



(DEEMED TO BE UNIVERSITY)

# STRUCTURAL ENGINEERING CONSTRUCTION TECHNOLOGY MANAGEMENT RESEARCH CENTRE (SECTMRC)

DEPARTMENT OF CIVIL ENGINEERING

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## STRUCTURAL ENGINEERING AND CONSTRUCTION TECHNOLOGY MANAGEMENT RESEARCH CENTRE (SECTMRC)

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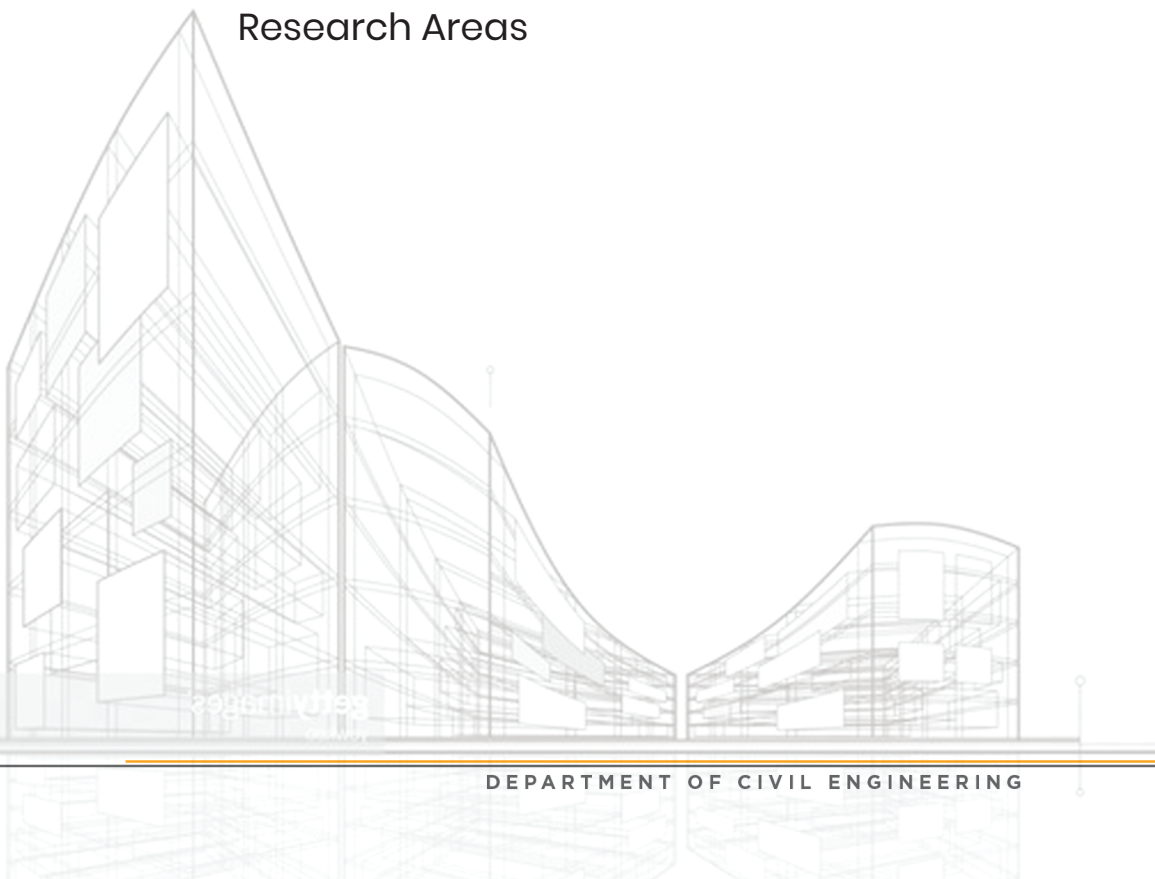
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Overview of SECTMRC

Established in 2012 with aim of developing  
Research Areas





## OVERVIEW OF SECTMRC

The Structural Engineering and Construction Technology Management Research Centre (SECTMRC) is a dedicated facility focused on advancing research and innovation in structural engineering and construction technology. The lab serves as a hub for developing sustainable construction practices, innovative building materials, and advanced structural systems. It integrates cutting-edge tools and methodologies to address challenges in design, construction management, and infrastructure resilience. By fostering collaboration among researchers, industry professionals, and students, SECTMRC aims to enhance construction efficiency, safety, and sustainability while contributing to the global body of knowledge in civil engineering.

