



Concrete Times

Volume 1

Technical Magazine

2021-22

S. S. V. S. S's

Dr. Bapuji Salunkhe Institute of Engineering &
Technology.

Department of Civil Engineering

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Editorial Team

Concrete Times – Volume 1

VISION OF INSTITUTION

To be the institute of quality engineering education and research for producing capable industry professionals with responsibilities towards nation building

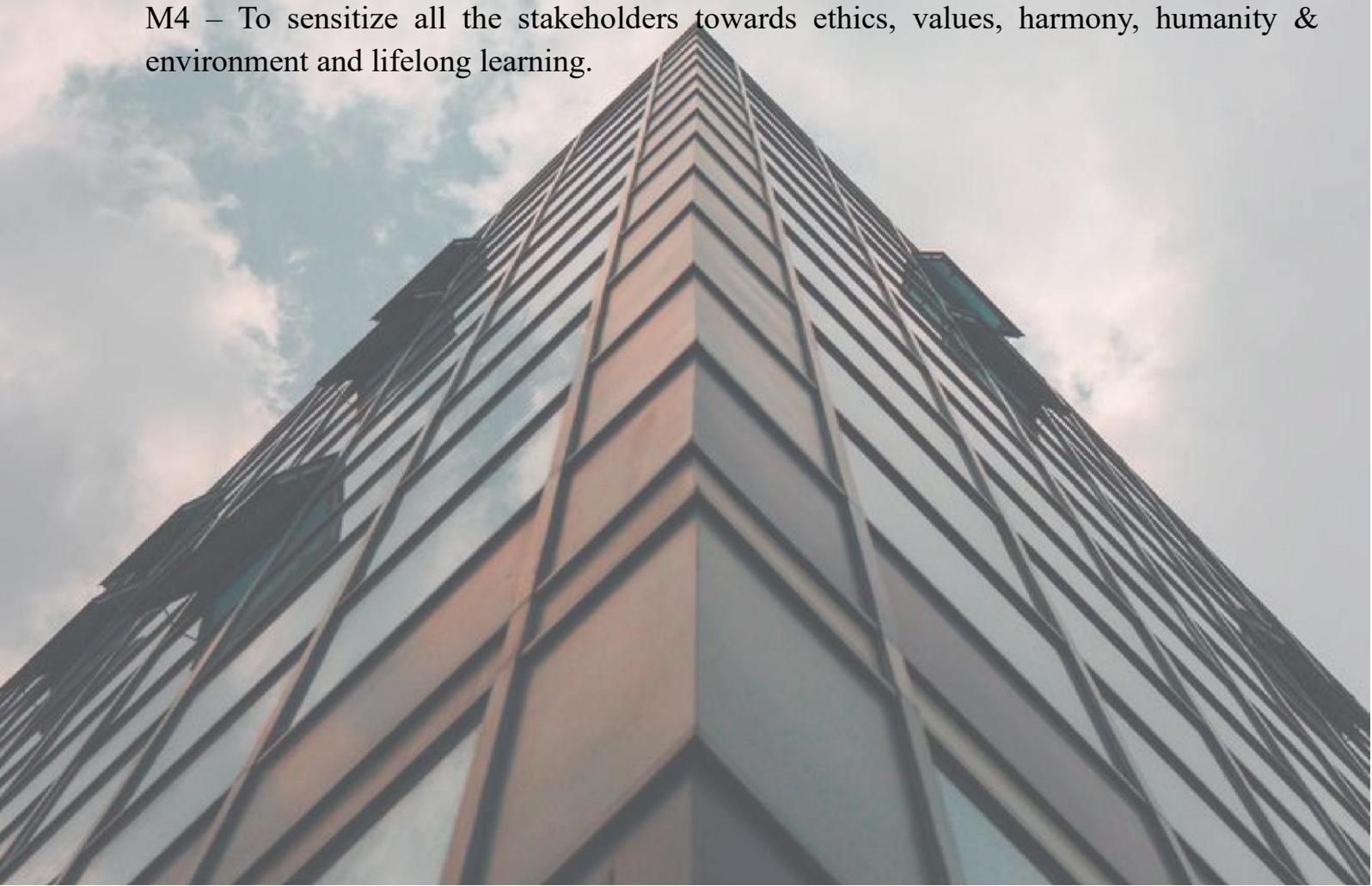
MISSION OF INSTITUTION

M1–To imbibe and implement outcome -based education for effective teaching learning process.

