Vel Tech
Rangarajan Dr. Sagunthala
R&D Institute of Science and Technology

CIVIL BUZZ

Accreditation & Rankings

- Ranked 86th in Engineering Category by NIRF in the year 2024.
- Accredited by NAAC with Highest grade A++.
- Accredited by NBA under Tier 1 category since 2018.
- Recognized as Category – I Deemed to be University by UGC.
- University of the Year 2023 by Higher Education Review.
- Ranked in the Band 651-700 in QS Asia University Rankings 2023.

Specific Achievements

- 90% of faculty members are with doctoral qualification from eminent Institutions like IISc, State University.
- Faculty members have published 5 papers in per reviewed International Journals (WoS - 1 & Scopus - 4) and attended 11 events.
- Presented 15 papers in International Conferences and Published 2 Book Chapters.
- Indian IPR – Patent Published: 8
- Consultancy works was conducted for a worth of Rs. 2,47,800.

Department Vision

To impart knowledge and excellence in Civil Engineering with global perspectives to the student community and to make them ethically strong engineers to build the nation.

Department Mission

- To produce Civil Engineers of high calibre with advanced technical skills and ethical values to serve the society and the nation.
- To make the Department as a centre of excellence in the field of Civil Engineering and allied research activities.
- To provide knowledge base and consultancy services to the community in all areas of Civil Engineering.
- To promote innovative ideas with original thinking in the minds of budding Engineers to face the future challenges.

CIVIL – News Letter (January to April 2025), Issue 4, April 2025

CESA

Newsletter – Published by
Department of Civil Engineering,
School of Mechanical & Construction

Inside

ABOUT THE DEPARTMENT

The Department of Civil Engineering was started in the year 2009 and it offers B.Tech. Programme, M.Tech Programme (Structural Engineering and Environmental Engineering), and Ph.D Programme. The Department has 20 faculty members (most of them with Ph.D. qualifications). The department has been accredited by NBA (Tier I). Most of the faculty members are fellow and member of professional bodies in various fields of Civil Engineering covering the areas of concrete, soil mechanics, water resources and remote sensing. Faculty members continuously update their knowledge by attending training programmes at IISc and other premier Institutions. Active participation of the faculty members in research, consultancy services & sponsored research activities help them to interact with industries and demonstrate the application of concepts in field and improve the teaching learning activities of the department.

HOD'S MESSAGE

Dr. A. Geetha Selvarani
Professor & Head – Civil Engineering

Greetings! It is an immense gratification in producing this newsletter-Civil prominence in all the academic related activities and events organized by the Civil Engineering department. I thank the faculty members and students for their incessant support and encouragement throughout the year in all the ways as usual, which is the prime tractive force of the Department. This news letter covers the substantial number of Guest Lectures delivered by national and international Professors and hands on training by industry experts which are more helpful in sharing ideas pertaining to recent trends and knowledge for the benefit of students and faculty members. Further Faculty members input in effective teaching learning, Implementation of active Learning Methods, their research activities, article publication in reputed Journals, patent filing have been reported.

Presentation based Learning
was implemented in the course "Wastewater Treatment and Recycling" handled by
Dr. K. Tamilarasan

Peer Teaching Method
was implemented in the course "Irrigation Engineering" handled by
Dr. S. Baskar

Field Practice Learning
was implemented in the course "Transportation Engineering" handled by
Dr. J. Logeshwari

Events Organized for Students

The Four Days Industry/Higher Institute Learning Course on "Slope Stability Modelling and Applications of Geosynthetics" was conducted during 07.04.2025 to 10.04.2025 to the second and Third-year undergraduate students to practice the Modelling used for slope stability in various type of soil structures. The training was provided by

Prof. Dr. Fauziah Ahmed

Universiti Sains Malaysia, Engineering Campus, Malaysia.

The One Day Industry Interaction on "Advances in Construction Techniques" was conducted on 12.03.2025 to the second and third year undergraduate students to gain knowledge in latest industry demanding software courses. The lecture was provided by

Mr. T.V. Ganesh

Director & National Head

Shriram Properties.

The Specialized Programme Elective Course Report on "Building Information Modeling" was conducted during 17.02.2025 to 24.02.2025 to the second and Third-year undergraduate students to study the concept and software and to make them employable according to industrial demand. The training was provided by

Mr. Rajesh Kumar

Director Technical Sales, Tech Apps Consulting Services Chennai.

Mr. Akbar Ali Khader

CEO & Managing Director – KHAAS Group, Chennai.

The One Day Workshop on "Plumbing As-Built Diagram & WPD Celebration" was conducted on 11.03.2025 to the second and final year undergraduate students for their career opportunities. The training was provided by

Dr. S. Virapan
Chairman, Chennai Chapter
Indian Plumbing Association, Chennai.

The following final year undergraduate students were undergone "Internship" to the reputed industries for their "Major Project" work.

