

DAFTAR PUSTAKA

- Ab Manaf, Mohd Badrul Hisyam, Mohd Mustafa Al Bakri Abdullah, Rafiza Abdul Razak, Muhammad Munsif Ahmad, Mustaqqim Abdul Rahim, and Sharifah Nurfarhana Tuan Muda. 2021. "Substitution of Fly Ash as Mineral Filler in Wearing Course of Hot Mix Asphalt." *Journal of Physics: Conference Series* 2129(1). doi:10.1088/1742-6596/2129/1/012039.
- Abo-Qudais, Saad, and Akram Suleiman. 2005. "Monitoring Fatigue Famage and Crack Healing by Ultrasound Wave Velocity." *Nondestructive Testing and Evaluation* 20(2): 125–45. doi:10.1080/10589750500206774.
- Ahmadinia, Esmail, Majid Zargar, Mohamed Rehan Karim, Mahrez Abdelaziz, and Payam Shafiqh. 2011. "Using Waste Plastic Bottles as Additive for Stone Mastic Asphalt." *Materials and Design* 32(10): 4844–49. doi:10.1016/j.matdes.2011.06.016.
- Ahmedzade, Perviz, and Mehmet Yilmaz. 2008. "Effect of Polyester Resin Additive on the Properties of Asphalt Binders and Mixtures." *Construction and Building Materials* 22(4): 481–86. doi:10.1016/j.conbuildmat.2006.11.015.
- Akhtar, Mohammad Nadeem, Abdullah M. Al-Shamrani, Mohammed Jameel, Nadeem A. Khan, Zainah Ibrahim, and J. N. Akhtar. 2021. "Stability and Permeability Characteristics of Porous Asphalt Pavement: An Experimental Case Study." *Case Studies in Construction Materials* 15(May): e00591. doi:10.1016/j.cscm.2021.e00591.
- Al-Shamsi, Khalid, Hossam F. Hassan, and Louay N. Mohammed. 2017. "Effect of Low VMA in Hot Mix Asphalt on Load-Related Cracking Resistance." *Construction and Building Materials* 149: 386–94. doi:10.1016/j.conbuildmat.2017.05.120.
- Arabani, Mahyar, Pezhouhan T. Kheiry, and Behrooz Ferdosi. 2009. "Laboratory Evaluation of the Effect of Hma Mixt Parameters on Ultrasonic Pulse Wave Velocities." *Road Materials and Pavement Design* 10(1): 223–32. doi:10.1080/14680629.2009.9690189.
- Azizah, N. U., J. Andry, and F. Y. Pradana. 2024. "Analysis Stability of Asphalt

- Concrete Binder Course (AC-BC) with Fly Ash and Bottom Ash Substitution Material." *IOP Conference Series: Earth and Environmental Science* 1321(1). doi:10.1088/1755-1315/1321/1/012021.
- Biligiri, Krishna Prapoorna, and Kamil Elias Kaloush. 2009. "Prediction of Pavement Materials' Impedance Using Ultrasonic Pulse Velocity." *Road Materials and Pavement Design* 10(4): 767–87. doi:10.1080/14680629.2009.9690226.
- Biligiri, Krishna Prapoorna, and George Bert Way. 2014. "Noise-Damping Characteristics of Different Pavement Surface Wearing Courses." *Road Materials and Pavement Design* 15(4): 925–41. doi:10.1080/14680629.2014.902768.
- Bina Marga. 2003. Metode Pengujian Campuran Beraspal Panas dengan Alat Marshall *Rсни M- 01-2003*.
<https://binamarga.pu.go.id/index.php/nspk/detail/sni-24892018-metode-uji-stabilitas-dan-pelelehan-campuran-beraspal-panas-dengan-menggunakan-alat-marshall>.
- Challenge, Living Building. 2019. "Life Cycle Assessment of Asphalt Binder." *Asphalt Institute*: 1–5.
- Chen, C., G. Habert, Y. Bouzidi, A. Jullien, and A. Ventura. 2010. "LCA Allocation Procedure Used as an Incentive Method for Waste Recycling: An Application to Mineral Additions in Concrete." *Resources, Conservation and Recycling* 54(12): 1231–40. doi:10.1016/j.resconrec.2010.04.001.
- Chen, Gang, Bin Yu, and Peter Nielsen. 2019. "Preface: Operations Research for Transportation." *Annals of Operations Research* 273(1–2): 1–3. doi:10.1007/s10479-018-3113-7.
- Chen, Huaxin, Qinwu Xu, Shuanfa Chen, and Zhengqi Zhang. 2009. "Evaluation and Design of Fiber-Reinforced Asphalt Mixtures." *Materials and Design* 30(7): 2595–2603. doi:10.1016/j.matdes.2008.09.030.
- Choi, Min Ju, Yong Joo Kim, Hyeok Jung Kim, and Jae Jun Lee. 2020. "Performance Evaluation of the Use of Tire-Derived Fuel Fly Ash as Mineral Filler in Hot Mix Asphalt Concrete." *Journal of Traffic and Transportation*

