PRELIMINARY DRAFT

NATIONAL BUILDING CODE OF INDIA

PART 0 INTEGRATED APPROACH — PREREQUISITE FOR APPLYING PROVISIONS OF THE CODE

(Fourth Revision)

BUREAU OF INDIAN STANDARDS

C O N T E N T S

National Building Code Sectional Committee, CED 46

FOREWORD

This Code (Part 0) covers guidelines to be followed for judicious implementation of the provisions of various Parts/Sections of the National Building Code of India following an integrated approach.

In order to provide safe, healthy and sustainable habitat, careful consideration needs to be paid to the building construction activity. Building planning, designing and construction activities have developed over the centuries. Large number of ancient monuments and historical buildings all over the world bear testimony to the growth of civilization from the prehistoric era with the extensive use of manual labour and simple systems as appropriate to those ages to the present day mechanized and electronically controlled operations for designing and constructing buildings and for operating and maintaining systems and services. In those days, buildings were conceptualized and built by master builders with high levels of artisan skills. Technological and socio-economic developments in recent times have led to remarkable increase in demand for more and more sophistication in buildings resulting in ever increasing complexities. These perforce demand high levels of inputs from professionals of different disciplines such as architecture, civil engineering, structural engineering, functional and life safety services including special aspects relating to utilities, landscaping, etc, in conceptualization, spatial planning, design and construction of buildings of various material and technology streams, various services including operation, maintenance, repairs and rehabilitation aspects throughout the service life of the building.

This Code, besides prescribing various provisions, also allows freedom of action to adopt appropriate practices and provides for building planning, designing and construction for absorbing traditional practices as well as latest developments in knowledge in the various disciplines as relevant to a building including computer aided and/or other modern sensors aided activities in the various stages of conceptualization, planning, designing, constructing, maintaining and repairing the buildings. India being a large country with substantial variations from region to region, this Code has endeavoured to meet the requirements of different regions of the country, both urban and rural, by taking into consideration factors such as climatic and environmental conditions, geographical terrain, vulnerability to natural disasters, ecologically appropriate practices, use of eco-friendly materials, use of appropriate conventional and alternative technologies, reduction of pollution, protection and improvement of local environment and also socio-economic considerations, towards the creation of sustainable human settlements.

This Part of the Code dealing with 'integrated approach' gives an overall direction for practical applications of the provisions of different specialized aspects of spatial planning, designing and construction of buildings, creation of services, and proposes an integrated approach for utilizing appropriate knowledge and experience of qualified professionals, right from the conceptualization through construction and completion

stages of a building project and indeed during the entire life cycle. The 'integrated approach' should not only take care of functional, aesthetic and safety aspects, but also the operational and maintenance requirements. Also, cost optimization has to be achieved through proper selection of materials, techniques, equipment installations, etc. Further, value engineering and appropriate management techniques should be applied to achieve the aim set forth for the purpose of construction of a building fully meeting the specified and implied needs of spatial functions, user requirements, safety and durability aspects, life and health safety, comfort, services, etc, in the building. Integration among various professionals/services may be facilitated by use of appropriate software, systems, tools, simulations, etc.

The aim of the 'integrated approach' is to get the maximum benefit from the building and its services in terms of objectives such as quality, timeliness and cost-effectiveness. In the team approach which is an essential pre-requisite for integrated approach, the aim clearly is to maximize the efficiency of the total system through appropriate optimization of each of its sub-systems, and ensuring coordination among various disciplines and agencies that are involved during planning, design, construction, operation and maintenance of buildings and the associated infrastructure. In other words, in the team, the timely inputs from each of the professional disciplines have to be so optimized that the total system's efficiency becomes the maximum. It may be emphasized that maximizing the efficiencies of each sub-system may not necessarily assure the maximization of the efficiency of the total system. It needs hardly to be stated that specified or implied safety will always get precedence over functional efficiency and economy. Further, progressive approach such as that relating to the concept of intelligent buildings would be best taken care of by the 'integrated approach' as laid down in this Part.

The continued effort towards development may progressively be aimed at leading us to achieve better and smarter solutions, such as through development of smart cities encompassing sustainability apart from utilizing optimum resources and delivering through intelligent ways, the various facilities and amenities. The integrated approach enshrined in this Part is of immense help in achieving the objective of such smart buildings and cities. It goes without saying that the objective of sustainable development as professed in Part 11 'Approach to Sustainability' of the Code can be best achieved through such an integrated approach.

Proper construction management and certification covering the various dimensions brought out above may go a long way in achieving the above goal of real integrated approach.

