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सत्यमेव जयते

भारतीय मानक ब्यूरो
(भारत सरकार)
मानक भवन, 9, बहादुरशाह ज़फर मार्ग,
नई दिल्ली - 110 002
**Bureau of Indian Standards**
(Government of India)
Manak Bhawan, 9, Bahadur Shah Zafar Marg,
New Delhi - 110 002

**Our Ref: CED 46/Gen-8**

**13 September 2022**

**Subject: Publication of Guide for using National Building Code of India 2016 and Pamphlets for Homeowners and Home Buyers**

Dear Sir,

As the country envisions to reimage our cities into centres of sustainable living with opportunities for all, including women and youth, it would be pertinent to ensure orderly, safe and sustainable development of cities in accordance with the various regulatory provisions in place. This would also require capacity building of all the stakeholders involved in this activity, such as, building professionals, regulatory Authorities, builders, as also public at large, so that they can understand the regulatory framework, development and building regulations, and the most important publication of Bureau of Indian Standards (BIS), namely, National Building Code of India 2016 (NBC 2016) which supports these regulations, in a better and simple way. Better understanding of these aspects will encourage their use and implementation by the stakeholders.

2. NBC 2016 is a special publication brought out by BIS in which all provisions relating to planning, design, construction and operation and maintenance of buildings are covered in more than 2200 pages. The Code mainly covers aspects of administrative provisions; development control rules and general building requirements; fire safety requirements; stipulations regarding materials and structural design; rules for design of electrical installations, lighting, air conditioning and heating; installation of lifts, escalators and moving walks; provisions for ventilation, acoustics and plumbing services, such as water supply, drainage, sanitation and gas supply; provisions on solid waste management; measures to ensure safety of workers and public during construction; rules for erection of signs and outdoor display structures; provisions on landscape planning and design; and provisions on asset and facility management.

3. In order to promote the use of the Code, a simplified guide in the form of an illustrative booklet, titled **'Guide for Using National Building Code of India 2016'** has been brought out by BIS for all stakeholders for understanding the contents of various Parts/Sections of the Code and their interconnection. For ease of understanding of the technical information provided in NBC 2016, the key contents and concepts of each of the thirteen parts of NBC 2016 have been laid down in the booklet using infographics and simplified language.



-Contd-

4. Considering that the awareness of the general public about the regulation of building construction activity, and about the significance of involving building professionals in the building activity needs to be improved to a great extent, **BIS has published three pamphlets for creating awareness among general public about their rights and duties while constructing their own home or buying one from a builder/developer**. These pamphlets will also guide the public about the ways to take better services from not only municipal bodies/statutory authorities but also from all building professionals whom they should engage for building their safe and sustainable home. These pamphlets have been published both in Hindi and English, and include the following:

1) Guide for Homeowners – **Series 1 Building Permit Process**
2) Guide for Homeowners – **Series 2 Constructing your Independent House**
3) Guide for Homeowners – **Series 3 Buying an Apartment from a Developer/Builder**

With the help of flowchart and checklists, these pamphlets explain the process of obtaining the permits from the Authority for development or building construction, and also guides homeowners and homebuyers about the various aspects they must ensure while buying or building a home.

5. **We are pleased to enclose a copy each of the booklet and the pamphlets for your use, with a request to further disseminate the same.** These are also available on our website, www.bis.gov.in and can be downloaded from the following links:

https://www.bis.gov.in/index.php/guide-for-homeowners-and-homebuyers/

https://www.bis.gov.in/wp-content/uploads/2022/08/Booklet-Guide-for-Using-NBC-2016.pdf

With regards,

Yours sincerely,

Pramod

**(Pramod Kumar Tiwari)**

**Shri Kishore Chandra H.C**
**Chairman**
**Karnataka Real Estate Regulatory Authority**
**2nd Floor, Silver Jubli Block, Unity Building**
**CSI Compound, 3rd Cross**
**Mission Road, Bengaluru**
**Karnataka 560 027**

**Checklist 1:** List of documents to be submitted with the application for Building Permit

- [ ] Key Plan and Site Plan
- [ ] Subdivision Plan/Layout Plan, if required
- [ ] Building Plans including Sections and Elevations
- [ ] Structural Drawings and Design Calculations
- [ ] Services Plan (Electrical, Plumbing, HVAC, etc)
- [ ] Material Specifications
- [ ] Ownership Documents
- [ ] Certificate for Structure Design Sufficiency
- [ ] Certificate for Subsurface Investigation, if required
- [ ] Certificate of Supervision

**Checklist 2:** Tentative list of NOCs to be submitted along with permit application (where applicable)

- [ ] Airports Authority of India
- [ ] Ministry of Environment, Forest & Climate Change
- [ ] Fire Services Department
- [ ] Pollution Control Department
- [ ] Urban Art Commission
- [ ] Coastal Regulation Zone Management Authority
- [ ] National Monuments Authority

And any other NOCs if required.

GUIDE FOR HOMEOWNERS - **SERIES 1**

MEET YOUR GUIDE

Hi I'm Weaverbird,
I know that the process of constructing or buying your own home needs to be guided. I have developed a series of guides to help you in your journey of becoming a homeowner.

Any development or construction needs a permit from the Authority. This guide provides homeowners information on permits and the development/building permit process.

If you are constructing an independent house, please refer to **Guide for Homeowners - Series 2.**

If you buying a house from a developer, please refer to **Guide for Homeowners - Series 3.**

For more information, please contact:


Head (Civil Engg)
Bureau of Indian Standards
Manak Bhavan
9 Bahadur Shah Zafar Marg
New Delhi – 110002

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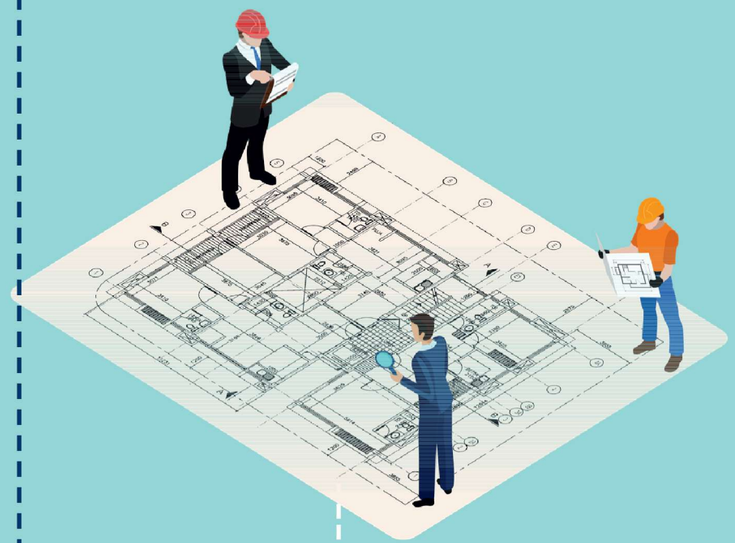
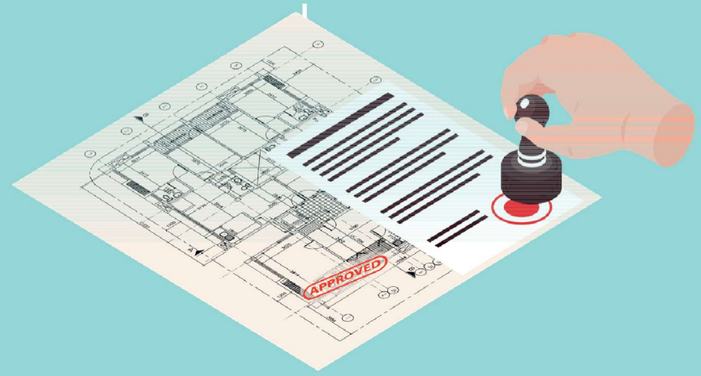
# GUIDE FOR HOMEOWNERS - **SERIES 1**

