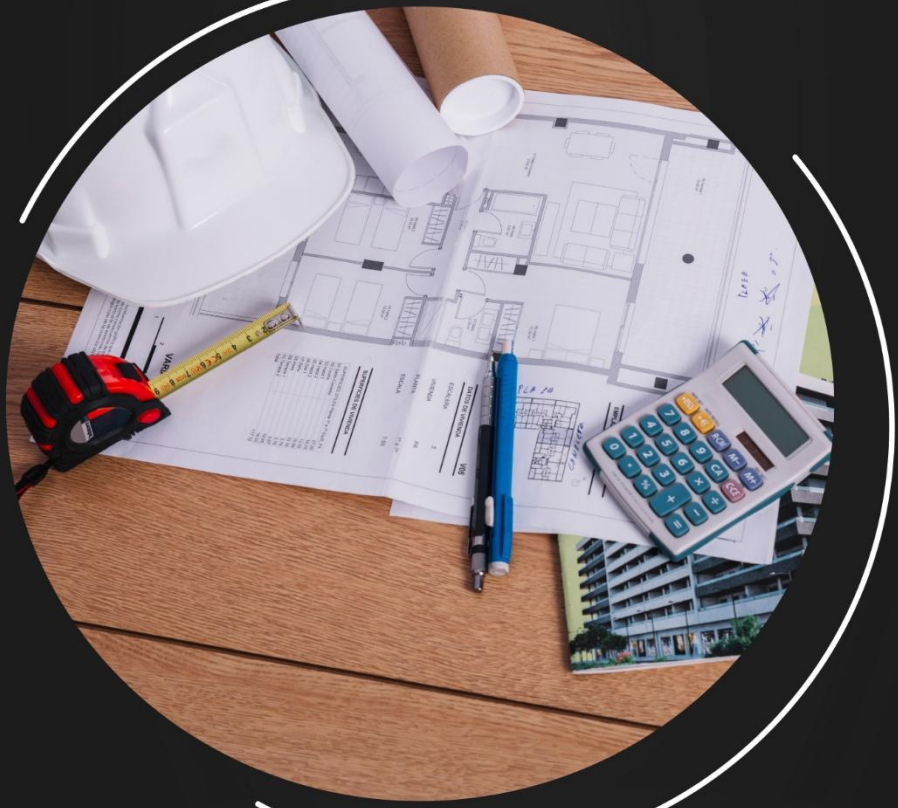
PENERBIT BUKULOKA

MANAJEMEN PROYEK KONSTRUKSI GEDUNG DAN INFRASTRUKTUR:

Estimasi Biaya dan RAB Proyek Konstruksi

Hery Agustian, ST., MT., Alfan Kurniawan, ST., MT., Alfi Sahrin, ST., MT., Dwi Aneka Kartini, ST., MT., Himalaya Bima Kenzo, ST., MT., Ismail Nur Ariyanto, ST., MT., Hj. Lani Febriani, SE., MKM., dan Yurisdal, ST., MT.



Manajemen Proyek Konstruksi Gedung dan Infrastruktur: Estimasi Biaya dan RAB Proyek Konstruksi

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KATA PENGANTAR

Puji syukur ke hadirat Tuhan Yang Maha Esa atas rahmat dan karunia-Nya, sehingga buku referensi berjudul *Manajemen Proyek Konstruksi Gedung dan Infrastruktur: Estimasi Biaya dan RAB Proyek Konstruksi* dapat disusun dengan baik. Buku ini memuat pembahasan mengenai perencanaan biaya proyek konstruksi, khususnya pada pekerjaan gedung dan infrastruktur, dengan penjelasan yang disajikan secara ringkas dan mudah dipahami.

Materi di dalam buku ini menguraikan konsep dasar estimasi biaya serta penyusunan Rencana Anggaran Biaya (RAB) yang menjadi bagian penting dalam perencanaan proyek konstruksi. Penjelasan disusun secara sistematis agar pembaca dapat memahami gambaran proses perhitungan dan perencanaan biaya proyek secara lebih jelas.

Buku ini hadir untuk masyarakat umum yang ingin menambah wawasan mengenai manajemen biaya proyek konstruksi. Penulis berharap buku ini dapat memberikan manfaat dan menjadi bacaan yang berguna bagi para pembaca.

Jakarta, April 2026

Tim Penyusun

DAFTAR ISI

Daftar Pustaka

Abu-Mahfouz, E., Al-Dahidi, S., Gharaibeh, E., & Alahmer, A. (2025). A novel feature engineering-based hybrid approach for precise construction cost estimation using fuzzy-AHP and artificial neural networks. Construction Management and Economics, 43(4), 285-298. https://doi.org/10.1080/15623599.2025.2482207

Aditya, I., Triswandana, E., & Agustini, N. K. A. (2024). Enhanced accuracy in construction cost estimates using BIM. Jurnal Universitas Karst, 8(2). https://doi.org/10.30737/ukarst.v8i2.5771

Aditya, I., Triswandana, E., & Agustini, N. K. A. (2024). Enhanced accuracy in construction cost estimates using BIM. Ukarst: Jurnal Arsitektur Dan Desain, 8(2), 165-178.

Afzal, M., & Shafiq, M. T. (2021). Evaluating 4D-BIM and VR for effective safety communication and training: A case study of multilingual construction job-site crew. Buildings, 11(8), 319. https://doi.org/10.3390/buildings11080319

Ajayi, T. O., Daramola, O. T., & Adhuze, O. (2024). Cost management evolution in building projects: A review of innovations and challenges. International Journal of Research and Innovation in Applied Science, 9(9), 9–23.

Akpe, A. T., Nuan, S. I., Solanke, B., & Iriogbe, H. O. (2024). Adopting integrated project delivery (IPD) in oil and gas construction projects. Global Journal of Advanced Research and Reviews, 2(1), 30–50.