This Part was first introduced in the Code in 2005 as an adjunct to various other Parts/Sections of the Code. Based on the experience gained in the use of this Part, this revision has been brought out. The modifications incorporated in the 2016 version of the Code included:

a) List of professionals who may be part of multi-disciplinary teams has been updated.
b) Considering the latest provisions relating to construction project management now included in the Part 7 'Construction Management, Practices and Safety' of

the Code, the provisions in this Part relevant to construction project management functions have been accordingly updated.

c) Various considerations to be taken care of by the design teams, project/construction management team, and operation and maintenance team have been further reinforced considering the present day requirements and expectations from buildings and built environment.

d) Provisions relating to operation and maintenance have been further extended to include decommissioning and deconstruction (including demolition) to give importance to planned decommissioning and deconstruction after the useful service life of the built facility is over.

e) With the introduction of the new Part 11 'Approach to Sustainability' of the Code, appropriate references to sustainability wherever relevant to the integrated approach, have been taken care of.

f) Accessibility and universal design for ensuring barrier free environment for persons with disabilities has been emphasized by further reinforcing the provisions to this effect appropriately.

The significant modifications incorporated in this revision include the following:

a) Use of digital framework in construction using building information modeling (BIM) is included, in clause **4.2**, and also referred to the Part 7 of the Code that details the provisions regarding digitization in construction and BIM.

b) Annex A giving brief details of the coverage of various provisions under different Parts/Sections of the Code, has been updated, considering modification in the scopes of existing Parts/Sections and inclusion of new Parts/Sections.

NATIONAL BUILDING CODE OF INDIA

PART 0 INTEGRATED APPROACH – PREREQUISITE FOR APPLYING PROVISIONS OF THE CODE

1 SCOPE

This Code (Part 0) covers guidelines to be followed for judicious implementation of the provisions of various Parts/Sections of the National Building Code of India following an integrated approach.

2 TERMINOLOGY

For the purpose of this Part, the following definitions shall apply.

2.1 Authority Having Jurisdiction – The authority which has been created by a statute and which, for the purpose of administering the Code/Part, may authorize a committee or an official or an agency to act on its behalf; hereinafter called the 'Authority'.

2.2 Building – Any structure for whatsoever purpose and of whatsoever materials constructed and every part thereof whether used as human habitation or not and includes foundation, plinth, walls, floors, roofs, chimneys, plumbing and building services, fixed platforms, verandah, balcony, cornice or projection, part of a building or anything affixed thereto or any wall enclosing or intended to enclose any land or space and signs and outdoor display structures. Tents/*Shamianahs*/*Pandals*, tarpaulin shelters, etc, erected for temporary and ceremonial occasions shall not be considered as building.

2.3 Owner – A person, a group of persons or a body having a legal interest in land and/or building thereon. This includes freeholders, leaseholders or those holding a sublease, who will have legal right to occupation and have liabilities in respect of safety or building condition.

In the case of lease or sublease holders, as far as ownership with respect to the structure is concerned, the structure of a flat or structure on a plot belongs to the allottee/lessee till the allotment/lease subsists.

NOTE – For the purpose of the Code, the word ‘owner’ will also cover the generally understood terms like ‘client’, ‘user’, etc.

3 GENERAL

3.1 Buildings shall be classified as Residential, Educational, Institutional, Assembly, Business, Mercantile, Industrial, Storage and Hazardous in groups and sub-divisions as classified in Part 4 'Fire and Life Safety' of the Code.

For various related provisions of buildings with respect to administration; development control rules and general building requirements; building materials; fire and life safety; structural design; construction management, practices and safety; building and plumbing services; landscape development, signs and outdoor display structures; sustainability; asset and facility management, and other Parts/Sections of the Code may be referred to. For provisions on sustainability of buildings and built environment, reference to the concerned Part may be made, which while also referring to the other Parts/Sections as may be required, gives a comprehensive approach to sustainability.

3.2 The scope of various Parts/Sections of the Code which cover detailed provisions on different aspects of development of land/building construction activity, are given in Annex A, with a view to providing an overview for the users of the Code.

4 TEAM APPROACH

4.1 A land development/building project and the built facility during its service life comprises the following major stages:

a) Location/siting,
b) Conceptualization and planning,
c) Designing and detailing,
d) Construction/execution,
e) Operation and maintenance, and
f) Decommissioning and deconstruction.

Each stage necessarily requires professionals of many disciplines who should work together as a well coordinated team to achieve the desired product delivery with quality and safety and other objectives, in an effective manner.