S. No.	Name of the Student	Company Details
1.	V Ramalingam	City Constructie (P) Ltd, Andaman
2.	Sanjay Kumar Shrestha	Ishworpur Municipality, Nepal
3.	Samraj Alam Mansuri	Jeetpur Simra Sub metropolitan city, Nepal
4.	Sruthi.bhukya	Mangalam Consultancy Service, Hyderabad
5.	Aganth k.Ravi	Mesco Builders Pvt Ltd, Kerala
6.	Shruti Lal	Andaman Public Works Department, Andaman
7.	Daneil Sharma	Engineers India Ltd, Haryana

Events - More than or equal to 5 days

S. No.	Name of the Faculty	Event Details
1.	Dr. M. Vinod Kumar	FDP on AI Application and Recent Trends in Civil Engineering organized by R.V.R. & J.P. College of Engineering, Tenkasi, from 5th – 9th February 2025.
2.	Dr. J. Logeshwari	FDP on AI & ML for smart and sustainable solutions in Civil Engineering organized by Sasi Institute of Technology and Engineering Tadepalligudem, Andhra Pradesh, from 18th – 22nd March 2025.
3.	Dr. J. Shanmugapriya	FDP on Recent Advances in Renewable Energy for Sustainable Development, organised by Amet University, Chennai from 20th – 24th January 2025
4.	Dr. S. Gopi Kumar	FDP on Sustainable Technologies for Water Treatment and Environmental Protection by KPR Institute of Engineering and Technology, Coimbatore from 24th – 29th March 2025

Events - Less than 5 days

S. No.	Name of the Faculty	Event Details
1.	Dr. J. Logeshwari	FDP on Inculcating Universal Human Values in Technical Education organized by Vel Tech Rangarajan Dr. Sagunthala R and D Institute of Science and Technology, Chennai, from 20th – 22nd February 2025.
2.	Dr. J. Shanmugapriya	
3.	Dr. S. Gopi Kumar	
5.	Dr. S. Baskar	
6.	Dr. M. Vinod Kumar	
6.	Dr. S. Baskar	Seminar on World Climate and Its Impact organized by Tagore Engineering College, Chennai on 18th March 2025.

S.No.	Name of the Faculty & Period	Project Title	Organization	Amount (Rs.)
1.	Dr. M. Vinod Kumar Dr. G. Kumar Dr. S. Baskar JANUARY 2025	COMPREHENSIVE THIRD-PARTY SITE INSPECTION	EMPIRE ESTATES, CHENNAI	11,800
2.	Dr. M. Vinod Kumar Dr. G. Kumar Dr. S. Baskar FEBRUARY 2025	COMPREHENSIVE THIRD-PARTY SITE INSPECTION	KALYANI CITY, CHENNAI	82,600
3.	Dr. M. Vinod Kumar Dr. G. Kumar Dr. S. Baskar FEBRUARY 2025	INSPECTION OF THIRD-PARTY QUALITY CHECKING	ERODE MUNICIPAL CORPORATION	59,000
4.	Dr. M. Vinod Kumar Dr. G. Kumar Dr. S. Baskar Dr. A. Chithambar Ganesh FEBRUARY 2025	COMPREHENSIVE THIRD-PARTY DESIGN AUDIT (PROOF CHECKING) FOR DESIGN OF HOSPITAL BUILDING	THIRUTHANI MUNICIPAL CORPORATION 2	76,700
5.	Dr. M. Vinod Kumar Dr. G. Kumar Dr. S. Baskar MARCH 2025	COMPREHENSIVE THIRD-PARTY SITE INSPECTION	ONE WORLD LAND HOLDINGS, CHENNAI	17,700

S.No.	Name of the Faculty	Nature of Interaction	Organization	Date
1.	**Dr. S. Kandasamy**	**Guest Lecture** "A Novel approach towards enhancing the service life of RCC structures"	NPR College of Engineering & Technology, Dindigul	28.02.2025
2.	**Dr. M. Vinod Kumar**	**Scientific Committee Member** "International Conference on Construction Engineering"	Universite De Lorraine, France	24.02.2025
3.		**Keynote Speaker in FDP** "Innovative Composite Slabs for Sustainable Urban Development in Smart City"	Vels Institute of Science, Technology and Advanced Studies, Chennai	22.01.2025
4.		**Technical Reviewer** "International Conference on Sustainable Goals in Materials, Energy, and Environment"	Mangalam College of Engineering, Kottayam	03.04.2025

Web of Science
Journal Indexing

The following articles are indexed in "Web of Science"

1. Sridhar, M., Kumar, M. V., Nagaprasad, N., Bhagat, S. K., & Ramaswamy, K. (2025). Microstructural and statistical analysis on mechanical performance of novel flattened end nylon fibre reinforced concrete. Scientific Reports, 15(1), 8483.

