PENERBIT BUKULOKA

# Teknologi perkerasan *dan* Drainase Jalan

Editor: Teguh Arief Santoso

# Teknologi perkerasan dan Drainase Jalan

**Elisabet Talakua, ST., MT., dkk.**
**Editor: Teguh Arief Santoso**

PT BUKULOKA LITERASI BANGSA

Anggota IKAPI: No. 645/DKI/2024

PENERBIT BUKULOKA

# Teknologi perkerasan dan Drainase Jalan


| | |
|---|---|
| Penulis | : Elisabet Talakua, ST., MT., Aria Ode, Romelo A. Elwuar, Angel Elian Aprilia Salasiwa, Nurmi Wolio, Kamil Fuad Loupary, Radja Wally Uar, Asril Ritwan Ode, Fitri Salamah Tuanany, Yanes Hany Leasaam, dan Beni Musa Sekewael |
| ISBN | : 978-634-324-083-9 (PDF) |
| Penyunting Naskah | : Teguh Arief Santoso |
| Tata Letak | : Teguh Arief Santoso |
| Desain Sampul | : Novikean Keysah Sanisri |

Penerbit

Penerbit PT Bukuloka Literasi Bangsa

Distributor: PT Yapindo

Kompleks Business Park Kebon Jeruk Blok I No. 21, Jl. Meruya Ilir Raya No. 88, Desa/Kelurahan Meruya Utara, Kecamatan Kembangan, Kota Adm. Jakarta Barat, Provinsi DKI Jakarta, Kode Pos: 11620

Email: penerbit.blb@gmail.com

Whatsapp: 0878-3483-2315

Website: bukuloka.com

# KATA PENGANTAR

Puji syukur ke hadirat Tuhan Yang Maha Esa atas rahmat dan karunia-Nya, sehingga buku berjudul *Teknologi Perkerasan dan Drainase Jalan* dapat tersusun dan hadir untuk pembaca.

Buku ini membahas berbagai aspek penting dalam pembangunan dan pemeliharaan jalan, khususnya terkait lapisan perkerasan serta sistem drainase yang berperan menjaga ketahanan dan kenyamanan infrastruktur. Uraian disajikan dengan bahasa yang sederhana agar mudah dipahami oleh berbagai kalangan, tidak terbatas pada bidang tertentu, sehingga masyarakat umum pun dapat mengenal dasar-dasar teknologi jalan secara lebih dekat.

Buku ini dijual untuk masyarakat luas dan dapat dimiliki oleh siapa saja yang ingin menambah wawasan mengenai infrastruktur jalan. Semoga buku ini memberikan manfaat serta menjadi tambahan pengetahuan dalam memahami pentingnya perencanaan dan pengelolaan jalan yang baik untuk mendukung aktivitas sehari-hari.

Jakarta, Juli 2026

Tim Penyusun

# DAFTAR ISI

# Daftar Pustaka


Abdelrahman, M., Abdelsalam, M., & El-Hakim, M. (2024). Quality Control and Performance Evaluation of Flexible Pavement Construction Projects. International Journal of Pavement Research and Technology.

Hardiyatmo, H. C. (2023). Perancangan perkerasan jalan dan penyelidikan tanah. Gadjah Mada University Press.

Huang, Y. H. (2024). Pavement analysis and design. Pearson Education.

Mahmoud, E., & El-Badawy, S. (2023). Advances in Quality Assurance and Quality Control Practices for Highway Construction Materials. Transportation Geotechnics.

Yoder, E. J., & Witczak, M. W. (2023). Principles of pavement design (2nd ed.). John Wiley & Sons.

Akan, A. O., & Houghtalen, R. J. (2023). Urban hydrology, hydraulics, and stormwater quality: Engineering applications and computer modeling (2nd ed.). Wiley.

Azzout, Y., Barraud, S., Cres, F. N., & Alfakih, E. (2023). Urban stormwater management and drainage systems in commercial areas. Springer.

Butler, D., & Davies, J. W. (2024). Urban drainage (5th ed.). CRC Press.

Chow, V. T., Maidment, D. R., & Mays, L. W. (2022). Applied hydrology. McGraw-Hill Education.

