SONA COLLEGE OF TECHNOLOGY

Learning is a Celebration!

An Autonomous Institution

DEPARTMENT OF CIVIL ENGINEERING

SONA CREA

Twenty Second Issue | August 2025

STUDENT CHAPTER

Indian Concrete Institute

ICI STUDENT CHAPTER

PRINCIPAL'S MESSAGE

I am gratified to know that the Department of Civil Engineering is bringing out the Twenty Second issue of their technical magazine "SONA CREA" of this academic year (2025 - 2026). This is a productive technical material and subsidiary skill-developing tool for the students. I wish the Civil Engineering Department a very big success in all their ventures. I also applaud the coordination and efforts behind the team to bring out this issue. I wish them all success.

Dr. S.R.R. SENTHIL KUMAR,
Principal

HOD'S MESSAGE

Dr. R. MALATHY, HoD / Civil,
Convenor/ ICI Student Chapter

I am glad in publishing the twenty Second issue of the magazine "SONA CREA" of our Civil Engineering Department, which is a reference of the most recent trends and activities in the field of AEC. This should serve as a source of guidance for the entire fraternity for building themselves with the beautiful colors. I acknowledge the efforts of the Editorial team who did a mind-blowing job in compiling activities for a year and disseminate them through this Magazine as well as on the website.I am feeling cherished in welcoming students with more innovation in bringing the article with more bright concepts and ideas in the next issue. I wish them success in to be colorful in their future.

A. MEENACHI
AP/ CIVIL | ISTE Students Chapter Coordinator

This issue marks the twenty Second issue of our Newsletter SONA CREA, that aims to keep our students past and present updated about the trending one in our Civil Fraternity. This newsletter will feature about the programs, articles, achievements of our students and faculties. We have particularly designed this newsletter also as a platform for the students to update their talents and get exposed to the current technologies. So, I request everyone to use this in an efficient manner. In future expecting more contributions from the entire team to make it more useful and a vibrant one.

"We cannot always build the future for our youth, but we can build our youth for the future."

B. Sri Ramanan
Final Year
ISTE Student Chapter Chairman

Dear juniors and fellow learners, As budding civil engineers, you are not just students – you are future builders of this nation. You will design cities, lay the foundations of progress, and shape skylines that tell the story of a strong and sustainable India. You are the backbone of development, the catalysts of innovation and the lands that will turn blueprints into reality.

VISION & MISSION OF THE DEPARTMENT

To become a school of excellence that brings out civil engineers with high technical competencies and promotes high-end research to meet the current and future challenges in Civil Engineering.

MDI : To become a school of excellence that brings out civil engineers with high technical competencies and promotes high-end research to meet the current and future challenges in Civil Engineering.

MD2: To provide quality education through Centre of Excellence in Research and Consulting with emerging technologies to industry and societal problems.

MD3: To impart knowledge and activities to students with emphasis in developing the leadership qualities and teamwork.

MD4: To impart knowledge and activities to students with emphasis in developing the leadership qualities and teamwork.

MD5: To encourage students to pursue higher education, take competitive exams and industry career with required training.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

To encourage students to pursue higher education, take competitive exams and industry career with required training.

PEO I: To encourage students to pursue higher education, take competitive exams and industry career with required training.

PEO 2: To analyze data and technical concepts pertaining to the development of infrastructure, design, sustainability, construction management and any other related field of civil engineering.

PEO 3: To analyze data and technical concepts pertaining to the development of infrastructure, design, sustainability, construction management and any other related field of civil engineering.

PROGRAMME OUTCOMES

Students in the Civil Engineering programme should, at the time of their graduation be able to:

a) Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to offer a solution to complex engineering problems..

b) Problem analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using the first principles of mathematics, natural sciences, and engineering sciences

c) Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental property.

d) Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

e) Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations

f) The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

g) Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.

h) Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

i) Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j) Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

k) Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects in multidisciplinary environments.

l) Life-long learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES

On completion of the B.E (Civil Engineering) degree, the graduates will be able to:

- Plan, analyze, design, prepare cost estimates and execute all kinds of Civil Engineering Projects.
- Apply modern construction techniques, equipment and management tools so as to complete the project within specified time and funds.