Indexed by Scopus

ELSEVIER

The following articles are indexed in "Scopus"

1. Regupathi, R., Srividhya, S., Prakash, R., & Kumar, M. V. (2025). Assessment of influence of granite waste powder on fresh, mechanical and durability characteristics of fibre reinforced self-compacting concrete. Structural Engineering and Mechanics, 93(5), 399.
2. Vathani, T. A., & Logeshwari, J. (2025). Life Cycle Assessment of Perishable Wastes from Koyambedu Market. Journal of Advanced Research in Applied Sciences and Engineering Technology, 43, 258-270.
3. Baskar, S., Sidhaarth, K. A., Mangaleshwaran, L., Lakkaboyana, S. K., Trilaksana, H., Kalla, R. M. N., ... & Praveenkumar, S. (2025). Elimination of nickel ions in a packed column using clamshell waste as an adsorbent. Scientific Reports, 15(1), 32.
4. Udhaya, K. T., & Jayadurgalakshmi, M. (2025, March). Development of Light Weight Green Efficient Interlocking Blocks Using Waste Plastics and Industrial Wastes for Low Cost Housing Construction. In Materials Science Forum (Vol. 1144, pp. 71-76). Trans Tech Publications Ltd.

Details of Conference	Presentation Title	Faculty Name
International Conference On Civil Engineering Innovative Development In Engineering Advances SRM Institute of Science and Technology, Chennai 20-22 March 2025.	Environment protection need: sustainable approach for soil conservation and use of beneficial microbes for managing plant soil interaction	Dr. A. Geetha Selvarani
International Conference On Sustainable Goals in Materials, Energy and Environment Mangalam College of Engineering, Kottayam 4-5 April 2025.	Recharge Response Mapping of Urban Aquifer	
International Conference On Civil Engineering Innovative Development In Engineering Advances SRM Institute of Science and Technology, Chennai 20-22 March 2025.	A Study on the Flow & Strength Gain Characteristics of Fly Ash Fortified Internally Cured Self-Compacting	Dr. J. Shanmugapriya
International Conference on Advances in Materials, Modeling and Sustainable and resilient Infrastructure Amrita Vishwa Vidyapeetham, Coimbatore Tiruchirappalli. 9-11 January, 2025.	A Comparative Analysis of Hemp, Kenaf, and SisalFibers as Internal Curing Agents in Concrete: A Performance Evaluation	

Details of Conference	Presentation Title	Faculty Name
International conference on Science & Innovative Engineering Prince Shri Venkateshwara Padmavathy Engineering College, Chennai. 26-27 April, 2025.	Performance of Sustainable Concrete Utilization in Sandwich Slabs	
International conference on Civil Engineering Trends and Challenges for Sustainability NMAM Institute of Technology, Karnataka 6-7 February, 2025.	Micro and Mechanical Characteristics of Concrete Incorporating with Calcined Kaolin and used Foundry Sand Structural Behavior of RC Flat Slabs with Various Structural Systems under Seismic Loading	
International Conference on Sustainable Development in Engineering and Technology University of Technology and Applied Sciences Oman 30 April – 1 May, 2025	Performance of Sustainable Concrete Utilization in Sandwich Slabs Strength and durability of eco-friendly interlocking blocks using cotton cloth grinding waste A Review on Internal Curing of Concrete Using Superabsorbent Polymers Sustainable approaches to Composite Sandwich Construction: A state-of-the-art review Mechanical Performance of Concrete Reinforced with Cotton and Nylon Fibres Considering Fibre Anchorage and Geometry	Dr. M. Vinod Kumar

Conference Presentation

Details of Conference	Presentation Title	Faculty Name
International conference on Civil Engineering Innovative Development in Engineering Advances SRM Institute of Science and Technology, Chennai. 20-22 March, 2025.	Experimental Investigation of the Mechanical Properties of Hybrid Fibre- Reinforced Concrete Mechanical Properties of High Strength Concrete using Mineral Admixtures Impact of GGBS on Mechanical Properties of Fly ash based Geopolymer Concrete Containing with Recycled Coarse Aggregate,	Dr. S. Kandasamy

Book Chapters

1. **Dr. A. Chithambar Ganesh** (2025). Behavior of Bacterial Strain over Cementless Geopolymer Concrete for Sustainable Development, Handbook of Innovative Adhesive Technology, Jenny Stanford Publishing., ISBN: 978-10-035989-2-3.

2. **Dr. A. Chithambar Ganesh** (2025). Geopolymer Bricks Using Industrial Wastes to Reduce CO2 Footprint, Handbook of Innovative Adhesive Technology, Jenny Stanford Publishing., ISBN: 978-10-035989-2-3

