

**BUREAU OF INDIAN STANDARDS**

**AGENDA**

**Panel for Timber and Bamboo, CED 46:P6 : Fifth Meeting**

**Thursday, 29 February 2024 : 1030 h**

**In Hybrid Mode from:**

**Forest Research Institute, PO. I.P.E. Dehradun, Uttarakhand 248 195**

**&**

**Online using:**

1) Meeting link:

<https://bismanak.webex.com/bismanak/j.php?MTID=m34cfc3a781cd2da81cd0b6534f408cc3>

2) Meeting number: [2516 673 1421](#)

3) Password: Nbc@2025

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**Convener:** Shri K. S. Pruthi

**Member Secretary:** Shri Arunkumar S.  
**NBC Officer:** Shri Abhishek Sharma

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**Item 0 OPENING REMARKS**

**Item 1 CONFIRMATION OF MINUTES OF THE LAST MEETING**

**1.1** The Minutes of the fourth meeting of the Panel held on 23 October 2015 in New Delhi, were circulated vide BIS DG letter No. CED 46:P6/A-2.4 dated 03 February 2016. No comments have been received.

The Panel may **CONFIRM** the Minutes.

## Item 2 COMPOSITION

2.1 The present composition of the Panel as reconstituted by the National Building Code Sectional Committee, CED 46 is given at **Annex 1 (P- 8)**.

The Panel may **CONSIDER**.

## Item 3 PROJECT OF REVISION OF NBC

3.1 Under the project of Revision of NBC, various Parts/Sections of NBC 2016 [a list of which is given in **Annex 2 (P-10)**] are being comprehensively revised, to bring out a most modern and state-of-the-art revision of the Code.

The Panel may consider revising the chapters (3A on Timber and 3B on Bamboo) taking into cognizance the latest developments in the field. In the revision exercise, due consideration may be given to ensuring coherence among various chapters of the Code. Where required, suggestions for improvements in the other chapters of the code may also be provided.

The Panel may **NOTE**

3.2 The Panel may therefore engage in a high-level review of the existing chapters covering Building Services namely 'Timber & Bamboo'. The contents of existing Part 6 'Structural Design' Section 3A 'Timber' & Section 3B 'Bamboo' are given in **Annex 3 (P-12)** and **Annex 4 (P-13)** respectively. This review may involve an examination of the structure, content, and alignment of the chapters with current industry standards and practices.

In addition, the following may be considered in this revision:

Addressing **new timber species** including **imported species** incorporating their strength properties, plantation/social/agro-forestry timber, finger jointing and such techniques, etc.

Incorporate traditional and newer bamboo design (including limit state method) and construction methodologies for foundation and superstructure to give push to bamboo buildings.

The Panel may **CONSIDER**.

3.3 The following were proposed for discussion by member of the Panel, Shri Prakash N Suthar:

- Discussions on Vision and Goals considering current climate crises and aim to provide climate solutions / resolving issues on climate crisis
- Brief overview on the Timber Innovation Act, 2016 (US Congress) And, Inflation Reduction Act. USA : 2/3 Minutes on The Purpose & Relevance Behind the Acts.

- Brief on White Paper Draft, "Seeding to Building for NET-ZERO"
- Overview of Mass timber Buildings and the IBC, 2021 / 2024 by International Code Council
- Overview on Codes and Official Test reports on FIRE CODES and Tests
- Mass timber Construction Components and ASTM / Design Values of Each Products available including documents on test reports
- Brief on ICC, Canadian Codes, EURO Codes on Mass timber Construction - available Guidance.

The Panel may **CONSIDER**.