### FACULTY ASSOCIATED WITH SECTMRC



Dr. P. Poluraju



Dr. Y. Himath Kumar



Dr. J. D. Chaitanya Kumar



Dr. Ashwin Raut.



Dr. N. Lingeswaran



Dr. A. VenkateswaraRao

## DETAILS OF EQUIPMENT AVAILABLE IN SERC

### 1. LOADING FRAME

#### DESCRIPTION:

Loading frames are used to test the load-bearing capacity and structural integrity of components like beams, columns, and slabs, ensuring they meet safety and design standards. They are crucial in R&D for developing structures, allowing researchers to study how materials behave under various loading conditions.

Users: All Students, Scholars, faculty and all departments can use it for research



### 2. DIGITAL COMPRESSION TESTING MACHINED 3000 KN

#### Description:

A Digital Compression Testing Machine with a capacity of 3000 kN is a high-capacity, precision instrument designed for testing the compressive strength of materials, particularly in construction and civil engineering. The machine is typically used to test concrete, cement, blocks, and other materials under compression.

#### Key Features:

1. High Capacity
2. Digital Control System
3. Hydraulic Operation
4. Sturdy Frame
5. Automatic Data Recording
6. Safety Features
7. Specimen Compatibility

Users: All Students, Scholars, faculty and all departments can use it for research



### 3. CORROSION TESTING MACHINE

#### DESCRIPTION:

A Corrosion Testing Machine is an essential tool in industries where materials are exposed to corrosive environments, providing critical insights into material performance, durability, and the effectiveness of protective measures. Utilized in R&D to develop new materials, coatings, and corrosion inhibitors that can withstand harsh environments, thereby enhancing product durability.

Users: All Students, Scholars, faculty and all departments can use it for research



### 4.. RCPT TESTING MACHINE

#### DESCRIPTION:

RCPT stands for Rapid Chloride Permeability Test. It's a method used to evaluate the resistance of concrete to the penetration of chloride ions, which can lead to corrosion of reinforcing steel and concrete deterioration. The machine essentially measures the electrical resistance of a concrete specimen when subjected to a specific electrical current. The higher the electrical resistance, the lower the chloride permeability of the concrete.

Users: All Students, Scholars, faculty and all departments can use it for research.



### 4. REBOUND HAMMER

#### DESCRIPTION:

A rebound hammer, also known as a Schmidt hammer or Swiss hammer, is a non-destructive testing tool used to estimate the compressive strength of concrete.

#### KEY FEATURES:

- Portability: Easily carried to the test site.
- Speed: Provides quick results compared to laboratory tests.
- Non-destructive: Does not damage the concrete structure.
- Cost-effective: Relatively inexpensive compared to other testing methods.

Users: All Students, Scholars, faculty and all departments can use it for research





## 5. UPV TESTER

### DESCRIPTION:

UPV stands for Ultrasonic Pulse Velocity. An UPV tester is a device used to measure the speed of sound through concrete. This measurement is then used to assess the concrete's quality, homogeneity, and potential defects.

#### Key Features:

- Non-destructive: Does not damage the concrete structure.
- Portable: Can be used on-site.
- Quick results: Provides rapid assessment of concrete quality.
- Versatile: Can be used for various concrete structures.

Users: All Students, Scholars, faculty and all departments can use it for research



## 6. CONCRETE PERMEABILITY TEST

### DESCRIPTION:

Concrete permeability is a measure of how easily water, or other fluids can pass through it. A high permeability can lead to issues like frost damage, corrosion of reinforcement, and reduced durability.

The primary goal of a concrete permeability test is to assess the resistance of concrete to water penetration.

This information is crucial for:

- Predicting the long-term durability of concrete structures.
- Selecting suitable concrete mixes for specific environments.
- Evaluating the effectiveness of waterproofing measures.