## BUILDING PERMIT PROCESS






Bureau of Indian Standards

*Hi Weaverbird, I have got plans prepared for my home and want to start construction. Do you have any guidance for me?*

No construction can be started without a Building Permit from your Authority[1]. This guide explains the process of acquiring one from your Authority.

*What is a Building Permit?*

A Building Permit is a permission granted by your Authority to undertake any building construction or reconstruction, alteration and demolition activity.

Before applying for a Building Permit, make sure that your plot is a part of an approved layout plan.

*Is a Permit required for making alterations?*

All major alterations have to be approved by the Authority unless provided in the list of exemptions given in the Local Building Regulations[2]

*What if I need to demolish my house and reconstruct?*

In that case you will also need a Demolition Permit.

*Note: You need to maintain your house as the Authority has all the rights to declare it unsafe and demolish it, if required.*

*What is a typical Building Permit process?*

The building permit process may differ in every State and Authority. It is prescribed in your Local Building Regulations.

[1]Authority may be a Municipal Corporation, Municipality, Development Authority, Town Planning Department or Panchayat based on the area where your plot is located.
[2] Building Regulations (also known as Building Byelaws in some local bodies) is a legal document to regulate the building construction activity.

## I HAVE ILLUSTRATED A TYPICAL BUILDING PERMIT PROCESS FOR YOU

1. Submission of Building Permit application along with plans and required documents (refer checklist 1) and fees to the Authority. In some cases, NOCs may be required (refer checklist 2).
2. Scrutiny and inspection by the Authority. Deficiencies, if any pointed out by the Authority to be resolved.
   - X → Refusal of Permit by the Authority citing reasons.
3. Grant of Permit by the Authority along with sanction of the submitted plans.
4. Submission of Notice of Commencement of work by the Owner to the Authority.
5. Commencement of construction as per the sanctioned plans with inspections by the Authority at regular intervals.
6. Submission of Notice of Completion by the Owner to the Authority
7. Inspection by the Authority to check if there are any deviations from the sanctioned plans.
8. Corrective action, if any by the Owner as directed by the Authority.
9. Grant of Occupancy Permit by the Authority.

**DID YOU KNOW?**

*Most Authorities have migrated to an online single window clearance system for a quick and transparent permit process. This system helps you obtain a permit within clearly defined timelines (usually one month) and pay the corresponding fees accordingly.*
*Check your Authority's website to find out more.*

## ALL BUILDING CONSTRUCTION HAS TO BE DONE UNDER THE GUIDANCE OF REGISTERED BUILDING PROFESSIONALS (RBPs)

### WHAT SERVICES CAN I GET FROM REGISTERED BUILDING PROFESSIONALS ?

You must hire RBPs to prepare all the plans, structural design and documents as per the Local Building Regulations and supervise building construction. RBPs are responsible for functionally efficient and structurally safe buildings.

In order to get better services from these professionals, you should be aware of their roles and responsibilities in the permit process, as given below:

| | |
|---|---|
| Architect | • Preparation of plans (building plan, key plan, subdivision/layout plan, services/ utility plans), and supervision. |
| Civil Engineer | • Preparation of plans (subdivision/layout plan, services/utility plans, demolition plan) including sub-surface investigation, structural design and drawings (that determines building is safe against loads, forces and effects, and against any natural disasters), and supervision. |
| Structural Engineer | • Prepare structural design and drawings, demolition plan and structural sufficiency certificate (that determines building is safe against loads, forces and effects, and against any natural disasters). |
| Geo-technical Engineer | • Sub-surface investigation for determining suitability of sub-strata, and preparation of its report. |
| Building Contractor | • Execute construction at site and ensure construction of building pertaining to architectural aspects as per the sanctioned plan. |

*Note: See Local Building Regulations for qualifications and competence of RBPs. You may also find a list of RBPs on your Authority's website.*

The Owner should obtain from the appointed RBP (in hard and soft copy format) a set of as-built drawings along with structural and foundation details, and should maintain these for future use.

*Wow! Thank you, Weaverbird for your help.*

*Where can I find further information?*

*You are welcome.*

*You may wish to refer to the following documents:*
- *Local Building Byelaws/Regulations*
- *Master Plan, Zonal Plans and Layout Plans*
- *National Building Code of India 2016 (NBC 2016)*
- *Town and Country Planning Act/Development Act*
- *Municipality/Municipal Corporation Act*

GUIDE FOR HOMEOWNERS - **SERIES 2**

MEET YOUR GUIDE

“

Hi I’m Weaverbird,
I know that the process of constructing or buying your own home needs to be guided. I have developed a series of guides to help you in your journey of becoming a homeowner.

This guide provides homeowners information about their rights and duties when constructing an independent house (which is low-rise having height less than 15m) on a plot of land.

If you are buying a house from a developer, please refer to **Guide for Homeowners - Series 3.**

”

Checklist for independent house

- ☐ Architect/Civil engineer appointed
- ☐ Civil/Structural engineer appointed
- ☐ Building plans, service plans and structural drawings prepared by architect and structural engineer as per Building Regulations
- ☐ Building Permit obtained from the Authority
- ☐ Notice of commencement submitted to the Authority
- ☐ Construction as per sanctioned plan and supervised by the appointed architect/civil engineer
- ☐ If the sanctioned plan is modified, Authority has been notified and approval has been taken
- ☐ On completion of work, Notice of Completion submitted to the Authority
- ☐ Received Occupancy Permit before occupying the house
- ☐ Obtain a new Building Permit when making addition or alteration to the house
- ☐ Obtain a Demolition Permit if the building is being demolished in whole or part

For more information, please contact: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# GUIDE FOR HOMEOWNERS - **SERIES 2**

## CONSTRUCTING YOUR INDEPENDENT HOUSE

Bureau of Indian Standards

*Hi Weaverbird, I want to construct a house on a plot.*

Before starting construction, a homeowner must know and undertake the following essential activities:

**1** Hire a qualified architect/civil engineer and structural engineer[1] and get your building plans and structural drawing, respectively prepared by them. In some cities, Authorities register such professionals and a list may be available on the Authority's website or in their office.