Fletcher, T. D., Andrieu, H., & Hamel, P. (2024). Urban Stormwater Management and Sustainable Drainage Systems: Recent Developments and Future Directions. Water Research.

Fletcher, T. D., Shuster, W., Hunt, W. F., Ashley, R., Butler, D., Arthur, S., & Viklander, M. (2024). Sustainable urban drainage systems and urban hydrology. IWA Publishing.

Suripin. (2023). Sistem drainase perkotaan yang berkelanjutan. Andi.

Wang, Y., Zhang, X., & Liu, H. (2023). Maintenance Strategies for Urban Drainage Systems and Their Impact on Flood Mitigation. Sustainable Cities and Society.

Bowles, J. E. (2022). Foundation analysis and design (6th ed.). McGraw-Hill Education.

Budhu, M. (2023). Soil mechanics and foundations (4th ed.). Wiley.

Das, B. M., & Sobhan, K. (2024). Principles of geotechnical engineering. Cengage Learning.

Gupta, A., Kumar, R., & Singh, V. (2024). Mechanical Performance of Natural Fiber and Cement Stabilized Clay Soils for

Pavement Applications. International Journal of Pavement Engineering.

Kurniawan, R., & Hidayat, A. (2023). Hydrological analysis for urban drainage planning using rainfall intensity data. Journal of Water and Land Development, 58, 125–134.

Prabakar, J., & Sridharan, A. (2023). Utilization of Coconut Fiber in Soil Stabilization and Ground Improvement Applications: A Review. Materials Today: Proceedings.

Putra, M. A., Prasetyo, B., & Nugroho, D. (2024). Land use change and its impact on urban drainage system performance. Journal of Infrastructure and Environmental Engineering, 15(2), 45–56

Solanki, P., & Zaman, M. (2023). Stabilization techniques for pavement subgrades and base courses. Springer.

Akan, A. O., & Houghtalen, R. J. (2024). Urban hydrology, hydraulics, and stormwater quality: Engineering applications and computer modeling. Wiley.

Butler, D., & Davies, J. W. (2024). Urban drainage (5th ed.). CRC Press.

Chow, V. T., Maidment, D. R., & Mays, L. W. (2023). Applied hydrology. McGraw-Hill Education.

Fletcher, T. D., Shuster, W., Hunt, W. F., Ashley, R., Butler, D., Arthur, S., & Viklander, M. (2024). SUDS, LID, BMPs,

WSUD and More – The Evolution and Application of Sustainable Drainage Systems. Water Research.

Suripin. (2023). Sistem drainase perkotaan yang berkelanjutan. Andi.

Viessman, W., & Lewis, G. L. (2023). Introduction to hydrology (6th ed.). Pearson.

Zhang, Y., Li, X., & Wang, H. (2023). Application of Geographic Information Systems for Urban Flood and Drainage Planning. Sustainability.

Abbondati, F., Gualtieri, C., Biancardo, S. A., & Dell'Acqua, G. (2025). Effects of granular material deposition on the road's stormwater drainage system. Infrastructures, 10(10), 271.

Highways Department. (2023). Guidance Notes on Road Pavement Drainage Design. Highways Department.

Martínez, C., Galván, B., Álvarez, J., & Mosquera, J. (2021). Efficient design of road drainage systems. Water, 13(12), 1661.

Ministry of Transportation Ontario. (2023). Highway Drainage Design Standards. Ministry of Transportation Ontario.

Munawir, M., Simanjuntak, I., & Simamora, I. W. (2023). Community Empowerment in Drainage Management to Overcome Floods. Inovasi Sosial: Jurnal Pengabdian Masyarakat, 1(1), 19–28.

Puspita, I. (2025). Study of the effect of sedimentation on the reduction of drainage capacity in urban areas (Case study: Letda Sujono Road). Jurnal Sondir, 10(1).

Rifki, M., Alhamuddin, M., & Pratama, A. (2025). Challenges and Innovations in Urban Drainage Systems: Sustainable Urban Drainage Systems (SUDS) for Resilient Cities. Water, 17(1), 76.