Akpe, T., Nuan, S. I., Solanke, B., & Iriogbe, H. O. (2024). Development and implementation of cost control strategies in oil and gas engineering projects. Global Journal of Agricultural Research and Reviews, 2(1), 28. https://doi.org/10.58175/gjarr.2024.2.1.0028

Al Amin, A., Apriliano, D. D., & Imron, I. (2024). Penerapan Building Information Modelling (BIM) untuk estimasi biaya pekerjaan struktur bangunan rumah tinggal 1 lantai di daerah Halim Jakarta Timur. *Jalakotek*, 2(1), 3351.

Ali, Z. H., Burhan, A. M., Kassim, M., & Al-Khafaji, Z. (2022). Developing an integrative data intelligence model for construction cost estimation. Journal of Construction Engineering and Management, 148(9), 1-12. https://doi.org/10.1155/2022/4285328

Alviani, E., Putra, A. D., Siregar, A., & Usman, K. (2023). Manajemen penjadwalan menggunakan Microsoft Project dan analisis risiko pada proyek pembangunan RSPTN Universitas Lampung. *Jurnal Rekayasa Sipil dan Desain*, 11(2), 3130.

Astuti, A. S. D., & Isvara, W. (2025). Development of strategies to improve the accuracy of cost estimates in risk-based building construction projects. Journal of Resilient and Sustainable Engineering Management, 4(12), 939. https://doi.org/10.59141/jrssem.v4i12.939

Atefie, T. G. (2025). Applying hybrid machine learning for construction material price prediction and procurement cost optimization. Journal of Engineering, Computing and Architecture, 1, 1651986.

Avlija, G. (2022). Using Earned Value Management for more sustainable project schedule control. Management: Journal of Contemporary Management Issues, 27(2), 11. https://doi.org/10.7595/management.fon.2022.0011

Azeez, M. N., & Al-Saffar, A. E. (2023). Construction time-cost optimization modeling using ant colony optimization. Engineering Journal, 27(1), 9-24. https://doi.org/10.31026/j.eng.2014.01.09

Bada, E., Muchla, A., Koulalis, I., Ioannidis, K., Dymarski, P., & Vrochidis, S. (2025). Ladder walking detection via action recognition for enhancing worker safety in construction. IEEE MetroLiveEnv, 64961, 11107036. https://doi.org/10.1109/metrolivenv64961.2025.11107036

Basaria, F. T., & Afroh, H. N. (2023). Reducing environmental and health risks in construction projects through hazard identification and risk assessment. E3S Web of Conferences, 388, 01028. https://doi.org/10.1051/e3sconf/202338801028

Bourahla, A., Fernandes, G., & Ferreira, L. M. D. F. (2024). Managing occupational health and safety risks in construction projects to achieve social sustainability: A review of literature. Procedia Computer Science, 235, 2269–2278. https://doi.org/10.1016/j.procs.2024.06.269

Bustomi, A. S., Shulhan, M., & Galuh, D. (2025). Analisis RAB struktur beton gedung RSUD Yogyakarta menggunakan Revit. Renovasi: Jurnal Tata Kelola Kampus, 9(2), 123-142.

Cahyadi, H., Maysarah, G., & Abdurrahman. (2024). Comparison analysis of unit prices for reinforced concrete column work using the 2022 Indonesian National Standard (SNI) method and field data: An empirical study on the construction project of the National Land Agency Building in Banjarbaru. Journal of the Indonesian Infrastructure, 2024(01), 1-15. https://doi.org/10.61453/joit.v2024no01

Chan, I. Y. S., Leung, H. Y., Ng, R. T. L., & Leung, M. (2016). How can BIM support construction safety management? Development of SIM. MATEC Web of Conferences, 66, 00018. https://doi.org/10.1051/matecconf/20166600018

Chen, L., & Tang, Y. (2024). Research on the path of cost control and economic benefit enhancement in construction engineering projects. Acta Mathematica Nionica et Sinica Supplement, 2024(2618), 1–15.

Choi, S., Oh, S. W., & Kim, Y. S. (2014). Development of enforcement rate for occupational safety and health management expense by construction project types and the percentage of completion. Journal of the Architectural Institute of Korea: Structure & Construction, 30(7), 105–112. https://doi.org/10.5659/jaik_sc.2014.30.7.105

Christopher, J., & Waty, M. (2021). Identifikasi faktor penyebab cost overrun (pembengkakan biaya) pada proyek rumah tinggal. *Jurnal Manajemen Teknologi dan Sains*, 0, 12502.

Chukwuma-Eke, E. C., Ogunsola, O. Y., & Isibor, N. J. (2024). A framework for financial risk mitigation in cost control and budget management for energy projects. International Journal of Social Science and Economic Research, 3(1), 251–271. https://doi.org/10.54660/ijsser.2024.3.1.251-271

Citra, Z., Wibowo, P. D., Malinda, Y., & Apdeni, R. (2023). Evaluasi biaya risiko proyek di masa pandemi Covid-19 dengan menggunakan Java programming pada konstruksi bangunan gedung. *Civil Engineering Dimension*, 10(1), 121601.

Costa, O., Matias, J., & Pimentel, C. (2021). Occupational health and safety in construction projects: A case study on chemical industry

sector. Pesquisa e Práctica em Educação, 5(2), 2. https://doi.org/10.24840/2184-0954_005.002_0002

Cusumano, L., Farmakis, O., Granath, M., Olsson, N., Jockwer, R., & Rempling, R. (2024). Current benefits and future possibilities with digital field reporting. Journal of Construction Engineering and Management, 150(5). https://doi.org/10.1080/15623599.2024.2340923

De Jong, E., Visser, H. A., Dias, A. S., Harvey, C., & Gruter, G. J. M. (2022). The road to bring FDCA and PEF to the market. *Polymers*, 14(5), 943.