**3.4** The standards formulated by BIS under the respective sectional committees related to the two chapters are listed below:

Sl. No.	IS No.	Title	No. of Amendments
<b>Timber and Timber Stores, CED 09</b>			
1)	IS 707 : 2011	Timber technology and utilization of wood, bamboo and cane — Glossary of terms (third revision)	1
2)	<a href="#">IS 1902 : 2006</a>	Preservation of bamboo and cane for non - Structural purposes - Code of practice (Second Revision)	-
3)	<a href="#">4873 : 2021</a>	Methods of Laboratory Testing of Wood Preservatives against Fungi and Borers ( Powder Post Beetles ) Part 2 Determination of Threshold Values of Wood Preservatives against Borers ( Powder Post Beetles ) in Wood and Bamboo ( Third Revision )	-
4)	<a href="#">IS 6874 : 2008</a>	Method of tests for bamboo (First Revision)	1
5)	<a href="#">IS 7344 : 1974</a>	Bamboo Tent Poles	2
6)	<a href="#">IS 8242 : 1976</a>	Methods of tests for split bamboos	-
7)	<a href="#">IS 8295 (Part 1) : 2023</a>	Bamboo Chicks - Specification Part 1 Fine	-
8)	<a href="#">IS 8295 (Part 1) : 1976</a>	Specification for bamboo chicks: Part 1 fine	-
9)	<a href="#">IS 8295 (Part 2) : 1976</a>	Specification for bamboo chicks: Part 2 coarse	-
10)	<a href="#">IS 8295 (Part 2) : 2023</a>	Bamboo Chicks - Specification Part 2 Coarse (First Revision)	-
11)	<a href="#">IS 9096 : 2006</a>	Preservation of bamboo for structural purposes - Code of practice	-
12)	<a href="#">IS 10145 : 1982</a>	Specification for bamboo supports for camouflaging equipment	1
<b>Wood and Other Lignocellulosic Products, CED 20</b>			
11.	<a href="#">IS 13958 : 1994</a>	Bamboo Mat Board For General Purposes - specification	4
16.	<a href="#">IS 14588 : 1999</a>	Bamboo mat - Veneer composite for general	3

Sl. No.	IS No.	Title	No. of Amendments
		purposes - Specification	
20.	<a href="#">IS 15476 : 2004</a>	Bamboo mat corrugated sheets - specification	4
29.	<a href="#">IS 15972 : 2012</a>	Bamboo - Jute composite corrugated and semi - Corrugated sheets - Specification	1
54.	<a href="#">IS 17571 : 2021</a>	Flattened Bamboo Board - Specification	-
55.	<a href="#">IS 17572 : 2022</a>	BWP Grade Bamboo Mat-Venner Composite Board - Specification	-
56.	<a href="#">IS 17573 : 2021</a>	BWP Grade Bamboo Mat Board – Specification	-
<b>Construction Practices, CED 13</b>			
1	IS 883:2013	Design of structural timber in building — Code of practice (fifth revision)	
2	IS 15912:202	Structural design using bamboo — Code of practice (first revision)	

The Panel may **NOTE**.

#### **Item 4 COMMENTS RECEIVED ON / INPUTS RELATED TO PART 6 'STRUCTURAL DESIGN: SECTION 3A 'TIMBER' &SECTION 3B 'BAMBOO' OF SP7 : 2016**

**4.1** No comments were received on the above Chapters of NBC 2016.

**4.2** The following lists some of the articles, books, standards that relate to the chapters under consideration by the Panel:

A paper titled "**Engineered bamboo for structural applications**" published in the Construction and Building Materials Volume 81, 15 April 2015, Pages 66-73

<https://www.sciencedirect.com/science/article/pii/S0950061815001117>

Books titled:

**Let's Build With Bamboo – A complete construction manual – Vol. 1 & 2**  
Ar Neelam Manjunath – Centre for Green Building Materials and Technology

The ISO's Timber Structures technical committee, ISO/TC 165 has published the following:

Standard under the direct responsibility of ISO/TC 165 Secretariat
<a href="#">ISO 5257:2023</a> Bamboo structures — Engineered bamboo products — Test methods for determination of mechanical properties using small size specimens
<a href="#">ISO 19624:2018</a> Bamboo structures — Grading of bamboo culms — Basic principles and procedures
<a href="#">ISO 22156:2021</a> Bamboo structures — Bamboo culms — Structural design
<a href="#">ISO 22157:2019</a> Bamboo structures — Determination of physical and mechanical properties of bamboo culms — Test methods
<a href="#">ISO 23478:2022</a> Bamboo structures — Engineered bamboo products — Test methods for determination of physical and mechanical properties

The Panel may **NOTE**.