**2** Building plans must be prepared in accordance with the Building Regulations[2] notified by your Authority[3]. Ensure soil conditions are suitable for building construction.

**3** Important provisions of Building Regulations that you must be aware of, are:

- Maximum Ground Coverage, minimum front, rear and side setbacks, parking, open spaces and Floor Area Ratio (FAR) permissible on your plot.
- Permissible land use and its ancillary activities, especially relevant if you also want to build a shop or office in your house.
- Building Permit process which includes the list of documents that are to be submitted for getting the Building Permit along with the sanctioned plan and the No Objection Certificates (NOCs) that have to be obtained from other Government departments.
- Minimum sizes of rooms of the house to ensure proper light, ventilation, circulation space & safety.
- Restrictions on dimensions (height, width, etc) of other parts of the building like staircase, balcony, chajja, porch, mumty, boundary wall and ramp.

**4** After finalizing the building plan with the architect /civil engineer, the drawings should be sent to the appointed civil/structural engineer for structural design and drawings.

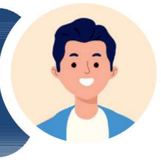
**5** The architect/civil engineer will also prepare the drawings for building and plumbing services such as electrical, water supply, sewerage and drainage services.

**6** After your satisfaction, submit the application for Building Permit along with the building plan, structural plan, services plans and specifications (refer **Guide for Homeowners - Series 1** for details) to the Authority for obtaining the Building Permit along with sanctioned plans.

**DID YOU KNOW?**

*Any building construction including boundary wall or foundation work cannot be started on the site without obtaining Permit from the Authority.*

*Hi Weaverbird, I have received the Building Permit from the Authority, I am going to start the construction of my house today.*



*That's great. Now you should ensure that the building is in accordance with sanctioned plan, and is supervised by appointed architect/civil engineer.*

*If required, a separate building contractor may be appointed.*

*Oh I didn't know that, what else should I be aware of?*

A HOMEOWNER MUST UNDERTAKE THE FOLLOWING ACTIVITIES:

**1** BEFORE CONSTRUCTION ENSURE TO:

- Submit a notice of commencement of work to the Authority.
- Acquire a temporary electricity and water connection from service utilities.
- Keep a copy of your sanctioned plans, services plans, drawings and specifications at the construction site.

**2** DURING CONSTRUCTION:

- Ensure construction as per the sanctioned plan.
- Send a written notice to the Authority for any change in Registered Building Professionals.
- Send a written notice to the Authority on completion of work at various stages of construction, as required by the Local Building Regulations.
- In case of any major modifications, submit revised plans and obtain sanction from the Authority.
- Use BIS Standard marked (ISI) building materials.

**3** AFTER COMPLETION OF CONSTRUCTION:

- Submit Notice of Completion to the Authority.
- Apply for Occupancy Permit.

**4** DURING THE USE OF BUILDING PREMISES:

- Ensure upkeep and maintenance.
- If you make any addition or alteration to your house, such as adding a new floor, making structural changes, etc apply for a fresh Building Permit[4] before commencing any work.
- If any building is to be demolished, in whole or part, take Demolition Permit from the Authority.

**POINTS TO REMEMBER**

- *You may want to make provisions for rainwater harvesting, use of solar PVs for electricity, solar water heating system, recycle and re-use of grey water, provision of composting pits and energy efficient devices in your house.*
- *It is also advisable to incorporate universal accessibility features such as handrails and ramps for common areas, entrances and toilets. This helps create a more inclusive living space for children, elderly and the disabled.*
- *Most Authorities have migrated to an online single window clearance system for an easy and transparent Permit process. This system helps you obtain a Permit and NOCs from various external departments within clearly defined timelines and pay the fees online. Check your Authority's website for details.*
- *If you are installing a lift in your house, you have to take a licence from the concerned body and a safety certificate after the installation of the lift.*

[1] More details about these professionals have been provided in Guide for Homeowners- Series 1.

[2] Building Regulations (also known as Building Byelaws in some local bodies) is a legal document to regulate the building construction activity.

[3] Authority may be a Municipal Corporation, Municipality, Development Authority, Town Planning Department or Panchayat based on the area where your plot is located.

[4] Building Regulations also provide a list of activities that are exempted from the revised approval process. Please check the list in applicable Building Regulations.

GUIDE FOR HOMEOWNERS - **SERIES 3**

MEET YOUR GUIDE

“Hi I’m Weaverbird,
I know that the process of constructing or buying your own home needs to be guided. I have developed a series of guides to help you in your journey of becoming a homeowner.

This guide provides homeowners information about their rights and duties when buying an apartment from a developer.

If you want to know more about permits and the permit process, please refer to **Guide for Homeowners - Series 1.**

If you are constructing an independent house, please refer to **Guide for Homeowners - Series 2.**”

List of documents to ask from a developer before possession

- ☐ Building Permit along with sanctioned plans and NOCs
- ☐ Copy of RERA registration certificate
- ☐ Area statements and other facilities available
- ☐ Occupancy Permit and approvals for connections from utilities
- ☐ Land Use Certificate
- ☐ Land Title documents


For more information, please contact:

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# GUIDE FOR HOMEOWNERS - **SERIES 3**

## BUYING AN APARTMENT FROM A DEVELOPER/BUILDER

Bureau of Indian Standards

Hi Weaverbird, I am looking to buy an apartment from a developer/builder.

That's nice. But is the apartment ready-to-move or still under construction?

Well, it is almost complete, and we will be able to occupy in a few month's time.

Ok, you must be clear if it is ready-to-move or under construction. The papers that you need to ensure in each type will be different and I am summarizing them here for you.

## FOR AN UNDER-CONSTRUCTION PROPERTY

**1** Ensure that the project is registered with your State's Real Estate Regulatory Authority (RERA) and check the details on their website.

**2** Make sure that the project has been issued a Development and Building Permit from the Authority. Ask your builder or developer to show you this Permit.

**3** The Development and Building Permit of the project always has the sanctioned plan. Ask for a copy of the sanctioned plan from the developer and verify that the construction is as per the plan.

**4** The developer may sell or price the apartment on the basis of carpet area. You should verify the actual carpet area[1] that will be available for your use.

**5** Read the brochure/prospectus and Builder Buyer Agreement (BBA) carefully. Some terms and conditions of the BBA are included in your registration document. Also look for specifications of materials which should be BIS Standard marked ISI.

**6** Ask for a copy of the Occupancy Permit.

## FOR A READY-TO-MOVE IN PROPERTY

**1** If it is registered under RERA, check all the following documents:

1. Occupancy Permit.
2. Sanctioned Plans.
3. Structural drawings/details.
4. Builder Buyer Agreement (BBA).
5. Information submitted to RERA with the registration.