Appropriate multi-disciplinary teams (*see* **4.1.1** to **4.1.3**) need to be constituted to successfully meet the requirements of different stages. Each team may comprise need based professionals out of the following depending upon the nature, magnitude and complexity of the project:

a) Architect;
b) Civil engineer;
c) Structural engineer;
d) Geotechnical engineer;
e) Electrical engineer;
f) Plumbing engineer;
g) Fire protection engineer;
h) Heating, ventilation and air conditioning engineer;
j) Lift, escalator and moving walk specialist;
k) Acoustics specialist;
m) Information/communication technology engineer;
n) Health, safety and environment specialist;
p) Environment/sustainability specialist;
q) Town planner;
r) Urban designer;

s) Landscape architect;
t) Security system specialist;
u) Interior designer;
v) Quantity surveyor;
w) Project/construction manager;
y) Accessibility and universal design specialist; and
z) Other subject specialist(s).

It is important that leaders and members of design team, project management/construction management team, and operation and maintenance team, depending on the size and complexity of the project, are carefully selected considering their qualification, experience and expertise in these fields.

4.1.1 *Design Team*

In building projects, various aspects like form; space planning; aesthetics; fire and life safety; structural adequacy; plumbing services; lighting and natural ventilation; electrical and allied installations; air conditioning, heating and mechanical ventilation; acoustics, sound insulation and noise control; installation of lifts and escalators; building automation; data and voice communication; other utility services installations; landscape planning, design and development; urban planning; etc need to be kept in view right at the concept stage. The project requiring such multi-disciplinary inputs need a coordinated approach among the professionals for proper integration of various design inputs. For this, and to take care of the complexities of multi-disciplinary requirements, a design team of professionals from the required disciplines shall be constituted at the appropriate stage. Here, it is desirable that the multi-disciplinary integration is initiated right from the concept stage. The team shall finalize the plan. The composition of the team shall depend on the nature, magnitude and complexities of the project. Design is an evolutionary and participatory process, where participation of the owner constitutes a very important input at all stages, and the same shall be ensured by the design team.

To ensure proper implementation of the design, the design team, may be associated during the construction/execution stage.

4.1.2 *Project Management and Construction Management Teams*

The objective of project management or construction management is primarily to achieve accomplishment of a project in accordance with the designs and specifications in a stipulated time and cost framework, etc, with a degree of assurance prior to commencement and satisfaction on completion and commissioning.
For large projects, separate teams of experienced professionals from the required disciplines may be constituted for project management (including planning and scheduling) and for construction management depending upon the complexities of the project. However, for smaller projects these teams may be combined. The teams shall be responsible for day-to-day execution, supervision, quality control, etc, and shall ensure inter-disciplinary coordination during the construction stage. The team shall be responsible to achieve satisfactory completion of the project in respect of all relevant project management functions like cost, time, quality, safety, etc. Some members of

the design team may also be included in the project management team and/or associated actively during the project execution stage.

4.1.3 *Operation and Maintenance Team*

Operation, maintenance and repairs also require a multi-disciplinary approach to ensure that all the requirements of the users are satisfactorily met. During maintenance and repairs, the jobs requiring inter-disciplinary coordination have to be executed in such a manner as not only to cause least inconvenience to the user but also to ensure that there is no mismatch or damage to the structure, finishing, fittings and fixtures, and to preserve the integrity of other services. For carrying out routine maintenance/repair jobs, utilization of the services of trained technicians preferably having multi-disciplinary skills should be encouraged.

Special repairs, rehabilitation and retrofitting are specialized jobs which demand knowledge of the existing structure/installations. Association of concerned specialists may be helpful for these works.

The operation and maintenance team may also be known as asset and facility management or estate management team.

4.2 Building Information Modelling (BIM)

Building Information Modelling (BIM) is a transformative technology for managing and sharing digital information throughout the lifecycle of a building project. It facilitates collaboration among multiple stakeholders by creating a shared digital asset that integrates graphical, parametric, and documentation details. This asset evolves through the design, construction, and operational phases, serving as a single source of truth for better coordination, decision-making, and efficiency.

BIM is a digital framework that integrates and manages information across a project's lifecycle, enabling better collaboration, planning, and decision-making. It supports various analyses such as structural, environmental, and operational, contributing to cost and time efficiencies. BIM should be strategically adopted to enhance the multidisciplinary approach in design and execution teams and as a fundamental tool in planning and development stages. For further details regarding the same, reference shall be made to Part 7 ‘Construction Management, Practices and Safety’ of the Code.

