

International Journal of Inventive

Engineering and Sciences

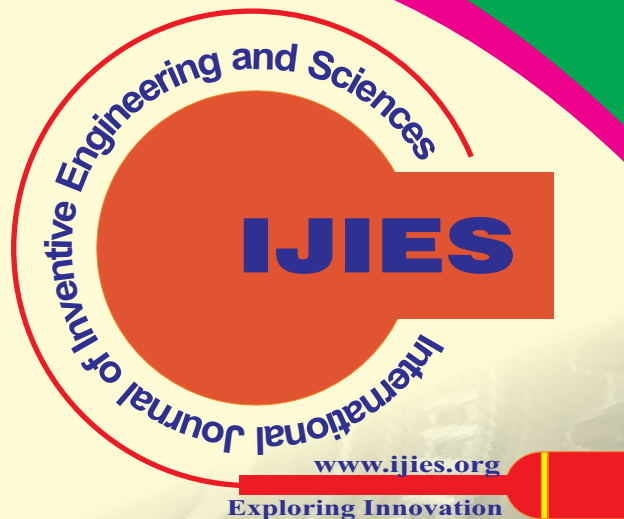
ISSN : 2319- 9598

Website: www.ijies.org

Volume-5 Issue-12, OCTOBER 2020

Published by:

Lattice Science Publication



L
S
P **Lattice Science**
Publication
www.latticescipub.com

Editor-In-Chief

Dr. Shiv Kumar

Ph.D. (CSE), M.Tech. (IT, Honors), B.Tech. (IT), Senior Member of IEEE, Member of the Elsevier Advisory Panel
Lattice Science Publication, Bhopal (MP), India

Associate Editor-In-Chief Chair

Dr. Hitesh Kumar

Ph.D.(ME), M.E.(ME), B.E. (ME)

Professor and Head, Department of Mechanical Engineering, Technocrats Institute of Technology, Bhopal (MP), India

Dr. Anil Singh Yadav

Ph.D(ME), ME(ME), BE(ME)

Professor, Department of Mechanical Engineering, LNCT Group of Colleges, Bhopal (M.P.), India

Dr. Gamal Abd El-Nasser Ahmed Mohamed Said

Ph.D(CSE), MS(CSE), BSc(EE)

Department of Computer and Information Technology, Port Training Institute, Arab Academy for Science, Technology and Maritime Transport, Egypt

Members of Associate Editor-In-Chief Chair

Dr. Mayank Singh

PDF (Purs), Ph.D(CSE), ME(Software Engineering), BE(CSE), SMACM, MIEEE, LMCSI, SMIACSIT

Department of Electrical, Electronic and Computer Engineering, School of Engineering, Howard College, University of KwaZulu-Natal, Durban, South Africa.

Scientific Editors

Prof. (Dr.) Hamid Saremi

Vice Chancellor of Islamic Azad University of Iran, Quchan Branch, Quchan-Iran

Dr. Moinuddin Sarker

Vice President of Research & Development, Head of Science Team, Natural State Research, Inc., 37 Brown House Road (2nd Floor) Stamford, USA.

Prof. (Dr.) Nishakant Ojha

Principal Advisor (Information & Technology) His Excellency Ambassador Republic of Sudan & Head of Mission in New Delhi, India

Dr. Shanmugha Priya. Pon

Principal, Department of Commerce and Management, St. Joseph College of Management and Finance, Makambako, Tanzania, East Africa, Tanzania

Dr. Veronica Mc Gowan

Associate Professor, Department of Computer and Business Information Systems, Delaware Valley College, Doylestown, PA, Allman, China.

Dr. Fadiya Samson Oluwaseun

Assistant Professor, Girne American University, as a Lecturer & International Admission Officer (African Region) Girne, Northern Cyprus, Turkey.