M2 – To upbringing critical thinking, research aptitude and problem-solving attitude among the students & teachers.

M3 – To strengthen industry interactions for upskilling and solving real world problems towards better internship & job opportunities.

M4 – To sensitize all the stakeholders towards ethics, values, harmony, humanity & environment and lifelong learning.



VISION OF DEPARTMENT

“To provide quality technical education for fulfilling social needs as a civil engineer”

MISSION OF DEPARTMENT

M1- To impart quality teaching, hands on training and value education to students.

M2- To inculcate professional ethics through quality and modern construction practices.

M3- To facilitate students for self – employability and pursue career enhancing courses.



PROGRAMME EDUCATIONAL OBJECTIVES

PEO 1 - Provide socially responsible, environment friendly solutions to Civil engineering related broad-based problems adapting professional ethics.

PEO 2 - Adapt state-of-the-art Civil engineering broad-based technologies to work in multidisciplinary work environments.

PEO 3 - Solve broad-based problems individually and as a team member communicating effectively in the world of work.

PROGRAMME OUTCOMES

PO 1. Basic knowledge: Apply knowledge of basic mathematics, sciences and basic engineering to solve the broad-based Civil engineering problems.

PO 2. Discipline knowledge: Apply Civil engineering knowledge to solve broad-based Civil engineering related problems.

PO 3. Experiments and practice: Plan to perform experiments and practices to use the results to solve broad-based Civil engineering problems.

PO 4. Engineering tools: Apply relevant Civil technologies and tools with an understanding of the limitations.



PO 5. The engineer and society: Assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to practice in field of Civil engineering.

PO 6. Environment and sustainability: Apply Civil engineering solutions also for sustainable development practices in societal and environmental contexts.

PO 7. Ethics: Apply ethical principles for commitment to professional ethics, responsibilities and norms of the practice also in the field of Civil engineering.

PO 8. Individual and team work: Function effectively as a leader and team member in diverse/multidisciplinary teams.

PO 9. Communication: Communicate effectively in oral and written form.

PO 10. Life -long learning: Engage in independent and life-long learning activities in the context of technological changes also in the Civil engineering and allied industry.

PROGRAMME SPECIFIC OUTCOME

PSO1: Civil Engineering Fundamentals Apply fundamental concepts of civil engineering such as building construction, surveying, structural engineering, transportation engineering, geotechnical engineering, and water resources engineering to solve practical engineering problems.

PSO2: Planning, Design, and Execution Assist in planning, designing, estimation, and execution of civil engineering projects using standard codes, drawings, and specifications with the help of modern tools and software.

PSO3: Site Practices and Quality Control Perform site supervision, material testing, quality control, and safety practices in construction projects by following standard procedures and professional ethics.

PSO4: Sustainability and Professional Practice apply sustainable construction practices, environmental considerations, and ethical responsibilities while working in civil engineering projects and professional environments.





MR VIREN D BHIRDI

PRINCIPAL'S MESSAGE

Dear Readers, It is my pleasure to present this edition of our biannual newsletter, highlighting the Department of Civil Engineering's achievements, innovations, and initiatives. Civil Voice reflects our commitment to excellence, leadership, and continuous learning. I applaud the team's dedication in crafting this platform, which fosters engagement and inspires progress. My heartfelt gratitude to all contributors for their hard work in making this possible. As we move forward, I am confident Civil Voice will grow stronger, capturing more milestones and sparking greater creativity. Let's keep turning ideas into action and shaping a brighter future together.



MR RHITURAJ K PATIL

HOD'S MESSAGE

Department mainly equips its students with diploma level expertise and appropriate skills in the field of civil engineering. This semester we organized guest lecture and Industrial visit which helped students to learn Advanced Civil Engineering software's, Construction Practices & Hands on Training on different surveying instruments. We also organized "CESA Departmental activities" a department level technical event.