**4.3** The Panel may also **NOTE** regarding the Structural Reforms in Standardization established by BIS to bring greater efficiency in standards formulation and revision work in BIS addressing speed, skill and scale. The same relates to aspect like:

- a) technical committees of BIS having members with widely acknowledged domain area expertise and experience on the subjects
- b) optimum size of the technical committee
- c) review of membership with focus on continuity of participation including contribution by every member
- d) holding periodic meetings (physical/virtual/hybrid)
- e) decide on timelines to enable stage-wise development of the documents (draft standards)
- f) resource centre to enable share the information and documents associated with the standardization work

**4.4** Further, BIS has established in place systems such as action research projects, R&D for standards development and provision for having short-term Consultants. Also, focus should be made w.r.t developments on the subject happening world-wide including in technical events, literature, research publications, standard bodies, etc. Wherever possible research based inputs be generated including by associating with the various eminent institutions with whom BIS has entered into MoU with.

The Panel may **NOTE**.

## **Item 5 PROJECT OF PROMOTION OF USE OF NBC 2016 IN ALL STATES AND UTs OF INDIA**

**5.1** An ambitious Project for Promotion of use of National Building Code of India 2016 in all States and UTs of India was earlier taken up by BIS involving a comprehensive study and review of rules and regulations governing land development and building construction in various states and union territories of India. The Project involves preparing draft regulations which are aligned with provisions in

National Building Code of India 2016 (NBC 2016), for use by the States and UTs in revising their existing regulatory documents in line with the revised state-of-the-art NBC 2016. The Project had 09 deliverables as below:

SI No.	Deliverable
1	Compilation and study of existing processes, rules and regulations as existing in various States and UTs which govern the land development and building construction, and other statutory provisions which have to be complied with currently, etc
2	Classification of the Provisions in various Rules and Regulations as mandatory/recommendatory, identification of commonalities/dissimilarities, conflicts, if any
3	Mapping the existing Rules, Regulations, Processes against provisions given in NBC 2016
4	Identification of other best practices which may currently not be a part of the existing rules or of NBC 2016, which may be aspirational but will help further the Aim/Objective of this project
5	Preparation of a draft revised standardized/model Rules and Regulations aligned with the provisions of NBC 2016, for the consideration of the Bureau
6	Preparing State/UT-wise standardized/model regulatory documents, including such required documents for some metro/mega cities, which can be adopted by various authorities & obtaining approval of the Bureau as per scope of work
7	Creating pamphlets for an awareness campaign for general public
8	Creating a simplified booklet on using NBC which can be used by all stakeholders- academicians, students and professionals
9	Dissemination to designated States/UTs, the knowledge base created and presenting to them advantages of adopting the same through meetings and workshops

With the support of an external consultant, the main deliverable namely Draft Development and Building Regulations for each of the States and UTs of India was prepared. Followed by 20 number of 2-day workshops covering all the States and UTs, the inputs received as part of such workshops, the finalized regulations were shared with the respective States & UTs.

In addition, a new special publication, **SP 73 : 2023 'Standardized Development and Building Regulations, 2023'** was also published and released, which is available for access (free download) from the BIS' website and from: <https://standardsbis.bsbedge.com/>

The Panel may **NOTE**.