Sarra, S., Pasaribu, B., & Sembiring, E. (2023). Evaluation of an urban drainage system in a big city. Jurnal Teknik Pertanian Lampung, 12(3), 531–544.

ACI Committee 318. (2023). Building Code Requirements for Structural Concrete (ACI 318-23). Farmington Hills, MI: American Concrete Institute.

Marinković, S., Ignjatović, I., Radonjanin, V., & Malešev, M. (2024). Sustainability and Circular Economy in Concrete Production Using Recycled Construction Materials. Sustainability, 16(3), 1124.

Silva, R. V., Brito, J., & Dhir, R. K. (2024). A review of the characteristics of recycled aggregates and the use of recycled aggregates in concrete production. Buildings, 14(1).

Silva, R. V., De Brito, J., & Dhir, R. K. (2023). Properties and performance of recycled aggregate concrete. Construction and Building Materials, 392, 131963.

Tam, V. W. Y., Soomro, M., & Evangelista, A. C. J. (2023). A Review of Recycled Aggregate Concrete and Its Application in Sustainable Construction. Journal of Building Engineering, 71, 106437.

Tam, V. W. Y., Soomro, M., & Evangelista, A. C. J. (2024). Sustainable use of recycled construction materials in concrete production. Journal of Building Engineering, 84, 108487.

Wang, Y., Zhang, H., Li, X., & Chen, Z. (2024). Properties and performance evaluation of concrete incorporating recycled aggregate materials. Construction and Building Materials, 418, 135673.

Xiao, J. (2023). Recycled Aggregate Concrete: Structures and Structural Members. Springer.

Direktorat Jenderal Bina Marga. (2023). Spesifikasi Umum Bina Marga 2023 untuk Pekerjaan Konstruksi Jalan dan Jembatan. Jakarta: Kementerian Pekerjaan Umum dan Perumahan Rakyat.

Haas, R., Hudson, W. R., & Zaniewski, J. P. (2015). Modern Pavement Management (2nd ed.). Krieger Publishing Company.

Luo, X., Huang, B., Shu, X., & Dong, Q. (2023). Performance Evaluation of Asphalt Pavements under Repeated Traffic Loading. Construction and Building Materials, 394, 132188.

Rahman, M., Pratama, R., & Nugroho, A. (2024). Performance evaluation of asphalt concrete wearing course under repeated traffic loading. International Journal of Pavement Engineering, 25(4), 587–598.

Shahin, M. Y. (2021). Pavement Management for Airports, Roads, and Parking Lots (3rd ed.). Springer.

Wang, H., Zhang, Y., Li, N., & Chen, X. (2024). Pavement Preservation Strategies and Performance Assessment for Sustainable Road Infrastructure. Sustainability, 16(5), 1987.

Yousefi, A., Ameri, M., & Hesami, S. (2023). Performance evaluation of hot mix asphalt pavements under traffic loading and environmental conditions. Case Studies in Construction Materials, 19, e02461.

Zhang, Y., Li, X., Wang, H., & Chen, M. (2024). Quality control and performance assessment of asphalt pavement construction. Construction and Building Materials, 418, 135412.

Bibi, T. S., & Tekesa, N. W. (2024). Study rainfall intensity duration frequency relationships under climate change for design of efficient urban stormwater drainage systems in Dodola

Town, Ethiopia. International Journal of Hydrology Science and Technology.

Fletcher, T. D., Andrieu, H., & Hamel, P. (2024). Understanding, Management and Benefits of Sustainable Drainage Systems in Urban Areas. Urban Water Journal, 21(2), 115–128.

Gunn, C. A., & Var, T. (2020). Tourism Planning: Basics, Concepts, Cases (5th ed.). Routledge.

Hall, C. M. (2023). Tourism and Transport: Modes, Networks and Flows. Channel View Publications.

Hammond, M. J., Chen, A. S., Djordjević, S., Butler, D., & Mark, O. (2023). Urban Flood Impact Assessment and Infrastructure Resilience for Sustainable Development. Sustainability, 15(9), 7421.