5 PLANNING, DESIGNING AND DEVELOPMENT

5.1 The main functions of design team (*see* **4.1.1**) constituted for the planning, designing and development, are as under:

a) Formalization of design brief in consultation with the owner.
b) Site survey and soil investigation.
c) Preparation of alternative concept designs, highlighting both their positive and negative aspects.
d) Selection of a concept in consultation with and with the consent of the owner.

e) Sizing the system.
f) Development of design, involving:
    1) integration of architecture, structure and services,
    2) synthesis of requirements of each discipline, and
    3) interaction with each other within the design team and with the owner.
g) Preparation of preliminary designs and drawings and obtaining the owners' approval.
h) Preparation of preliminary cost estimates for approval of owner.
j) Preparation of work-breakdown structure and programme for pre-construction activities.
k) Assisting client to obtain approvals of the Authority/authorities.
m) Preparation of detailed specifications and construction working drawings with integration of engineering inputs of all concerned disciplines.
n) Preparation of detailed design of each discipline for various services.
p) Peer review/proof checking of the drawings/designs in case of major/important projects, depending upon their complexity and sensitivity.
q) Preparation of detailed cost estimate.
r) Obtaining final approval of the client.
s) Preparation of bill of quantities, specifications and tender documents.

5.2 The following considerations, as may be applicable to the project, may be considered during planning, notwithstanding the other relevant aspects specifically prescribed in concerned Parts/Sections of this Code; these considerations in general are with the objective of addressing important issues like environmental protection, energy conservation, cultural issues, creating barrier free built-environment, safety aspects, etc, all of these leading towards sustainable development, and have to be applied with due regard to the specific requirements of size and type of project:

1) Geoclimatic, geological and topographical features.
2) Geotechnical considerations with respect to soil/rock, water table, etc.
3) Varied sociological pattern of living in the country.
4) Effective land use to cater to the needs of the society in a most convenient manner.
5) Modular planning and standardization to take care of future planning giving due consideration to the specified planning controls.
6) Emphasis on daylight utilization, natural ventilation, shielding, and window area and disposition; daylighting to be supplemented with an integrated design of artificial lighting.
7) Optimum utilization of renewable energy sources duly integrated in the overall energy system design; with consideration of active and passive aspects in building design including thermal performance of building envelope.
8) Rain water harvesting, integrated water management including recycle and reuse, etc.
9) Use of appropriate building materials considering aspects like energy consumption in production, transportation and utilization, recyclability, etc, and for deconstruction, for promoting sustainable development.
10) Requisite mandatory provisions for persons with disabilities.
11) Acoustical controls for buildings and the surroundings.

12) Promotion of artwork in buildings, especially, major/important buildings.
13) Due cognizance of recommendations of the Archaeological Survey of India with regard to national monuments and construction in archaeologically important sites.
14) Due cognizance of relevant provisions applicable to coastal regulation zone.
15) Conservation of heritage structures and areas, with due consideration to the concerns of the archaeological departments.
16) Environmental and social impact analysis.
17) Design of services with emphasis on aspects of energy efficiency, environment friendliness and maintainability.
18) Integrated waste management.
19) Voice and data communication, automation of building services, and intelligent building; use of security and surveillance system in important and sensitive buildings, such as access control for the people as well as for vehicle.
20) Interlinking of fire alarm system, fire protection system, security system, ventilation, electrical systems, etc.
21) Analysis of emergency power, standby power requirement and captive power systems.
22) Cost optimization through techniques like value engineering.
23) Adoption of innovative technologies giving due consideration to constructability and quality aspects.
24) Instrumentation of building, monitoring and use of information so generated to effect improvements in planning and design of future building projects, and use of such instrumentation to monitor any adverse effect on the building as well as neighbouring buildings.

6 CONSTRUCTION/EXECUTION (ACTUALIZATION)

6.1 The main functions of the teams (*see* **4.1.2**) constituted for Project Management/ Construction Management may be to,

a) specify criteria for selection of constructors;
b) specify quality control, quality audit system and safety system;
c) short-list constructors;
d) have pre-bid meetings with the intending constructors;
e) receive and evaluate tenders;
f) select constructors;
g) execution and supervision;
h) monitor for quality, time and cost control and for other project management functions;
j) prepare/certify the completion (as-built) drawings;
k) assist in getting statutory approvals at various stages; and
m) ensure availability of operation manuals for field use.