SRI RAMANAN VIJAY AKASH SOMESH
FINAL YEAR, CIVIL ENGINEERING

Mentor:
Prof.A.Meenachi,
Assistant Professor

AN APP TO EVALUATE AND MINIMIZE EMBODIED EMISSIONS IN BUILDINGS

OBJECTIVE

This project proposes the development of a comprehensive mobile and web-based application dedicated to embodied carbon calculation for building materials and infrastructure projects.The proposed app aims to assist architects, civil engineers, sustainability consultants, and developers in quantifying embodied carbon across all lifecycle stages of a construction element or system.The application integrates a user-friendly interface with a robust backend database containing emission factors for a wide range of construction materials such as cement, steel, aluminum, glass, wood, and emerging green alternatives. It allows users to input project-specific data including material quantity, source location, transportation mode, and construction method.

METHODOLOGY

User Input – Column details, concrete grade, steel %, low-carbon options.

Calculation Engine – Volume, material quantities, embodied carbon.

Impact Modules – Transport + waste emissions.

Results – Material use, carbon per stage, total footprint.

TECHNICAL STACK

Frontend: React Native / Flutter (mobile), React.js (web)
Backend: Node.js (Express) or Python (FastAPI/Django)
Database: PostgreSQL / MongoDB
Core Engine: Python (NumPy, Pandas) for carbon & material calculations
Integrations: Google Maps API (transport), Firebase Auth (login)
Visualization: Chart.js / Plotly, PDF/Excel export
Deployment: Docker, AWS/GCP/Azure

CONCLUSION

The study shows that embodied carbon in concrete construction arises mainly from materials, transport, and waste. Emissions can be reduced by using low-carbon alternatives like fly ash and GGBS, sourcing materials locally to cut transport emissions, and minimizing waste through optimization, recycling, and better planning. Adopting low-carbon materials, efficient construction processes, and circular economy practices is crucial to reducing the construction industry's carbon footprint and meeting climate goals.

A. MONITHA
III RD YEAR

T. Dharshini
III RD YEAR

Sustainable Construction Exploring Alternatives to Traditional Materials

INTRODUCTION

As the construction industry continues to evolve, the need for sustainable and environmentally-friendlybuilding materials has become increasingly important.
In this article, we will delve into the world of alternative construction materials, highlighting their benefits, applications, and potential to transform the industry.

WHAT ARE THE USES OF BIM?

- The construction industry is one of the largest consumers of natural resources, accounting for approximately 40% of global energy use and 30% of greenhouse gas emissions.
- Traditional construction materials, such as steel and concrete,have significant environmental impacts, including:

- **Resource Depletion**
- **Energy Consumption**
- **Waste Generation**

Alternative Materials :

1. **Bamboo** – Renewable, strong, and lightweight alternative to steel/timber.
2. **Recycled Materials** – Use of reclaimed wood, glass, and plastic to reduce waste.
3. **Low-Carbon Concrete** – Uses fly ash/slag to cut emissions and energy use.
4. **Straw Bales** – Natural, renewable, and insulating material.
5. **Hempcrete** – Hemp, lime, and water mix with good insulation and sustainability.

BENEFITS AND APPLICATIONS

- **Reduced Environmental Impact:** Alternative materials minimize resource depletion, energy consumption, and waste generation.
- **Improved Building Performance:** Alternative materials offimproved thermal insulation, acoustic performance, and durability.
- **Cost Savings:** Alternative materials can reduce construction costs, particularly when using recycled or locally sourced materials.
- **Increased Design Flexibility:** Alternative materials offer new design possibilities, enabling architects and engineers to create innovative and sustainable buildings.