S.No.	Inventors Name in Vel Tech	Name of the Invention	Application No. & Date	Granted / Published
1.	Dr. M. VINOD KUMAR Faculty Mr. T. UDHAYA KUMAR Research Scholar	Manufacturing of Ecofriendly Interlocking Blocks using cotton cloth grinding waste as fine aggregate	202441103936 & 03/01/2025	Published
2.	Mr. T. UDHAYA KUMAR Faculty	Sustainability assessment in Utilization of agricultural wastes and Construction demolition waste in paver blocks	202441104104 & 10/01/2025	Published
3.	DR. J. ANITA JESSIE DR. K.K. GAAYATHRI Faculty	Effect of Elevated Temperatures on Compressive Strength of Cement Mortar Blended with Coconut Fibre Waste and Carbon Nanotubes	202441104099 & 10/01/2025	Published
4.	Mr. T. UDHAYA KUMAR Faculty	Development of Artificial Fine Aggregate Using Coal Washery Rejects by Geopolymer Technology	202441104100 & 10/01/2025	Published
5.	Dr. M. VINOD KUMAR Faculty MR. M. SRIDHAR Research Scholar	Advanced Multi-layer Concrete Panels with Innovative Fibre-Enhanced Eco-Concrete Technology	202441105165 & 10/01/2025	Published
6.	Mr. T. UDHAYA KUMAR Faculty	Manufacturing of Geopolymer Aggregate Using Graphene Oxide as a Sustainable Alternative to Natural Aggregate	202541007421 & 07/02/2025	Published
7.	Dr. M. VINOD KUMAR Faculty Mr. T. UDHAYA KUMAR Research Scholar	Affordable Prefabricated Wall Panels Using Coal Washery Rejects Artificial Fine Aggregate	202541018439 & 14/03/2025	Published
8.	MR. T. UDHAYA KUMAR DR. S. KANDASAMY Faculty	Development of Paver Blocks with Electronic Plastic Waste And Polyethylene Fibre	202541032342 & 11/04/2025	Published

Funded Projects

The following two faculty members were submitted their research proposals to various funding agencies for the AY 2024-2025 during September-December 2024.

Name of the Faculty	Project Title	Funding Agency	Amount (Rs.)
Dr. K.K. Gaayathri (PI)	Development of Eco-Efficient Sustainable Flexible High-Strength Concrete by Enhancing Cyclic Performance and Reducing Carbon Footprint	Department of Science and Technology	32,89,200
Dr. J. Shanmugapriya (PI)	Development of Advanced Internal Curing Mechanism using Pretreated Natural Fibres for Ternary Blended Concrete Systems	Department of Science and Technology	36,47,800

Dr. M. Vinod Kumar and Dr. T. Udhaya Kumar submitted the proposal for conducting event to the following agency, AICTE-Vibrant Advocacy for Advancement and Nurturing of Indian Languages for the event titled "Two Day National Seminar On Next-Gen Urbanism: IoT and Sustainable Infrastructure in Smart Cities".

13 Faculty Members were received Rewards (Cash Incentive) for Publications / Funded Projects / Consultancy / Patents in the CY 2024 on 19.02.2025.

S. No.	Faculty Name	Designation	Indian Rupees
1.	Dr. KANDASAMY. S	Professor	₹ 30,000
2.	Dr. S. SELVAKUMAR	Associate Professor	₹ 5,000
3.	Dr. SAMSON. S	Professor	₹ 15,000
4.	Dr. G. KUMAR	Professor	₹ 35,000
5.	Dr. LOGESHWARI. J	Associate Professor	₹ 10,000
6.	Dr. VINODKUMAR. M	Professor	₹ 70,000
7.	Dr. TAMILARASAN. K	Associate Professor	₹ 60,000
8.	Dr. A. CHITHAMBAR GANESH	Associate Professor	₹ 2,500
9.	Dr. GOPIKUMAR. S	Assistant Professor	₹ 35,000
10.	Dr. CICI JENNIFER RAJ. J	Associate Professor	₹ 30,000
11.	Mr. NELSON PONNU DURAI. T	Assistant Professor	₹ 5,000
12.	Dr. BASKAR S	Assistant Professor	₹ 5,000
13.	Dr. T. UDHAYA KUMAR	Assistant Professor	₹ 5,000

Dr. M. Vinod Kumar awarded as recognition reviewer in Discover Civil Engineering Journal in Springer Nature.

The following SIX Faculty Members were received Research Development Fund (RDF) Seed Reward for the Research contribution in the CY 2024.

Name of the Faculty	Designation	Reward (Rs)
Dr. S. Samson	Professor	50000
Dr. M. Vinod Kumar	Professor	75000
Dr. S. Kandasamy	Professor	75000
Dr. G. Kumar	Professor	75000
Dr. K. Tamilarasan	Associate Professor	75000
Mr. T. Nelson Ponnu Durai	Assistant Professor	50000

The following FACULTY MEMBERS completed the NPTEL course during Jan - Apr 2025:


Elite

NPTEL ONLINE CERTIFICATION

Skill India

This certificate is awarded to

SHANMUGAPRIYA J

for successfully completing the course

Effective Writing

with a consolidated score of 84 %

Online Assignments	Proctored Exam
22.50/25	61.5/75

Total number of candidates certified in this course: 3877

Jan-Mar 2025

8 week course

swayam


Elite

NPTEL ONLINE CERTIFICATION

Skill India

This certificate is awarded to

TAMILARASAN KARUPPIAH

for successfully completing the course

Industrial Wastewater Treatment

with a consolidated score of 84 %

Online Assignments	Proctored Exam
22.5/25	61.5/75

Total number of candidates certified in this course: 304

Jan-Apr 2025

12 week course

swayam


Elite

NPTEL ONLINE CERTIFICATION

Skill India

This certificate is awarded to

DR J LOGESHWARI

for successfully completing the course

Environmental Impact Assessment

with a consolidated score of 72 %

Online Assignments	Proctored Exam
24.00/25	48/75

Total number of candidates certified in this course: 1268

Jan-Apr 2025

12 week course

swayam

Placements

S.No.	Name of the Student	Name of the Company	Salary
1.	V RAMALINGAM	City Constructie (P) Ltd, Andaman	2.4 Lakh Per Annum
2.	GUTHIREDDY JAYANTH REDDY	Trispace Design Private Limited, Chennai	1.2 Lakh Per Annum
3.	YERRAMSETTY JETENDRA	Milekal Engineering Pvt., Ltd., Hyderabad	4.8 Lakh per Annum
4.	POREDDY SURESH REDDY	Megha Infrastructure Engineering	3.0 Lakh per Annum
5.	ABHISHEK KUMAR	Megha Infrastructure Engineering	3.0 Lakh per Annum
6.	ALAMURI AJAY BABU	NCC Limited, Hyderabad	3.19 Lakh per Annum
7.	BAGDE AMAN ASHOK	Shriram Properties, Bangalore	2.4 Lakh per Annum
8.	DEVISARASWATHI KUNDETI	Shriram Properties, Bangalore	2.4 Lakh per Annum
9.	TEKI SRINIVAS	Pollucare Engineers India Private Limited, Chennai	3.0 Lakh per Annum

Journal Publications

1. Sriram, M., (Research Scholar – Part Time) (2025). Effects of Hybrid Ramie-Steel Fibers on Mechanical Properties and Durability of Eco-Friendly Hybrid-Fiber Reinforced Concrete. Strength of Materials, 1-23.
(Supervisor: Dr. K.R. Aswin Sidhaarth)

2. Anstey Vathani, T. ., (Research Scholar – Full Time) (2025). Life Cycle Assessment of Perishable Wastes from Koyambedu Market. Journal of Advanced Research in Applied Sciences and Engineering Technology, 43, 258-270.
(Supervisor: Dr. J. Logeshwari)

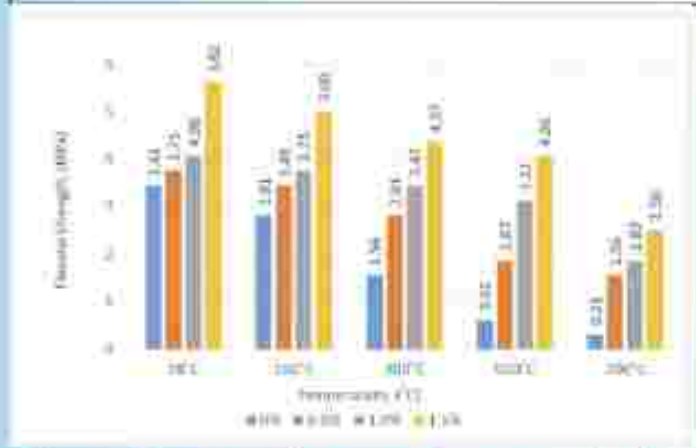
Details of Conference	Presentation Title	Student Name
International Conference On Civil Engineering Innovative Development In Engineering Advances SRM Institute of Science and Technology, Chennai 20-22 March 2025.	Environment protection need: sustainable approach for soil conservation and use of beneficial microbes for managing plant soil interaction	Prashant Sidramayya Swami **(Supervisor: Dr. A. Geetha Selvarani)**
International conference on Science & Innovative Engineering Prince Shri Venkateshwara Padmavathy Engineering College, Chennai. 26-27 April, 2025.	Performance of Sustainable Concrete Utilization in Sandwich Slabs	Afshanah Wazeer (M.Tech - II Year) **(Supervisor: Dr. M. Vinod Kumar)**
International conference on Renewable and Sustainable Energy Institute of Research Engineers and Scientists, Bulgaria. 11-12 March, 2025.	Innovative Electrochemical Purification of Pharmaceutical Wastewater: $MnCo_2O_4$ Electrode Enabling Sustainable Energy Generation	E. Arul Devi **(Supervisor: Dr. K. Tamilarasan)**
International Conference on Advances in Materials, Modeling and Sustainable and resilient Infrastructure Amrita Vishwa Vidyapeetham, Coimbatore Tiruchirappalli. 9-11 January, 2025.	A Comparative Analysis of Hemp, Kenaf, and SisalFibers as Internal Curing Agents in Concrete: A Performance Evaluation	Carwyn Vyvian Rymbai (B.Tech - IV Year) **(Supervisor: Dr. J. Shanmugapriya)**