6.2 Apart from the specific provisions laid down in the concerned Parts/Sections of the Code, the following considerations, as may be applicable to the project concerned, shall be given due attention:

a) Adopting scientific principles of construction project management, including quality, cost, time, and safety management.
b) Engagement of executing and supervising agencies, which meet the specified norms of skills, specialization, experience, resourcefulness, etc, for the work.
c) Ensuring inter-disciplinary coordination during construction.
d) Contract management and techno-legal aspects.
e) Completion, commissioning and trial run of installations/equipment and their operation and maintenance through the suppliers/other teams, where necessary.
f) Make available shop drawings as well as as-built drawings for the building and services.
g) Arrange all maintenance and operation manual from the concerned suppliers/manufacturers.

6.3 The team of professionals (*see* **4.1.2**) shall work and monitor the project activities for successful construction/execution of the project with regard to various construction project management functions, particularly, time, cost, quality and safety.

7 OPERATION, MAINTENANCE, DECOMMISSIONING AND DECONSTRUCTION

7.1 The team of professionals (*see* **4.1.3**) shall set up a system of periodic maintenance and upkeep of constructed buildings.

7.2 The operation and maintenance team shall be responsible for preparation/application of operation and maintenance manual, and draw maintenance schedule/frequencies and guidelines for maintenance personnel. Apart from the specific provisions laid down in concerned Parts/Sections of the Code, the following, as may be applicable to the project concerned, shall additionally be taken into account:

a) Periodic validation of buildings by competent professionals through inspection of the buildings in respect of structural safety and safety of electrical and other installations and ensuring that all fire safety equipment/systems are in proper working condition.
b) Periodic accessibility audits to ensure that the buildings remain universally accessible and barrier free for persons with disabilities.
c) Preparation of predictive/preventive maintenance schedules for all installations in the building and strictly following the same; the record of the preventive maintenance to be properly kept.
d) Ensuring inter-disciplinary coordination during operation and maintenance, and repairs; deployment of trained personnel with multi-disciplinary skills to be encouraged.
e) Condition survey of structures and installations, identification of distress of various elements and initiating plans for rehabilitation/retrofitting well in time. Post-disaster investigations by competent engineer/specialist.

7.3 The proposals for rehabilitation/retrofitting should be prepared after detailed investigations through visual inspection, maintenance records and testing as required and got executed through specialized agencies under the guidance and supervision of

competent professionals. For further details and good practices regarding the same, reference shall be made to Part 7 'Construction Management, Practices and Safety' of the Code.

7.4 After the useful service life of a building is over, or for other reasons such as redevelopment and proposed change in use of the land and built facility, it may be required to deconstruct a building. Such a deconstruction is preceded by an organized decommissioning. The decommissioning and deconstruction needs to be well planned and coordinated among concerned building professionals so as to ensure safety during such operations, as also retrieval of appropriate products, components and systems, for their possible reuse or recycling, or disposal as may be appropriate. This may in turn require a comprehensive decommissioning and deconstruction (including demolition) plan, which may be prepared during the initial stages of the project and kept available for use at the end of life cycle of the same.

ANNEX A
(*Clause* 3.2)

BRIEF DETAILS OF THE COVERAGE OF VARIOUS PROVISIONS UNDER DIFFERENT PARTS/SECTIONS OF THIS CODE

A-1 PART 1 DEFINITIONS

It lists the terms appearing in all the Parts/Sections of the National Building Code of India. However, some common definitions are reproduced in this Part also.

A-2 PART 2 ADMINISTRATION

It covers the administrative aspects of the Code, such as applicability of the Code, organization of building department for enforcement of the Code, procedure for obtaining development and building permits, and responsibility of the owner and all professionals involved in the planning, design and construction of the building. related professionals.

A-3 PART 3 DEVELOPMENT CONTROL & PROMOTION RULES AND GENERAL BUILDING REQUIREMENTS

It covers the development control rules and general building requirements for proper planning and design at the layout and building level to ensure health safety, public safety and desired quality of life. It also covers requirements for accessibility in buildings and built environment for elders and persons with disabilities.

A-4 PART 4 FIRE AND LIFE SAFETY

It covers the requirements for fire prevention, life safety in relation to fire, and fire protection of buildings. The Code specifies planning and construction features and fire protection features for all occupancies that are necessary to minimise danger to life and property.

A-5 PART 5 BUILDING MATERIALS

It covers the requirements of building materials and components, and criteria for accepting new or alternative building materials and components.

A-6 PART 6 STRUCTURAL DESIGN

This Part through its eight Sections provides for structural adequacy of buildings to deal with both internal and external environment, and provides guidance to

engineers/structural engineers for varied usage of material/technology types for building design.