The image features a central text element surrounded by a decorative border. The border is composed of four gold-colored L-shaped brackets, one in each corner, which together form a rectangular frame. The top and bottom edges of the frame are solid gold bars. The text is centered within this frame.

Technical Articles

Importance of Geotechnical Engineering in Construction

By-Mrs. S. P. Mengane

Geotechnical engineering is a specialized branch of civil engineering that deals with the study of soil, rock, and their behavior under different loading conditions. It plays a fundamental role in the planning, design, and construction of almost every type of civil engineering project. Since all structures ultimately rest on the ground, a proper understanding of subsurface conditions is essential to ensure safety, stability, and durability. Geotechnical engineering provides the necessary information about soil and rock properties, enabling engineers to design foundations and earth structures that can safely support the loads imposed by buildings and infrastructure.

One of the primary objectives of geotechnical engineering is to investigate and evaluate the subsurface conditions of a construction site. This is achieved through various soil exploration methods such as borehole drilling, trial pits, sampling, and in-situ testing. Laboratory tests are also conducted on soil samples to determine important properties such as grain size distribution, moisture content, Atterberg limits, shear strength, and compressibility. These tests help engineers classify the soil and assess its suitability for supporting different types of structures.

Foundation design is one of the most critical applications of geotechnical engineering. The foundation serves as the interface between the structure and the ground, transferring loads safely to the underlying soil or rock. If the foundation is not properly designed, the

structure may experience excessive settlement, tilting, or even collapse. Geotechnical engineers analyze the bearing capacity of soil and predict settlements to select the most appropriate type of foundation, such as shallow foundations, raft foundations, or deep foundations like piles and caissons. Proper foundation design ensures that the structure remains stable throughout its service life.

Geotechnical engineering also plays a vital role in the design and construction of earth-retaining structures such as retaining walls, sheet piles, and diaphragm walls. These structures are used to support soil in excavations, slopes, and embankments. Engineers must carefully analyze soil pressure, groundwater conditions, and potential failure mechanisms to ensure the stability of these systems. A well-designed retaining structure prevents landslides, soil erosion, and collapse, thereby protecting nearby buildings and infrastructure.

Another important area of geotechnical engineering is slope stability analysis. Natural and man-made slopes are commonly found in hilly regions, highways, railways, and open excavations. Unstable slopes can lead to landslides, which pose serious risks to human life and property. Geotechnical engineers assess slope stability by studying soil and rock properties, groundwater flow, and external loads. Based on these analyses, suitable stabilization measures such as retaining walls, soil nailing, rock bolting, and drainage systems are implemented to improve safety.

Groundwater conditions significantly influence the behavior of soil and the performance of foundations. High groundwater levels can reduce soil strength, increase settlement, and cause problems such as uplift pressure and seepage. Geotechnical engineering involves the study of groundwater flow and its interaction with soil. Dewatering techniques such as well points, deep wells, and drainage systems are used to control groundwater during construction. Effective groundwater management ensures a safe and dry working environment and improves the long-term performance of structures.

Geotechnical engineering is also essential in the design of transportation infrastructure such as roads, railways, airports, and tunnels. The strength and deformation characteristics of subgrade soil directly affect pavement performance. Weak or expansive soils can cause cracking, rutting, and uneven surfaces. Geotechnical investigations help in selecting suitable soil improvement techniques such as compaction, stabilization with lime or cement, and use of geosynthetics. These measures enhance the load-carrying capacity of soil and extend the service life of transportation facilities.

In addition to traditional construction, geotechnical engineering plays a crucial role in modern and specialized projects such as offshore structures, wind turbine foundations, and underground constructions. These projects often involve complex soil-structure interactions and challenging environmental conditions. Advanced analytical methods and numerical modeling tools are used to predict soil behavior and optimize design solutions. The application of modern technology has significantly improved the accuracy and reliability of geotechnical designs.

Safety and risk management are central to geotechnical engineering practice. Many construction failures in the past have occurred due to inadequate understanding of subsurface conditions. By conducting thorough site investigations and adopting appropriate design methods, geotechnical engineers help minimize uncertainties and reduce the risk of failure. This not only protects human life but also prevents costly repairs and project delays.