- Engineering (English Edition)* 7(2): 249–58. doi:10.1016/j.jtte.2019.05.004.
- Choudhary, Jayvant, Brind Kumar, and Ankit Gupta. 2020. “Feasible Utilization of Waste Limestone Sludge as Filler in Bituminous Concrete.” *Construction and Building Materials* 239: 117781. doi:10.1016/j.conbuildmat.2019.117781.
- Fadholah, R, A Setyawan, and S Suryoto. 2017. “Konsumsi Energi Dan Emisi Gas Rumah Kaca (CO₂) Pada Proses Pelaksanaan Pekerjaan Perkerasan Jalan.” *Matriks Teknik Sipil* (36): 326–34.
<https://103.23.224.239/matriks/article/view/36975>.
- Hou, Xuan, Shuhua Ma, Xiaohui Wang, Ruiping Liu, and Muhammad Ibrahim. 2024. “Hydrothermal Transformation of Fly Ash to Tobermorite or Katoite: Impact of Ca and Si Concentration in the Liquid Phase without Alkali Activation.” *Ceramics International* 50(10): 17291–301.
doi:10.1016/j.ceramint.2024.02.210.
- Jiang, Zhi Yong, Joseph Ponniah, and Giovanni Cascante. 2006. “Improved Ultrasonic Pulse Velocity Technique for Bituminous Material Characterization.” *TAC/ATC 2006 - 2006 Annual Conference and Exhibition of the Transportation Association of Canada: Transportation Without Boundaries* (January 2006).
- Krisdiyanto, Aris, Kemmala Dewi, and Muhammad Arif Wijayanto. 2022. “Analisa Perbandingan Perencanaan Tebal Perkerasan Lentur Metode AASHTO 1993 Dan Tebal Perkerasan Lentur Metode Bina Marga 2017.” *Jurnal Teknik Sipil* 15(1): 22–33.
- Kurda, Rawaz, José D. Silvestre, and Jorge de Brito. 2018. “Toxicity and Environmental and Economic Performance of Fly Ash and Recycled Concrete Aggregates Use in Concrete: A Review.” *Heliyon* 4(4).
doi:10.1016/j.heliyon.2018.e00611.
- Lavin Patrick. 2015. “Asphalt Pavement, Taylor & Francis e-Library, London and New York.”
- Likitlersuang, Suched, and Thanakorn Chompoorat. 2016. “Laboratory Investigation of the Performances of Cement and Fly Ash Modified Asphalt Concrete Mixtures.” *International Journal of Pavement Research and Technology* 9(5):

337–44. doi:10.1016/j.ijprt.2016.08.002.