Users: All Students, Scholars, faculty and all departments can use it for research



### SPONSORED PROJECTS:

Project Title: Design And Development of Thermally Insulated Sustainable Building Material to Improve Energy Efficiency of Building Envelop

**NAME OF THE PI:** Dr. Ashwin Raut

**FUNDING AGENCY:** Koneru Lakshmaiah Education Foundation

**SANCTIONED AMOUNT:** Rs.2,20,000

**DURATION:** 12 Months on 27th January 2022

S. NO.	NAME OF THE SCHOLAR	UNIVERSITY ID. NO	NAME OF GUIDE	YEAR OF	
				REGIS-TRATION	AWARD
1.	Mr. B. Sarath Chandra Kumar	13302003	Dr. K. Ramesh	2013	2019
2.	Mr. Ch. Srinivasa Rao	13302013	Dr. A. Siva Sankar	2013	2019
3.	Mr. Sunil	13302012	Dr. A. Siva Sankar	2013	2019
4.	Mr. M. Achyutha K. Reddy	163020007	Dr. B.K. Rao Dr. V. Ranga. Rao	2016	2022
5.	Mr. Lingeshwaran N	163020024	Dr. P. Poluraju Dr. Veerendrakumar Khed	2016	2022
6.	Mr. Gangisetty Sri Harsha	163020019	Dr. P. Poluraju Dr. Veerendrakumar Khed	2016	2022
7.	Mr. Joshi Sreenivasa Prasad	173020004	Dr. P. Poluraju Dr. Umesh Kumar Singh	2017	2023
8.	Mr. Lanka Lakshmi Kanth	173020006	Dr. P. Poluraju	2017	2023
9.	Mr. Annabathina Sivakrishna	163020001	Dr. P. Poluraju	2016	2024
10.	Mr. Y. Himath Kumar		Dr.A. Venkateswara Rao	2016	2022

## CURRENT PH. D SCHOLARS FULL TIME

SL. NO	NAME OF THE SCHOLAR	UNIVERSITY ID. NO.	YEAR OF REGISTRATION
1	Vaddesawaram Sangeetha	2120020002	2022-23
2	Kaza Pranav Phani Sai	2120020003	2022
3	Rahul Reddy	2120020004	2022
4	Kashif Tanzil	2120020005	2022
5	Shaik Shandani Basha	2202020101	2022-23
6	Janga Supriya	2002020002	2021-22
8	Pesarlanka Vaishnavi	2002020004	2021-22
9	Pawar Praveen	2120020001	2021-22
10	Chilukuri Sravan Kumar	2002020001	2020-21

## CURRENT MTECH STUDENTS STRUCTURES

SL. NO	NAME OF THE SCHOLAR	UNIVERSITY ID. NO.	YEAR OF REGISTRATION
1	Pathri Sree Pavan	2201020001	2022 - 2024
2	Singamsetti Mohan Sai	2201020002	2022 - 2024
3	Potluri Anudeep	2201020003	2022 - 2024
4	Yadlapalli Akhila	2201020004	2022 - 2024
5	Gurram Likhitha	2201020005	2022 - 2024
6	Gudipati Chaitanya Avinash	2201020006	2022 - 2024
7	Kalapala Vijay babu	2201020007	2022 - 2024
8	Chebathina Vasavya	2201020009	2022 - 2024
9	Maddula Anjali	2201020010	2022 - 2024
10	Mayank kumar thakur	2201020012	2022 - 2024
11	Dharma raj upadhyaya	2201020013	2022 - 2024
12	Bagirisoko Edison	2201020014	2022 - 2024
13	Vudata Harsha Sai	2301020001	2023-2025
14	Paritala Krishna Vamsi	2301020002	2023-2025
15	Pendyala Mohan naga Sai Krishna	2301020003	2023-2025
16	Putti Durga prasad	2301020005	2023-2025



## CTM

SL. NO	NAME OF THE SCHOLAR	UNIVERSITY ID. NO.	YEAR OF REGISTRATION
1	Jasonn Twinamatsiko	2301030001	2023 - 2025
2	Samudrala Aditya Sri Vishnu	2301030002	2023 - 2025
3	Nadigatla Naveen Kumar	2301030003	2023 - 2025
4	Kola Veera Gani Durga Prasad	2301030004	2023 - 2025
5	Shaik Shandani Basha	2202020101	2022-23
6	Janga Supriya	2002020002	2021-22
7	Pesarlanka Vaishnavi	2002020004	2021-22
8	Pawar Praveen	2120020001	2021-22
9	Chilukuri Sravan Kumar	2002020001	2020-21