Dr. Robert Brian Smith

International Development Assistance Consultant, Department of AEC Consultants Pty Ltd, AEC Consultants Pty Ltd, Macquarie Centre, North Ryde, New South Wales, Australia

Dr. Durgesh Mishra

Professor (CSE) and Director, Microsoft Innovation Centre, Sri Aurobindo Institute of Technology, Indore, Madhya Pradesh India

Prof. MPS Chawla

Member of IEEE, Professor-Incharge (head)-Library, Associate Professor in Electrical Engineering, G.S. Institute of Technology & Science Indore, Madhya Pradesh, India, Chairman, IEEE MP Sub-Section, India

Dr. Vinod Kumar Singh

Associate Professor and Head, Department of Electrical Engineering, S.R.Group of Institutions, Jhansi (U.P.), India

Dr. Rachana Dubey

Ph.D.(CSE), MTech(CSE), B.E(CSE)

Professor, Department of Computer Science & Engineering, Lakshmi Narain College of Technology Excellence (LNCTE), Bhopal (M.P.), India

Executive Editor Chair

Dr. Deepak Garg

Professor, Department Of Computer Science And Engineering, Bennett University, Times Group, Greater Noida (UP), India

Members of Executive Editor Chair

Dr. Vahid Nourani

Professor, Faculty of Civil Engineering, University of Tabriz, Iran.

Dr. Saber Mohamed Abd-Allah

Associate Professor, Department of Biochemistry, Shanghai Institute of Biochemistry and Cell Biology, Shanghai, China.

Dr. Xiaoguang Yue

Associate Professor, Department of Computer and Information, Southwest Forestry University, Kunming (Yunnan), China.

Dr. Labib Francis Gergis Rofaiel

Associate Professor, Department of Digital Communications and Electronics, Misr Academy for Engineering and Technology, Mansoura, Egypt.

Dr. Hugo A.F.A. Santos

ICES, Institute for Computational Engineering and Sciences, The University of Texas, Austin, USA.

Dr. Sunandan Bhunia

Associate Professor & Head, Department of Electronics & Communication Engineering, Haldia Institute of Technology, Haldia (Bengal), India.

Dr. Awatif Mohammed Ali Elsiddieg

Assistant Professor, Department of Mathematics, Faculty of Science and Humanities Studies, Elnielain University, Khartoum Sudan, Saudi Arabia.

Technical Program Committee Chair

Dr. Mohd. Nazri Ismail

Associate Professor, Department of System and Networking, University of Kuala (UniKL), Kuala Lumpur, Malaysia.

Members of Technical Program Committee Chair

Dr. Haw Su Cheng

Faculty of Information Technology, Multimedia University (MMU), Jalan Multimedia (Cyberjaya), Malaysia.

Dr. Hasan. A. M Al Dabbas

Chairperson, Vice Dean Faculty of Engineering, Department of Mechanical Engineering, Philadelphia University, Amman, Jordan.

Dr. Gabil Adilov

Professor, Department of Mathematics, Akdeniz University, Konyaalti/Antalya, Turkey.

Dr.Ch.V. Raghavendran

Professor, Department of Computer Science & Engineering, Ideal College of Arts and Sciences Kakinada (Andhra Pradesh), India.

Dr. Thanhtrung Dang

Associate Professor & Vice-Dean, Department of Vehicle and Energy Engineering, HCMC University of Technology and Education, Hochiminh, Vietnam.

Dr. Wilson Udo Udofia

Associate Professor, Department of Technical Education, State College of Education, Afaha Nsit, Akwa Ibom, Nigeria.

Editorial Chair

Dr. Arun Murlidhar Ingle

Director, Padmashree Dr. Vithalrao Vikhe Patil Foundation's Institute of Business Management and Rural Development, Ahmednagar (Maharashtra) India.

Members of Editorial Chair

Dr. Brijesh Gangil

Assistant Professor, Department of Mechanical Engineering, HNB Garhwal University (A Central University), Srinagar (Uttarakhand), India.

Dr. Sabyasachi Pramanik

Assistant Professor, Department of Computer Science and Engineering, Haldia Institute of Technology, Haldia (West Bengal), India.

Dr. M.L. Pavan Kishore

Senior Assistant Professor, Department of Mechanical Engineering, The ICFAI Foundation for Higher Education, Hyderabad (Telangana), India.

