



NOTIFICATION & IMPLEMENTATION PLAN FOR URBAN LOCAL BODIES

Development of Thermal Comfort Action Plan 2050 and
Thermal Comfort Performance based Design Standard cum
Guidelines for Affordable Housing in India. [REF: 8338 0638]



Environmental
Design Solutions
Private Limited



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Climate, Environment and
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Disclaimer

This report is prepared by Consortium of Environmental Design Solutions Private Limited [EDS], Wuppertal Institute for Climate, Environment and Energy GmbH and Hunnarshala Foundation for Building Technology and Innovation (referred to as Consortium Partners from here on) for the Ministry of Housing Affairs (MoHUA) and the Deutsche Gesellschaft fur Internationale Zusammenarbeit (GIZ) GmbH. This report is part of the *“Development of Thermal Comfort Action Plan 2050 and Thermal Comfort Performance based Design Standard cum Guidelines for Affordable Housing in India. [REF: 8338 0638]”* project under the *Climate Smart Buildings Program* funded by GIZ India.

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I Introduction

The Thermal Comfort Design Standard has been prepared to provide a framework for the development of thermally comfortable homes. The standard translates solar passive design principles into design requirements to ensure a minimum level of thermal comfort performance in unconditioned buildings with focus on affordability. The minimum level of thermal comfort performance is defined by the comfort potential achievable through passive design at no or minimal cost and without reliance on active space conditioning (with the exception of circulatory/exhaust fans). While the focus of the standard is indoor thermal comfort, it takes a far-sighted view to address future cooling use, and influence future planning policies.

In accordance with the Indian Constitution, national policies and international obligations, the standard identifies design requirements to ensure a certain minimum level of thermal comfort performance in residential developments with specific emphasis on low-income housing that have limited means/access to mechanical comfort systems. The requirements are based on adaptive thermal comfort. The standard further introduces design requirements for meeting progressively improved levels of thermal comfort. The further requirements would also prepare buildings for the potential use of active thermal comfort systems, to enable their operation at low energy use.

The standard applies to buildings used for residential purposes. It is a design standard applicable to building/s in the design stage, or building/s undergoing additions or alterations. The standard is applicable to the whole building. In the case of additions and/or alterations, compliance shall be demonstrated for the whole building. The standard is not applicable to parts of the building. It includes requirements for the building envelope, low energy cooling/heating systems, and lighting fixtures.

The Notification & Implementation Plan for Urban Local Bodies (ULBs) outlines the procedure to integrate thermal comfort design standards within building bye-laws including approval processes. It also recommends measures to strengthen the capacity of ULBs to adopt and implement the standard.

2 Integrating the standard in building bye-laws

Building regulations govern the construction and maintenance of buildings. Typically enacted by local or states governments, the inclusion of thermal comfort design considerations can be mandated in building bye-laws. The process for ULBs to integrate the standard in the existing bye laws and execute its provisions within their jurisdiction is proposed below.

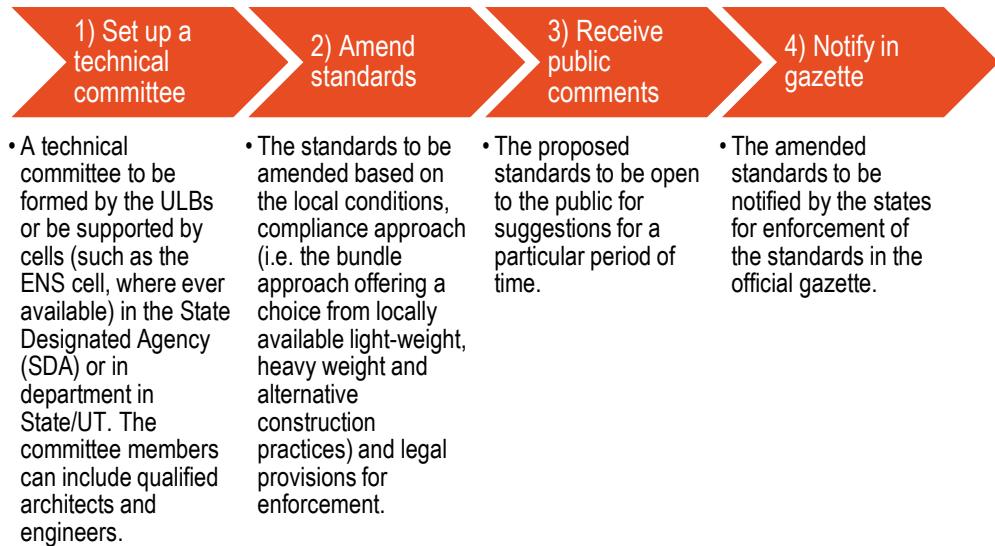


Figure 1 Proposed process to update bye-laws

3 Integration of the standard in building approval process

The integration of the thermal comfort design standard in the building approval process will involve reviews of documents and plans, on-site inspections, and compliance assessments at different stages. The proposed process can vary based on the regulations and practices of the individual state/UTs.