Details of Conference	Presentation Title	Student Name
International Conference on Sustainable Development in Engineering and Technology University of Technology and Applied Sciences Oman 30 April – 1 May, 2025	Performance of Structural Elements in Composite Structures Under Lateral Loading Conditions	Prabhu Ganesh S (M.Tech – II Year) **(Supervisor: Dr. M. Vinod Kumar)**
	A Review on Internal Curing of Concrete Using Superabsorbent Polymers	VVS Sarma (M.Tech - II Year) **(Supervisor: Dr. M. Vinod Kumar)**
	Sustainable approaches to Composite Sandwich Construction: A state-of-the-art review	D. Thangaraj **(Supervisor: Dr. M. Vinod Kumar)**
	Mechanical Performance of Concrete Reinforced with Cotton and Nylon Fibres Considering Fibre Anchorage and Geometry	Sridhar M **(Supervisor: Dr. M. Vinod Kumar)**
	Strength and durability of eco-friendly interlocking blocks using cotton cloth grinding waste	B. Shweta A. Keerthi B. M. Sai Vyshnavi (B.Tech - III Year) **(Supervisor: Dr. M. Vinod Kumar)**
	Performance of Sustainable Concrete Utilization in Sandwich Slabs	Afshanah Wazeer (M.Tech - II Year) **(Supervisor: Dr. M. Vinod Kumar)**

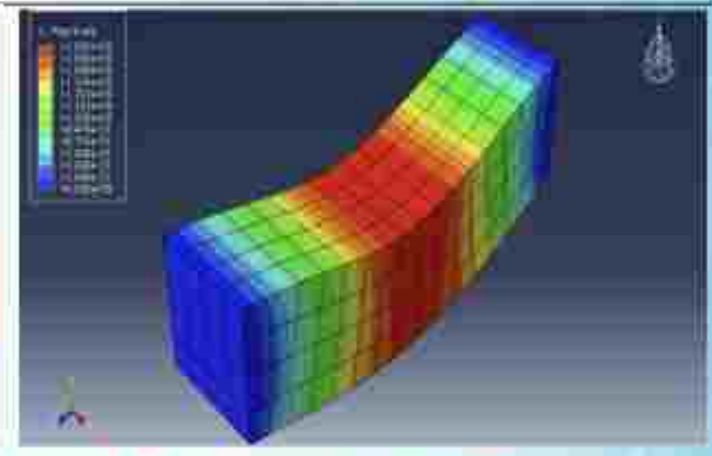
Numerical and experimental investigation on flexural performance of SFRC at various elevated temperatures

Dr. J. ANITA JESSIE, Assistant Professor

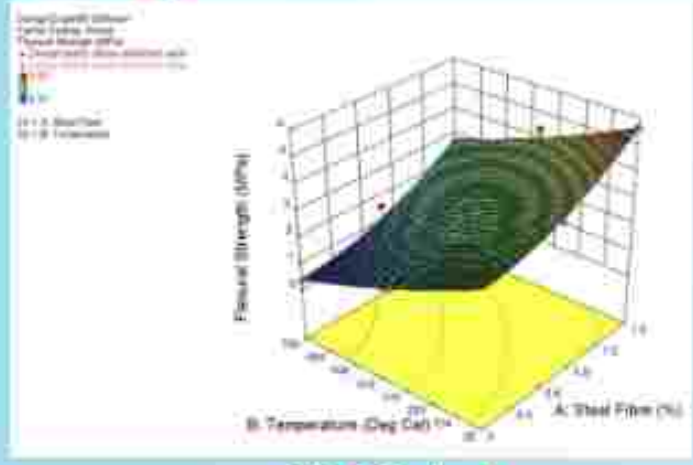
Steel fiber reinforced concrete (SFRC) is a popular material for structural buildings because of its ductility, bonding effect, durability, and stability at elevated temperatures. When exposed to elevated temperatures, concrete undergoes elemental changes that can lead to deterioration. This study observed the flexural behavior of concrete prisms with various steel fiber volume proportion of 0%, 0.5%, 1%, and 1.5% exposed to elevated temperatures (28 °C, 100 °C, 300 °C, 500 °C, and 700 °C) for time period of 1 h. Finite element modeling was used to predict the deflection of plain concrete and SFRC prisms under these conditions. Experimental and analytical results were compared, and optimization was achieved using the response surface method (RSM). A quadratic polynomial equation was developed using RSM to anticipate the flexural strength and deflection of plain and SFRC concrete at various temperatures and steel fiber volume fractions.