## LIST OF PUBLICATIONS

1. Raut, A. N., & Gomez, C. P. (2016). Thermal and mechanical performance of oil palm fiber reinforced mortar utilizing palm oil fly ash as a complementary binder. *Construction and Building Materials*, 126, 476-483. <https://doi.org/10.1016/j.conbuildmat.2016.09.03>
2. Raut, A. N., & Gomez, C. P. (2017). Development of thermally efficient fibre-based eco-friendly brick reusing locally available waste materials. *Construction and Building Materials*, 133, 275-284. <https://doi.org/10.1016/j.conbuildmat.2016.12.055>
3. Khan, K. A., Raut, A., Chandrudu, C. R., & Sashidhar, C. (2021). Design and development of sustainable geopolymers using industrial copper byproduct. *Journal of Cleaner Production*, 278, 123565. <https://doi.org/10.1016/j.jclepro.2020.123565>
4. Singh, R. J., Raut, A., Murmu, A. L., & Jameel, M. (2021). Influence of glass powder incorporated foamed geopolymers on thermal and energy analysis of building envelope. *Journal of Building Engineering*, 43, 102520. <https://doi.org/10.1016/j.jobe.2021.102520>
5. Raut, A. N., & Gomez, C. P. (2018). Assessment of thermal and energy performance of thermally efficient sustainable wall system for Malaysian low cost housing. *Applied Thermal Engineering*, 136, 309-318. <https://doi.org/10.1016/j.applthermaleng.2018.03.017>
6. Raut, A., Singh, R. J., Murmu, A., & Khan, K. A. (2022). Evaluation of thermal and energy consumption behavior of novel foamed copper slag based geopolymer masonry blocks. *Ceramics International*, 48(9), 12098-12111. <https://doi.org/10.1016/j.ceramint.2022.01.070>
7. Raut, A. N., & Gomez, C. P. (2017). Optimization of mix design of thermally efficient blocks using the process parameter approach. *Journal of Materials in Civil Engineering*, 29(3), 04016235. [https://doi.org/10.1061/\(ASCE\)MT.1943-5533.000178](https://doi.org/10.1061/(ASCE)MT.1943-5533.000178)
8. Raut, A. N., Murmu, A. L., & Alomayri, T. (2023). Physico-Mechanical and thermal behavior of prolonged heat cured geopolymer blocks. *Construction and Building Materials*, 370, 130309. <https://doi.org/10.1016/j.conbuildmat.2023.130309>
9. Raut, A., Singh, R. J., Gomez, C. P., & Jameel, M. (2023). Investigation of Thermal Efficiency

and Key Sustainability Features of Bricks Developed from Oil Palm and Glass Waste. *Journal of Materials in Civil Engineering*, 35(1), 04022368. [https://doi.org/10.1061/\(ASCE\)MT.1943-5533.000453](https://doi.org/10.1061/(ASCE)MT.1943-5533.000453)