Geotechnical engineering also contributes to sustainable construction. By understanding soil behavior, engineers can optimize foundation sizes, reduce material consumption, and reuse existing ground conditions effectively. Techniques such as ground improvement and soil stabilization allow problematic soils to be used safely, reducing the need for extensive excavation and replacement. This results in lower environmental impact and improved resource efficiency.

In conclusion, geotechnical engineering is an indispensable component of civil engineering that ensures the safe and economical design of foundations and earth structures. It provides the scientific basis for understanding soil and rock behavior and translating this knowledge into practical design solutions. From small residential buildings to massive infrastructure projects, geotechnical engineering influences every stage of construction. Its importance lies in safeguarding structures, protecting lives, and promoting sustainable development. As construction projects continue to grow in complexity, the role of geotechnical engineering will become even more critical in shaping the built environment.

Role of Sustainable Materials in Modern Construction

By- Mr. R. K. Patil

The construction industry is one of the largest consumers of natural resources and energy across the world. Rapid population growth, urbanization, and infrastructure development have significantly increased the demand for construction materials such as cement, steel, aggregates, bricks, and timber. While these materials have contributed immensely to the growth of modern society, their production and use also result in serious environmental challenges, including depletion of natural resources, high energy consumption, and emission of greenhouse gases. In this context, the adoption of sustainable materials in modern construction has become a necessity rather than an option.

Sustainable materials are materials that are environmentally responsible, economically viable, and socially beneficial throughout their entire life cycle. This life cycle includes extraction of raw materials, manufacturing, transportation, construction, operation, maintenance, and final disposal or recycling. The main objective of using sustainable materials is to minimize negative environmental impact while maintaining the required strength, durability, and performance of structures. Sustainable construction aims to achieve a balance between development and environmental protection.

One of the major environmental concerns in construction is the high carbon footprint associated with conventional materials. Cement production alone contributes a significant percentage of global carbon dioxide emissions. Sustainable alternatives such as blended cement, fly ash cement, and

geopolymer concrete help reduce these emissions by partially or completely replacing ordinary Portland cement with industrial by-products. Fly ash, ground granulated blast furnace slag (GGBS), and silica fume are commonly used supplementary cementitious materials that improve both environmental performance and mechanical properties of concrete.

Recycled and reused materials also play a crucial role in sustainable construction. Construction and demolition waste, when properly processed, can be reused as recycled aggregates in new concrete and road construction. Similarly, recycled steel, glass, and plastic can be incorporated into building components. The use of recycled materials reduces the demand for virgin resources and decreases the amount of waste sent to landfills. This approach supports the concept of a circular economy, where materials are continuously reused rather than discarded.

Energy efficiency is another important aspect of sustainable materials. Materials with good thermal insulation properties help reduce heat transfer through building envelopes. Examples include aerated concrete blocks, insulated wall panels, and reflective roofing materials. By improving thermal performance, these materials reduce the need for artificial heating and cooling, leading to lower energy consumption and operating costs. In hot climates, reflective and light-colored materials help minimize heat absorption, while in cold climates, insulating materials help retain heat within buildings.

Durability is a key characteristic of sustainable materials. Materials that resist corrosion, weathering, chemical attack, and wear require less maintenance and have a longer service life. High-performance concrete, fiber-reinforced concrete, and corrosion-resistant steel are examples of durable materials used in modern construction. Longer-lasting materials reduce the frequency of repairs and replacements, which in turn saves resources, energy, and money over the life of a structure.

Sustainable materials also contribute to improved indoor environmental quality. Many conventional building materials release volatile organic compounds (VOCs) that can cause health problems. Low-VOC paints, adhesives, sealants, and finishes help maintain better indoor air quality. Natural materials such as bamboo, wood, cork, and clay-based products are renewable and create healthier indoor environments. Good indoor environmental quality enhances occupant comfort, productivity, and well-being.