Authors: Veerendrakumar C Khed, Gokulanadh V, Hema Latha M

Paper Title: A Review on Recent Advancements in Roller Compacted Concrete

Abstract: Roller Compacted Concrete (RCC) is a durable material highly used for Pavements and Dams construction. In this regard being a high qualified material for its many advantages like Faster paving, Labor savings, Tax savings etc., researchers have produced many significant studies and derived the best results by various approaches. Some research includes the study of roller compacted concrete by partial replacement of cementitious minerals such as GGBS, admixtures like Glass fibres, Synthetic Fibres etc. With the help of locally available materials many tests have been conducted and results were shared to the world for further scope of study. Roller compacted concrete (RCC) has many advantages and the main attraction is its low water requirement with high workability and high compaction. This automatically results the outstanding compression strength. Current research has been focused on the improvement of mechanical properties and durability of the roller Compacted concrete incorporating different minerals and materials. In this paper, the Review of the papers have been presented in order to come to an overall understanding of the current progress for the Roller Compacted Concrete which is mainly being used for Roads, pavements, Parking lots and Dams.

Keywords: RCC, Compressive Strength, Pavements, Synthetic Fibres.

References:

- G. Liu, W. Lu, Y. Lou, W. Pan, and Z. Wang, "Interlayer shear strength of Roller compacted concrete (RCC) with various interlayer treatments," *Construction and Building Materials*, vol. 166, pp. 647-656, 2018/03/30/ 2018.
- X.-h. Wang, S.-r. Zhang, C. Wang, R. Song, C. Shang, and X. Fang, "Experimental investigation of the size effect of layered roller compacted concrete (RCC) under high-strain-rate loading," *Construction and Building Materials*, vol. 165, pp. 45-57, 2018/03/20/ 2018.
- S. Debbarma, G. D. Ransinchung R.N, S. Singh, and S. K. Sahdeo, "Utilization of industrial and agricultural wastes for productions of sustainable roller compacted concrete pavement mixes containing reclaimed asphalt pavement aggregates," *Resources, Conservation and Recycling*, vol. 152, p. 104504, 2020/01/01/ 2020.
- E. Rahmani, M. K. Sharbatdar, and M. H.A. Beygi, "The effect of water-to-cement ratio on the fracture behaviors and ductility of Roller Compacted Concrete Pavement (RCCP)," *Theoretical and Applied Fracture Mechanics*, vol. 109, p. 102753, 2020/10/01/ 2020.
- Z. Algin and S. Gerginci, "Freeze-thaw resistance and water permeability properties of roller compacted concrete produced with macro synthetic fibre," *Construction and Building Materials*, vol. 234, p. 117382, 2020/02/20/ 2020.
- D. Tavakoli, R. Sakenian Dehkordi, H. Divandari, and J. de Brito, "Properties of roller-compacted concrete pavement containing waste aggregates and nano SiO₂," *Construction and Building Materials*, vol. 249, p. 118747, 2020/07/20/ 2020.
- M. Hashemi, P. Shafigh, M. Abbasi, and I. Asadi, "The effect of using low fines content sand on the fresh and hardened properties of roller-compacted concrete pavement," *Case Studies in Construction Materials*, vol. 11, p. e00230, 2019/12/01/ 2019.
- H. Rooholamini, A. Hassani, and M. R. M. Aliha, "Fracture properties of hybrid fibre-reinforced roller-compacted concrete in mode I with consideration of possible kinked crack," *Construction and Building Materials*, vol. 187, pp. 248-256, 2018/10/30/ 2018.
- L. Shen, Q. Li, W. Ge, and S. Xu, "The mechanical property and frost resistance of roller compacted concrete by mixing silica fume and limestone powder: Experimental study," *Construction and Building Materials*, vol. 239, p. 117882, 2020/04/10/ 2020.
- E. Şengün, B. Alam, R. Shabani, and I. O. Yaman, "The effects of compaction methods and mix parameters on the properties of roller compacted concrete mixtures," *Construction and Building Materials*, vol. 228, p. 116807, 2019/12/20/ 2019.