- Majhi, Rajib K., Abinash Padhy, and Amar N. Nayak. 2021. "Performance of Structural Lightweight Concrete Produced by Utilizing High Volume of Fly Ash Cenosphere and Sintered Fly Ash Aggregate with Silica Fume." *Cleaner Engineering and Technology* 3. doi:10.1016/j.clet.2021.100121.
- Mistry, Raja, Sandip Karmakar, and Tapas Kumar Roy. 2019. "Experimental Evaluation of Rice Husk Ash and Fly Ash as Alternative Fillers in Hot-Mix Asphalt." *Road Materials and Pavement Design* 20(4): 979–90. doi:10.1080/14680629.2017.1422791.
- Paul, Dibyendu, Machavarapu Suresh, and Manish Pal. 2021. "Utilization of Fly Ash and Glass Powder as Fillers in Steel Slag Asphalt Mixtures." *Case Studies in Construction Materials* 15(August): e00672. doi:10.1016/j.cscm.2021.e00672.
- Peng, Bo, Chunli Cai, Guangkai Yin, Wenying Li, and Yaowen Zhan. 2015. "Evaluation System for CO₂ Emission of Hot Asphalt Mixture." *Journal of Traffic and Transportation Engineering (English Edition)* 2(2): 116–24. doi:10.1016/j.jtte.2015.02.005.
- Peraturan Menteri Pekerjaan Umum Nomor : 19/PRT/M/2011. 2011. "PERSYARATAN TEKNIS JALAN DAN KRITERIA PERENCANAAN TEKNIS JALAN." *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis* 16(2): 39–55.
- Al Qurny, Ahmad Uwwes, Imam Hagni Puspito, and Nuryani Tinumbia. 2022. "Pengaruh Penambahan Bahan Pengisi (Filler) Fly Ash Terhadap Campuran Aspal Beton Lapis Aus (Asphalt Concrete Wearing Course/Ac-Wc)." *Jurnal ARTESIS* 2(1): 87–97. doi:10.35814/artesis.v2i1.3766.
- Robert, Alexander Maniagasi. 2020. "STUDI KEKUATAN TARIK TIDAK LANGSUNG CAMPURAN AC-WC YANG MENGANDUNG ASPAL BUTON DAN MENGGUNAKAN LIMBAH PLASTIK SEBAGAI BAHAN TAMBAH." *Nature Microbiology* 3(1): 641. <http://dx.doi.org/10.1038/s41421-020-0164-0><https://doi.org/10.1016/j.solener.2019.02.027><https://www.golder.com/insights/block-caving-a-viable->

alternative/%0A???%0Ahttp://dx.doi.org/10.1038/s41467-020-15507-2%0Ahttp://dx.doi.org/10.1038/s41587-020-05.

- Di Schino, Anrea, and Marco Corradi. 2020. "Construction and Building Materials." *AIMS Materials Science* 7(2): 157–59. doi:10.3934/matetsci.2020.2.157.
- Sengoz, Burak, and Ali Topal. 2007. "Minimum Voids in Mineral Aggregate in Hot-Mix Asphalt Based on Asphalt Film Thickness." *Building and Environment* 42(10): 3629–35. doi:10.1016/j.buildenv.2006.10.005.
- Shah, Syeed Adnan Raheel, Muhammad Kashif Anwar, Hunain Arshad, Muhammad Ahmed Qurashi, Aqsa Nisar, Asfar Nasir Khan, and Muhammad Waseem. 2020. "Marshall Stability and Flow Analysis of Asphalt Concrete under Progressive Temperature Conditions: An Application of Advance Decision-Making Approach." *Construction and Building Materials* 262: 120756. doi:10.1016/j.conbuildmat.2020.120756.
- Sholichin, Ibnu, and Devi A. Sutarna. 2019. "Variations in the Addition of Polypropylene Fiber, Fly Ash and Immersion in Asphalt Mixtures on Stability and Flow." *International Journal of Civil Engineering and Technology* 10(2): 2032–39.
- Silva, Leandro S., Mayara Amario, Carina M. Stolz, Karoline V. Figueiredo, and Assed N. Haddad. 2023. "A Comprehensive Review of Stone Dust in Concrete: Mechanical Behavior, Durability, and Environmental Performance." *Buildings* 13(7). doi:10.3390/buildings13071856.
- Singh, Avinash Kumar, and Jagdish Prasad Sahoo. 2021. "Rutting Prediction Models for Flexible Pavement Structures: A Review of Historical and Recent Developments." *Journal of Traffic and Transportation Engineering (English Edition)* 8(3): 315–38. doi:10.1016/j.jtte.2021.04.003.
- Sugeha, Alif Lam Ra, sulandari Eti, and Sugiono Suyono Rudi. 2018. "Pemanfaatan Limbah Abu Batu Bara Sebagai Filler Pada Campuran Laston." *Jurnal PWK, Laut, Sipil, Tambang* 5(3): 1–11. <https://jurnal.untan.ac.id/index.php/JMHMS/article/view/29406>.
- Tan, Eng Hie, Elsaid M.M. Zahran, and Soon Jiann Tan. 2022. "The Optimal Use of

Crumb Rubber in Hot-Mix Asphalt by Dry Process: A Laboratory Investigation Using Marshall Mix Design." *Transportation Engineering* 10(August): 100145. doi:10.1016/j.treng.2022.100145.