Li, X., Zhang, Y., & Chen, H. (2023). Urban surface runoff response to impervious surface expansion under changing land use conditions. Sustainable Cities and Society, 96, 104671.

Rasoolimanesh, S. M., Chee, S. Y., & Ragavan, N. A. (2023). Tourists' perceptions of the sustainability of destination, satisfaction, and revisit intention. Tourism Recreation Research, 48(5), 1–20.

Wang, J., Liu, Y., Zhao, X., & Huang, Z. (2024). Assessment of drainage capacity and stormwater management in urban infrastructure systems. Journal of Hydrology, 633, 130987.

Mehta, P. K., & Monteiro, P. J. M. (2024). Concrete: Microstructure, Properties, and Materials (5th ed.). New York: McGraw-Hill Education.

Neville, A. M. (2023). Properties of Concrete (6th ed.). London: Pearson Education.

Siddique, R., & Khan, M. I. (2023). Supplementary cementing materials and chemical admixtures in concrete. Springer.

Wang, Y., Li, X., Zhang, H., & Chen, Z. (2024). Advances in High-Performance Concrete Incorporating Chemical Admixtures and Supplementary Cementitious Materials. Construction and Building Materials, 418, 135420.

Zhang, J., Liu, P., Wang, S., & Zhao, Y. (2023). Effects of Superplasticizers on the Mechanical Properties and Durability of Concrete: A Review. Materials, 16(18), 6124.

Bowles, J. E. (2024). Foundation analysis and design (6th ed.). McGraw-Hill Education.

Das, B. M., & Sobhan, K. (2023). Principles of foundation engineering (10th ed.). Cengage Learning.

Indraratna, B., Rujikiatkamjorn, C., & Ngo, T. (2023). Ground Improvement Techniques for Transportation Infrastructure on Soft Soils. Transportation Geotechnics, 42, 101069.

Xu, J., Zhang, L., Wang, Y., & Li, H. (2024). Integrated Geotechnical and Structural Design Approaches for Bridge

Approach Embankments. Journal of Bridge Engineering, 29(4), 04024015.

Zhang, W., Chen, Y., Li, X., & Zhao, H. (2024). Performance evaluation of bridge approach embankments considering differential settlement and traffic loading. Transportation Geotechnics, 48.

Ahammed, F., & Pandey, A. C. (2022). Urbanization and its impact on urban runoff and flooding: A review. Environmental Challenges, 9, 100624.

Butler, D., Digman, C. J., Makropoulos, C., & Davies, J. W. (2023). Urban Drainage (5th ed.). Boca Raton: CRC Press.

Fletcher, T. D., Shuster, W., Hunt, W. F., Ashley, R., Butler, D., Arthur, S., & Viklander, M. (2024). Urban drainage and stormwater management: Principles and practice. CRC Press.

Hammond, M. J., Chen, A. S., Djordjević, S., Butler, D., & Mark, O. (2024). Urban Flood Resilience and Community Participation in Sustainable Drainage Management. Sustainability, 16(2), 887.

Miguez, M. G., & Veról, A. P. (2024). Urban flood impacts and drainage system performance in densely populated cities. Water, 16(4), 587.

Zhou, Q., Li, J., Wang, Y., & Zhang, H. (2023). Impacts of urbanization on stormwater runoff and drainage system performance in urban areas. Journal of Hydrology, 621, 129620.

PENERBIT BUKULOKA

Buku referensi berjudul: Teknologi Perkerasan dan Drainase Jalan membahas pentingnya perencanaan, pembangunan, dan pemeliharaan jalan yang kuat, aman, serta tahan lama. Di dalamnya dijelaskan berbagai jenis perkerasan jalan, material yang digunakan, hingga sistem drainase yang berperan besar dalam mencegah kerusakan akibat genangan air.

Disusun dengan bahasa yang mudah dipahami, buku ini cocok untuk masyarakat umum yang ingin mengenal dunia konstruksi jalan secara lebih dekat. Buku ini dijual untuk pembaca luas yang tertarik memahami bagaimana jalan raya dibangun dan dijaga agar tetap nyaman digunakan.

ISBN 978-634-324-083-9 (PDF)
9 786343 240839