**2** If it is a resale property,

1. Obtain complete ownership/title documents-these are now also available on the websites of many concerned Sub-registrar/Authority.
2. Obtain papers of the first buyer of the property.
3. Assess need for quality audit in case of any cracks or visible signs of distress.
4. Check for any outstanding dues: water, electricity, house tax, RWA, etc.

[1] See local Building Regulations for definitions of covered area and carpet area.
[2] More details about these professionals have been provided in Guide for Homeowners - Series 1.

[3] Authority may be a Municipal Corporation, Municipality, Development Authority, Town Planning Department or Panchayat, based on the area where your plot/building is located.
[4] Building Regulation (also known as Building Byelaws in some local bodies) is a legal document to regulate the building construction activity.

## THINGS TO KNOW

- Details of the architect/civil engineer and structural engineer[2] who has designed the project.
- Check the Master Plan/Zonal Plan if the development is in accordance with the planned land use such as residential, commercial, public/semi-public, etc. In case the actual land use is different from notified zoning, ask for change in land use certificate. Master plan is available at the Authority[3] and at their official website.
- Layout should be as per the sanctioned plan and there should be no deviations. Any addition or change in the sanctioned development and/or building plan has to be approved by the authority and an application for approval has to be submitted along with fees as prescribed in Local Building Regulations[4].
- The Owner can take a recourse to approach to RWA/RERA/Authority and other mechanisms such as consumer courts to redress their complaints relating to quality, services, wokmanship and other obligations. RERA provides a 5 year defect liability period wherein the builder/developer is obligated to address various defects.
- Important provisions of Building Regulations that you must be aware of, are:
  - *Ground coverage, front, rear and side setbacks, Floor Area Ratio (FAR), parking, density permissible on your plot. Also check if space for visitors parking and accessible parking are provided in the proposed layout.*
  - *Permissible land use and its ancillary activities, especially relevant if you also want to build a shop or office in your house.*
  - *Administrative process of plan approval which includes the list of documents that will be submitted for getting plan sanctioned and the NOCs that have to be obtained from other Government departments/agensies.*
  - *Minimum sizes of rooms of the house so that proper light, ventilation and safety is ensured.*
  - *Restrictions on dimensions (height, width, etc.) of other parts of the building like stairs, porch, mumty, boundary wall, ramps etc.*
- For all high-rise apartments (height more than 15 m), fire and life safety systems such as fire detection and alarm system, emergency lighting, fire hydrants etc should be installed and working.
- The developer/ builder has to maintain building and its campus till it is handed over to the RWA.
- You may select projects which include sustainability features such as rain-water harvesting, use of solar PVs for electricity, solar water heating system, recycle and re-use of grey water, provision of composting pits and energy efficient devices and/or use of sustainable building materials.
- Check whether the universal accessibility features such as handrails, ramps are provided to access common areas (parks, community centers, parking, building entrances, lobby, lift, etc) for a more inclusive space for children, elderly and the disabled. Every building should include accessible dwelling units at lower levels and accessible toilet close to entrance lobby.

# GUIDE FOR USING NATIONAL BUILDING CODE OF INDIA 2016

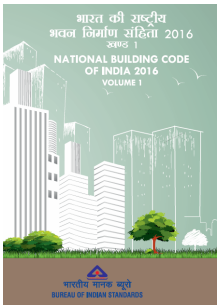
भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS

# Guide for Using National Building Code of India 2016

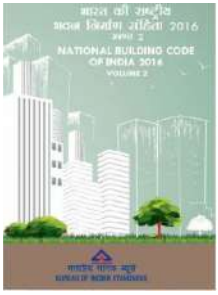

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS

# About

**Bureau of Indian Standards** (BIS) is the National Standards Body of India established under the BIS Act 2016 for development of standards, marking and quality certification of goods and for matters connected therewith or incidental thereto. BIS has been providing traceable and tangible benefits to the national economy in a number of ways – ensuring provision of safe reliable quality goods; minimizing health hazards to consumers; promoting exports and imports substitute; control over proliferation of varieties, etc through standardization, certification and testing.




The **National Building Code of India 2016** (NBC 2016), a comprehensive building Code prepared by BIS, is a national instrument providing guidelines for regulating the building construction activities across the country. It serves as a Model Code for adoption by all agencies involved in building construction works, be the Public Works Departments, other government construction departments, local bodies or private construction agencies. The Code mainly contains administrative regulations, development control rules and general building requirements; fire safety requirements; stipulations regarding materials, structural design and construction (including safety in construction); building and plumbing services; landscaping and outdoor display structures; approach to sustainability; and asset and facility management.




Thus, the Code gives all the information required by the architect, engineer, structural engineer, construction engineer, services engineer and other professionals from the early stages of planning to translating the building on to *terra firma.* The comprehensive NBC 2016 contains 13 Parts some of which are divided into Sections and Subsections totalling 33 chapters (refer page ii).

# NBC 2016 at a glance

**VOLUME 1**

- Part 0 Integrated Approach – Prerequisite for applying provisions of the Code
- Part 1 Definitions
- Part 2 Administration
- Part 3 Development control rules and general building requirements
- Part 4 Fire and life safety
- Part 5 Building materials
- Part 6 Structural design
  - Section 1 Loads, forces and effects
  - Section 2 Soils and foundations
  - Section 3 Timber and bamboo
    - 3A Timber
    - 3B Bamboo
  - Section 4 Masonry
  - Section 5 Concrete
    - 5A Plain and reinforced concrete
    - 5B Prestressed concrete
  - Section 6 Steel
  - Section 7 Prefabrication, systems building and mixed/composite construction
    - 7A Prefabricated concrete
    - 7B Systems building and mixed/composite construction
  - Section 8 Glass and glazing

**VOLUME 2**

- Part 7 Construction management, practices and safety
- Part 8 Building services
  - Section 1 Lighting and natural ventilation
  - Section 2 Electrical and allied installations
  - Section 3 Air conditioning, heating and mechanical ventilation
  - Section 4 Acoustics, sound insulation and noise control
  - Section 5 Installation of lifts, escalators and moving walks
    - 5A Lifts
    - 5B Escalators and moving walks
  - Section 6 Information and communication enabled installations
- Part 9 Plumbing services (including solid waste management)
  - Section 1 Water supply
  - Section 2 Drainage and sanitation
  - Section 3 Solid waste management
  - Section 4 Gas supply
- Part 10 Landscape development, signs and outdoor display structures
  - Section 1 Landscape planning, design and development
  - Section 2 Signs and outdoor display structures
- Part 11 Approach to sustainability
- Part 12 Asset and facility management

# Introduction

The National Building Code of India (NBC 2016) is a national instrument providing guidelines for regulating the building construction activities across the country. This Guide has been prepared to help the readers of the NBC 2016 in using the Code, understanding the contents of various Parts/Sections and their connection. The key contents and concepts of each part are laid out using infographics and simplified language such that all stakeholders including officials from regulatory and other government departments, private developers, builders, contractors, professionals, academicians, and students from different backgrounds can get an understanding of the information provided within the Code.