Planning Stage

The pre-construction approval process includes land purchase. The process requires securing the necessary approvals (as applicable), including any other relevant approvals that are mandated. These approvals may include:

- Forest Approval (From Forest Department)
- Environment Clearance (From MoEF&CC)
- Consent to Establish Building
- Mining Approval

After the mining approval (if applicable), the subsequent step is the commencement of the building excavation phase, followed by the initiation of the construction phase. This may include the following approvals (as applicable):

- Zoning Approval
- Fire Fighting Scheme
- Height Clearance

Design and Construction Phase

Building plans are sanctioned by the development authority through a procedure that typically requires inputs on architecture, mechanical, electrical and plumbing (MEP), and Eco Niwas Samhita (ENS) Compliance, etc. The set of plans and drawings may include;

- Site and Building Plans
- Structural Design
- Electrical Layout
- Plumbing Layout
- HVAC Layout
- ENS Compliance Report

Thermal comfort compliance can be a part of this approval process. It is recommended to include the following set of documents and specifications to ensure that the building achieves the desired level of thermal comfort performance.

- Material specification sheets (provided by the manufacturer)
- Calculations for window area to exposed wall area ratio (by wall surface), window area/operable window area to carpet area ratio, U-factor for composite opaque assemblies, and density for composite opaque assemblies.
- Equipment schedules
- Compliance forms for building envelopes, low energy systems, lighting systems, and other special requirements in large residential complexes.

It is recommended that the development authority conduct inspection to check thermal comfort compliance when the building reaches the plinth level. Furthermore, an examination of thermal comfort compliance can also be conducted at the terrace level.

Post Construction Phase

During post construction phase, after commissioning of installed equipment, No Objection Certificates (NOCs); such as fire, lift, sewage treatment plant, HYSD (HSD), diesel generator, electrical systems, and ENS; as applicable may be applied for. A final check for thermal comfort compliance is recommended at this stage to avail the occupancy certificate.

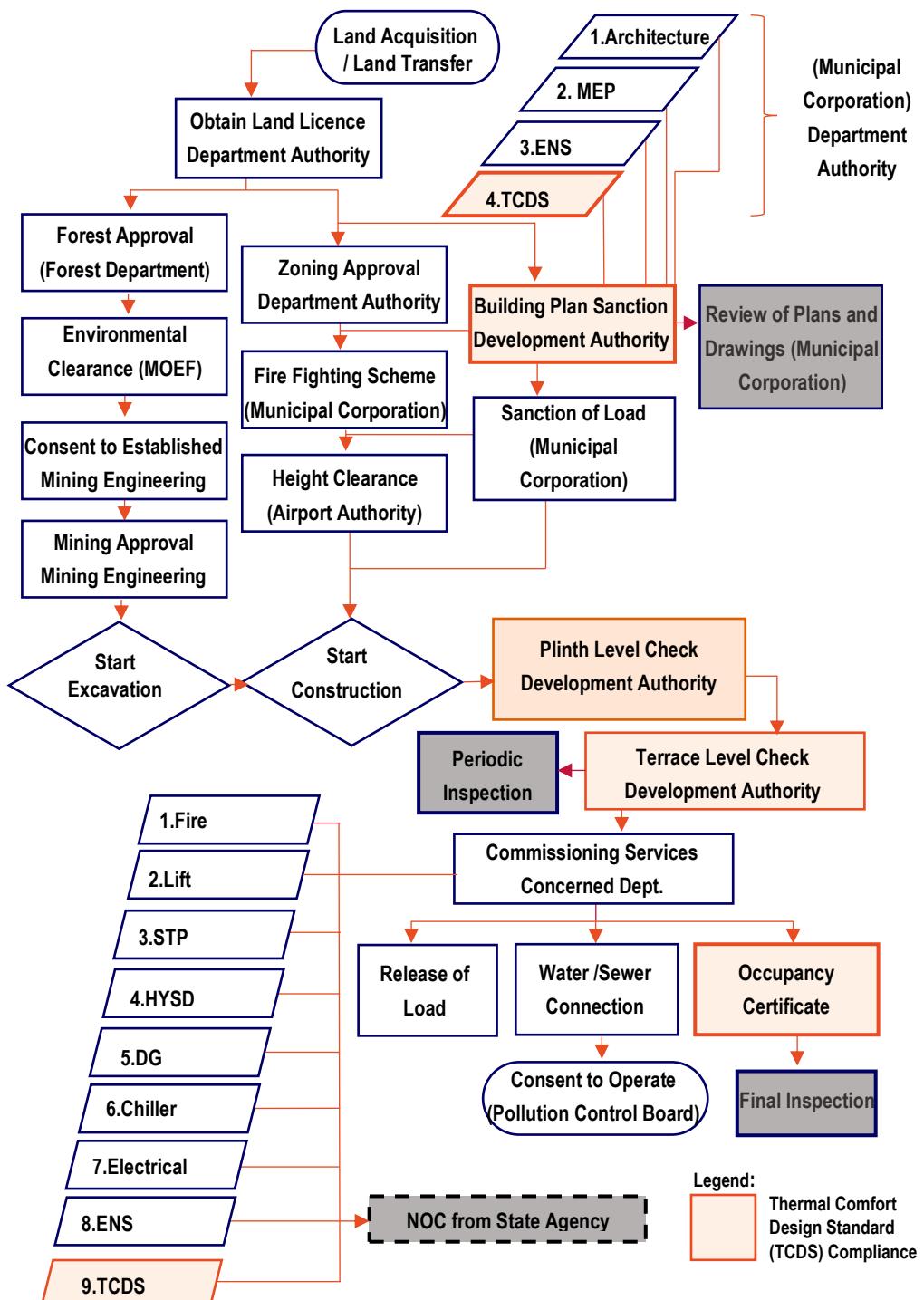


Figure 2 Integration of the Thermal Comfort Design Standard in the building approval process

Note: The proposed process can vary based on the regulations and practices of the individual state/UTs.