Edwards, P. J., & Bowen, P. A. (1998). Risk and risk management in construction: A review and future directions for research. Engineering, Construction and Architectural Management, 5(4), 339–349. https://doi.org/10.1108/eb021087

Eldin, A. M. S., Abdelalim, A. M., & Tantawy, M. (2024). Enhancing cost management in construction: The role of 5D Building Information Modeling (BIM). Egyptian Research Journal, 2024. https://doi.org/10.21608/erj.2024.377303

Fajar, C., & Oetomo, W. (2023). Analisis rencana anggaran biaya dan durasi pekerjaan perkerasan jalan pada proyek peningkatan jalan Weekapoda-Dikira Kabupaten Sumba Barat Daya. Journal of Sustainable Roads, 13(2), 1656. https://doi.org/10.47647/jsr.v13i2.1656

Firatama, A. D., Shalehoddin, M., Ishaq, I., & Yakin, H. (2025). Analisis kebutuhan rencana anggaran biaya dan K3 pembangunan pemeliharaan gedung docking pelabuhan perikanan Tambakrejo. Agora: Jurnal Manajemen Proyek dan Rekayasa, 10(1), 26141. https://doi.org/10.30651/ag.v10i1.26141

Firdausy, M. A. (2025). Analisis perbandingan bekisting metal deck dan perencanaan ulang bekisting konvensional pada pelat lantai dan pelat atap Gedung IGD RSUD Sidoarjo Barat tinjauan efisiensi biaya dan waktu. *Sintesi*, 3(1), 1575.

Geni, R. L., & Munandar, A. (2025). Pentingnya sistem informasi Primavera P6 untuk membantu manajemen mengefisiensi waktu dan biaya di perusahaan konstruksi. *Journal of Financial Research and Justice System*, 572.

Ghuzdewan, T. A. (2025). Program berbasis Python untuk estimasi biaya dan perencanaan sumber daya proyek konstruksi. *Nautical*, 4(3), 1702.

Giri, O. P., Sainju, P. R., & Htet, A. (2024). Evaluating occupational health and safety practices in an airport construction project in Nepal. Built Environment Project and Asset Management, 14(3), 054. https://doi.org/10.1108/bepam-03-2024-0054

Gunduz, M., Naji, K. K., & Al-Marri, H. (2025). Factors driving construction material price volatility in Qatar's construction industry: An investigation using generalized structured component analysis (GSCA). Buildings, 15(9), 1475.

Habibbullah, M. N., Lusiana, L., & Rafie, R. (2026). Penerapan BIM dalam perhitungan volume pekerjaan dan biaya konstruksi menggunakan software Autodesk Revit pada proyek gedung pengadilan agama Sungai Raya. Jurritek: Jurnal Riset Teknik Sipil, 5(1), 45-68.

Habibi, M., & Kermanshachi, S. (2018). Phase-based analysis of key cost and schedule performance causes and preventive strategies. Engineering, Construction and Architectural Management, 25(10), 1236-1255. https://doi.org/10.1108/ECAM-10-2017-0219

Hanelt, A., Bohnsack, R., Marz, D., & Marante, C. (2020). A systematic review of the literature on digital transformation: Insights and implications for strategy and organizational change. *Journal of Management Studies*, 57(5), 2639.

Harahap, S., & Pulungan, S. S. (2025). Pengaruh pemakaian ukuran batu bata terhadap harga satuan pasangan dinding pada bangunan sederhana. Mutiara Teknik Sipil, 3(2), 2146. https://doi.org/10.59059/mutiara.v3i2.2146

Harahap, S., & Pulungan, S. S. (2025). Study on the application of integrated job titles and duties of construction site construction managers to improve safety work efficiency. Korean Journal of Safety Culture, 44, 91. https://doi.org/10.52902/kjsc.2025.44.91

Hari Setiadji, B., Hatmoko, J. U. D., & Ferdiana, F. C. (2023). Pengaplikasian tingkatan sistem manajemen mutu pada proyek konstruksi. *Syntax Literate*, 8(7), 12945.

Hassanean, S. H. J., Hasan, M. F., Altaee, M. J., & Gamil, Y. (2025). A model for preliminary cost estimation in buildings construction projects. Frontiers in Built Environment, 11, 1359777. https://doi.org/10.3389/fbuil.2025.1359777

Hendrajaya, H., Samtono, S., Guritno, B., Listyorini, H., Yuliamir, H., & Sukrisno, S. (2022). Peningkatan kinerja pengembangan produk berkelanjutan berbasis budaya organisasi lingkungan dan kapasitas daya serap keberlanjutan. *Ekombis Review*, 10(2), 2328.

Hidayat, M., Pratama, M. D. A., & Nugroho, N. S. (2023). Estimasi biaya rehabilitasi berat pada bangunan sekolah menggunakan metode cost significant model. *Teslink*, 4(2), 135.

Hinze, J., Hallowell, M. R., & Baud, K. C. (2013). Construction-safety best practices and relationships to safety performance. Journal of

Construction Engineering and Management, 139(6), 751. https://doi.org/10.1061/(ASCE)CO.1943-7862.0000751

Hosamo, H., Rolfsen, C. N., Zeka, F., Sandbeck, S., Said, S., & Stre, M. A. (2024). Navigating the adoption of 5D Building Information Modeling: Insights from Norway. Infrastructures, 9(4), 75. https://doi.org/10.3390/infrastructures9040075

Huang, X., & Hinze, J. (2003). Analysis of construction worker fall accidents. Journal of Construction Engineering and Management, 129(3), 262–271. https://doi.org/10.1061/(ASCE)0733-9364(2003)129:3(262)

Ihsan, T., Hamidi, S. A., & Putri, F. A. (2020). Penilaian risiko dengan metode HIRADC pada pekerjaan konstruksi gedung kebudayaan Sumatera Barat. Civil-Ronlit: Jurnal Literasi Teknik Sipil, 5(2), 67. https://doi.org/10.33087/civronlit.v5i2.67

Isfahani, M. N., Romadhon, E. S., & Romadhon, M. (2024). Cost overrun factor of toll road project construction. IOP Conference Series: Earth and Environmental Science, 1321(1), 012025.

