

CIVIL PULSE

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Message from HoD's Desk

It gives me immense pleasure to present this edition of **CIVIL PULSE**, the newsletter of the Department of Civil Engineering, Ahalia School of Engineering and Technology. This newsletter reflects the dynamic academic environment, technical advancements, and vibrant student activities that continue to shape our department.

Civil Engineering today is rapidly evolving with the integration of modern technologies such as robotics, drones, automation, sustainable wastewater management systems, and eco-friendly construction materials like geopolymers concrete. These developments emphasize that the role of a civil engineer extends far beyond conventional practices and now demands innovation, digital competence, and a strong commitment to sustainability. The insightful technical articles featured in this issue highlight these emerging trends and encourage our students and faculty to stay aligned with global engineering transformations.

Alongside academics, our department remains committed to experiential and outcome-based learning. Activities such as the industrial visit to the Water Treatment Plant at Malampuzha, the inauguration of the Civil Engineering Association STHAPATYA 2025 with the keynote session "From Pixels to Policy: Geospatial Tools for Monitoring Sustainable Development Goals," hands-on training in structural engineering essentials, and expert webinars on managerial leadership and circular economy practices have provided our students with valuable industry exposure and practical insights. These initiatives effectively bridge the gap between classroom

knowledge and real-world applications, enhancing professional skills, leadership qualities, and industry readiness.

I sincerely appreciate the dedicated efforts of our faculty members, student coordinators, and contributors who made this newsletter possible. I also congratulate our students for their enthusiastic participation in all departmental activities. Let us continue to strive for excellence, innovation, and sustainable development in the field of Civil Engineering.

Wishing everyone continued success and learning.



Dr. Mathew B V
HoD-CE

Vision

To emerge as a centre of excellence in Civil Engineering education and research, committed to nurturing socially responsible, skilled, and innovative professionals who contribute to sustainable infrastructure development and betterment of society.

Mission

- **To impart strong technical knowledge and practical skills in civil engineering to address current and future challenges in sustainable infrastructure development.**
- **To promote a culture of research, innovation, and continuous learning focused on environmental concerns and sustainable solutions incorporating the emerging trends**

- **To instil ethical values, leadership qualities, and a sense of social responsibility for the holistic development of students as competent professionals.**

Programme Educational Objectives

- **PEO 1 – Graduates will have strong foundation to pursue a successful profession in Civil Engineering.**
- **PEO 2 – Graduates will identify and resolve Civil Engineering problems with the help of engineering tools and technology.**
- **PEO 3 – Graduates will exhibit managerial skills and professional ethics to meet social responsibilities.**

Tech Trends in Civil Engineering: Robotics, Drones & Automation in Construction

Anurudh R, Assistant Professor

The construction industry is witnessing rapid transformation with the integration of advanced technologies such as robotics, drones, and automation. These innovations are redefining conventional construction practices by improving productivity, precision, and safety throughout various stages of project execution.

Robotic systems are increasingly employed to carry out repetitive and labour-intensive tasks including bricklaying, concrete placement, rebar tying, and surface finishing. The use of robotics ensures consistent quality, reduces material wastage, and minimizes human involvement in hazardous working conditions, particularly in high-rise and large-scale infrastructure projects.

Drones, also known as Unmanned Aerial Vehicles (UAVs), have become valuable tools in civil engineering applications such as surveying, mapping, inspection, and construction progress monitoring. Equipped with high-resolution cameras and advanced

sensors, drones enable accurate topographic surveys, structural inspections, and real-time site documentation, thereby enhancing project planning and management efficiency.

Automation in construction involves the adoption of intelligent machinery, smart sensors, and digital platforms integrated with Building Information Modeling (BIM). These systems support real-time monitoring, effective resource management, and improved quality control. Automation also facilitates predictive maintenance and early detection of structural issues, contributing to safer and more reliable infrastructure development.



With the growing adoption of digital construction technologies, future civil engineers are expected to acquire skills beyond traditional design and analysis. Familiarity with robotics, drone technology, BIM, and automated construction systems will play a crucial role in improving employability and meeting evolving industry demands.