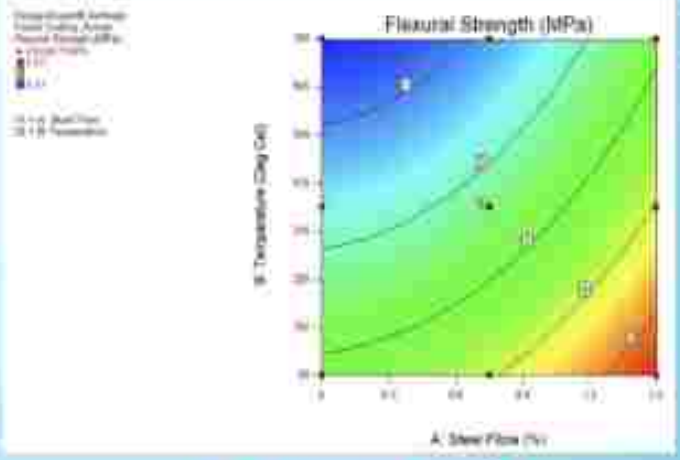
Flexural strength at various steel fiber percentage



Deflection result at 700˚ C



RSM 3D chart

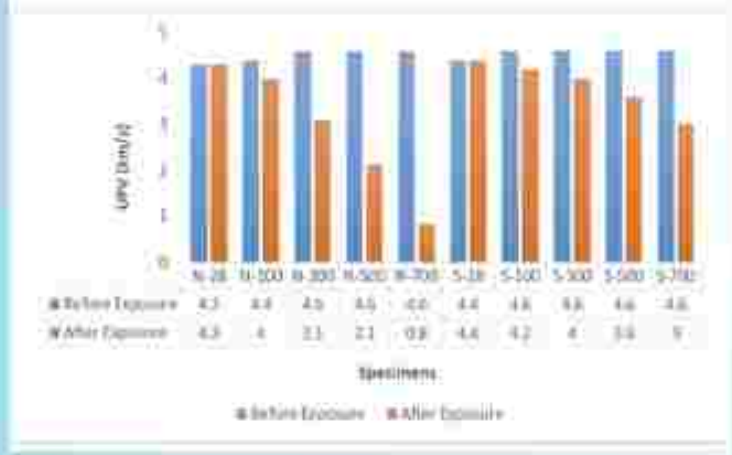


RSM Contour Graph

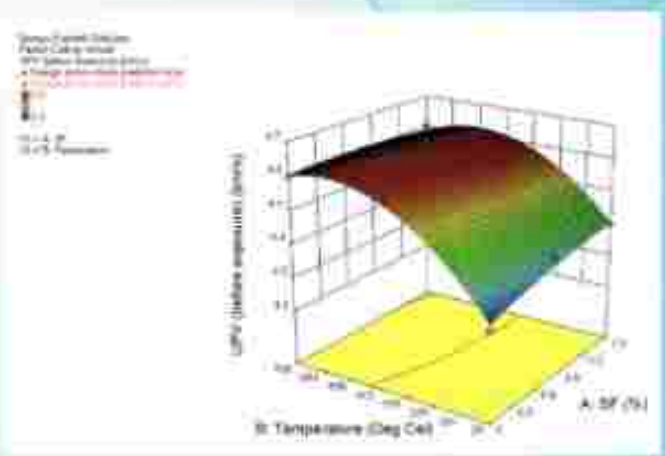
Application Of RSM For The Optimization Of Steel Fibre Reinforced Concrete Quality At Elevated Temperatures

Dr. K. K. GAAYATHRI, Assistant Professor

This study uses Ultrasonic Pulse Velocity (UPV) to assess the quality of SFRC after exposure to high temperatures. Prism specimens were cast without steel fibre content and with 1.5% steel fibre volume fractions. Following a 28-day curing period, the concrete specimens were dried and then subjected to a heating regimen in an electric furnace. The temperature inside the furnace was gradually increased to reach four target levels: 100◦C,300◦C,500◦C, and 700◦C. Each temperature level was maintained for a duration of 1 hour. The exposed specimens were then cooled down to ambient air. At 700◦C, the quality of normal concrete significantly dropped to "Doubtful", while Steel Fibre Reinforced Concrete (SFRC) maintained a "Medium" quality. The Response Surface Methodology (RSM) model is proposed to predict the quality through the UPV at various elevated temperatures. The adjusted R squared value for UPV before and after temperature exposure was observed to be 0.9729 and 0.9407 respectively. This research explores how to optimize steel fibre-reinforced concrete (SFRC) for better performance at high temperatures. This is crucial for structures exposed to fire, such as tunnels, bridges, and high-rise buildings. Improved SFRC behaviour under high temperatures translates to enhanced safety and potentially extends the life of structures in fire scenarios.