Isvara, W., & Kamilah, F. (2024). Conceptual cost estimation in green buildings by using regression analysis and artificial neural network methods to improve accuracy. Journal of Resilient and Sustainable Engineering Management, 4(5), 751. https://doi.org/10.59141/jrssem.v4i5.751

Jassim, H. S. H., Hasan, M. F., Altaee, M. J., & Gamil, Y. (2025). A model for preliminary cost estimation in buildings construction projects. Frontiers in Built Environment, 11, 1359777. https://doi.org/10.3389/fbuil.2025.1359777

Javaherikhah, A., Alimohammadi, P., Sarvari, H., Edwards, D., Chan, D. W. M., & Cheung, C. (2025). Factors influencing the safety

enhancement and cost reduction in site layouts of construction projects. Buildings, 15(7), 1089. https://doi.org/10.3390/buildings15071089

Jawat, I. W., & Suwitanujaya, I. N. (2018). Estimasi biaya pencegahan dan pengawasan K3 pada proyek konstruksi. Parahita Desain, 7(1), 88–101. https://doi.org/10.22225/pd.7.1.820.88-101

Jeelani, I., Han, K., & Albert, A. (2018). Scaling personalized safety training using automated feedback generation. In Construction Research Congress 2018 (pp. 020). American Society of Civil Engineers. https://doi.org/10.1061/9780784481288.020

Jo, B., Lee, Y., Khan, R. M. A., Kim, J. H., & Kim, D. K. (2019). Robust construction safety system (RCSS) for collision accidents prevention on construction sites. Sensors, 19(4), 932. https://doi.org/10.3390/s19040932

Kalbuadi, F., & Yuwono, B. E. (2023). Study of work unit price PERMEN PUPR number 28 of 2016 with PERMEN PUPR number 1 year 2022 in JU 1 river excavation work. Acta Innovations and Research, 5(1), 991. https://doi.org/10.34306/ajri.v5i1.991

Karata, I. (2025). Deep learning-based system for prediction of work at height in construction site. Heliyon, 11(1), e41779. https://doi.org/10.1016/j.heliyon.2025.e41779

Khodeir, L., & Dine, Y. S. (2018). The impact of integrating occupational safety and health into the pre-construction phase of projects: A literature review. Archive of the Past, 2(3), 357. https://doi.org/10.21625/archive.v2i3.357

Kim, H., Park, S., Yeom, M., Shim, H., Park, S., & Kim, J. (2022). Bluetooth load-cell-based support-monitoring system for safety

management at a construction site. Sensors, 22(10), 3955. https://doi.org/10.3390/s22103955

Kumar, K. D., Kumar, P., Gokul, G. S., Kabilan, J., Dhanush, G., & Pandi, S. S. (2024). Construction project estimation with LSTM: Materials, costs and timelines. Proceedings of the 2024 IEEE International Conference on Innovative Computing and Communication, 1-8. https://doi.org/10.1109/IC3IoT60841.2024.10550246

Lahu, E., Winanda, L. A. R., Aditama, V., & Maruf, A. (2025). Perencanaan waktu dan biaya struktur bawah jembatan menggunakan metode Precedence Diagram (PDM). *Sondir*, 9(2), 16101.

Laksmi, I. A., & Armaeni, N. K. (2023). Project cost estimation method for small-scale construction service operators in Bali. E3S Web of Conferences, 328(4), 02007. https://doi.org/10.4108/eai.28-10-2022.2328215

Le, A., & Sutrisna, M. (2023). Project cost control system and enabling-factors model: PLS-SEM approach and importance-performance map analysis. Engineering, Construction and Architectural Management, 30(3), 619. https://doi.org/10.1108/ecam-07-2022-0619

Lee, J. S. (2022). A study on predicting the occurrence probability of safety accidents of major work type in construction work. Korean Journal of Safety Culture, 16, 23. https://doi.org/10.52902/kjsc.2022.16.23

Lee, K. W. (2024). Cost performance comparison of road construction projects considering bidding condition and project characteristics.

Sustainability, 16(22), 10083. https://doi.org/10.3390/su162210083

Lendra, L., Gawei, A. B. P., Sintani, L., Afanda, D. M., & Tjakra, J. (2023). The assessment of occupational safety and health risk management on construction projects during the COVID-19 pandemic. International Journal of Disaster Management, 6(1), 30811. https://doi.org/10.24815/ijdm.v6i1.30811

Li, P., Zhang, T., Li, Q., Zhu, X., Ye, C., & Xu, L. (2025). Optimization modeling and verification of building materials cost budget for urban rail transit construction. Proceedings of the 2025 International Conference on Computing and Data Processing, 3745676. https://doi.org/10.1145/3745676.3745704

Li, W. (2025). Application and improvement of variational autoencoder (VAE) in construction engineering material cost optimization based on big data. Journal of Building Materials and Construction, 2025, 1371219.