Zero Liquid Discharge: A Step toward sustainable waste water management

Neethu John, Assistant Professor

Zero Liquid Discharge (ZLD) is an advanced wastewater treatment approach that ensures complete recycling and reuse of industrial effluents, leaving behind no liquid waste. With growing concerns over water scarcity and environmental degradation, ZLD has emerged as a vital solution, especially in water-

intensive industries such as textiles, pharmaceuticals, and thermal power plants. The process typically involves a combination of membrane filtration, evaporation, and crystallization techniques to recover clean water and convert remaining contaminants into solid waste. The ZLD process begins with pre-treatment, where suspended solids, oils, and organic matter is removed using conventional methods like coagulation, flocculation, and sedimentation. This is followed by membrane-based technologies such as reverse osmosis (RO) or Nano filtration, which separate clean water from dissolved salts and other dissolved solids. The concentrate left behind from this step is then subjected to thermal processes like multi-effect evaporation (MEE) or mechanical vapour recompression (MVR), which further reduce the liquid volume. In the final stage, crystallization units are used to convert the

remaining brine into solid salts, which can be disposed of safely or sometimes even reused in industrial processes. The water recovered through these stages is of high purity and can be reused within the plant, reducing dependency on freshwater sources. The solid waste generated is typically non-hazardous, making disposal easier and environmentally safer. While the environmental benefits of ZLD are significant, its implementation comes with certain challenges. The initial capital cost for setting up a ZLD system is high, and the energy requirements for thermal processes can be substantial. However, advancements in technology are gradually making ZLD systems more energy-efficient and cost-effective. Moreover, the long-term benefits of regulatory compliance, reduced freshwater consumption, and minimized environmental impact outweigh the operational challenges.

In countries where industrial pollution of water bodies is a major concern, regulatory bodies such as the Central Pollution Control Board (CPCB) have begun mandating ZLD for select industries, especially in water-stressed regions. This move not only safeguards public health and ecosystems but also promotes the idea of water as a renewable resource that must

be preserved and reused wisely. ZLD is not just a treatment method but a revolutionary step toward sustainable water management. ZLD offers promising avenues for innovation and improvement such as energy-saving designs, hybrid treatment systems, and waste recovery techniques. As industries strive to align with global sustainability goals, Zero Liquid Discharge stands out as a forward-looking and responsible approach in the field of wastewater treatment.

National Highways in India

Jayakrishnan R, Assistant Professor

India's National Highway network continues to be a cornerstone of the nation's infrastructure growth, connecting major urban centers, industrial hubs, ports, and border regions. Over the past decade, the National Highway network has witnessed remarkable expansion — **growing by around 60–61 % in length** from approximately **91,287 km in 2014 to about 1,46,500 km today**, making India's highway grid one of the largest in the world. This includes a massive increase in high-speed corridors and expressways, as well as a significant rise in 4-lane and higher capacity stretches, enhancing mobility and safety across regions.

In recent months, **several major developments** have highlighted both progress and challenges in the sector. New national highway projects like the invitation of bids for 52 highway stretches spanning over **2,100 km** aim to accelerate ongoing construction targets for the current financial year, backed by substantial investment plans.

Strategic projects are being launched to improve regional and international connectivity — including new **4-lane corridors** in Uttar Pradesh that will link to interstate and cross-border trade routes. At the same time, enhancements to existing routes continue: key bypass sections like parts of the **Vijayawada West Bypass** have been opened to ease congestion and shorten travel times, with full completion expected by 2026.



The **National Highways Authority of India (NHAI)** is also working toward **financial sustainability** — reducing its debt burden significantly, projected to drop below ₹2 lakh crore by March 2026.

However, the sector still faces **engineering and administrative challenges**. Local planning proposals sometimes face regulatory pushback due to safety and design standards, affecting ancillary infrastructure works like drainage. In certain regions, disputes over utilities have delayed essential road safety features such as street lighting on busy stretches. There are also environmental concerns as tree felling for new highway alignments triggers public debate over sustainability and ecological impact.

Overall, India's national highways remain dynamic and rapidly evolving — driving economic growth, improving connectivity, and offering myriad opportunities for civil engineers in design, construction, and asset management.

with practical insights into water treatment processes and distribution systems.