4 Empanelment process of professionals

Strengthening the institutional capacities at state/UT and ULB levels is required to ensure design and construction of thermally comfortable homes. Accredited professionals are key to this.

An accreditation program can be developed to offer training to professionals to design and construct buildings based on the thermal comfort design standard. The trained professionals can be empanelled by the ULBs. The training program can cover topics related to passive design strategies and alternate building materials, low-energy systems, as well as compliance mechanisms, etc.

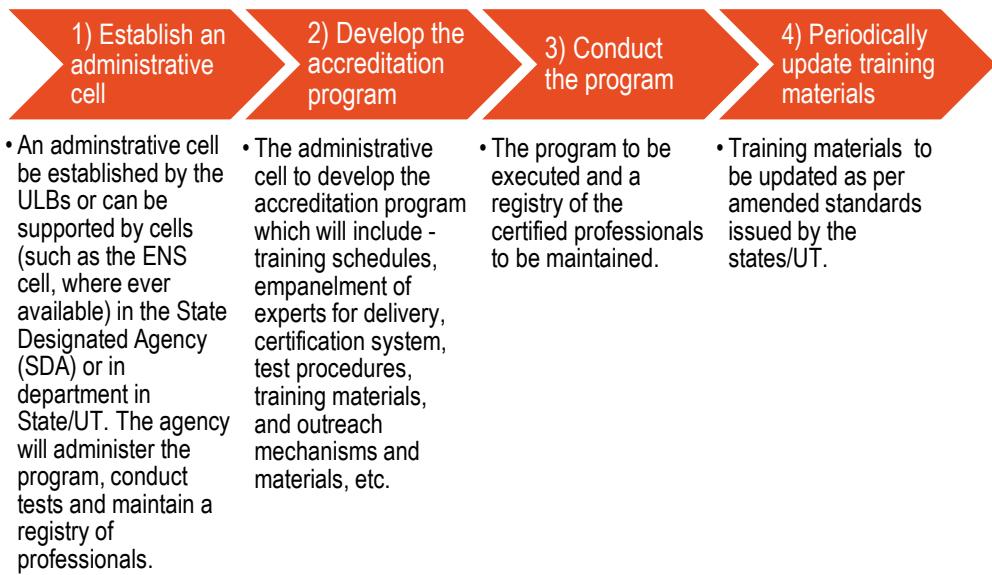


Figure 4 Proposed process to empanel professionals.

5 Notification Template (Draft)

The following notification template is drafted for states to announce the 'Thermal Comfort Design Standard' and the 'Implementation Plan for Urban Local Bodies (ULBs)' to elicit public comments. After the received comments are reviewed, an official notification can be published in the state/UT's official gazette.

THE 'enter STATE/UT' OFFICIAL GAZETTE

Date: **enter date**

Article 19 (1)(e) Indian Constitution recognizes the right to shelter as a fundamental right. Through their various rulings, the honourable courts of India have also established the right to housing as essential to right to life guaranteed by Article 21 of the Indian Constitution. The Universal Declaration of Human Rights – 1948, also ratified by India, extends the right to housing to the right to 'adequate housing'. The United Nations, in its interpretation of the 'right to adequate housing', stresses that adequate housing is not limited to the building structure, but it also extends to sustainability, and non-discriminatory access to facilities essential for health, security, comfort and nutrition. Recognizing and acknowledging adequate housing that is thermally comfortable and resilient puts focus on passive design principles at the outset.

In accordance with the Indian Constitution, national policies and international obligations, the 'enter state/UT' hereby specifies the 'Thermal Comfort Design Standard'. The standard identifies the design requirements to ensure a certain minimum level of thermal comfort performance in residential developments with specific emphasis on low-income housing that have limited means/access to mechanical comfort systems. The state also hereby specifies the 'Implementation Plan for Urban Local Bodies (ULBs).' The plan recommends steps and strategies to integrate thermal comfort standards into the building bye-laws and building approval processes, and measures to strengthen the capacity to adopt and implement the standard.

For information of the public likely to be affected thereby and notice is hereby given that the said notification will be taken into consideration on or after the expiry of a period of thirty (30) days from the date of publication of the draft in the official Gazette;

The objections or suggestions, which may be received from any person with respect to the said Notification within the period specified above, will be taken into consideration by the Central Government;

Objections or suggestions, if any, may be addressed to the **enter name, enter department** and may be sent to e-mail id: **enter email address**.