- P. Sukontasukkul, U. Chaisakulkiet, P. Jamsawang, S. Horpibulsuk, C. Jaturapitakkul, and P. Chindaprasirt, "Case investigation on application of steel fibers in roller compacted concrete pavement in Thailand," *Case Studies in Construction Materials*, vol. 11, p. e00271, 2019/12/01/ 2019.
- H. Rooholamini, R. Sedghi, B. Ghobadipour, and M. Adresi, "Effect of electric arc furnace steel slag on the mechanical and fracture properties of roller-compacted concrete," *Construction and Building Materials*, vol. 211, pp. 88-98, 2019/06/30/ 2019.
- R. Abbaszadeh and A. Modarres, "Freeze-thaw durability of non-air-entrained roller compacted concrete designed for pavement containing cement kiln dust," *Cold Regions Science and Technology*, vol. 141, pp. 16-27, 2017/09/01/ 2017.
- M. AliAhmad, M. Miri, and M. Rashki, "Probabilistic and experimental investigating the effect of pozzolan and Lumachelle fine aggregates on roller compacted concrete properties," *Construction and Building Materials*, vol. 151, pp. 755-766, 2017/10/01/ 2017.
- S.-r. Zhang, X.-h. Wang, C. Wang, R. Song, and H.-y. Huo, "Compressive behavior and constitutive model for roller compacted concrete under impact loading: Considering vertical stratification," *Construction and Building Materials*, vol. 151, pp. 428-440, 2017/10/01/ 2017.
- M. Shamsaei, I. Aghayan, and K. A. Kazemi, "Experimental investigation of using cross-linked polyethylene waste as aggregate in roller compacted concrete pavement," *Journal of Cleaner Production*, vol. 165, pp. 290-297, 2017/11/01/ 2017.
- M. N.-T. Lam, S. Jaritngam, and D.-H. Le, "Roller-compacted concrete pavement made of Electric Arc Furnace slag aggregate: Mix design and mechanical properties," *Construction and Building Materials*, vol. 154, pp. 482-495, 2017/11/15/ 2017.
- J. LaHucik, S. Dahal, J. Roesler, and A. N. Amirhanian, "Mechanical properties of roller-compacted concrete with macro-fibers," *Construction and Building Materials*, vol. 135, pp. 440-446, 2017/03/15/ 2017.
- A. Omran, D. Harbec, A. Tagnit-Hamou, and R. Gagne, "Production of roller-compacted concrete using glass powder: Field study," *Construction and Building Materials*, vol. 133, pp. 450-458, 2017/02/15/ 2017.
- S. A. Ghahari, A. Mohammadi, and A. A. Ramezani-pour, "Performance assessment of natural pozzolan roller compacted concrete pavements," *Case Studies in Construction Materials*, vol. 7, pp. 82-90, 2017/12/01/ 2017.
- M. Li, M. Zhang, Y. Hu, and J. Zhang, "Mechanical properties investigation of high-fluidity impermeable and anti-cracking concrete in high roller-compacted concrete dams," *Construction and Building Materials*, vol. 156, pp. 861-870, 2017/12/15/ 2017.
- C. Chhorn, S. J. Hong, and S.-W. Lee, "A study on performance of roller-compacted concrete for pavement," *Construction and Building Materials*, vol. 153, pp. 535-543, 2017/10/30/ 2017.
- N. K. Krishna, M. Prasanth, R. Gowtham, S. Karthic, and K. M. Mini, "Enhancement of properties of concrete using natural fibers," *Materials Today: Proceedings*, vol. 5, no. 11, Part 3, pp. 23816-23823, 2018/01/01/ 2018.
- C. Chhorn, S. J. Hong, and S. W. Lee, "Relationship between compressive and tensile strengths of roller-compacted concrete," *Journal of Traffic and Transportation Engineering (English Edition)*, vol. 5, no. 3, pp. 215-223, 2018/06/01/ 2018.
- C. Wang, W. Chen, H. Hao, S. Zhang, R. Song, and X. Wang, "Experimental investigations of dynamic compressive properties of roller compacted concrete (RCC)," *Construction and Building Materials*, vol. 168, pp. 671-682, 2018/04/20/ 2018.
- M. Hashemi, P. Shafigh, M. R. B. Karim, and C. D. Atis, "The effect of coarse to fine aggregate ratio on the fresh and hardened properties of roller-compacted concrete pavement," *Construction and Building Materials*, vol. 169, pp. 553-566, 2018/04/30/ 2018.