UPV measured before and after exposure to temperature

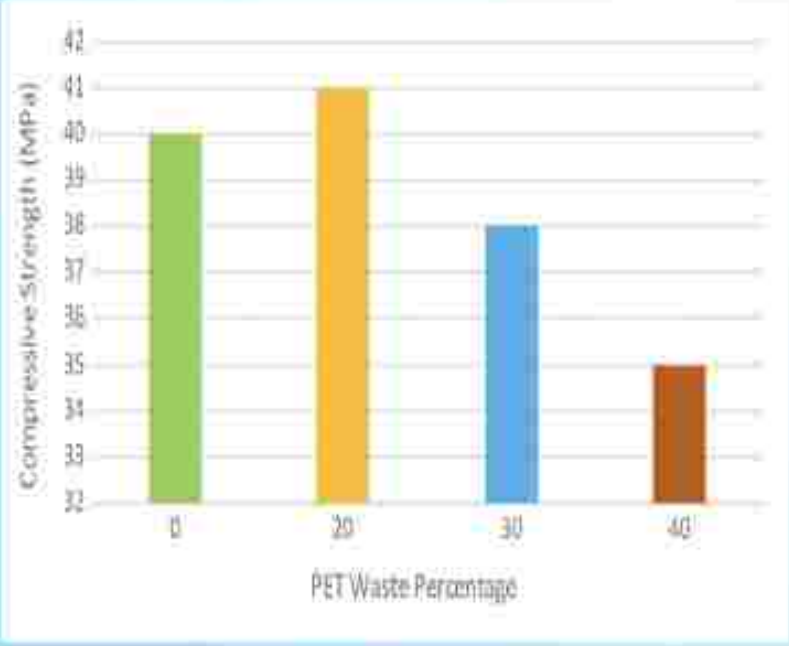


3-D surface chart for UPV (Before Exposure)

Implementation of waste plastic as a sustainable partial replacement of fine aggregate

Jetendra Yarramsetty, III Year Student

Plastic waste is the most environmentally damaging type of garbage. Since plastic cannot decompose naturally, it must be recycled or reused to prevent further harm. The study aims to examine the behavior and certain physical properties of concrete made from recycled plastic materials.This study investigates the probability and efficiency of utilizing disposed plastic as a fractional replacement of fine aggregate in construction materials. Research focuses on understanding the concrete mechanical properties, when merging waste plastic particles in lieu of a portion of traditional fine aggregates. Various types of waste plastic, including plastic bottles, bags, and packaging materials, are analyzed for their suitability as a replacement material. Additionally, various treatment methods, such as shredding, melting, and chemical modification, are considered to enhance the compatibility of plastic with the base materials. Compressive strength was found to investigate the impact of disposed plastic on the concrete mechanical characteristics. A comparative study between conventional concrete and 20% replacement of shredded plastic in fine aggregate was done. 20% replacement mix showed almost equal strength to the conventional concrete. The strength of 20% replacement was found to be 41 MPa, whereas the 30% and 40% was observed to be 38 MPa and 35 MPa respectively

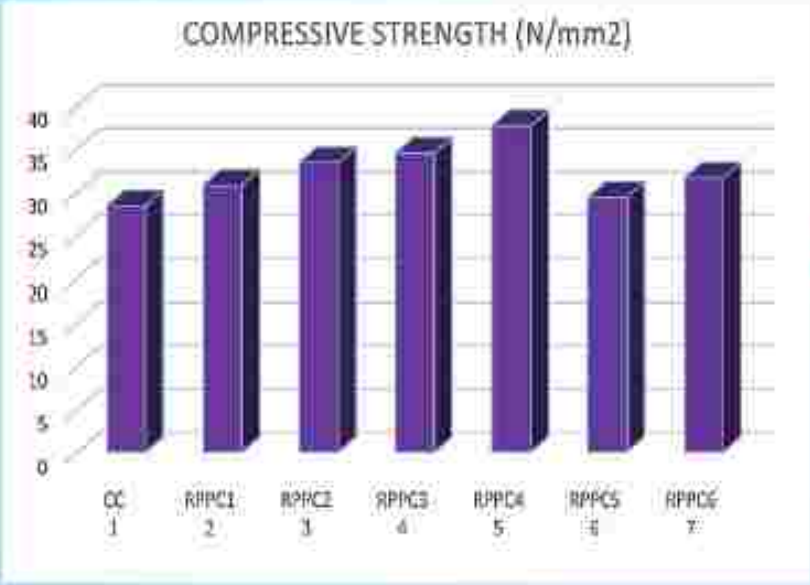


Compressive strength results at various PET percentage

A study on mechanical properties of rubberized concrete with polypropylene fibres

Bagde Aman Ashok, III Year Student

As the construction industry's resource demands surge and environmental concerns over natural aggregate mining intensify, the search for alternative and environmentally sound construction material sources has gained momentum. The research focuses on understand ing the properties when incorporating rubber as coarse aggregate in place of traditional coarse aggregates with Polypropylene (PP) fibres. The use rubber as a substitute for coarse aggregates in concrete has gained attention due to its potential benefits in enhancing strength, toughness and ductility. However, the addition of rubber can adversely affect the strength and stiffness. To counteract these drawbacks, PP fibers were introduced as a reinforcing material to increase the properties of concrete. The experimental program in volved the preparation of concrete mixtures with varying rubber contents (0%, 2.5%, 5%, and 7.5% as a replacement for coarse aggregates by volume) and PP fiber dosages (0%, 0.1%, 0.2% by volume of concrete). The fresh and hardened properties, including slump, compressive strength were evaluated according to relevant standards. The study showed good compressive strength for 5% replacement of coarse aggregate and 0.2% replacement of PP Fibres as compared to other mixes



Compressive strength results of various percentage

Editorial Board

Civil Engineering

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