

# Training Program on Innovative Construction Technologies & Thermal Comfort in Affordable Housing



## RACHNA for Officers on 15<sup>th</sup> June 2022

Venue: Imperial-3 (Second Floor), Le Lac Sarovar Portico, Line Tank Road, Behind, Firayalal, Ranchi- 834001

### Thermal Comfort Training Modules in Affordable Housing

‘RACHNA for Officers’ training program will deliver in-depth knowledge on thermal comfort, its nuances, and its relationship with building physics. Moreover, it will discuss design strategies, construction techniques, policy documents, building codes, international practices, and other aspects relevant to thermal comfort in affordable housing through a suite of case studies. Additionally, it will familiarize participants with the evaluation process of thermal comfort, the statistics, and indicators involved as well as affordable cooling technologies and their applicability in various climates.

### Session plan

Thermal Comfort Training Module		
10h00 – 10h10	<b>Welcome address and Introduction to PMAY-U</b>	<b>MoHUA</b>
10h10 – 10h15	<b>Introduction to Climate Smart Buildings Programme (IGEN – CSB) and overview of a workshop</b>	<b>GIZ</b>
10h15 – 11h00	<b>Session 2 (Technical): Importance of Thermal Comfort</b> <i>This session will establish the importance of thermal comfort. It will provide an insight into the connections between comfort, physiology, health, and productivity. It will very briefly expose the readers to the connection between buildings and comfort. It will provide overarching guidance about the ways and means to achieve comfort in buildings. With the help of examples, the section on the factors affecting thermal comfort will help the reader understand the factors affecting thermal comfort. The chapter will end with establishing a relation between comfort and associated energy consumption through cooling needs.</i>	<b>Dr. Rajan Rawal</b>
11h00 – 11h10	<b>Questions and Answers</b>	

11h10 – 11h20	<b>Health Break</b>	
11h20 – 12h05	<p><b>Session 3 (Technical): Affordable Housing Passive Design Strategies</b></p> <p><i>This session will start with the introduction of passive design and its importance. It will provide a quick overview of various strategies before detailing out few strategies that are important to be incorporated in affordable housing. The session will provide insights into the site level design decisions as well as building-level design decisions. It will further provide a comparative understanding of appropriate orientation, use of building mass to reduce radiative heat gains in warm climates, it will guide fenestration design, location, and shading design appropriate for affordable housing. The use of appropriate ventilation for comfort and well-being also will be covered in this session. The session will also provide selected case studies that have adopted best practice approaches at the site and at the building level to implement passive design strategies.</i></p>	<b>Dr. Rajan Rawal</b>
12h05 – 12h15	<b>Questions and Answers</b>	
12h15 – 13h15	<p><b>Session 4 (Technical): Building Materials and Methods of Construction for Affordable Housing</b></p> <p><i>This session will start with the overview of affordable walling, roofing and fenestration materials and technologies. It will further detail the appropriateness of materials and methods of the construction for housing and its applicability in various housing typologies. The chapter further enhances the understanding of the reader to adopt materials and methods according to the climate context. The focus would also be given to alternative construction technologies, low embodied carbon materials, availability of material locally and economics of it. The chapter will also provide selected case studies that have adopted best practice approaches at the building level with construction technologies and materials.</i></p>	<b>Dr. Rajan Rawal</b>
13h15 – 13h30	<b>Questions and Answers</b>	
13h30 – 14h30	<b>Lunch Break</b>	
14h30 – 15h15	<p><b>Session 5 (Technical): Building Codes, Affordable Housing and Thermal Comfort</b></p> <p><i>This session will provide an understanding of the provision of various thermal comfort-related clauses in the National Building Code, Eco Niwas Samhita, various</i></p>	<b>Dr. Rajan Rawal</b>

	<p><i>guidelines provided by the government. It also will provide insights into the implementation of policy. The reader will be able to comprehend the process of implementing the code at the local level. It will discuss the programming of code implementation, the economics of it as well as the benefits of the codes. Further, this section will outline the codes implemented internationally through the voluntary market-based systems, government byelaw, provisions in ISO, and ASHRAE standards.</i></p>	
15h15 – 15h30	<b>Questions and Answers</b>	
15h30 – 15h45	<b>Health Break</b>	
15h45 – 16h45	<p><b>Session 6 (Technical): Application of Thermal Comfort in Affordable Housing- A Suite of Case Studies</b></p> <p><i>This session will bring salient features of the projects that have demonstrated approaches to achieve thermal comfort in affordable housing. This session will include the projects that were conceived using integrated design practices. The case studies in this session will highlight more than one aspect of the project that meets the objective of affordability and comfort. The on-site performance of the housing also will be included to help the participants understand the methods of field performances.</i></p>	<b>Dr. Rajan Rawal</b>
16h45 – 16h55	<b>Questions and Answers</b>	
16h55 – 17h25	<p><b>Overview of Innovative construction technologies implemented in Light House Projects (LHPs)*</b></p> <p>This session will highlight the following innovative technologies being implemented in six LHPs:</p> <ol style="list-style-type: none"> <li>1. Chennai: Industrialized '3-S' Prefab Technology</li> <li>2. Rajkot: Tunnel Formwork</li> <li>3. Lucknow: Stay-in-Place Formwork System</li> <li>4. Indore: Prefabricated Sandwich Panel System</li> <li>5. Ranchi: Precast Concrete Construction – 3D Volumetric</li> <li>6. Agartala: Light Gauge Steel Structural System &amp; Pre-engineered Steel Structural System</li> </ol>	<b>BMTPC</b>
17h25 – 17h30	<b>Session 7: Feedback and concluding remarks</b>	<b>Dr. Rajan Rawal</b>

\*The session cannot be conducted in a hybrid or online format for the in-person events.