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**TRAINING**

**PROGRAMME**

**REPORT**

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# **ACKNOWLEDGEMENT**

The Energy Conservation and Sustainable Building Code (ECSBC), Building Cell, UREDA, Uttarakhand extends its heartfelt gratitude to Mr. Vishal Kumar (Manager), for their invaluable support, visionary guidance, and continuous encouragement in organizing the One-Day Type-A Workshop Energy Conservation and Sustainable Building Code (ECSBC),

Our sincere appreciation also goes to Mr. Vishal Kumar (gswgrew), whose expert-led sessions on offered valuable insights and enriched the learning experience for all participants.

Their shared expertise and deep understanding of Building Envelope, HVAC Design Awareness, Sustainable Site Planning, Waste Management and Water Conservation and management greatly contributed to the knowledge-sharing objectives of the workshop, empowering stakeholders to advance energy-efficient and sustainable building practices across Rajasthan.

Finally, we thank all **participants and departmental representatives** for their active engagement, feedback, and commitment to promoting sustainable and energy-efficient buildings in the state

# **EXECUTIVE SUMMARY**

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| This initiative aims to foster the development of environmentally responsible and resource-efficient buildings through a comprehensive and integrated approach. Central to this vision is the optimization of building envelopes, the use of energy-efficient HVAC systems, and the implementation of sustainable site planning, water conservation, and waste management practices.  By enhancing thermal performance, reducing energy consumption through intelligent HVAC design, and employing passive design strategies, the project seeks to significantly reduce the environmental impact of buildings. These efforts are further supported by advanced water-saving technologies and comprehensive waste management systems that align with circular economy principles and reduce environmental pollution.  The program also emphasizes the importance of designing climate-resilient buildings that are responsive to their environmental context. This includes maximizing the use of natural ventilation and daylight, incorporating renewable energy sources, and selecting low-impact, sustainable materials.  A holistic green building strategy underpins the entire initiative, integrating architectural, mechanical, and environmental systems. This approach ensures occupant comfort, lowers operational costs, and supports long-term sustainability objectives—positioning buildings as key contributors to a more sustainable and resilient future. |

# **INTRODUCTION**

The **Energy Conservation and Sustainable Building Code (ECSBC) 2024** is a major policy upgrade introduced by India’s Bureau of Energy Efficiency (BEE) to promote environmentally sustainable and energy-efficient construction practices. Building on the foundation of the earlier ECBC 2017, the ECSBC 2024 expands its scope to include both commercial and residential buildings, making it a unified and inclusive code. It applies to new constructions with a connected load of 100 kW or more and introduces performance-based standards across key areas such as energy-efficient HVAC and lighting systems, renewable energy integration (including solar power and EV charging infrastructure), water conservation, waste management, sustainable materials, and indoor environmental quality.

The ECSBC 2024 categorizes buildings into three performance tiers—ECSBC-Compliant, ECSBC+, and Super ECSBC—encouraging developers to adopt increasingly sustainable practices. States like Andhra Pradesh and Telangana are leading its implementation, integrating it into local bylaws and launching training programs for architects, engineers, and third-party assessors. With projections of up to 50% energy savings in the building sector and potential reductions of 300 million tons of CO₂ by 2030, the code plays a critical role in supporting India’s climate commitments under the Paris Agreement. While challenges remain in terms of enforcement, awareness, and coordination across jurisdictions, ECSBC 2024 represents a significant step toward transforming India’s construction landscape for a low-carbon future.

# **OBJECTIVE**

To develop environmentally responsible and resource-efficient buildings by integrating key components such as envelope optimization, energy-efficient HVAC systems, sustainable site planning, and effective water and waste management practices.

To reduce the environmental impact of buildings by enhancing thermal performance through optimized envelopes, reducing energy consumption with smart HVAC design, and employing passive design strategies that complement sustainable site use.

To promote sustainable resource use by implementing advanced water conservation systems and comprehensive waste management strategies that reduce environmental pollution and support circular economy principles.

To design climate-resilient buildings that respond effectively to their environmental context by leveraging sustainable site planning, maximizing natural ventilation and daylight, and using renewable energy and low-impact materials.

To apply a holistic green building strategy that integrates architectural, mechanical, and environmental systems—ensuring occupant comfort, reducing operational costs, and achieving long-term sustainability goals.

# **Workshop Details**

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| --- | --- |
| **Venue**: | qadfaef |
| **Organized By**: | sdfaef |
| **Dated:** | 2023-05-2910:00 AM – 05:00 PM |
| **Master’s Trainer Introduction:** | |
| Mr. Vishal Kumar (gswgrew) | |

# **Inaugural Session**

The event began with a warm welcome address delivered by officials from the UREDA

The session was graced by the esteemed presence of Mr. Vishal Kumar who attended as the Chief Guest.

The presence and guidance of {{GUIDANCE\_PERSON}} , was instrumental in reinforcing the significance of the workshop and encouraging participants to take active roles in promoting sustainable practices in their respective departments.