CHALLENGES AND THE WAY FORWARD

To promote the use of alternative materials, standardization and regulation are essential by establishing proper testing and certification procedures to ensure safety and reliability. Alongside this, public awareness and education play a key role in informing architects, engineers, and builders about the benefits and practical applications of these materials. Furthermore, improving scalability and availability is crucial to meet the increasing demand and make alternative materials a viable option for widespread adoption in the construction industry.

CONCLUSION

The construction industry must shift toward sustainable materials to reduce environmental impact, improve performance, and save costs. Prioritizing alternative materials is key to building a greener future.

STUDENT ARTICLES

UP BAVADHARANI
III YEAR

SEISMIC RETROFIT OF HISTORIC BUILDING STRUCTURES

ABSTRACT

BUILDINGS WITH HISTORIC VALUES ARE REGIONAL CULTURAL ASSETS WORTH PRESERVING. THE DESIGN TECHNOLOGIES AND BUILDING MATERIALS AND METHODS THAT WENT INTO THE ORIGINAL CONSTRUCTION OF THESE BUILDINGS ARE OFTEN DRASTICALLY DIFFERENT FROM THEIR CONTEMPORARY COUNTERPARTS, THEIR STRUCTURAL RENOVATION OR RETROFIT BRINGS FORTH MANY TECHNICAL CHALLENGES TO THE DESIGN PROFESSIONAL.

THIS PAPER PROVIDES A GENERALSURVEY OF THE TECHNICAL ISSUES PERTAINING TO THESEISMIC RETROFIT OF HISTORIC BUILDINGS, AND EXPLORESVARIOUS DESIGN PROCEDURES AND CONSTRUCTIONMETHODS FOR THAT PURPOSE, INCLUDING INNOVATIVE TECHNOLOGIES SUCH AS POST TENSIONING, SEISMIC ISOLATION, COMPOSITE WRAPS, ETC

EVOLUTION OF BUILDING MATERIALS

BUILDING MATERIALS HAVE EVOLVED GRADUALLY THROUGHOUT THECONSTRUCTION HISTORY, AND THE PACE OF THE EVOLUTION IS ACCELERATED THROUGHOUT THE PAST CENTURY.
IMPROVEMENTS IN CONVENTIONAL BUILDING MATERIALS USED BOTH IN HISTORIC AND CONTEMPORARY STRUCTURES ARE DESCRIBED AS:

MASONRY, STONE, AND ADOBE BUILDINGS

BEARING WALL BUILDINGS WERE THE DOMINANT TYPE OF STRUCTURES TILL LATE YEARS OF NINETEENTH CENTURY, WHEN THEYWERE REPLACED BY STEEL FRAME SKELETON AS THE TYPICALSTRUCTURAL FORM IN LARGE BUILDINGS.

WOOD AND TIMBER

WOOD, AS A NATURAL BUILDING MATERIAL, HAS NOT BEEN SUBJECTED TO ANY MAJOR CHANGE, BUT MODERN TECHNOLOGYPROVIDES STRENGTH GRADING METHODS, WOODEN PANELPRODUCTS, PRESERVATION TREATMENT PROCESS AND WOOD PROTECTION.