10. Raut, A. N., Adamu, M., Khed, V. C., Murmu, A. L., & Ibrahim, Y. E. (2023). Effects of agro-industrial by-products as alumina-silicate source on the mechanical and thermal properties of fly ash based-alkali activated binder. *Case Studies in Construction Materials*, 18, e02070. <https://doi.org/10.1016/j.cscm.2023.e02070>
11. Chilukuri, S. K., Raut, A. N., Kumar, S., Singh, R. J., & Sakhare, V. (2023). Enhancing thermal performance and energy Efficiency: Optimal selection of steel slag crumb rubber blocks through Multi-Criteria decision Making. *Construction and Building Materials*, 409, 134094. <https://doi.org/10.1016/j.conbuildmat.2023.134094>
12. Alzein, Razan, M. Vinod Kumar, Ashwin Narendra Raut, Ahmad Alyaseen, Parveen Sihag, Daeho Lee, Raj Kumar, and Tej Singh. "Polypropylene waste plastic fiber morphology as an influencing factor on the performance and durability of concrete: Experimental investigation, soft-computing modeling, and economic analysis." *Construction and Building Materials* 438 (2024): 137244
13. Janga, S., Raut, A. N., Adamu, M., & Ibrahim, Y. E. (2024). Thermo-mechanical performance assessment of geopolymer synthesized with steel slag and glass powder at elevated temperatures. *Powder Technology*, 444, 120047.
14. Dara, H. M., Raut, A., Adamu, M., Ibrahim, Y. E., & Ingle, P. V. (2024). Reducing non-value added (NVA) activities through lean tools for the precast industry. *Heliyon*, 10(7).
15. Potluri Anudeep, M. Achyutha Kumar Reddy, Veerendrakumar C. Khed, Musa Adamu, Mada Varalakshmi, Yasser E. Ibrahim, Omar Shabbir Ahmed. Effect of superplasticizer in geopolymer and alkali-activated cement mortar/concrete: A review. *Reviews on Advanced Materials Science*. Vol. 63 (1), 1-19, 2024.
16. Peteti, Jhansi; A. Venkateswara Rao, and M. Achyutha Kumar Reddy. Experimental study on strength properties of self-curing concrete with fly ash and GGBS. *Materials Today: Proceedings*, V7ol 65, 3646-3650, 2022
17. B. Kameswara Rao, M. Achyutha Kumar Reddy, and A. Venkateswara Rao. Effect of flyash as cement replacement material and pore filling material in concrete. *Materials Today: Proceedings*, Vol 52, 1775-1780, 2022
18. M. Achyutha Kumar Reddy, V. Ranga Rao, Veerendrakumar C Khed and Kavuri Naga Chaitanya. Optimization of Bentocrete parameters using Response Surface Methodology (RSM), *AIMS Material Science*, vol. 8, No. 2, 241-246, 2021.
19. M Prathyusha, SP Challagulla, M Achyutha Kumar Reddy. An experimental investigation of thermal characteristics of graphene oxide and multi-walled carbon nanotechnology in cementitious composites. *Journal of Building Pathology and Rehabilitation*. Vol.8 (2), 78-89, 2023.
20. Veerendrakumar Khed, Vyshnavi Pesaralanka, Musa Adamu \*, Yasser E. Ibrahim, Marc Azab, M Achyutha Kumar Reddy, Ahmad Hakamy, Ahmed Farouk Deifalla. Optimization of Graphene Oxide Incorporated in Fly Ash Based Self Compacting Concrete. *Buildings*, vol 12(2002), 1-18, 2022.
21. M. Achyutha Kumar Reddy, V. Ranga Rao, Veerendrakumar C Khed and Kavuri Naga Chaitanya. Optimization of Reinforced Bentocrete Column Parameters

Under Eccentric Compression. Structures, vol. 41, 1027–1060, 2022.