The dignitaries also interacted briefly with the participants and encouraged them to adopt energy-efficient design principles in upcoming building projects to support the state’s energy conservation mission.

The inaugural session concluded with the felicitation of the **Chief Guest,** guest speakers and a group photograph with participants and officials.

# **Technical Sessions Overview & Key Learnings**

**Envelope Optimization**

**Understand Key Principles**

Grasp the fundamental concepts of building envelope design and its role in enhancing energy efficiency, thermal performance, and environmental sustainability.

**Identify Effective Materials and Techniques**

Recognize and select appropriate materials and construction techniques that improve insulation, reduce thermal bridging, and maximize daylighting potential without compromising thermal performance.

**Evaluate and Apply Performance Strategies**

Analyse envelope design strategies and apply best practices to improve overall building performance, reduce energy consumption, and enhance occupant comfort and well-being.

**HVAC Design Awareness**

**Gain Knowledge of Energy-Efficient HVAC Design and Operations**

Develop an understanding of HVAC system components, design principles, and operational strategies that maximize energy efficiency and minimize environmental impact.

**Understand HVAC’s Impact on Indoor Air Quality and Building Efficiency**

Explore how HVAC systems influence indoor air quality, occupant health, and overall building performance, including ventilation, humidity control, and pollutant management.

**Explore Emerging Trends and Technologies**

Stay informed about the latest innovations and sustainable technologies in HVAC design, such as smart controls, variable refrigerant flow (VRF) systems, geothermal heating, and advanced filtration

**Sustainable Site Planning**

**Recognize Principles of Sustainable Site Selection and Planning**

Understand key criteria for choosing and planning sites that minimize environmental disruption and promote long-term sustainability.

**Integrate Environmental Impact Considerations**

Incorporate strategies that assess and mitigate the ecological footprint of site development, including soil preservation, water management, and habitat protection.

**Develop Strategies to Reduce Heat Island Effect and Enhance Biodiversity**

Implement design solutions such as green landscaping, permeable surfaces, and native vegetation to lower urban heat buildup and support local ecosystems.

**Water Conservation and Management**

**Learn Best Practices for Efficient Water Use**

Explore methods to optimize water consumption in both building systems and landscape irrigation, emphasizing sustainability and cost-effectiveness.

**Understand Rainwater Harvesting, Greywater Reuse, and Water-Efficient Fixtures**

Gain knowledge of innovative water-saving technologies and systems, including rainwater collection, greywater recycling, and high-efficiency plumbing fixtures.

**Waste Management and Other Components**

**Develop Sustainable Waste Management Strategies**

Formulate effective approaches for waste reduction through recycling, composting, and responsible disposal during construction and building operation.

**Understand Materials Selection to Minimize Waste**

Recognize how choosing sustainable, durable, and recyclable materials can significantly reduce both construction debris and operational waste generation.

**Explore Additional Sustainability Components**

Investigate complementary sustainability aspects such as renewable energy integration, enhancing indoor environmental quality, and achieving green building certifications (e.g., LEED, WELL).

# **Photo Gallery**

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# **Conclusion**

The ECSBC Commercial and Residential (ENS) training empowers participants with critical knowledge and practical skills in sustainable building practices across both commercial and residential sectors. Through focused learning on envelope optimization, HVAC design, sustainable site planning, water conservation, and waste management, trainees gain the ability to significantly improve building performance, energy efficiency, and environmental stewardship. This training enhances professionals’ capacity to integrate innovative solutions and comply with evolving regulations and green certification standards, ultimately contributing to healthier, more comfortable, and sustainably built environments.

Recommendations for future workshops

**Advanced Building Envelope Technologies**

Dive deeper into cutting-edge materials and smart systems that further enhance thermal performance, moisture control, and durability in both commercial and residential buildings.

**Integrated HVAC Systems and Smart Controls**

Explore advanced HVAC designs incorporating IoT, AI-driven controls, and adaptive systems to optimize energy use and indoor air quality dynamically.

**Net-Zero and Carbon-Neutral Building Strategies**

Focus on comprehensive approaches to achieve net-zero energy and carbon neutrality, including renewable energy integration, energy storage, and embodied carbon reduction.

**Water Resilience and Climate-Adaptive Strategies**

Develop expertise in innovative water management solutions that address climate variability, drought resilience, and urban water challenges.

**Circular Economy and Sustainable Materials**

Investigate material lifecycle approaches, circular economy principles, and innovations in construction waste reduction and reuse.

**Indoor Environmental Quality and Health**

Address emerging research on indoor air quality, occupant health, and well-being, integrating ventilation, lighting, acoustics, and materials choices.

# **Annexure-I (Agenda of the Training)**



# **Annexure-II (Flyer of the Training)**



# **Annexure-III (Attendance Sheet)**

{{ANNEXURE3\_TABLE}}

# **Annexure-IV (Feedback Form)**

{{ANNEXURE4\_TABLE}}

# **Annexure-V (Registration Form)**

{{ANNEXURE5\_TABLE}}