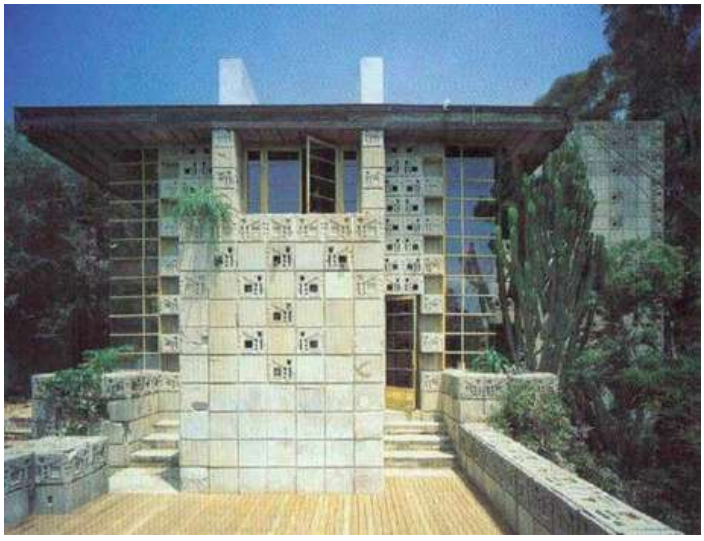
CONCRETE

CONCRETE HAS BEEN SUBJECTED TO SIGNIFICANT EVOLUTION DURING TWENTIETH CENTURY. IMPROVED INGREDIENTS, QUALITYCONTROL, PREPARING, AND CASTING PROCESS OFFERED STRONGERAND MORE DURABLE CONCRETES. IMPROVEMENTS IN CONCRETE TECHNOLOGY.

CHALLENGES OF RETROFITTING HISTORIC FABRIC

MINIMIZING NOISE, DISTURBANCE, AND DAMAGE TO THESURROUNDING BUILDINGS AND PROVIDING
TEMPORARY SHORING AND SUPPORT ARE TYPICALCHALLENGES INVOLVED IN MOST RETROFIT PROJECTS.

DEPENDING ON THE EXTENDS OF RETROFITTING, ASSESSEDRISK, TECHNICAL LIMITATIONS, STRUCTURAL HISTORIC VALUE, AND ECONOMICAL CONSTRAINTS, THE PREFERRED RETROFITSTRATEGIES ARE STUDIED AND PRIORITIZED TO PRESERVE THE AUTHENTICITYOF HISTORIC FABRICATION AND MINIMIZE REMOVAL OF ARCHITECTURALMATERIAL.



COST IMPLICATIONS, COMPARISON OF RETROFITTING VERSUS NEWCONSTRUCTION PREMIUM MANY FACTORS AFFECT THE COST FOR RETROFITTING A HISTORIC STRUCTURE. IT REQUIRES INFORMATION COLLECTION, SPECIAL ENGINEERING PROCEDURES, TRAINED WORKERS AND UNCONVENTIONAL BUILDING MATERIALS. DEPENDING ON THEPROJECT OBJECTIVES, THE RETROFIT DESIGN MAY TARGET ONE OFFOUR PERFORMANCE LEVELS

REFERENCES

APPLIED TECHNOLOGY COUNCIL, 1992. EVALUATION OF THE PERFORMANCE OFSEISMICALLY RETROFITTED BUILDINGS, APPLIED TECHNOLOGY COUNCIL, 31, REDWOOD CITY, CA.

BROCKENBROUGH, R. L., 2002, AISC REHABILITATION AND RETROFITGUIDE; A REFERENCE FOR HISTORIC SHAPES AND SPECIFICATIONS, AMERICAN INSTITUTE OF STEEL CONSTRUCTION.

STUDENT ARTICLES

KISHORE KUMAR S S
II year

NET ZERO ENERGY BUILDINGS (NZEB): A SUSTAINABLE FUTURE

Net Zero Energy Buildings (NZEBs) are designed to achieve sustainability by reducing energy use and generating renewable energy on-site.

They minimize dependence on non-renewable resources while promoting energy efficiency.

This article discusses their concept, benefits, case studies, and design strategies.

Case studies like The Edge in the Netherlands highlight how design strategies can achieve energy independence and environmental responsibility.

CASE STUDY : THE EDGE NETHERLANDS

A notable example of a Net Zero Energy Building is The Edge in the Netherlands. It demonstrates how modern technologies and design principles can result in a building that generates more energy than it consumes.

Highlights:

- Solar PV Panels: Over 1,000 panels installed on the roof and south-facing facades generate 102% of the building's energy needs.
- Rainwater Harvesting & Greywater Recycling: Water collected is reused for irrigation and toilet flushing.
- Heating System: While a backup gas-fired boiler exists, the primary heating comes from geothermal sources, minimizing fossil fuel usage.