This guide summarizes the key sections of each part of NBC. For details, please refer to NBC with latest amendments.

# Part 0 Integrated Approach– Prerequisite for Applying Provisions of the Code

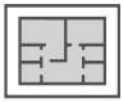
## Key Content

This Part gives an overall direction for practical applications of different aspects of spatial planning, designing and construction of buildings, and laying of services. It proposes an integrated approach for utilizing appropriate knowledge and experience of qualified professionals during the entire life cycle of a development/building project.

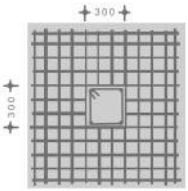
## Part 0 at a glance

A development/building project and the built facility comprises 6 major stages.

1 Location/Siting



2 Conceptualization and Planning




3 Designing and Detailing

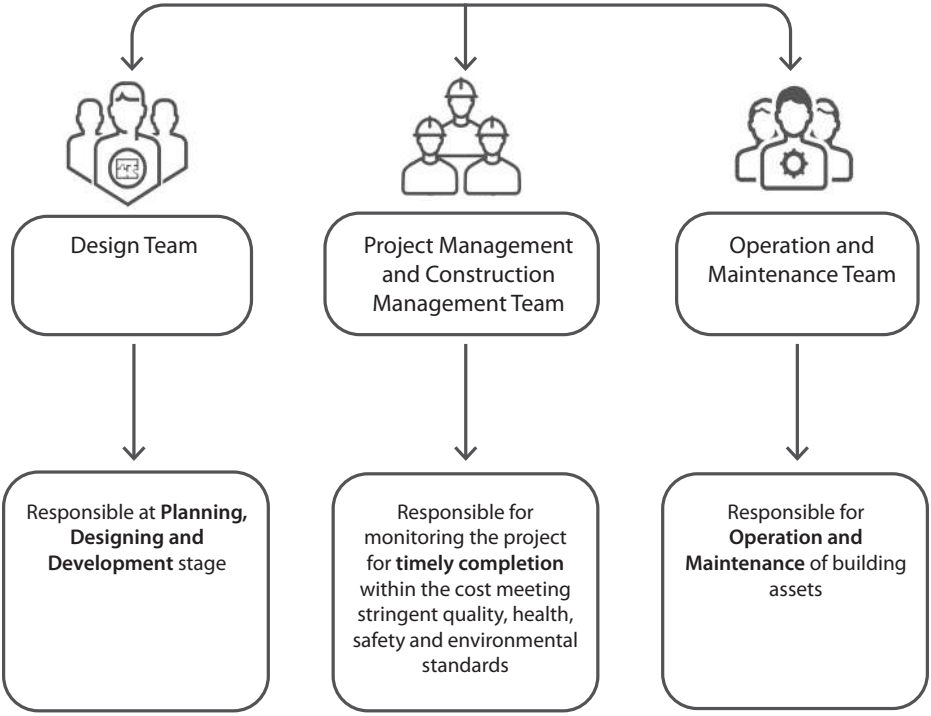
4 Construction/Execution

5 Operation and Maintenance

6 Decommissioning and Deconstruction

Key Teams of Multidisciplinary Professionals

Architect; Civil engineer; Structural engineer; Geotechnical engineer; Electrical engineer; Plumbing engineer; Fire protection engineer; HVAC engineer; Lift, escalator and moving walk specialist; Acoustics specialist; Information/Communication technology engineer; Health, safety and environment specialist; Environment/Sustainability specialist; Town planner; Urban designer; Landscape architect; Security system specialist; Interior designer; Quantity surveyor; Project/Construction manager; Accessibility and universal design specialist; Asset/Facility manager; and other subject specialists.




Depending on the complexity and magnitude of the project, a multidisciplinary team of professionals need to be engaged as a well–coordinated team to achieve the desired delivery in an effective manner.

**For more details on Part 0, please refer to NBC 2016**

# Part 1 Definition

## Key Content

There are approximately 1,776 terms defined in NBC 2016. Each Part or Section of the NBC gives the definitions of the important terms used in it, which may be found in the clause 'Terminology' for each Part/Section of NBC 2016.

## Part 1 at a glance

Part 1 gives an index of all such definitions and directs the user to refer to the correct Part/ Section for locating the desired definition. Examples of terms whose definitions are covered in various Parts/Sections are:

| | |
|---|---|
| Part 0 Integrated Approach– prerequisite for applying provisions of the Code | Authority having jurisdiction/Authority, Building, Owner,.... |
| Part 2 Administration | Development, Unsafe building, Sanctioned plan, Permit, Alteration,... |
| Part 3 Development Control Rules and General Building Requirements | Open space, Floor Area Ratio (FAR), Building height, Chajja, Covered area, Habitable room,.... |
| Part 4 Fire and Life Safety | Exit, High rise building, Refuge area, Evacuation Lift, Horizontal Exit,.... |
| Part 6 Structural Design | Column, Structural timber, Curtain wall, Load bearing wall, Poisson's ratio, Prestressed concrete, Diaphragm,.... |
| Part 7 Construction Management, Practices and Safety | Scaffold, Wall opening, Platform, Pile rig, Construction equipment,.... |
| Part 8 Building Services | Daylight factor, Glare, Cable, Building energy simulation, Ambient noise, Lift car,.... |
| Part 9 Plumbing Services | Service pipe, Storage tank, Water outlet, Soil pipe, Municipal solid waste,.... |
| Part 10 Landscape Development, Signs and Outdoor Structures | Contour, Gradient, Green roof, Permeable paving, Sign, Advertising sign,.... |
| Part 11 Approach to Sustainability | Embodied energy, Environmental impact, Indoor air quality, Renewable Source, Thermal comfort,.... |
| Part 12 Asset and Facility Management | Building management system, Facility, End user, Housekeeping, Operational strategy,.... |

**For more details on Part 1, please refer to NBC 2016**

# Part 2 Administration

## Key Content

This Part describes organization of a building department for enforcement of the Code including procedure for obtaining development, building and occupancy permits; responsibility of the owner and all professionals involved in planning, design and construction of the building.