1.

1-8

27. B. S. Mohammed and M. Adamu, "Mechanical performance of roller compacted concrete pavement containing crumb rubber and nano silica," *Construction and Building Materials*, vol. 159, pp. 234-251, 2018/01/20/ 2018.
28. B. S. Mohammed, M. Adamu, and M. S. Liew, "Evaluating the effect of crumb rubber and nano silica on the properties of high volume fly ash roller compacted concrete pavement using non-destructive techniques," *Case Studies in Construction Materials*, vol. 8, pp. 380-391, 2018/06/01/ 2018.
29. M. Adamu, B. S. Mohammed, and M. Shahir Liew, "Mechanical properties and performance of high volume fly ash roller compacted concrete containing crumb rubber and nano silica," *Construction and Building Materials*, vol. 171, pp. 521-538, 2018/05/20/ 2018.
30. M. K. Velagala, G. Buddi, K. B. Chari, and I. S. J. T. Kishore, "TENSILE AND FLEXURAL BEHAVIOUR OF HIGH STRENGTH CONCRETE REINFORCED WITH NATURAL (VALVET MESQUITE) FIBERS," vol. 8, no. 4, pp. 1384-1393, 2017.
31. S. Suresh and M. S. J. T. Charan, "STRENGTH AND BEHAVIOUR OF CONCRETE BY USING NATURAL AND ARTIFICIAL FIBRE COMBIATIONS," vol. 8, no. 4, pp. 1652-1658, 2017.
32. S. Ikkurthi and K. Kiran, "An experimental study on partial replacement of cement with bagasse ash in concrete mix," *International Journal of Civil Engineering and Technology*, vol. 8, pp. 452-455, 01/01 2015.
33. M. V. Bhargav, B. S. C. J. I. J. o. C. E. Kumar, and Technology, "Strength and Durability Study of Geopolymer Concrete Incorporating Metakaolin and Ggbs with 10m Alkali Activator Solution," vol. 8, no. 1, 2017.
34. M. Achyutha Kumar Reddy and R. R. Vummaneni, "Utilization of Bentonite in Concrete: A Review," 06/05 2019.
35. H. Rooholamini, A. Hassani, and M. R. M. Aliha, "Evaluating the effect of macro-synthetic fibre on the mechanical properties of roller-compacted concrete pavement using response surface methodology," *Construction and Building Materials*, vol. 159, pp. 517-529, 2018/01/20/ 2018.
36. M. K. Hygrive, I. S. Kishore, and K. J. I. J. o. C. E. Chari, "COMPARATIVE STUDY STRENGTH OF," vol. 8, no. 4, 2017.
37. V. V. K. Bhargava, K. B. Chari, and V. R. J. M. T. P. Rao, "Experimental investigation of M40 grade concrete with supplementary cementitious materials and glass fiber," 2020.
38. L. Ajay and A. K. Mangalampalli, "Experimental Study on Mechanical Properties of Concrete strengthened with Alkali Resistant Glass Fibers," *Test Engineering and Management*, vol. 83, pp. 16295-16298, 09/16 2020.
39. V. C. Khed, B. S. Mohammed, M. Liew, N. A. W. A. J. C. Zawawi, and B. Materials, "Development of response surface models for self-compacting hybrid fibre reinforced rubberized cementitious composite," vol. 232, p. 117191, 2020.
40. S. A. M. Rad and A. Modarres, "Durability properties of non-air entrained roller compacted concrete pavement containing coal waste ash in presence of de-icing salts," *Cold Regions Science and Technology*, vol. 137, pp. 48-59, 2017/05/01/ 2017.
41. S. Naveena and J. D. C. Kumar, "Experimental investigation on fibre reinforced beam column joint by partial replacement of cement with GGBS," in *International Conference on Advances in Civil Engineering (ICACE-2019)*, 2019, vol. 21, p. 23.
42. A. Muralidhar and J. D. C. Kumar, "Strength and Durability Studies on Lightweight Fiber Reinforced Concrete by Incorporating with Palm Oil Shells," in *International Conference on Advances in Civil Engineering (ICACE-2019)*, 2019, vol. 21, p. 23.
43. M. N.-T. Lam, D.-H. Le, and S. Jaritngam, "Compressive strength and durability properties of roller-compacted concrete pavement containing electric arc furnace slag aggregate and fly ash," *Construction and Building Materials*, vol. 191, pp. 912-922, 2018/12/10/ 2018.
44. S. Saluja, K. Kaur, S. Goyal, and B. Bhattacharjee, "Assessing the effect of GGBS content and aggregate characteristics on drying shrinkage of roller compacted concrete," *Construction and Building Materials*, vol. 201, pp. 72-80, 2019/03/20/ 2019.
45. W. Zhang, S. Gong, and J. Zhang, "Effect of rubber particles and steel fibers on frost resistance of roller compacted concrete in potassium acetate solution," *Construction and Building Materials*, vol. 187, pp. 752-759, 2018/10/30/ 2018.