Design Strategies for NZEBs

To achieve net zero energy performance, a combination of advanced design strategies and technologies is essential.

Energy Sources and Technologies:

Solar Photovoltaic (PV) Panels

Wind Turbines

Geothermal Energy Systems

High-Efficiency HVAC Systems

Smart Sensors and IoT-based Energy Monitoring

Passive Design Features:

Maximizing natural daylight

Bamboo and other sustainable resources

Enhancing insulation

Promoting natural ventilation

Energy Storage and Management:

Use of batteries and integration with smart grids for efficient energy usage

Eco-Friendly Materials:

Low-carbon concrete

Recycled steel

Conclusion

Net Zero Energy Buildings represent a transformative shift in architecture and environmental responsibility. By combining renewable energy, smart technology, and sustainable materials, NZEBs are setting a new standard for the future of construction — one that aligns economic benefits with environmental consciousness.

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STUDENTS' ACHIEVEMENTS

SRI RAMANAN B, SOMESH P G,KISHALAN N third year student won the first prize in the Emerging Engineers Competition held at Engineers Build Expo campus 03.01.2025

SANJAY M., a first-year student participated in the district-level round of the 'Speak for India' competition – Tamil Nadu Edition (State-Level competition) held on 26.02.2025.

DHANUSH KUMAR P, HARISH V and **SUJAN**, second-year students, won the **II Prize** in **FIESTAA'25** organized by KPR Institute of Technology, Coimbatore on 14.03.25.

E.K. HARSHINI, a final-year student, received the ISTE Best Student Award for the year 2024.

MEIYARASAN, GIRIDHARAN, ROHITH KUMAR, VASANTH, AND JEEVA, second-year students, won the I Prize in REFUERZO'25, a National-level technical symposium held at Agni College of Technology, Chennai, on 05.04.2025

SIVAPRAKASH S. AND NANTHA KUMAR S. second-year students, won the tennis match held at Paavai Engineering College, Namakkal, on 10.10.2024.

T.KIRUBANITHI & SUNSREE received **Best Performer Award** participated in **PERSONA'25** competition held at Sona College of Technology.

APROSE A a second-year student, participated in the football match at the University of Calicut from 21st to 28th December 2024.

V. UMESH, a final-year Civil Engineering student, secured the bronze medal at Paavai Engineering College, Namakkal, on 22nd December 2024.

APROSE A. AND UMAR FAROOK A., second-year students, secured the runner-up position in the football match held at Kongunadu College of Engineering and Technology, Thokurpatti, Thottiyam, from 07.10.2024 to 09.10.2024.

SIVAPRAKASH S. AND NANTHA KUMAR S., second-year students, achieved the runner-up position in the football tournament held at Syed Ammal College, Ramanathapuram, from 25th to 27th October 2024

V. KIRUTHIKA, a final-year student, received the **Best Paper Award** at an event held at SRM Institute of Science and Technology from 20th to 22nd March 2025.

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STUDENTS' ACHIEVEMENTS

K. OM PRAKASH, a final-year Civil Engineering student, won the silver medal at K.S.R. College of Technology, Tiruchengode, on 30.11.2024

APROSE A. AND UMAR FAROOK A, second-year students, won the football match held at Selvam College of Technology, Namakkal, on 03.10.2024.

KISHORE ARUNACHALAM, , a second-year student, secured the runner-up position at Sona College of Technology, on 25.09.2024.

K. OM PRAKASH, a final-year student, and Umar Farook, a second-year student, secured the gold and bronze medals in Athletics at Selvam College of Technology, Namakkal, on 23rd and 24th October 2024.

UMAR FAROOK A, a second-year student, participated in and won the handball match held at Paavai Engineering College, Namakkal, on 05.11.2024

S. KANISHK AND J. DHANANJAYAN, first-year Civil Engineering students, secured the runner-up position in the hockey competition at Paavai Engineering College, Namakkal, on 21.10.2024.