22. Sri Harsha, G., Poluraju, P., Hemanth Kumar, T. and Subbarao, G. “Finite element simulation on the effect of steel bars in concrete beams with & without web openings,” Materials Today: Proceedings–Elsevier, February 2023. (Impact Factor – 2.59) <https://doi.org/10.1016/j.matpr.2023.02.322> – (Q2)
23. Joshi Sreenivasa Prasad and Poluraju, P., “Experimental investigation on M50 grade concrete beams with influence of aggregate interlocking and dowel action under flexural loading,” Materials Today: Proceedings–Elsevier, Vol. 33, pp. 1158–1164, October 2020. (Impact Factor – 2.59) – (Q2)
24. Lingeswaran, N. and Poluraju, P., “Analytical Study on Seismic Performance of Bed Joint Reinforced Solid Brick Masonry Walls,” Materials Today: Proceedings–Elsevier, Vol. 33, pp. 136–141, August 2020. (Impact Factor – 2.59) – (Q2)
25. Lingeswaran, N. and Poluraju, P., “Experimental Study on Seismic Performance of Bed Joint Reinforced Solid Brick Masonry Walls,” Journal of Critical Reviews, Vol. 21, No. 03, pp. 2282–2287, May 2020. (Impact Factor – 1.091)
26. Vennam Swathi, Asadi, S.S. and Poluraju, P., “An Integrated Methodology for Structural Performance of High-Volume Fly Ash Concrete Beams using Hybrid Fibers,” Materials Today: Proceedings– Elsevier, Vol. 27, No. 02, pp. 1630–1635, March 2020. – (Impact Factor – 2.59) – (Q2)
27. Muppalla Venkata Sai Surya Pratap Chowdary, Asadi, S.S. and Poluraju, P., “Design and Development of High Performance Based Engineered Cementitious Composite Eco-friendly Beams Preparation: An Integrated Approach,” Materials Today: Proceedings– Elsevier, Vol. 27, pp. 1299–1303, February 2020. (Impact Factor – 2.59) – (Q2)
28. Muppalla Venkata Sai Surya Pratap Chowdary, Asadi, S.S. and Poluraju, P., “Impact of materials on characteristics of Engineered Cementitious Composite at Elevated Temperatures,” Materials Today: Proceedings–Elsevier, Vol. 27, pp. 1389–1393, February 2020. (Impact Factor – 2.59) – (Q2)
29. Appa Rao, G. and Poluraju, P., “Influence of longitudinal rebars and boundary elements on the performance of 3D sandwich walls in direct compression,” Journal of Structural Engineering (JOSE) SERC, Vol. 44, No. 1, pp. 1–13, April–May 2017. (Impact Factor – 0.11) – (Q4)
30. Sarath Chandra Kumar, B1., and Ramesh, K2. and Poluraju, P., “An Experimental Investigation on Flexural Behavior of GGBS And Metakaolin Based Geopolymer Concrete,” ARPN Journal of Engineering and Applied Sciences, Vol. 12, No. 7, pp. 2052–2062, April 2017. (Impact Factor – 0.52) – (Q3)
31. Rao, A. V., & Rao, K. S. (2019). Effect of fly ash on strength of concrete. In Springer eBooks (pp. 125–134). [https://doi.org/10.1007/978-981-15-0014-5\\_9](https://doi.org/10.1007/978-981-15-0014-5_9)
32. Yasaswini, K., & Rao, A. V. (2020). Behaviour of geopolymer concrete at elevated temperature. Materials Today Proceedings, 33, 239–244. <https://doi.org/10.1016/j.matpr.2020.03.833>
33. Kavya, A., & Rao, A. V. (2020). Experimental investigation on mechanical properties of concrete with M-sand. Materials Today Proceedings, 33, 663–667. <https://doi.org/10.1016/j.matpr.2020.05.774>



34. Tejaswini, G. L. S., & Rao, A. V. (2020). A detailed report on various behavioral aspects of self-compacting concrete. *Materials Today Proceedings*, 33, 839–844. <https://doi.org/10.1016/j.matpr.2020.06.273>
35. Rao, A. V., & Rao, K. S. (2019b). Effect of fly ash on strength of concrete. In Springer eBooks (pp. 125–134). [https://doi.org/10.1007/978-981-15-0014-5\\_9](https://doi.org/10.1007/978-981-15-0014-5_9)
36. Rao, B. K., Reddy, M. a. K., & Rao, A. V. (2022). Effect of flyash as cement replacement material and pore filling material in concrete. *Materials Today Proceedings*, 52, 1775–1780. <https://doi.org/10.1016/j.matpr.2021.11.444>
37. Kishore, I. S., Chowdary, C. M., & Rao, V. R. (2020). Effect of Debonding on Stiffness and Long-term Creep of Sandwich panels IOP: Conference Series. IOP Conference Series Materials Science and Engineering, 993(1), 012169. <https://doi.org/10.1088/1757-899x/993/1/012169>
38. Kumar, S. P., Rao, B. K., & Jawahar, J. G. (2018). Experimental investigation on fly Ash and GGBS based geopolymer concrete incorporate black marble waste aggregate. *International Journal of Engineering & Technology*, 7(3.12), 1233. <https://doi.org/10.14419/ijet.v7i3.12.17844>
39. Kalyan, C. P., Kumar, D. A., Raju, K. S., Kumar, B. S. C., Reddy, C. R. K., Kumar, Y. H., & Kumar, J. D. C. (2021). Application of RSM in the optimization of GGBS and metakaoline based geopolymer concrete. In *Lecture notes in civil engineering* (pp. 365–373). [https://doi.org/10.1007/978-981-16-6557-8\\_29](https://doi.org/10.1007/978-981-16-6557-8_29)
40. Sailaja, N., Naveen, M., Basha, S. K. A., Kumar, B. S. C., Reddy, C. R. K., Kumar, Y. H., & Kumar, J. D. C. (2021). Chloride Ion Penetration of GGBS-Based Geopolymer Concrete with Different Molarities of NaOH. In *Lecture notes in civil engineering* (pp. 355–364). [https://doi.org/10.1007/978-981-16-6557-8\\_28](https://doi.org/10.1007/978-981-16-6557-8_28)
41. Jagarapu, D. C. K., & Eluru, A. (2020). Strength and durability studies of lightweight fiber reinforced concrete with agriculture waste. *Materials Today Proceedings*, 27, 914–919. <https://doi.org/10.1016/j.matpr.2020.01.257>
42. Jagarapu, D. C. K., & Eluru, A. (2020). Strength and durability studies of lightweight fiber reinforced concrete with agriculture waste. *Materials Today Proceedings*, 27, 914–919. <https://doi.org/10.1016/j.matpr.2020.01.257>