A-6.1 Section 1 Loads, Forces and Effects

It covers basic design loads to be assumed in the design of buildings. The imposed loads, wind loads, seismic forces, snow loads and other loads, which are specified herein, are minimum working loads which should be taken into consideration for purposes of design.

A-6.2 Section 2 Soils and Foundations

It covers geotechnical design (principles) of building foundations, such as shallow foundations, like, continuous strip footings, combined footings, raft foundations, deep foundations like pile foundations and other foundation systems to ensure safety and serviceability without exceeding the permissible stresses of the materials of foundations and the bearing capacity of the supporting soil/rock. It also covers provisions relating to preliminary work required for construction of foundations and protection of excavation.

A-6.3 Section 3 Timber and Bamboo

A-6.3.1 *Section 3A Timber*

It covers the general principles involved in the design of structural timber in buildings, including elements of structures connected ~~together~~ by fasteners/fastening techniques.

It shall not be interpreted to prevent the use of material or methods of design or construction not specifically mentioned herein; and the methods of design may be based on analytical and engineering principles, or reliable test data, or both, that demonstrate the safety and serviceability of the resulting structure. The classification of timber into strength groups as in the sub-section should not be interpreted as preventing the use of design data desired for a particular timber or grade of timber on the basis of reliable tests.

A-6.3.2 *Section 3B Bamboo*

It covers the general principles involved in the design of structural bamboo in buildings with regard to mechanical resistance and durability of structures. It also covers design of both bamboo (round bamboo, split bamboo, glued laminated bamboo) and bamboo-based panels joined together with adhesives or mechanical fasteners. It also covers minimum strength data, dimensional stability, grading requirements and traditional bamboo joints for quality assurance. Constructional aspects using bamboo, such as, work on site, fabrication of components off-site and their erection on site are also covered to the extent necessary to indicate and ensure the quality of material and standard of workmanship to comply with the assumptions of the design rules and the limitations.

It also covers precautions and design limitations on bamboo. The provisions relating to proper procurement and storage of bamboo are covered in Part 7 'Construction Management, Practices and Safety' of the Code.

A-6.4 Section 4 Masonry

It covers the structural design aspects of unreinforced load bearing and non-load bearing walls, constructed with masonry units permitted.

It also deals with the selection of materials, special features of design and construction for masonry construction using rectangular masonry units and covers guidelines regarding earthquake resistant buildings constructed using masonry of low strength. It also covers provisions for design of reinforced brick and reinforced brick concrete floors and roofs. It gives the recommendations for structural design aspects of reinforced load bearing and non-load bearing walls, constructed with different types of bricks and blocks.

A-6.5 Section 5 Concrete

It covers the general structural use of plain and reinforced concrete; and of prestressed concrete, covering both work carried out on site and the manufacture of precast prestressed concrete units.

Section 5A Plain and Reinforced Concrete and *Section 5B Prestressed Concrete* are **being merged in the revision of IS 456**, which will be included in NBC as Part 6/Sec 5.

~~**A-6.5.1** *Section 5A Plain and Reinforced Concrete*~~

~~It covers the general structural use of plain and reinforced concrete.~~

~~**A-6.5.2** *Section 5B Prestressed Concrete*~~

~~It covers the general structural use of prestressed concrete. It covers both work carried out on site and the manufacture of precast prestressed concrete units.~~

A-6.6 Section 6 Steel

~~It covers the use of structural steel in general building construction including the use of hot rolled steel sections and steel tubes, joined using riveting, bolting and welding.~~

A-6.6.1 *Section 6A Steel*

It covers the structural design aspects of steel structures in buildings. This Section applies to general construction using hot rolled steel sections and steel tubes joined using riveting, bolting, and welding. Cold formed light gauge steel sections are covered in separate standards. It also covers the design by limit state method and plastic theory, and also enables design by working stress method.

It gives only general guidance as regards to the various loads to be considered in the design. For the actual loads, such as dead, live, snow, wind and earthquake loads and load combinations to be used, reference may be made to Part 6 'Structural Design', Section 1 'Loads, Forces and Effects' of the Code.

Fabrication and erection requirements covered in this Section are general and the minimum necessary quality of material and workmanship consistent with assumptions in the design rules. The actual requirements may be further developed as per other standards or the project specification, the type of structure and the method of construction.

For seismic design, recommendations pertaining to steel frames only are covered in this section. For more detailed information on seismic design of other structural and non-structural components, reference be made to 5 of Part 6 'Structural Design', Section 1 'Loads, Forces and Effects' of the Code and other special publications on the subject.