Liu, Q., & Cao, Q. (2024). Dynamic control method of construction cost based on fuzzy neural network. Automatika: Journal for Control, Measurement, Electronics, Computing and Communications, 65(2), 747. https://doi.org/10.1080/00051144.2024.2372747

Liu, R., Mou, X., & Liu, H. (2020). Occupational health and safety risk assessment based on combination weighting and uncertain linguistic information: Method development and application to a construction project. Journal of Risk Research, 24(2), 1875519. https://doi.org/10.1080/24725838.2021.1875519

Liu, W., Luo, X., Liang, B., & Xie, J. (2025). Causal analysis and prevention strategies for safety risks in prefabricated building

construction based on accident data and complex network theory. Buildings, 15(2), 152. https://doi.org/10.3390/buildings15020152

Lukhele, T. M., Botha, B., & Mbanga, S. (2022). Exploring the nexus between professional ethics and occupational health and safety in construction projects: A case study approach. Engineering Project Organization Journal, 12(1), 2033498. https://doi.org/10.1080/15623599.2022.2033498

Lung, L. W., Wang, Y. R., & Chen, Y. S. (2025). Leveraging deep learning and Internet of Things for dynamic construction site risk management. Buildings, 15(8), 1325. https://doi.org/10.3390/buildings15081325

Machfudiyanto, R. A., Rachmawati, T. S. N., Laksono, N. B., Soltani, M., & Park, C. (2024). Development of construction safety dashboard based on four-dimensional building information modeling for fall prevention: Case study of stadium roof works. Buildings, 14(9), 2882. https://doi.org/10.3390/buildings14092882

Maharani, Z., Nursalman, M., & Sukamto, R. (2025). Pengembangan plugin Sketchup untuk otomatisasi rancangan anggaran biaya (RAB) bangunan menggunakan Google Services. Digitech: Jurnal Transformasi Digital, 5(1), 6338. https://doi.org/10.47709/digitech.v5i1.6338

Manullang, M., & Rini, R. (2025). Optimalisasi manajemen proyek konstruksi berbasis teknologi digital: Studi efisiensi biaya dan waktu pada pembangunan infrastruktur perkotaan. *Architecture For Sustainability and Social Justice*, 5(2), 1033.

Marinho, P. R. M., Sousa, M. D., Pequeno, L. A. B., Barros, P. P. D., Sá, A. M. F. D., & Grismino, M. H. V. (2025). Main risk factors and recurrent causes of accidents in civil construction: A literature

review. Revista de Gestão Social e Ambiental, 19(10), 074. https://doi.org/10.24857/rgsa.v19n10-074

Mishra, D. P., Siddiqui, N. A., Mondal, P., & Srivastava, P. (2025). Hazard associated with work at height and concept of horizontal lifeline uses as fall protection at work site. Environmental Engineering and Ecology Research, 31(2), 016. https://doi.org/10.53550/eec.2025.v31i02.016

Mon, T. Y. (2020). Hazards identification & risks assessment for high-rise building construction by failure mode and effects analysis [FMEA] & prevented by OH&S management system. Problems of Engineering and Structure, 2(4), 005. https://doi.org/10.24874/pes02.04.005

Nadhim, E. A., Hon, C. K. H., Xia, B., Stewart, I. B., & Fang, D. (2016). Falls from height in the construction industry: A critical review of the scientific literature. International Journal of Environmental Research and Public Health, 13(7), 638. https://doi.org/10.3390/ijerph13070638

Narbaev, T., Hazr, N. C., Khamitova, B., & Talgat, S. (2023). A machine learning study to improve the reliability of project cost estimates. International Journal of Production Research, 61(19), 7062–7076. https://doi.org/10.1080/00207543.2023.2262051

Nindya, N., Rachman, A., & Fuad, M. J. (2024). Optimasi biaya dan waktu pada proyek peningkatan ruas jalan Kanto-Pulahenti dengan menggunakan metode TCTO (Time Cost Trade Off). *Jurnal Vokasi Teknik Sipil*, 3(2), 56.

Noh, H. S., Park, J. Y., & Na, H. C. (2025). Construction sites effect of the 5 construction machinery work on safety accident: Verification of

the mediating effect of smart technology. Korean Journal of Safety Culture, 39, 51. https://doi.org/10.52902/kjsc.2025.39.51

Noorwahyudi, F., Hendriyani, I., & Kencanawati, M. (2026). Analisis pekerjaan struktur dengan Building Information Modeling (BIM) 5D pada pembangunan rusun satuan Brimob Polda Kaltim. Jurnal Talenta Sipil, 9(1). https://doi.org/10.33087/talentasipil.v9i1.1127

Nugroho, A., & Fadhilah, M. (2023). Customer-centric strategy dalam menghadapi persaingan perusahaan jasa konstruksi. *Transformasi Multi Inisiatif*, 2(4), 296.

Oyegoke, A., Powell, R., Ajayi, S., Godawatte, A. G. R., & Akenroye, T. O. (2021). Factors affecting the selection of effective cost control techniques in the UK construction industry. Journal of Financial Management of Property and Construction, 26(2), 50. https://doi.org/10.1108/JFMPC-07-2020-0050

Palawi, E. G., Susanti, J., & Winarsih, A. L. C. (2024). Estimasi biaya dan waktu pelaksanaan pekerjaan grouting proyek pembangunan bendungan Lausimeme. *Jurnal Teknik Sipil dan Manajemen*, 1(2), 209.

Patel, D., Kikani, K., & Jha, K. N. (2016). Hazard assessment using consistent fuzzy preference relations approach. Journal of Construction Engineering and Management, 142(6), 1192. https://doi.org/10.1061/(ASCE)CO.1943-7862.0001192

Pereira, F., García, M. de las N. G., & Martins, J. P. (2025). BIM for safety: Applying real-time monitoring technologies to prevent falls from height in construction. Applied Sciences, 15(4), 2218. https://doi.org/10.3390/app15042218

Pilyay, A. (2025). Application of intelligent price monitoring systems at the design stage of construction. Journal of Civil Engineering, 13(1), 5-5. https://doi.org/10.29039/2308-0191-2025-13-1-5-5

Plamonia, N., Agustin, A., & Andreas, A. (2023). Analisis faktor penentu tingkat akurasi estimasi biaya proyek menggunakan Analytical Hierarchy Process (AHP). *Arsitekta*, 5(1), 400.