The team of students was accompanied by Dr. B. V. Mathew, Mrs. Neethu John, and Mr. Prasanth A, Staff members of the Department of Civil Engineering. During the visit, officials of the Kerala Water Authority briefed the students on the various stages of water purification, including sedimentation, filtration, disinfection, and supply management.



**Industrial Visit to Water Treatment Plant,
Malampuzha [22-08-2025]**



Activities (August - December 2025)

Industrial Visit to Water Treatment Plant at Malampuzha

The Civil Engineering students of Ahalia School of Engineering and Technology organized an industrial visit to the Water Treatment Plant at Malampuzha, operated under the Kerala Water Authority. The visit was conducted on August 22, 2025, with the objective of providing students

STHAPATYA 2025 Inaugurated at ASET

The Civil Engineering Association of Ahalia School of Engineering & Technology (ASET), Palakkad, formally inaugurated **STHAPATYA 2025** on September 17, 2025, marking the commencement of a series of academic and co-curricular activities planned for the year.

The programme began with a prayer followed by a warm welcome address by **Dr. B. V. Mathew**, Professor & Head, Department of Civil Engineering. The association logo was officially launched during the inaugural session, after which **Dr. P. R. Suresh**, Principal, ASET, delivered the presidential address, highlighting the importance of professional associations in shaping industry-ready engineers.

Dr. Rajeev N., Dean Academics, ASET, offered felicitation addresses, appreciating the efforts of the Civil Engineering Association in promoting technical excellence and student engagement. The inaugural address was delivered by **Mr. Anand Sebastian**, Senior Scientist & Head, Geospatial Science and Technology Division, Integrated Rural Technology Centre, Palakkad. His address emphasized the growing role of geospatial technologies in sustainable development.

A keynote session titled **“From Pixels to Policy: Geospatial Tools for Monitoring Sustainable Development Goals”** was conducted from 10:30 am to 1:15 pm, providing valuable insights into the application of geospatial tools in policy formulation and development planning. The session was well received by students and faculty alike.

The programme also featured an association briefing and the release of the association newsletter. The event concluded with a vote of thanks delivered by the Secretary of the Civil Engineering Association, expressing gratitude to the management, chief guest, Principal, faculty members, and students for their wholehearted support.

In the afternoon session, a series of technical games organized by the students added enthusiasm to the event, fostering teamwork, innovation, and active participation, thereby making the inauguration of STHAPATYA 2025 a memorable and enriching experience for all participants.



Training Program on Structural Engineering Essentials

A two-day hands-on training program on Structural Engineering Essentials was conducted on December 4 and 5, 2025, at the Design and Analysis Lab, organized by Archetype Design Services Pvt. Ltd., Coimbatore. The sessions were led by Er. S. Jagadesh Kannan, a chartered structural engineer with extensive industry experience.

The program introduced students to structural analysis software, plane and 3D frame modeling, and practical design techniques. Through demonstrations and hands-on tasks, participants gained valuable insights into industry-standard tools and methods. The event received positive feedback and proved to be a highly beneficial learning experience for students.



Webinar on Transition from Technical Roles to Managerial Leadership in the CRIP Sector

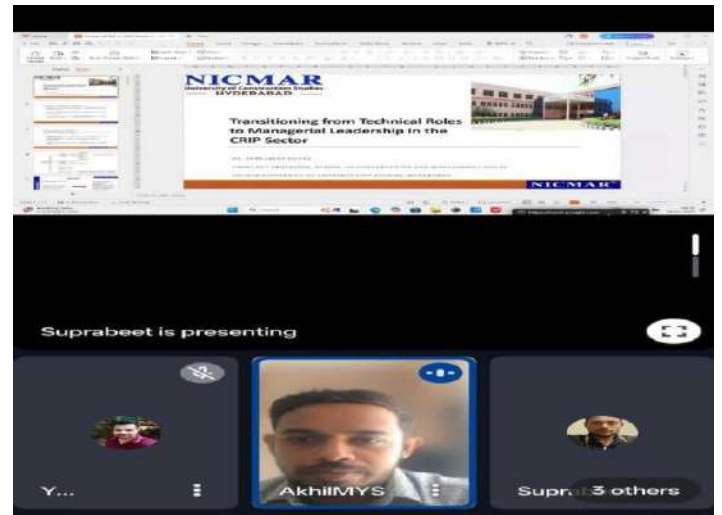
The Department of Civil Engineering, Ahalia School of Engineering & Technology (ASET), Palakkad, in association with NICMAR University, successfully organized a webinar titled “Transition from Technical Roles to Managerial Leadership in the CRIP Sector” on 16 December 2025, from 9:30 AM to 11:00 AM.