A-6.6.2 *Section 6B Composite Construction in Structural Steel and Concrete*

It deals with the design and construction of composite structures made up of structural steel and cast-in-situ/precast concrete, joined together to act integrally.

It is also applicable to simply supported as well as continuous beams slabs and supporting column systems. The design provisions are based on the limit states method of design

A-6.7 Section 7 Prefabricated Concrete Construction~~, Systems Building and Mixed/Composite Construction~~

~~**A-6.7.1** *Section 7A Prefabricated Concrete*~~

It covers recommendations regarding modular planning, component sizes, prefabrication systems, design considerations, joints and manufacture, storage, transportation and erection of prefabricated concrete elements for use in buildings and such related requirements for prefabricated concrete. Aspects relating to mixed/composite construction have also been included.

~~**A-6.7.2** *Section 7B Systems Building and Mixed/Composite Construction*~~

~~It covers recommendations regarding modular planning, component sizes, joints, manufacture, storage, transport and erection of prefabricated elements for use in buildings and such related requirements for systems building and mixed/composite construction.~~

A-6.8 Section 8 Glass and Glazing

It covers the following:

a) Selection and application of glass in buildings, different types of glass, their requirements and associated glazing materials.
b) Guiding provision for glazing in buildings with respect to their effect on energy, visual (light) and solar environments in the building.
c) Selection of glass in buildings, subject to wind loading, seismic loading and special considerations for fire rated glass and related materials.
d) Provisions for the selection of and manifestation ~~on~~ of glass ~~used~~ in buildings, subject to safety with respect to human impact on the occupants.
e) Provisions relating to glazing systems such as selection, design, fabrication, installation, testing and maintenance

A-7 PART 7 CONSTRUCTION MANAGEMENT, PRACTICES AND SAFETY

It covers construction project management; construction planning, site management and building construction practices; storage, stacking and handling of materials; and safety of personnel during construction operations for all elements of a building and demolition of buildings; and habitat and welfare requirements for workers. It also covers guidelines relating to repairs, retrofitting and strengthening of buildings; apart from digitization in construction and use of BIM tools.

The provisions in respect of sustainable building construction practices are covered in Part 11 ‘Approach to Sustainability’ of the Code.

Provisions relating to maintenance management are covered in Part 12 'Asset and Facility Management' of the Code.

A-8 PART 8 BUILDING SERVICES

This Part through its six elaborate Sections on utilities provides detailed guidance to concerned professionals/utility engineers for meeting necessary functional requirements in buildings.

A-8.1 Section 1 Lighting and Natural Ventilation

It covers requirements and methods for lighting and natural ventilation of buildings.

The provisions in respect of lighting and ventilation in sustainable buildings are covered in Part 11 ‘Approach to Sustainability’ of the Code.

For all buildings and facilities open to and used by the public, including all forms of public housing by the government/civic bodies and private developers, adequate lighting and ventilation for barrier free access and movement within and around buildings by for elderly and persons with disability and of different age groups, shall be ensured in accordance with Part 3 ‘Development Control Rules and General Building Requirements’.

A-8.2 Section 2 Electrical and Allied Installations

It covers the essential requirements for electrical installations in buildings to ensure efficient use of electricity including safety from fire and shock. It also includes general requirements relating to lightning protection of buildings and allied installations.

A-8.3 Section 3 Air Conditioning, Heating and Mechanical Ventilation

It covers the planning, design considerations, installation, testing, commissioning and handing over and also operation and maintenance of air conditioning, heating and mechanical ventilation systems for buildings. It also covers refrigeration for cold storages.

It aims to ensure an air conditioning, heating and mechanical ventilation system which shall provide comfort by managing air temperature, humidity, indoor air quality and distribution of conditioned air for the specific use and occupancy of built space while giving due consideration to minimizing energy consumption and other resources.

The provisions in respect of air conditioning, heating and mechanical ventilation system in sustainable buildings are covered in Part 11 'Approach to Sustainability' of the Code.

A-8.4 Section 4 Acoustics, Sound Insulation and Noise Control

It covers requirements and guidelines regarding planning against noise, acceptable noise levels and the requirements for sound insulation in buildings with different occupancies.

A-8.5 Section 5 Installation of Lifts, Escalators and Moving Walks and Parking Systems

A-8.5.1 *Section 5A Lifts*

It covers the requirements for planning, design, installation, operation, maintenance and inspection of lifts (passenger lifts, home lifts, goods lifts, hospital lifts, automobile lifts, rack and pinion lifts, service lifts and dumb waiter) so as to ensure safe movement of people with satisfactory performance.