Pontan, D., Dieta, S. K., Andi, M., Andi, T. P., Daffa, M. B., & Furqon, W. (2023). Comparative study of bill of quantity planning and actual work mechanical, electrical and plumbing construction of hospital buildings. International Journal of Scientific and Research Submissions, 3(8), 483. https://doi.org/10.46799/ijssr.v3i8.483

Pramesti, I. A. C., Jawat, I. W., & Eryani, I. G. A. P. (2025). Perencanaan pelaksanaan proyek konstruksi kantor KPU Kabupaten Badung. Forum Teknika, 13(2), 3574. https://doi.org/10.24929/ft.v13i2.3574

Priyanka, V., & Basaria, F. T. (2023). Minimizing work risks in Indonesia: A case study analysis of hazard identification, risk assessment, and risk control implementation. E3S Web of Conferences, 426, 01017. https://doi.org/10.1051/e3sconf/202342601017

Purnomo, D. A., & Prisilia, H. (2025). Analysis of occupational safety and health in the construction project of integrated lecture building. Green Technology, 9(1), 6108. https://doi.org/10.70609/gtech.v9i1.6108

Putera, I. G. A. A. (2022). MANFAAT BIM DALAM KONSTRUKSI GEDUNG: Suatu kajian pustaka. *Jurnal Ilmu Teknik*, 26(1), 06.

Putri, N. N., & Prafitasiwi, A. G. (2025). Analisa risiko pada proyek pembangunan Gedung Rawat Inap RS Muhammadiyah Gresik Tahap 2B. *Journal of Transportation and Logistics*, 2(1), 9521.

Rafiei, M. H., & Adeli, H. (2018). Novel machine-learning model for estimating construction costs considering economic variables and indexes. Journal of Construction Engineering and Management, 144(9), 1570. https://doi.org/10.1061/(ASCE)CO.1943-7862.0001570

Rahman, A., Saleh, L., & Siahay, M. C. (2024). Perencanaan anggaran biaya dan waktu pelaksanaan pembangunan gedung gereja kehidupan jemaat GPM. Jurnal Sains, 14(2), 2731. https://doi.org/10.31959/js.v14i2.2731

Rahman, F., Paryati, N., Sylviana, R., & Agussalim, A. M. (2025). Rencana anggaran biaya struktur pembangunan masjid politeknik di Tangerang menggunakan metode AHSP PUPR 2023. Jurnal Ggsfga, 73, 112-134.

Rajendran, S., Gambatese, J., & Behm, M. (2009). Impact of green building design and construction on worker safety and health. Journal of Construction Engineering and Management, 135(10), 1058. https://doi.org/10.1061/(ASCE)0733-9364(2009)135:10(1058)

Ratna, C. P., Rachim, F., & Mahyuddin, M. (2025). Studi manajemen risiko pada pelaksanaan proyek pembangunan perumahan Rachita Indah di Kab. Takalar. *Seminar Nasional Arsitektur dan Rekayasa Struktur Teknik*, 2(1), 772.

Rehiara, J. A. H., Tethool, Y. C. V., & Puteri, M. K. F. (2025). Digital versus manual estimation in construction budgeting: A comparative study. Technium: Romanian Journal of Applied Sciences and Technology, 29, 12809. https://doi.org/10.47577/technium.v29i.12809

Rudi, R., Budiman, V. L., Masdiana, M., Nur, K. N., & Bachtiar, E. (2025). The impact of material price fluctuation on cost overruns in national toll road infrastructure projects. Indonesian Journal of Civil Engineering, 1(2), 314.

Rudolphs, P. (2018). Paul Rudolphs design principles on high-rise office buildings in Indonesia case study: Wisma Dharmala Sakti Jakarta and Wisma Dharmala Sakti Surabaya. *Riwayat Studi Arsitektur Berkelanjutan*, 2(4), 3048.

Sabara, L., Adityawan, M. H. D., & Masdiana, M. (2024). Tinjauan rencana anggaran biaya (RAB) pengaspalan AC-BC pada proyek peningkatan jalan Budi Utomo Baru tahun anggaran 2023. Media Konsultasi, 9(2), 31. https://doi.org/10.33772/medkons.v9i2.31

Safira, S., & Ramdhan, D. H. (2020). Inclusion of construction occupational health and safety management system (OHSMS) components in building construction project. Nusantara Journal of Occupational Health and Safety, 1(01), 4588. https://doi.org/10.59230/njohs.v1i01.4588

Salim, I. P., Simanjuntak, M. A., & Jin, O. F. (2024). Model of cost management for the Jakarta Bandung High Speed Railway Project. Proceedings of the Institution of Civil Engineers – Management, Procurement and Law, 177(4), 17. https://doi.org/10.1680/jmapl.24.00017

Samad, N. A., Hasmori, M. F., & Ismail, R. (2023). Identification of fall event and classification of the factors causing fall from height accidents in the construction industry. IOP Conference Series: Earth and Environmental Science, 1205(1), 012036. https://doi.org/10.1088/1755-1315/1205/1/012036

Sampepajung, I. W., & Gunawarman, A. A. G. R. (2021). Identifikasi stakeholder dan impikasinya terhadap kesuksesan sebuah proyek studi kasus: Proyek the Baladewa Villas-Bali. *Jurnal Arsitektur*, 4(2), 34428.

Sanjaya, I. P. A., Suputra, I. G. N. O., & Prayogi, I. M. D. W. (2025). Perencanaan dan estimasi biaya K3 pada pembangunan jalan dan jembatan Singaraja-Mengwitani Titik 7D dan 7E. *Konteks*, 2(2), 205.