The economic benefits of sustainable materials are often realized over the entire life cycle of a building. Although some sustainable materials may have a higher initial cost, their long-term benefits such as reduced energy consumption, lower maintenance costs, and extended service life result in overall cost savings. Life-cycle cost analysis is an important tool used to compare different material options and select the most economical solution in the long run.

Sustainable materials also support social sustainability by promoting safer and healthier living conditions. The use of non-toxic materials, improved ventilation, and better thermal comfort contributes to the quality of life of building occupants. In addition, the use of locally available materials creates

Government regulations and green building rating systems have further encouraged the use of sustainable materials. Many countries have introduced building codes and standards that promote energy efficiency and environmental protection. Green building certification systems evaluate projects based on material selection, energy performance, water efficiency, and indoor environmental quality. Such initiatives motivate designers and builders to adopt sustainable practices.

Civil engineers play a vital role in the successful implementation of sustainable materials. They are responsible for selecting appropriate materials, evaluating their performance, and ensuring compliance with standards. Engineers must stay updated with the latest developments in sustainable technology and incorporate innovative solutions into their designs. Education and training in sustainable construction practices are essential for preparing future engineers to address environmental challenges.

In conclusion, sustainable materials are transforming modern construction by making it more environmentally responsible, energy-efficient, and economically viable. Their use helps conserve natural resources, reduce pollution, and improve the quality of life for present and future generations. As the demand for infrastructure continues to grow, the importance of sustainable materials will become even greater. By embracing sustainable material practices, the construction industry can contribute significantly to a greener and more sustainable future..

Photo Gallery





सकाळ

कोल्हापूर, शनिवार,
१७ जुलै २०२१

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रमण मळा : कार्यकारी अभियंता अशोक धोंगे यांचे स्वागत करताना प्रा. अभयकुमार साळुंखे आदी.

‘डॉ. साळुंखे इन्स्टिट्यूट’ची तांत्रिक सल्लागारपदी निवड

रमण मळा, ता. १६ : डॉ. बापूजी साळुंखे इन्स्टिट्यूट ऑफ इंजिनिअरिंग अँड टेक्नॉलॉजीची शासनामार्फत जिल्हा परिषदेच्या ग्रामीण पाणीपुरवठा विभागांतर्गत राबट्रिण्यात येणाऱ्या घनकचरा, सांडपाणी व्यवस्थापनाचा प्रकल्प अहवाल तयार करण्यासाठी तांत्रिक सल्लागारपदी निवड झाली.

स्वच्छ भारत अभियान (ग्रामीण टप्पा क्रमांक २) अंतर्गत घनकचरा, सांडपाणी व्यवस्थापन प्रकल्प राबट्रिण्याच्या अनुषंगाने पाणीपुरवठा, स्वच्छता विभागाच्या मार्गदर्शक सूचनेनुसार जिल्हा परिषदेमार्फत घनकचरा, सांडपाणी व्यवस्थापनाचे प्रकल्प अहवाल तयार करण्यासाठी तांत्रिक सल्लागार नेमणुकीबाबत जाहिरात प्रसिद्ध केली होती. त्यानुसार प्राप्त प्रस्तावांची छाननी होऊन मुख्य कार्यकारी अधिकार्यांनी डॉ. बापूजी साळुंखे इन्स्टिट्यूट ऑफ इंजिनिअरिंग अँड टेक्नॉलॉजीची निवड केली. निवडीचे पत्र ग्रामीण पाणीपुरवठा विभागाचे कार्यकारी अभियंता अशोक धोंगे यांच्या हस्ते श्री स्वामी विवेकानंद शिक्षण संस्थेचे कार्याध्यक्ष प्रा. अभयकुमार साळुंखे यांच्याकडे प्रदान करण्यात आले.

हा प्रस्ताव तंत्रनिकेतनमधील सिव्हील इंजिनिअर विभागामार्फत सादर केला. यासाठी विभागप्रमुख प्रा. आर. के. पाटील, प्रा. ए. बी. सोनळकर, विभागामधील कर्मचाऱ्यांनी परिश्रम घेतले. सचिव प्रा. शुभांगी गावडे, तंत्रनिकेतनचे प्राचार्य रामचंद्र पाटील यांचे प्रोत्साहन लाभले.



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