### Organization and Enforcement

- Department of buildings
- Appointment of team of building officials
- Qualification of building officials
- Delegation of powers
- Powers and duties of team of building officials
- Board of appeals
- Violation and penalties
- Power to make rules

### Permit and Inspection

- Application for development, building permit
- Responsibilities and duties of the owner
- Validity
- Architectural control
- Inspection, occupancy permit and post–occupancy inspection
- Unsafe building
- Demolition of building

## Key Stakeholders

Owner/Developer

Authority having jurisdiction (called Authority)

Architect

Civil Engineer

Structural Engineer

Geotechnical Engineer

Supervisor

Town Planner

Landscape Architect

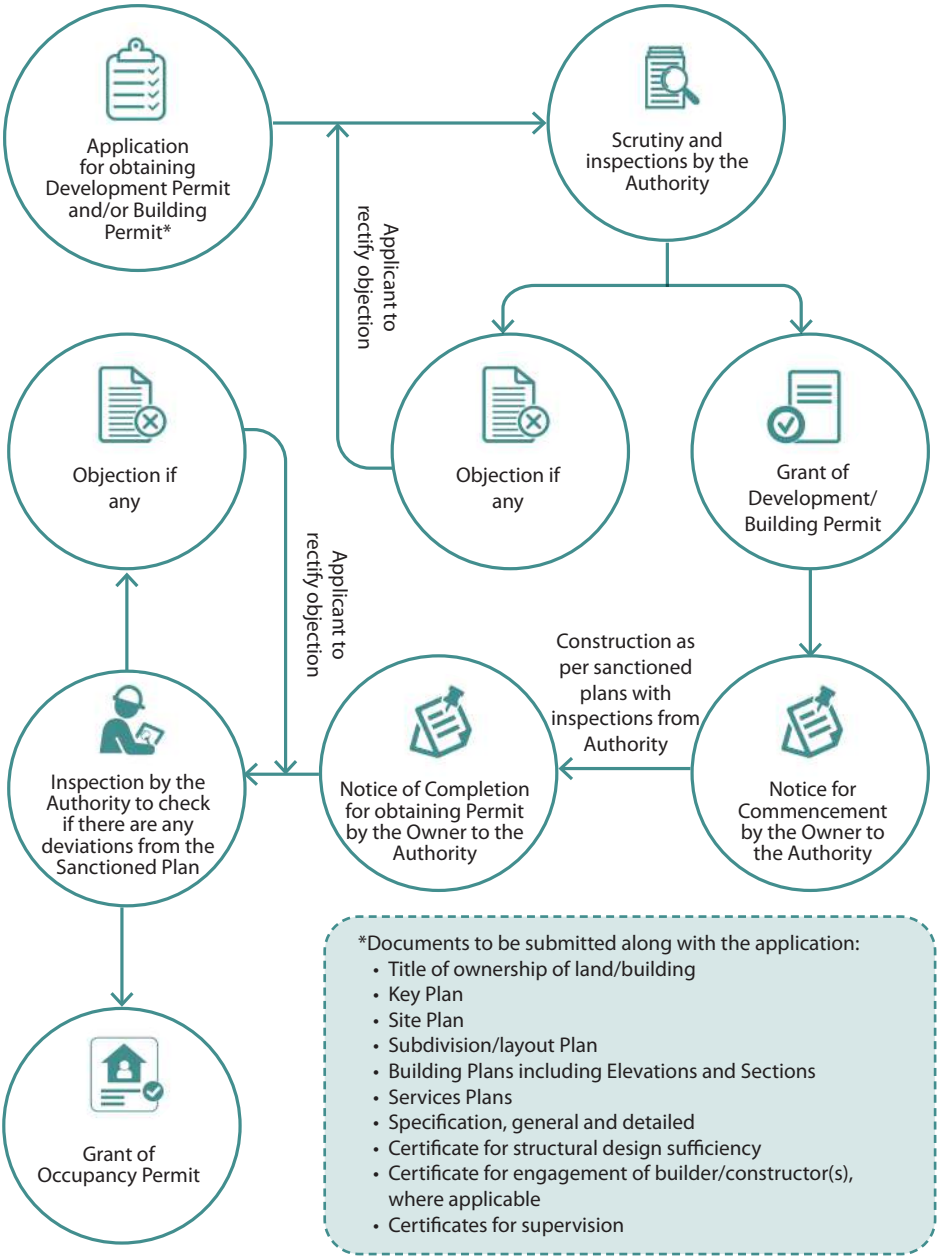
Urban Designer

Engineers for Utility Services

Builder/Constructor

For qualifications and competencies of professionals, refer to Annex A of Part 2 of NBC 2016

## Part 2 at a glance




**For more details on Part 2, please refer to NBC 2016**

# Part 3 Development Control Rules and General Building Requirements

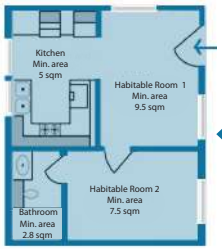
## Key Content

This Part covers development control rules such as land use classification, requirements for subdivision and layout plan including means of access, open spaces, plot requirements, area and height limitations, off street parking spaces, green belts and landscaping. This Part also covers general building requirements for various parts of building and accessibility requirements in the built environment.

Hierarchy of Development

Landuse Classification

Layout/Subdivision Plan




Requirement for parts of building

- Means of access
- Fire tender movement
- Open spaces (within a plot)
- Area and height limitations
- Community open spaces and amenities
- Off street parking spaces
- Group housing
- Buildings on podium
- Green belts, landscaping

**Accessibility in Public Buildings and Public Spaces**

- Minimum width, gradient and specifications for walkways/ pathways and kerb ramps
- Installation of tactile ground surface indicators to aid visually impaired persons
- Adequate accessible parking spaces with signages
- Specifications of accessible approach to building, access at entrance and within the building
- Handrails and grab bars to be provided for easy movement and use of facilities
- Specifications for making level changes (stairs, ramps, lifts) accessible
- At least one accessible unisex toilet to be provided
- Accessibility to various services and their fittings such as door, windows, handles, electrical switches and taps
- In public buildings, all public areas to be made accessible
- Minimum accessibility provisions specific to different building occupancy types
- The signage requirements for universal accessibility in public buildings and public spaces are covered in Annexure B, Part 3 of NBC 2016.

**Accessibility in Group Housing**

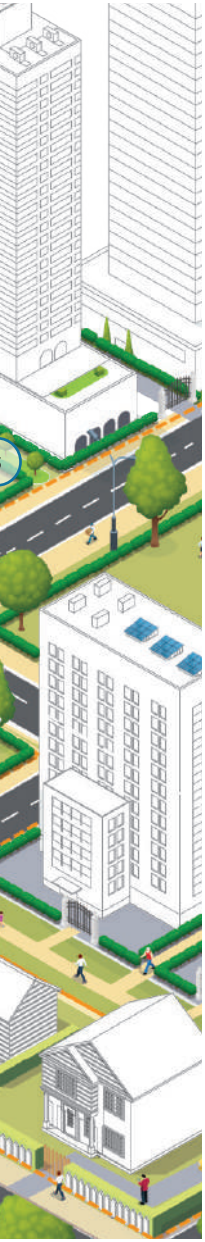
- Some ground floor Dwelling Units in group housing to be made universally accessible
- All Dwelling Units to have minimum universal design features such as minimum clear door width of main entrance, rooms, kitchen, one toilet.

This Part also covers requirements for low income housing in urban areas, cluster planning, low income habitat planning in rural areas and development planning in hilly areas.