**Item 6 DATE & PLACE OF THE NEXT MEETING**

**Item 7 ANY OTHER BUSINESS**

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**ANNEX 1**  
(Item 2.1)

**COMPOSITION OF THE PANEL FOR TIMBER AND BAMBOO, CED 46:P6**

<b>SI No.</b>	<b>NAME OF THE ORGANISATION</b>	<b>REPRESENTED BY</b>
1)	In Personal Capacity, Dehradun	Shri K. S. Pruthi ( <b>Convener</b> )
2)	Bamboo Society of India, Bengaluru	Shri Punathi Sridhar Shri K. N. Murthy (Alternate)
3)	Building Materials and Technology Promotion Council, New Delhi	Dr Shailesh Kr Agrawal Shri C. N. Jha (Alternate)
4)	CSIR - Central Building Research Institute, Roorkee	Dr B. S. Rawat Shri Micky Mecon Dalbeharea (Alternate I) Shri Prasanta Kar (YP)
5)	Central Public Works Department, New Delhi	Chief Engineer (CSQ) – Shri Prem Mohan Superintending Engineer (TAS) – Shri Dinesh K Ujjainia (Alternate)
6)	Creative Consultants & Engineers Pvt Ltd, Ghaziabad	Shri Aman Deep
7)	Forest Research Institute (ICFRE), Dehra Dun	Shri Rajesh Bhandari Shri R. S. Topwal (Alternate)
8)	Forum of Scientists, Engineers and Technologists, Kolkata	Shri Rabi Mukhopadhyay Dr. Parthasarathi Mukhopadhyay (Alternate)
9)	Housing and Urban Development Corporation Ltd, New Delhi	Dr Deepak Bansal Ms Pooja Nandy (Alternate) Smt Nirmal Batra (Alternate-II)
10)	Indian Association of Structural Engineers, New Delhi	Dr Dulal Goldar Shri Hari Om Gupta (Alternate)
11)	Indian Institute of Technology Delhi, New Delhi	Dr Suresh Bhalla
12)	Indian Plywood Industries Research and Training Institute, Bangalore	Shri Anand Nandanwar Dr Narasimhamurthy (Alternate)
13)	Iyer and Mahesh Architects, Thiruvanthapuram	Shri N. Mahesh Shri K. Gangadharan (Alternate)
14)	Manasaram Architects, Bengaluru	Smt Neelam Manjunath Smt Sanjita Shrikant (Alternate)

15)	Military Engineer Services, Engineer-in-Chief's Branch, Army HQ, New Delhi	Smt Rivoo Mahendru Smt Remika Sharma (Alternate)
16)	Mutha Industries Pvt Ltd, Maharashtra	Shri Anil Mutha Shri Neeraj Mutha (Alternate I) Shri Sudip Chakraborty (Alternate II)
17)	North East Centre for Technology Application and Reach, Shillong	Shri Krishna Kumar
18)	The Institution of Engineers (India), Kolkata	Shri Manoj Kumar Singh Shri Kumar Arvind (Alternate)
19)	Windsor Wood (India) Pvt Ltd, Mumbai	Shri Prakash Narmadashankar Suthar
20)	Wonder Grass Initiative Pvt Ltd, Nagpur	Shri Vaibhav Kaley
21)	In Personal Capacity, Dehradun	Shri S. S. Rajput