The session was delivered by Dr. Suprasbeet Datta, an eminent academic and industry expert from NICMAR University, who shared valuable insights into career progression within the Construction, Real Estate, Infrastructure, and Project (CRIP) sector. The webinar primarily targeted final-year and pre-final-year Civil Engineering students, aiming to bridge the gap between technical education and managerial competencies required in the industry.

Dr. Datta elaborated on the evolving role of civil engineers, highlighting the importance of management skills, leadership qualities, decision-making abilities, and industry-oriented education for career advancement. He also discussed emerging opportunities in project management, construction management, and infrastructure leadership roles, emphasizing the need for continuous learning and professional development.

The session was highly interactive, with students actively participating in discussions and seeking guidance on higher education options, career pathways, and industry expectations. The webinar concluded with a question-and-answer session, providing clarity on professional growth and the transition from site-level technical roles to strategic managerial positions.

The event was well received and proved to be informative and motivating, successfully achieving its objective of orienting students toward leadership roles in the built environment sector.



Webinar on “Circular Economy for Sustainable Development”

The Department of Civil Engineering, Ahalia School of Engineering and Technology, successfully organized a webinar on “Circular Economy for Sustainable Development” on 18 December 2025 at 7:00 PM under the Institution’s Innovation Council (IIC) initiative.



The session was led by Dr. Hema Nalini A. V., Dean (Research), Professor and Head, Department of Civil Engineering, MEAEC, Perinthalmanna, who delivered an informative and engaging talk on the principles of circular economy. She highlighted the significance of adopting circular economic models to minimize environmental impact, optimize resource utilization, and support long-term sustainable development.

During the webinar, Dr. Hema Nalini elaborated on the fundamentals of the circular economy, compared linear and circular economic models, and discussed practical applications of circular economy concepts in civil engineering and construction practices. She also emphasized the crucial role of engineers in achieving the Sustainable Development Goals (SDGs).

The webinar witnessed active participation from students, who engaged in interactive discussions and sought clarification on sustainable engineering practices. The event successfully enhanced awareness among participants about sustainability-oriented approaches in engineering and reinforced the department's commitment to innovation and environmental responsibility.



ACHIEVEMENTS



Nethra Pramod (S1 CE) Selected for 31st Senior National South Zone Kho-Kho Championship

Ahalia School of Engineering & Technology proudly congratulates **Nethra Pramod (S1 Civil Engineering)** on her remarkable achievement of being selected to represent the **Kerala State Team** at the **31st Senior National South Zone Kho-Kho Championship held in Karnataka**.

Her selection to this prestigious national-level tournament reflects her dedication, athletic excellence, and unwavering commitment to the sport. Competing at the senior national level is a significant milestone and a matter of great pride for our institution.

We applaud her hard work and determination and wish her continued success in all her future sporting endeavors.



institutions like IITs showcases their dedication and strengthens their technical foundation.

The department appreciates their hard work and encourages more students to actively participate in such value-added courses in the future.

Civil Engineering Students Successfully Complete NPTEL-SWAYAM Courses

The Department of Civil Engineering, Ahalia School of Engineering & Technology, proudly congratulates its students on successfully completing prestigious **NPTEL-SWAYAM online certification courses** offered by leading IITs.

Our students successfully completed courses including **Geotechnical Engineering Laboratory (IIT Bombay)**, **Global Navigation Satellite Systems and Applications (IIT Roorkee)**, **Electronic Waste Management – Issues and Challenges (IIT Kharagpur)**, and **Building Materials as a Cornerstone to Sustainability (IIT Madras)**.

This accomplishment reflects their commitment to academic excellence, continuous learning, and skill enhancement beyond the regular curriculum. Successfully earning certifications from premier