

**BEFORE THE NATIONAL GREEN TRIBUNAL SOUTHERN
BENCH CHENNAI**

APPLICATION NO. 02 OF 2023

IN THE MATTER OF:

Shri Jagan Kumar J

.....APPLICANT

VERSUS

**The Additional Chief Secretary
Government of Karnataka, Department Of
Forest, Ecology and Environmental Science & Ors**

..... RESPONDENTS

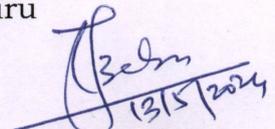
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Signed and verified on this 13th day of May, 2024 at Bengaluru



**COUNSEL FOR
3rd RESPONDENT**



DEPONENT

**J. Chandra Babu
REGIONAL DIRECTOR
CENTRAL POLLUTION CONTROL BOARD
REGIONAL DIRECTORATE - BENGALURU
(MIN. OF ENV, FOREST & CC, GOVT OF INDIA)
BENGALURU - 560 079. MOB: 9868278903**



**BEFORE THE NATIONAL GREEN TRIBUNAL
SOUTHERN BENCH CHENNAI**

ORIGINAL APPLICATION NO. 02 OF 2023

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..... Applicant

VERSUS

The Additional Chief Secretary, Government of Karnataka, Department of Forest, Ecology and Environmental Science & Ors

.....Respondents

Statement on Behalf of the Respondent No. 3, The Central Pollution Control Board (CPCB) in compliance to Hon'ble tribunal order dated 04.04.2024

I, J Chandra Babu, son of late Shri. J Balaramaiah, aged 55 years, having office at the Regional Directorate, Central Pollution Control Board, 1st & 2nd Floors, Nisarga Bhavan A- Block, Thimmaiah Main Road, 7th D Cross, Shivanagar, Bengaluru – 560 079 do hereby solemnly affirm and state on oath as follows:

1. That I am presently working as Scientist 'E' & Regional Director, Regional Directorate, Central Pollution Control Board (hereafter called as CPCB), Bengaluru and authorized to file the present statement on behalf of the 3rd Respondent. I am fully conversant with the facts of the case and hence, competent and authorized to depose and swear this statement.

J Chandra Babu
13/5/2024

J. Chandra Babu
REGIONAL DIRECTOR
CENTRAL POLLUTION CONTROL BOARD
REGIONAL DIRECTORATE - BENGALURU
(MIN. OF ENV, FOREST & CC, GOVT OF INDIA)
BENGALURU - 560 079. MOB: 9868278903



2. That the Hon'ble NGT SZ Chennai vide order dated 04.04.2024 directed CPCB and relevant portion of the directions is reproduced below:

“4. The learned counsel appearing for the Central Pollution Control Board (CPCB) has furnished a copy of the Energy Conservation Building Code (ECBC), 2007. Let the relevant clauses regarding the issue involved be highlighted and furnished in the next hearing.”

3. It is humbly submitted that matter was discussed regarding the issue involved with representatives of Bureau of Energy Efficiency (BEE). Relevant clauses regarding provisions in the Energy Conservation Building Code 2007 and Energy Conservation Building Code 2017 related to use of Glass Facades in Building Construction provided by BEE are enclosed in **Annexure-I**



J. Chandra Babu
13/11/2024

J. Chandra Babu
REGIONAL DIRECTOR
CENTRAL POLLUTION CONTROL BOARD
REGIONAL DIRECTORATE - BENGALURU
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Annexure-I

Relevant clauses in the Energy Conservation Building Code 2007 and Energy Conservation Building Code 2017 related to use of Glass Facades in Building Construction

1. ECBC 2007 was introduced by the Bureau of Energy Efficiency, Ministry of Power in 2007 to establish minimum energy efficiency requirements for commercial buildings, as well as providing guidelines for their design and construction. The ECBC 2007 outlines standards related to building envelope, lighting, heating, ventilation, air conditioning, and electrical systems to ensure energy efficiency in commercial buildings.
2. The ECBC 2007 has undergone revisions and updates over the years to keep pace with advancements in building technology and to enhance energy efficiency standards. ECBC 2017 with amendment upto 2020 is the latest published code, is presently undergoing further revisions to integrate sustainability criteria.