**ANNEX 2**  
(Item 3.1)

***Details of Chapters of NBC 2016***

<i>Part/Section</i>	<i>Title</i>
1	<b>PART 0 INTEGRATED APPROACH – A PRE-REQUISITE FOR APPLYING THE PROVISIONS OF THE CODE</b>
2.....	<b>PART 1 DEFINITIONS</b>
3.....	<b>PART 2 ADMINISTRATION</b>
4.....	<b>PART 3 DEVELOPMENT CONTROL RULES AND GENERAL BUILDING REQUIREMENTS</b>
5.....	<b>PART 4 FIRE AND LIFE SAFETY</b>
6.....	<b>PART 5 BUILDING MATERIALS</b>
	<b>PART 6 STRUCTURAL DESIGN</b>
7.....	Section 1 Loads, Forces and Effects
8.....	Section 2 Soils and Foundations
	Section 3 Timber and Bamboo
9.....	3A Timber
10.....	3B Bamboo
11.....	Section 4 Masonry
	Section 5 Concrete
12.....	5A Plain and Reinforced Concrete
13.....	5B Prestressed Concrete
14.....	Section 6 Steel
	Section 7 Prefabrication and Systems Building and Mixed/Composite Construction
15.....	7A Prefabricated Concrete
16.....	7B Systems Building and Mixed/Composite Construction
17.....	Section 8 Glass and Glazing
18.....	<b>PART 7 CONSTRUCTIONAL PRACTICES AND SAFETY</b>
	<b>PART 8 BUILDING SERVICES</b>
19.....	Section 1 Lighting and Ventilation
20.....	Section 2 Electrical and Allied Installations
21.....	Section 3 Air-conditioning, Heating and Mechanical Ventilation
22.....	Section 4 Acoustics, Sound Insulation and Noise Control
	Section 5 Installation of Lifts and Escalators and Moving Walks
23.....	5A Lifts
24.....	5B Escalators and Moving Walks
25.....	Section 6 Information and Communication Enabled Installations

	<b>PART 9</b>	<b>PLUMBING SERVICES</b>
26.....		Section 1 Water Supply
27.....		Section 2 Drainage and Sanitation
28.....		Section 3 Solid Waste Management
29.....		Section 4 Gas Supply
	<b>PART 10</b>	<b>LANDSCAPING, SIGNS AND OUTDOOR DISPLAY STRUCTURES</b>
30.....		Section 1 Landscape Planning, Design and Development
31.....		Section 2 Signs and Outdoor Display Structures
32.....	<b>PART 11</b>	<b>APPROACH TO SUSTAINABILITY</b>
33.....	<b>PART 12</b>	<b>ASSET AND FACILITY MANAGEMENT</b>

**ANNEX 3**  
*(Item 3.2)*

**CONTENTS OF PART 6 'STRUCTURAL DESIGN'**  
**SECTION 3A TIMBER (OF NBC 2016)**

FOREWORD

- 1 SCOPE
- 2 TERMINOLOGY
- 3 SYMBOLS
- 4 MATERIALS
- 5 PERMISSIBLE STRESSES
- 6 DESIGN CONSIDERATIONS
- 7 DESIGN OF COMMON STEEL WIRE NAIL JOINTS
- 8 DESIGN OF NAIL LAMINATED TIMBER BEAMS
- 9 DESIGN OF BOLTED CONSTRUCTION JOINTS
- 10 DESIGN OF TIMBER CONNECTOR JOINTS
- 11 GLUED LAMINATED CONSTRUCTION
- 12 LAMINATED VENEER LUMBER
- 13 GLUED FINGER JOINTS
- 14 STRUCTURAL USE OF PLYWOOD
- 15 TRUSSED RAFTER
- 16 STRUCTURAL SANDWICHES
- 17 LAMELLA ROOFING
- 18 NAIL AND SCREW HOLDING POWER OF TIMBER
- 19 PROTECTION AGAINST TERMITE ATTACK IN BUILDINGS

LIST OF STANDARDS

**ANNEX 4**  
*(Item 3.2)*

**CONTENTS OF PART 6 'STRUCTURAL DESIGN'  
SECTION 3B BAMBOO (OF NBC 2016)**

FOREWORD

- 1 SCOPE
  - 2 TERMINOLOGY
  - 3 SYMBOLS
  - 4 MATERIALS
  - 5 PERMISSIBLE STRESSES
  - 6 DESIGN CONSIDERATIONS
  - 7 DESIGN, TECHNIQUES OF JOINTS AND CONSTRUCTION PRACTICES
  - 8 BAMBOO AS REINFORCEMENT IN CONCRETE
  - 9 WALLING, ROOFING, AND IN-FILL PANELS FOR WALL AND COMMON ROOF COVERING/CLADDING MATERIALS
- ANNEX A SOURCE AND LOCAL NAMES OF SOME OF THE SPECIES OF BAMBOO

LIST OF STANDARDS

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