Santoso, A. B., & Yuliyanti, E. (2025). Comparative analysis of the RAB for the Kampi Sunter Hotel Development Project Structural Work Package between AHSP 2024 and AHSP 2025. International Journal of Science and Technology, 4(3), 2290. https://doi.org/10.56127/ijst.v4i3.2290

Sapkota, A., Karki, S., Pokharel, B., & Dhital, M. (2023). Comparative study of machine learning algorithms for early cost estimation of building projects in Nepal. Kathmandu Journal of Engineering and Management, 3(1), 62-87.

Sebastian, D., & Jin, O. F. (2025). Penyebab dan tindakan mitigasi pembengkakan biaya pada proyek konstruksi. *Jurnal Manajemen Teknologi dan Strategi*, 23(1), 37846.

Sen, K. N., & Muralidhar, G. (2024). Prevention of accidents through application of digital technologies at large construction projects in India. Occupational Medicine, 74(6), 0122. https://doi.org/10.1093/occmed/kqae023.0122

Seni, A., Dobrodolac, M., & Stojadinović, Z. (2024). Development of risk quantification models in road infrastructure projects. Sustainability, 16(17), 7694.

Shahatreh, H., Sawalmeh, A., AlFuqaha, A., Dou, Z., Almaita, E., Khalil, I., ... & Guizani, M. (2019). Unmanned aerial vehicles (UAVs): A survey on civil applications and key research challenges. IEEE Access, 7, 48572–48634. https://doi.org/10.1109/access.2019.2909530

Shamim, M., Hamid, A. B. A., Nyamasvisva, T. E., & Rafi, N. S. B. (2025). Advancement of artificial intelligence in cost estimation for project management success: A systematic review of machine learning, deep learning, regression, and hybrid models. Modelling, 6(2), 35. https://doi.org/10.3390/modelling6020035

Sina, M. T. S., Findia, F., & Nugraha, A. J. A. (2023). Perbandingan estimasi Rencana Anggaran Biaya (RAB) antara metode AHSP dengan BOW proyek rekonstruksi jalan Patung Lembuswana Sebulu. *Teknik Dinamika*, 11(3), 8384.

Siregar, S. I., Mulia, A. P., Hasibuan, G. C. R., & Bakara, R. (2025). Analisis faktor penyebab pembengkakan biaya konstruksi (cost overrun) pada proyek konstruksi di Kota Medan. *Comserva: Jurnal Penelitian*, 4(11), 3005.

Sofiyudin, M., Kurniawan, P., Suwela, S., & Indah, A. K. (2025). Application of Value Engineering in Port Wharf Development in Gorontalo. International Journal of Social Science and Emerging Research, 5(8), 1293. https://doi.org/10.46799/ijssr.v5i8.1293

Soviana, W., Iqbal, M., & Herlina, E. (2025). Analisis pengaruh percepatan lintasan kritis terhadap durasi dan biaya proyek dengan menggunakan CPM. *Tameh: Jurnal Teknik Arsitektur dan Manajemen Konstruksi*, 14(1), 268.

Subramani, T., & Kumar, T. S. (2018). Analyzing inventory material management control techniques on residential construction project

using SPSS. International Journal of Engineering and Technology, 7(3), 1566-1572. https://doi.org/10.14419/ijet.v7i3.10.15625

Sudarsana, D. K., Istri Prima Dewi, A. A. A., & Haloho, I. A. (2024). Analisis risiko durasi penyelesaian proyek dengan metode kuantitatif pada proyek bangunan Inna Bali Beach Garden. *Konteks*, 1(5), 86.

Sunarjo, D. K., & Amin, M. (2024). Construction project performance based on occupational safety, occupational health and work motivation. Asian Journal of Education and Social Studies, 3(10), 431. https://doi.org/10.46799/ajesh.v3i10.431

Suparno, S., Tjendani, H. T., & Witjaksana, B. (2025). Analysis of cost and schedule variances using earned value method on Waru - Buduran frontage road bridge construction project. AJESH: American Journal of Engineering Systems and Sustainability, 4(2), 528.

Susanto, A., & Wiyanto, H. (2025). Analisis pengaruh keterlambatan proyek terhadap estimasi biaya dan waktu penyelesaian proyek X di Sawangan. *Jurnal Manajemen Teknologi dan Strategi*, 8(1), 32613.

Susanto, R. H., Furuhitho, X., Slameto, P. J., Setiawan HP, L., Al-Khudhoiby, R., & Pramono, D. (2025). Perencanaan biaya dan waktu pada proyek pembangunan rusun Bringkav 1-/LA Kodam Jaya Tangerang Selatan. Riggs: Jurnal Pengabdian Masyarakat, 4(4), 3338. https://doi.org/10.31004/riggs.v4i4.3338

Suwarni, A., & Anondho, B. (2021). Perbandingan perhitungan volume kolom beton antara Building Information Modeling (BIM) dengan metode konvensional. *Jurnal Teknik Sipil dan Lingkungan*, 6(2), 743.

Syahputra, H., Abdillah, W., Widodo, S., & Anwar, S. (2022). Manajemen risiko proyek berdasarkan panduan Body of Knowledge manajemen proyek 2017. *Jurnal Manajemen Bisnis*, 2(1), 1987.

Tangui, M. G. (2024). Perbandingan metode standar nasional Indonesia dan analisis harga satuan pekerjaan dengan menggunakan aplikasi berbasis web. Al-Risalah: Jurnal Ilmu Hukum dan Hukum Islam, 8(9), 617. https://doi.org/10.46799/arl.v8i9.617

Tender, M., Fuller, P., Vaughan, A., Long, M., Couto, J. P., Damien, P., ... & Reis, R. (2022). Lessons from implementation of key technological developments to improve occupational safety and health processes in a complex UK-based construction project. IOP Conference Series: Earth and Environmental Science, 1101(9), 092016. https://doi.org/10.1088/1755-1315/1101/9/092016

Tu, T. (2025). BIM application in life-cycle cost management of construction projects. Data-Intensive Research and Engineering, 2025, 78288.