#### **PATENTS GRANTED:2**

1. RAUT Aswin, JANGA Supriya “A rubberized steel slag based Thermally Insulated Geopolymer” Government of India, Patent No. 477549, Application No. 202341002650, Dt.12th January 2023.
2. Khan Asudullah Khan, RAUT Aswin Narendra, “A composition for preparing foamed copper slag based Geopolymer blocks and method of preparation there of” Government of India, Patent No. 509883, Application No. 202141017146, Dt.12th January 2023.

#### **PATENTS PUBLISHED:09**

1. Chennam Vishal, K.L.E.F, Raut Aswin,” Design and development of hollow interlocking Geopolymer blocks using waste glass”, Application No. 202341061836 Dt. 14/09/2023, Published Dt.06/10/2023.

2. Dara Haritha Malik, Chennam Vishal, K.L.E.F, Raut Aswin, “Design and development of precast in fil Geopolymer wall panel using glass powder”. Application No. 202341062067Dt. 14/09/2023, Published Dt.06/10/2023.
3. K.L.E.F, Raut Aswin, Chilukuri Sravan, Kumar Sanjjit, “A method and composition for preparing thermally insulated building blocks”. Application No. 202341078575, Dt. 14/09/2023, Published, Dt.21/06/2024.
4. Raut Aswin N, CHarpe Anuja, “ A composition for preparing thermally foamed glass powder geopolymer blocks and method of preparation there of””. Application No. 202141026639 Dt. 15/06/2021, Published, Dt.16/07/2021.
5. Suseela, A., Asadi, S.S. and Poluraju, P., “Utilization of Snail Shells for Enhancement of Mechanical Properties of Cement Through Reduction of Impacts on Environment”, OFFICIAL JOURNAL OF THE PATENT OFFICE, The Patent Office Journal No. 07/2021 Dated 12/02/2021, pp. 6817, Application No.202141004905 A, Publication Date : 12/02/2021.
6. Prasad, Joshi Sreenivasa, Poluraju, Palleboina “Evaluation on Dowel Force of Flexural Reinforcement with Shear Reinforcement”, In accordance with section 44(1) of the Patents Act, No. 57 of 1978, Patent Office No. 2022/01776 Dated 25/05/2022, Application No.2022/01776, Publication Date: 25/05/2022.
7. Lakshmikanth, L., Poluraju, P., and Sumit Kumar Behera “A novel method to prepare reinforced concrete voided slabs with replacement of concrete present in the tension zone”, OFFICIAL JOURNAL OF THE PATENT OFFICE, The Patent Office Journal No. 24/2022 Dated 17/06/2022, pp. 37164, Application No.202241030735 A, Publication Date: 17/06/2022.
8. Sangeetha, V., Poluraju, P., “Artificial Neural Network Based Optimization of Concrete Mix Design”, OFFICIAL JOURNAL OF THE PATENT OFFICE, The Patent Office Journal No. 24/2022 Dated 13/12/2024, pp. 1240, Application No.202441030865 A, Publication Date : 13/12/2024.
9. Talasila Bhavani, Dr.A.V.Rao, “Design and Analysis of Lightweight Alkali -Activated slag and fly ash Geopolymer mortars using ANFIS-SSO” Office of the Controller General of Patents, Designs &Trade Marks, Department for Promotion of Industry and International Trade Ministry of Commerce & Industry, Government of India. Application No.202441097218 Dt. 17/04/2024, Publication Date : 13/12/2024.



## CATEGORY 1 UNIVERSITY

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