It also gives information that should be exchanged among the architect/engineer, the consulting engineer and the lift manufacturer from the stage of planning to installation including maintenance.

A-8.5.2 *Section 5B Escalators and Moving Walks*

It covers the essential requirements for planning and design, installation, operation, maintenance and inspection of escalators and moving walks so as to ensure safe movement of people with satisfactory performance, while using these.

It also gives information that should be exchanged among the architect/engineer, the consulting engineer and escalator/moving walk manufacturer from the stage of planning to installation including maintenance.

A-8.5.3 *Section 5C Parking Systems*

It covers the requirements for planning, design, installation, operation, maintenance and inspection of hydraulic lift parking systems in buildings so as to ensure safe movement of cars with satisfactory performance.

It gives information that should be exchanged among the architect/engineer, the consulting engineer and the car parking solution providers /installers from the stage of planning of installation including up to the functioning and maintenance stage.

A-8.6 Section 6 Information and Communication Enabled Installations

It covers the essential requirements for information and communication enabled installations, technology systems and cabling installations and other passive & active equipment in a building. It also covers the basic design and integration requirements for telecommunication spaces within the building/buildings along with their cabling infrastructure, their pathway components and passive required connectivity hardware considering future requirements.

It also includes general requirements relating to installation of different communication equipment, cable terminations, power connections and general guidelines required for planning and providing information and communication technology (ICT) services in the building at the planning and execution stages. The provisions given herein are basic requirements applicable to all residential and other buildings. These can be used at the time of upgradation of existing buildings for properly accommodating telecom systems/services. Buildings meant for data centres and those for housing telecom exchanges/facilities for offering public services may have various other considerations. For such buildings, provisions of this Section are indicative and may be a subject of actual requirements.

A-9 PART 9 PLUMBING SERVICES

This Part through its four Sections gives detailed guidance to concerned professionals/plumbing engineers with regard to plumbing and other related requirements in buildings.

A-9.1 Section 1 Water Supply

It covers the basic requirements of water supply for residential, business and other types of buildings, including traffic terminal stations. It also deals with general requirements of plumbing connected to public water supply and design of water supply systems along with general guidelines about expansion in piping systems, and swimming pools.

A-9.2 Section 2 Drainage and Sanitation

It covers the design, layout, construction and maintenance of drains for foul water, surface water and subsoil water and sewage; together with all ancillary works, such as connections, manholes and inspection chambers used within the building and from

building to the connection to a public sewer, private sewer, individual sewage-disposal system, cesspool, soakaway or to other approved point of disposal/ treatment work.

A-9.3 Section 3 Solid Waste Management

~~It covers the provisions relating to solid waste management.~~

It covers the solid waste management systems, assessment of per capita solid waste quantities and treatment of solid waste within the building, building complexes and their built environments.

A-9.4 Section 4 Gas Supply

It covers the requirements regarding the safety of persons and property for all piping uses and for all types of gases ~~used for fuel or lighting purposes in buildings~~. for purposes like fuel, lighting and medical in buildings.

A-10 PART 10 LANDSCAPE DEVELOPMENT, SIGNS AND OUTDOOR DISPLAY STRUCTURES

A-10.1 Section 1 Landscape Planning, Design and Development

It covers requirements of landscape planning, design and development with the view to promoting quality of outdoor built and natural environments and the protection of land and its resources.

A-10.2 Section 2 Signs and Outdoor Display Structures

It covers the requirements with regard to public safety, structural safety and fire safety of all signs and outdoor display structures.

A-11 PART 11 APPROACH TO SUSTAINABILITY

It covers the perspective of sustainability and the role of the built environment, keeping in mind emerging challenges such as climate-change, ecological disruption and wide-spread toxicity (endocrine disruptors, forever chemicals, micro/nano plastics, etc. ~~parameters required to be considered for planning, design, construction, operation and maintenance of buildings and those relating to land development, from sustainability point of view.~~
It is a supplement to all other Parts/Sections of the Code and shall be read along with them.

A-12 PART 12 ASSET AND FACILITY MANAGEMENT

~~It covers provisions relating to management of building assets and associated facilities and deals with issues relating to maintenance of all types of facilities and fixed assets such as buildings and building services. It does not cover assets other than physical assets.~~

It covers provisions relating to management of building assets and associated facilities and includes various aspects relating to maintenance of all types of facilities and fixed assets, such as, buildings and building services.

****