The Winners of "SEED Fund" from MSME Idea Hackathon 4.0
SONA BUSINESS INCUBATION CENTER
Department of Civil Engineering

SEED FUND Rs. 15 Lakh
Title :
Forging 3-Dimensional DNA shaped steel fibres for structural concrete in high seismic zones

Students' NPTEL 2024-2025

NPTEL 2024 - 2025

swayam

Affiliated to Anna University

Availability and Management of Groundwater Resources


ATHISH PRANAV V S


HEMAVARSHINI R


MADHUMATHI SS


MADHUMITHA AV


MADHUSHRI K


NITHYASRI


SASIDHARAN K


SRI RAMANAN B


ARULSELVAM M


BHARATHI S


CHANTHRU R


DHINESH KANNAN M


GOKUL P


KIRUBHANITHI T


POOJA T


ABISHEK M


HARI HARAN V

2021-2022	2022-2023	2023-2024	2024-2025
Elite 13	Elite 29	Elite 18	Elite 34
Elite + Gold 01	Elite + Silver 05	Elite + Gold 05	Elite + Silver 17

FACULTY ACHEIVEMENTS

Dr.R.Malathy received Best Teacher Award (Engineering) for the year 2024 from IE(I) TNSC Chennai on 15.09.2024

Dr.R.Malathy guided M.Tech student Mr.B.Sakthivelan and received 1st prize from ISTE on 5.09.2024

Dr.R.Malathy received Thiranmigu Poriyalar 'Award 2024 on 5.12.2024

Sona College of Technology received Best ESG Practices on Water from the Bangalore Chamber of Industry and Commerce (BCIC) on April 11, 2025

Sona College of Technology received Best ESG Practices on Water from the Bangalore Chamber of Industry and Commerce (BCIC) on April 11, 2025

Dr.MNA.GulshanTaj guided M.Tech student Ms.K.Pavithra and received 1st prize from ISTE on 5.09.2024

Dr.Gulshan Taj, Professor/Civil, was selected as one among the top 40 scientists by DST for the Women in Space and Allied Science Program (WISE-KIRAN), which was held at the Indian Association of Cultivation Science at Kolkata during the period 28-31 January 2025.

Dr.Jegatheeswaran received International Outstanding Research Award 2024 from Honorable Education Minister Mr.Anbil Mahesh Poyyamozhi on 20.10.2024

Dr.A.Shalini recognized as NPTEL DISCIPLINE STAR for the period (July -Dec 2024)

Dr.A.Shalini and her team Praveen, Suthiksan ram, Sudhakaran received Best Paper Award in DIGITECHCON 2025 on 16.04.2025

Prof.A.Meenachi and Final year student Mr.Sr.Ramanan B received SEED fund of Rs.15,00,000/- from MSME Idea Hackathon 4.0