"The-Asphalt-Handbook-Ms-4-7th-Edition-2007-Compressed-2-Pdf_compress.Pdf."

Thives, Liseane Padilha, and Enedir Ghisi. 2017. "Asphalt Mixtures Emission and Energy Consumption: A Review." *Renewable and Sustainable Energy Reviews* 72(September 2016): 473–84. doi:10.1016/j.rser.2017.01.087.

Usman, A., M. H. Sutanto, M. Napiah, S. E. Zoorob, M. I. Khan, and M. B. Ibrahim. 2020. "Application of Gamma Irradiation on Polyethylene Terephthalate (PET) for Use in Asphaltic Concrete Mixtures as Aggregates Replacement." *IOP Conference Series: Earth and Environmental Science* 498(1). doi:10.1088/1755-1315/498/1/012008.

Wałach, Daniel, Piotr Dybeł, Joanna Sagan, and Magdalena Gicala. 2019. "Environmental Performance of Ordinary and New Generation Concrete Structures—a Comparative Analysis." *Environmental Science and Pollution Research* 26(4): 3980–90. doi:10.1007/s11356-018-3804-2.

Zvonarić, Matija, Ivana Barišić, and Tihomir Dokšanović. 2024. "Effect of Rubber Granules and Rubber Threads on Mechanical Properties of Cement-Bound Base Course." *Construction and Building Materials* 437(March). doi:10.1016/j.conbuildmat.2024.137094.

LAMPIRAN

	Universitas Hasanuddin	lin Fitrianty S Cangara
	Program Studi Magister Teknik Sipil	D012231028
	LAMPIRAN	February 2024

Persiapan material



	Universitas Hasanuddin	<u>lin Fitrianty S Cangara</u>
	<u>Program Studi Magister</u> <u>Teknik Sipil</u>	<u>D012231028</u>
	LAMPIRAN	February 2024

Pengujian Karakteristik



	Universitas Hasanuddin	<u>lin Fitrianty S Cangara</u>
	<u>Program Studi Magister</u> <u>Teknik Sipil</u>	<u>D012231028</u>
	LAMPIRAN	February 2024

Pengujian Karakteristik



	Universitas Hasanuddin	<u>lin Fitrianty S Cangara</u>
	<u>Program Studi Magister</u> <u>Teknik Sipil</u>	<u>D012231028</u>
	LAMPIRAN	February 2024

Proses Pencampuran
Material dan Aspal



	Universitas Hasanuddin	lin Fitrianty S Cangara
	Program Studi Magister Teknik Sipil	D012231028
	LAMPIRAN	February 2024

Karakteristik Marshall

- Perendaman selama 24 jam
- Menimbang bricket dalam air
- Proses SSD Bricket



	Universitas Hasanuddin	<u>lin Fitrianty S Cangara</u>
	<u>Program Studi Magister</u>	<u>D012231028</u>
	<u>Teknik Sipil</u>	<u>February 2024</u>
LAMPIRAN		

Pengujian UPV



	Universitas Hasanuddin	lin Fitrianty S Cangara
	Program Studi Magister Teknik Sipil	D012231028
	LAMPIRAN	February 2024

Karakteristik Marshall

- Perendaman 30 menit
Waterbath
dengan suhu
60°C
- Pengangkatan
Bricket Setelah
30 Menit



	Universitas Hasanuddin	lin Fitrianty S Cangara
	Program Studi Magister Teknik Sipil	D012231028
	LAMPIRAN	February 2024

Karakteristik Marshall

Pengujian
Menggunakan
Universal Testing
Mechine



	Universitas Hasanuddin	<u>lin Fitrianty S Cangara</u>
	Program Studi Magister	<u>D012231028</u>
	Teknik Sipil	February 2024
LAMPIRAN		

Hasil Uji Marshall