Utomo, J., & Setiadji, B. H. (2023). Pengaplikasian tingkatan sistem manajemen mutu pada proyek konstruksi (Quality Inspection, Quality Control, Quality Assurance, dan Total Quality Management). *Syntax Literate*, 8(7), 12945.

Vigneshwar, R. V. K., & Shanmugapriya, S. (2022). Investigating the factors affecting construction site productivity: A case of India. Engineering, Construction and Architectural Management, 29(6), 2529-2547. https://doi.org/10.1108/ECAM-06-2022-0529

Vitsek, S., & Macek, D. (2026). Current possibilities of using BIM models for compiling cost estimates in the design phase of residential buildings. Buildings, 16(1), 203. https://doi.org/10.3390/buildings16010203

Waffy Fazil, M., Muhamad Tamyez, P. F., & Chia Kuang, L. (2024). The impact of task and technology characteristics on cost estimation performance in construction projects: A regression analysis. ABMS Journal, 33(1), 114. https://doi.org/10.37934/arbms.33.1.114

Wanberg, J., Harper, C. M., Hallowell, M. R., & Rajendran, S. (2013). Relationship between construction safety and quality performance. Journal of Construction Engineering and Management, 139(5), 732. https://doi.org/10.1061/(ASCE)CO.1943-7862.0000732

Wong, C. F., Teo, F. Y., Selvarajoo, A., Tan, O. K., & Lau, S. H. (2022). Hazard identification risk assessment and risk control (HIRARC) for Mengkuang Dam construction. Contemporary Educational Administration and Applications, 10(3), 02. https://doi.org/10.13189/cea.2022.100302

Xu, Q., Liu, J., Tang, Y., & Zhang, Z. (2025). Research on construction project cost prediction based on BP neural network. Proceedings of IEEE SSITCON 2025, 1-8. https://doi.org/10.1109/SSITCON66133.2025.11342235

Yang, Y., & Xiang, P. (2025). Unveiling key aspects of safety management in mega construction projects: A perspective on different levels and types of accidents. Engineering, Construction and Architectural Management, 32(5), 1255. https://doi.org/10.1108/ecam-09-2024-1255

Yilmaz, S., Kumar, D., Hada, S., Demirkesen, S., Zhang, C., & Li, H. (2024). A PMBOK-based construction cost management framework for BIM integration in construction projects. Journal of Construction Engineering and Management, 150(8), 2371626.

Yin, Q., Liu, H., Tommelein, I. D., & Yeluripati, K. (2025). A granular framework for construction material price forecasting: Econometric and machine-learning approaches. Journal of Computing in Civil Engineering, 1–20.

Ylmaz, S., Kumar, D., Hada, S., Demirkesen, S., Zhang, C., & Li, H. (2024). A PMBOK-based construction cost management framework for BIM integration in construction projects. Journal of Construction Engineering and Management, 150(6). https://doi.org/10.1080/15623599.2024.2371626

Yuliana, N., & Yuni, N. K. S. E. (2024). Manajemen risiko estimasi biaya pada tahap perencanaan proyek konstruksi. *Jurnal Ilmu Pendidikan dan Riset*, 19(2), 360.

Zakariyya, B., Ridwan, A., & Suwarno, S. (2020). Analisis biaya dan jadwal proyek pembangunan Gedung Dinas Kesehatan Kabupaten Trenggalek dengan metode Earned Value. *Jurnal Manajemen Teknologi dan Sains*, 3(2), 1197.

Zamzami, A. K., Hasyim, W., & Suhana, N. (2024). Optimasi waktu pelaksanaan proyek pembangunan infrastruktur Gedung dan Laboratorium dengan metode PERT dan CPM. *Jurnal Riset Infrastruktur*, 10(2), 273.

Zeng, Q., & Yoon, J. (2022). The optimized process for effective decision makings to minimize fall from height (FFH) accidents on construction site. International Symposium on Automation and Robotics in Construction, 39, 0084. https://doi.org/10.22260/isarc2022/0084

Zhang, S. (2025). Technology-driven development and application of engineering cost databases. Journal of Data Analytics, 2025. https://doi.org/10.54254/2755-2721/2025.mh25386

Zhang, Y. (2023). Research and application of cost control algorithm for engineering projects based on BIM technology. Proceedings of the Institution of Civil Engineers-Smart Infrastructure and Construction, 23, 21.

PENERBIT BUKULOKA

Buku referensi Manajemen Proyek Konstruksi Gedung dan Infrastruktur: Estimasi Biaya dan RAB Proyek Konstruksi menyajikan penjelasan praktis mengenai pengelolaan proyek pembangunan, khususnya dalam menyusun estimasi biaya serta perencanaan anggaran proyek secara sistematis. Pembahasan di dalamnya menguraikan tahapan penting dalam perencanaan biaya, penyusunan Rencana Anggaran Biaya (RAB), hingga pengendalian pengeluaran selama proses pembangunan berlangsung.

Disampaikan dengan bahasa yang jelas dan mudah dipahami, buku ini membantu pembaca mengenali berbagai komponen biaya konstruksi, perhitungan volume pekerjaan, serta strategi perencanaan anggaran yang efisien pada proyek gedung maupun infrastruktur. Buku ini ditujukan untuk masyarakat umum yang ingin memahami dasar-dasar pengelolaan biaya dalam proyek konstruksi, sekaligus menjadi sumber bacaan yang bermanfaat bagi siapa saja yang tertarik pada dunia pembangunan dan perencanaan proyek.

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