The salient features of the Code are:

1. Technology Neutral
2. Renewable Energy Integration
3. Incremental energy performance levels (ECBC, ECBC plus and Super ECBC)
4. Integration of passive design strategies like daylighting and shading
5. Efficiency requirements specific to climate, building types and operation intensity

With respect to the construction of building envelope, ECBC 2007 provides the mandatory and prescriptive requirement for Fenestration, opaque construction (Exterior walls & Roof).

In ECBC mentioned the parameter values such as the, Solar Heat Gain Coefficient (SHGC), and Visible Light Transmittance (VLT) of the glass to achieve the compliance.

ECBC 2007 defines under “**Vertical Fenestration (refer Section 4.3.3)**”,

- The **maximum** allowed **SHGC (Solar heat gain coefficient)**
- **Window to wall Ratio (WWR)** requirement in accordance with the climatic zone.

- Further, in the **section 4.3.3.1** it provides the **minimum Visible Light Transmission (VLT)** requirement of the glass in accordance with the window to wall Ratio (WWR).

Wherein, Fenestration means- all area (including the frames) in the building envelope that let in light, including windows, plastic panels, clerestories, skylights, glass doors that are more than one-half glass and glass walls.

3. **In ECBC 2017**, the code sets the mandatory and prescriptive provisions within building envelope chapter for Roof, opaque wall and Fenestration. **Section 4.3.3**, outlining prescriptive requirements, stipulates that **the maximum allowable Window-to-Wall Ratio (WWR) is 40%, applicable to buildings demonstrating compliance through the prescriptive method**, including the building trade-off method.

For all climatic zones, vertical fenestration compliance requirements for all three energy efficiency levels, i.e. ECBC, ECBC+, and Super ECBC, shall comply with the following:

- Maximum allowable Window Wall Ratio (WWR) is 40%** (applicable to buildings showing compliance using the Prescriptive Method, including Building Envelope Trade-off Method)
- Minimum allowable Visible light transmittance (VLT) is 0.27**
- Assembly U-factor shall be determined for the overall fenestration product (including the sash and frame)

Vertical fenestration shall comply with the maximum Solar Heat Gain Coefficient (SHGC) and U-factor requirements of Table 1 for ECBC buildings and Table 2 for ECBC+ buildings and Super ECBC buildings. Vertical fenestration on non-cardinal direction, shall be categorized under a particular cardinal direction if its orientation is within $\pm 45^\circ$ of that cardinal direction.

Table 1: Vertical Fenestration Assembly U-factor and SHGC Requirements for ECBC Buildings

	<i>Composite</i>	<i>Hot and dry</i>	<i>Warm and humid</i>	<i>Temperate</i>	<i>Cold</i>
Maximum U-factor (W/m ² .K)	3.00	3.00	3.00	3.00	3.00
Maximum SHGC Non-North	0.27	0.27	0.27	0.27	0.62
Maximum SHGC North for latitude $\geq 15^\circ\text{N}$	0.50	0.50	0.50	0.50	0.62
Maximum SHGC North for latitude $< 15^\circ\text{N}$	0.27	0.27	0.27	0.27	0.62

See Appendix A for default values of unrated fenestration.

Table 2: Vertical Fenestration U-factor and SHGC Requirements for ECBC+ buildings and Super ECBC buildings

	<i>Composite</i>	<i>Hot and dry</i>	<i>Warm and humid</i>	<i>Temperate</i>	<i>Cold</i>
Maximum U-factor (W/m ² .K)	2.20	2.20	2.20	3.00	1.80
Maximum SHGC Non-North	0.25	0.25	0.25	0.25	0.62
Maximum SHGC North for latitude ≥ 15°N	0.50	0.50	0.50	0.50	0.62
Maximum SHGC North for latitude < 15°N	0.25	0.25	0.25	0.25	0.62