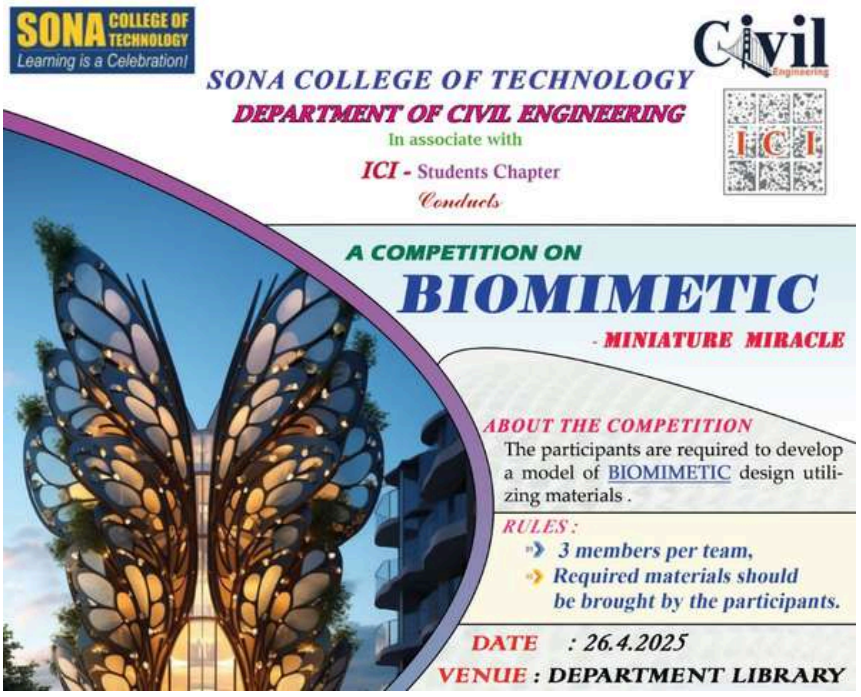
Dr.Kasiviswanathan has attended the CEEE Program of INAE+AICTE+Infosys for Civil and Environmental Engineering at IIT Bombay from 30 June to 11th July 2025

Under Dr. Kasiviswanathan's guidance, V.Krithika received the Best Paper Award in the 2nd International Conference on Civil Engineering Innovative Development in Engineering Advances (ICC IDEA -2025)

EVENTS ORGANIZED

EVENTS ORGANIZED

EVENTS ORGANIZED



Dr. K. Chinnaraju, Retired Professor, Anna University Chennai , for a special guest lecture

Second year students had the opportunity to explore the dam and gain valuable knowledge from Industrial Visit to Mettur Dam !!

Our distinguished alumnus Mr. C. Thinakaran (Batch 2015–2019), currently BIM Manager at Noida International Airport. delivered an insightful session on “BIM Applications and Case Study in the Construction Industry”


RECONNECT 25
Sona - Coimbatore
Alumni


SONA ALUMNI ASSOCIATION
Retrospect '25
25
SONA MBA
9 AUG 2025
RETROSPECT '25
A CHAPTER WE WILL KEEP REREADING !!
CIVIL ♥
ALUMNI
DIARIES

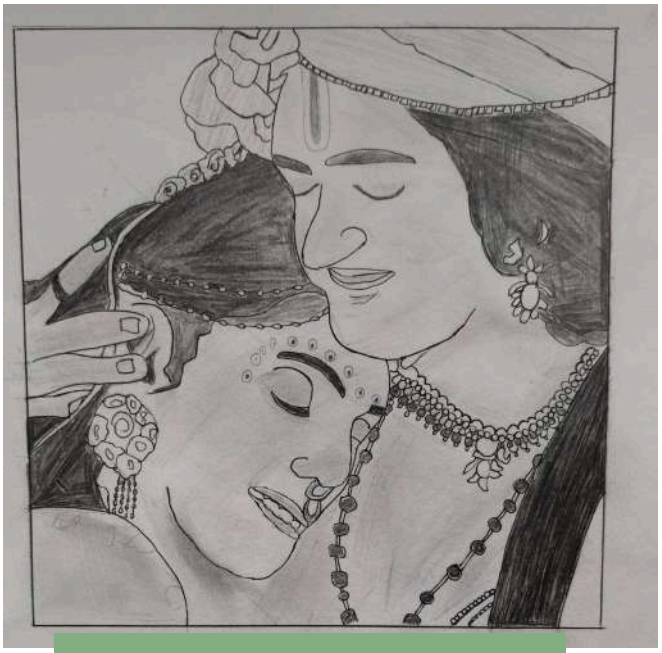

Sona Alumni Association
RECONNECT 25
Sona - Coimbatore
Alumni Chapter
2006-10
2010-14
2014-18
2021-23
2024-2028
CIVIL TIMELINE
Where past meets the present

Students' Drawings

Bavadharani UP
III yr

Nisha S
III yr

Abishek
IV yr



Sabari lakshmi
II yr