Authors:	Ch. Mallika Chowdary, I. Siva Kishore
Paper Title:	Comparative Study of the Natural Fiber and Artificial Fibre as an Admixture in M30 Grade Concrete

Abstract: The Sugarcane Bagasse which is produced in tones every year which can cause inconvenience to environment, we use this material as one of the admixtures in the concrete mix to reduce its effect on surroundings. As we add the material, we can economize the total expenditure on the construction. By using this we are able to improve the ordinary Portland cement through means of strength which can rise the durability of the structure. By using these materials in proportions, we produce various nominal conventional concrete mixes which are very economical and suitable for any environmental conditions. We want to use the sugarcane bagasse as the main source is an eco-friendly material, but only with this material we can't get good strength hence it imparts strength to the concrete we are using the combination of the sugar cane bagasse and the optical fiber as an admixture. Here the test results give good improvement. Hence low-cost materials with good strength is obtained.

Keywords: Artificial fibres, Bagasse ash, Compressive strength, Natural fibres, plastic optical fibre.

References:

1. G. O. Young, "Synthetic structure of industrial plastics (Book style with paper title and editor)," in *Plastics*, 2nd ed. vol. 3, J. Peters, Ed. New York: McGraw-Hill, 1964, pp. 15-64.
2. W.-K. Chen, *Linear Networks and Systems* (Book style). Belmont, CA: Wadsworth, 1993, pp. 123-135.
3. H. Poor, *An Introduction to Signal Detection and Estimation*. New York: Springer-Verlag, 1985, ch. 4.
4. B. Smith, "An approach to graphs of linear forms (Unpublished work style)," unpublished.
5. E. H. Miller, "A note on reflector arrays (Periodical style—Accepted for publication)," *IEEE Trans. Antennas Propagat.*, to be published.
6. J. Wang, "Fundamentals of erbium-doped fiber amplifiers arrays (Periodical style—Submitted for publication)," *IEEE J. Quantum Electron.*, submitted for publication.
7. C. J. Kaufman, Rocky Mountain Research Lab., Boulder, CO, private communication, May 1995.
8. Y. Yorozu, M. Hirano, K. Oka, and Y. Tagawa, "Electron spectroscopy studies on magneto-optical media and plastic substrate interfaces(Translation Journals style)," *IEEE Transl. J. Magn.Jpn.*, vol. 2, Aug. 1987, pp. 740-741 [Dig. 9th Annu. Conf. Magnetism Japan, 1982, p. 301].
9. M. Young, *The Technical Writers Handbook*. Mill Valley, CA: University Science, 1989.
10. (Basic Book/Monograph Online Sources) J. K. Author. (year, month, day). *Title* (edition) [Type of medium]. Volume(issue). Available: <http://www.URL>
11. J. Jones. (1991, May 10). *Networks* (2nd ed.) [Online]. Available: <http://www.atm.com>
12. (Journal Online Sources style) K. Author. (year, month). *Title. Journal* [Type of medium]. Volume(issue), paging if given. Available: <http://www.URL>