## Part 3 at a glance

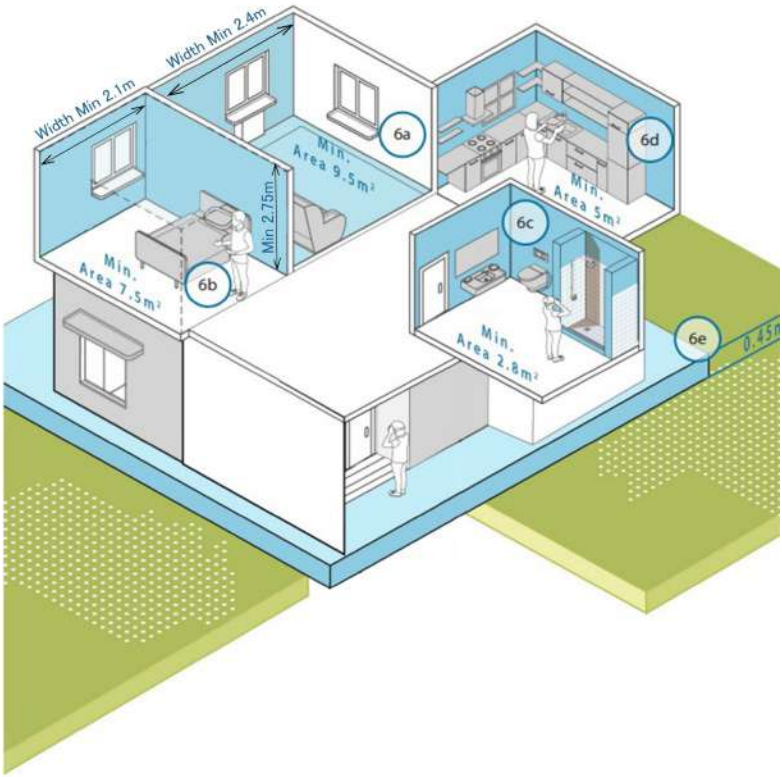

Typical Subdivision Layout

Key: 1) Open spaces (around buildings)
2) Off–street parking spaces
3) Means of access connecting different layouts
4) Greenbelts and landscaping
5) Provisions regarding plot sizes and frontage
6) General Building Requirements (Check next page for details)



Some requirements for parts of building as per Clause 12 of Part 3 of NBC 2016

6a) Habitable room 1 (Minimum area 9.5 $m^2$ and minimum width 2.4 m)
6b) Habitable room 2 (Minimum area 7.5 $m^2$ and minimum width 2.1 m)
6c) Toilet (Minimum area with W.C. 2.8 $m^2$)
6d) Kitchen (Minimum area 5 $m^2$ without dining)
6e) Plinth height (Minimum height 0.45 m for plain areas/hilly area and 0.6 m flood prone )




**For more details on Part 3, please refer to NBC 2016**

# Part 4 Fire and Life Safety

## Key Content

This Part deals with safety from fire. It specifies the demarcation of fire zones, restrictions on construction of buildings in each fire zone, classification of buildings based on occupancy, types of building construction according to fire resistance of the structural and non–structural components and other restrictions and requirements necessary to minimize danger to life from fire, smoke, fumes or panic before the buildings can be evacuated. The provisions covered in this Part are divided in three broad areas: Fire Prevention, Life Safety and Fire Protection.

## Part 4 at a glance

**Fire and life Safety**

### Fire Prevention

- Classification of buildings based on occupancy, from fire safety point of view
- Demarcation of fire zone
- Types of building construction
- Openings in fire resistant walls and floors
- Electrical installations
- Escape lighting and exit signage
- Air conditioning, ventilation and smoke control
- Heating
- Glazing
- Surface interior finishes
- Fire Command Centre (FCC)

### Life Safety

- General exit requirements
- Occupant load
- Egress components
  - Exit access
  - Exit
  - Exit discharge
- Compartmentation
- Smoke control
- Gas supply
- Hazardous areas, gaseous, oil storage yard, etc
- Fire Officer
- Fire drills and fire orders

### Fire Protection

- Requirements for firefighting installations (refer Table 7)
- Maintenance of firefighting installation and systems

Additional occupancy wise requirements

**Additional** fire safety requirements for high rise building, atrium, commercial kitchen, car parking facilities, metro stations, metro trainways and measures for venting in industrial buildings, are also covered in this Part of NBC 2016.

**All buildings shall satisfy minimum requirements for safety of life from fire, smoke, fumes or panic arising from these or similar causes.**

## FIRE PREVENTION

### Classification of buildings based on occupancy.

The city or area under the jurisdiction of the Authority shall be demarcated into distinct fire zones depending upon the existing layout, types of building construction, classification of existing buildings based on occupancy and expected future development of the city or area. Intermixing of hazardous occupancies should not be allowed in other zones.

**Fire Zone 1**

- **Group A: Residential Buildings**
  - Subdivision A–1 Lodging and rooming houses
  - Subdivision A–2 One or two family private dwellings
  - Subdivision A–3 Dormitories
  - Subdivision A–4 Apartment houses
  - Subdivision A–5 Hotels
  - Subdivision A–6 Starred Hotels
- **Group B: Educational Buildings**
  - Subdivision B–1 Schools up to senior secondary level
  - Subdivision B–2 All others/training institutions
- **Group C: Institutional Buildings**
  - Subdivision C–1 Hospitals and sanatoria
  - Subdivision C–2 Custodial institutions
  - Subdivision C–3 Penal and mental institutions
- **Group D: Assembly Buildings**
  - Subdivision D–1 Buildings with stage and fixed seats over 1,000 persons
  - Subdivision D–2 Buildings with stage and fixed seats upto 1,000 persons
  - Subdivision D–3 Buildings without permanent stage, accommodation for 300 or more persons, and no permanent seating arrangements
  - Subdivision D–4 Buildings without permanent stage, accommodation less than 300 persons, and no permanent seating arrangements
  - Subdivision D–5 Temporary structures designed for assembly
  - Subdivision D–6 Shopping malls with multiplexes and food courts
  - Subdivision D–7 Underground and elevated mass rapid transit system
- **Group E: Business Buildings**
  - Subdivision E–1 Offices, banks, professional establishments
- **Group F: Mercantile Buildings**
  - Subdivision F–1 Shops, stores departmental stores (area upto 500 $m^2$)
  - Subdivision F–2 Shops, stores departmental stores (area > 500 $m^2$)
  - Subdivision F–3 Underground shopping centres

**Fire Zone 2**

- **Group E: Business Buildings**
  - Subdivision E–2 Laboratories, outpatient clinics, research establishments, libraries and test houses
  - Subdivision E–3 Electronic data processing centres, computer installations,information technology parks and call centres
  - Subdivision E–4 Telephone exchanges
  - Subdivision E–5 Broadcasting stations, T.V. stations and air traffic control towers
- **Group G: Industrial Buildings**
  - Subdivision G–1 Buildings used for low hazard industries
  - Subdivision G–2 Buildings used for moderate hazard industries

**Fire Zone 3**

- **Group G: Industrial Buildings**
  - Subdivision G–3 Buildings used for high hazard industries
- **Group H: Storage Buildings**
- **Group J: Hazardous Buildings**

1) Fire resistant walls, floors and compartments

- To limit the spread of fire
- No compromise for openings such as shafts, refuse chutes, vertical openings, etc.

2) Shafts

- To be provided with fire resistant rated inspection door for passage of building services such as cables, electrical wires, telephone cables, plumbing pipes, etc depending upon location.

3) Refuge area

- An area within the building for a temporary use during egress. It generally serves as a staging area which is protected from the effect of fire and smoke.

4) Fire detection and firefighting installations

- These include fire alarm, fire extinguishers, hose reels, wet riser, down comer, yard hydrants, sprinklers, deluge system, water spray, foam, water mist systems, gaseous or dry powder system, water storage tanks and pumps, etc.


**All buildings shall satisfy minimum requirements, for safety of life from fire, smoke, fumes or panic arising from these or similar causes.**

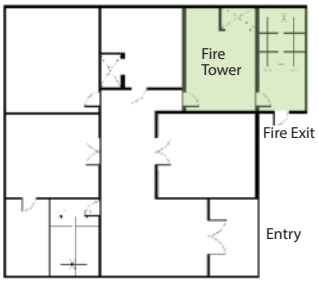
## 5) Means of egress

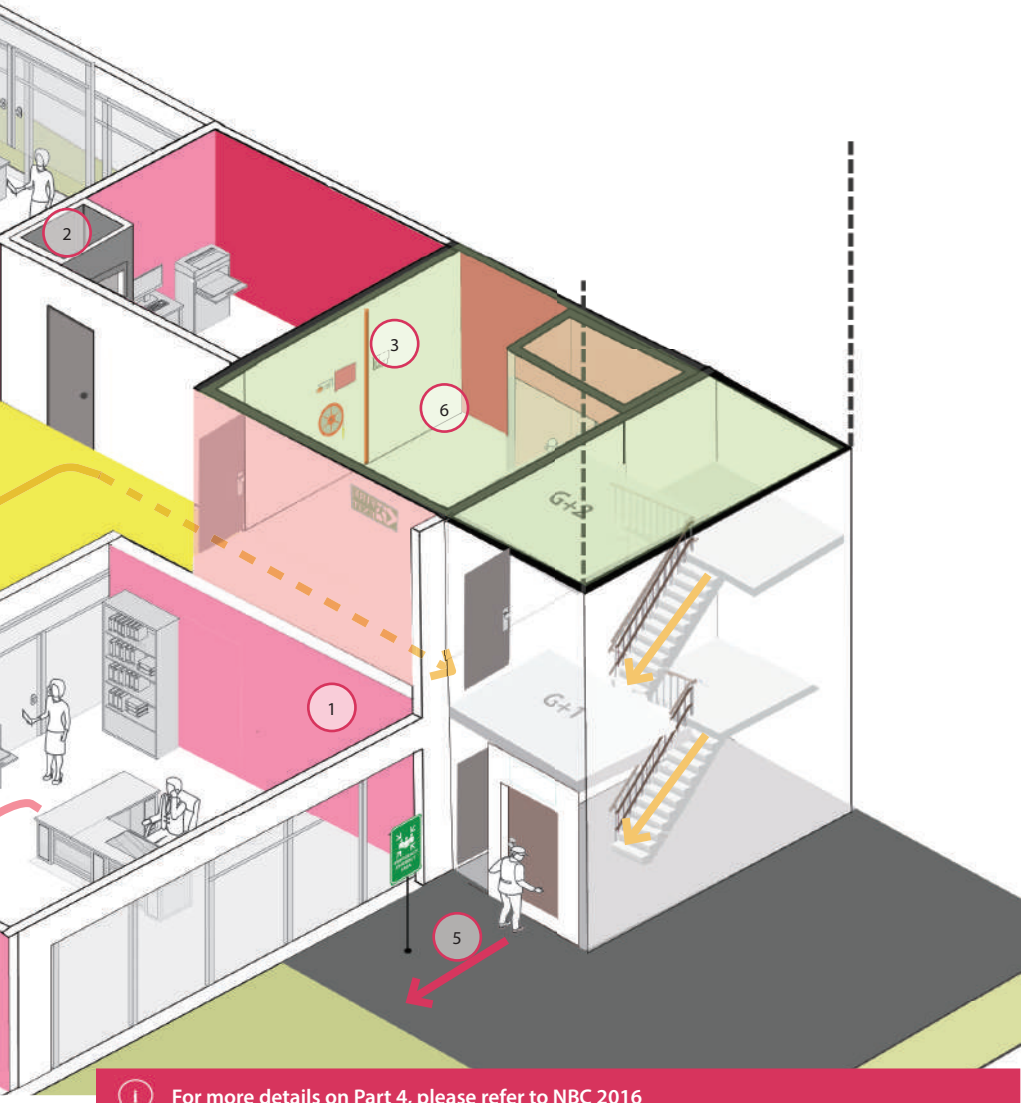
- Consists of three separate and distinct parts, that is, exit access, exit and exit discharge
- Exit access are working/functional areas
- Various types of exit access and exits are doorways, corridors and passageways, horizontal exits, internal staircases, exit passageways, external staircases and ramps.

## 6) Fire fighting shafts

- With fire man talk back, fire door, wet riser, hose reel, signage showing floor plan and stairways and fire man's lift

Key Plan (First Floor Plan)




**For more details on Part 4, please refer to NBC 2016**

# Part 5 Building Materials

## Key Content

This Part covers the requirements of building materials and components, criteria for accepting new or alternative building material. It details the quality and effectiveness of building materials used in the construction and of their storage, which are important aspects of building activity.

- Methods of Test
- Third Party Certification
- Materials
- Storage of Materials
- Sustainable Materials
- New or Alternative Materials

## Part 5 at a glance

All building materials shall conform to relevant Indian Standards, unless otherwise specified or approved. NBC 2016 enlists around 1500 IS code specifications and methods of test under the following 30 categories of materials.


1. Aluminium and other light metals and their alloys


2. Bitumen and tar products

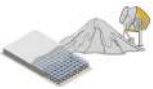

3. Bricks, blocks and other masonry building units


4. Builder's hardware


5 .Building chemicals


6. Building lime and products


7. Clay and stabilized soil products


8. Cement and concrete


9. Composite matrix products


10. Conductors and cables


11. Doors, windows and ventilators


12. Electrical wiring, fittings and accessories


13. Fillers, stoppers and putties


14. Floor covering, roofing and other finishes


15. Glass


16. Gypsum based materials


17. Mortar (including sand for mortar)


18. Paints and allied products


19. Polymers, plastics and geosynthetics/ geotextiles


20. Sanitary appliances and water fittings


21. Steel and its alloys


22. Stones


23. Structural sections

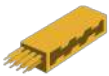

24. Thermal insulation materials


25. Threaded fasteners, rivets and nails


26. Timber, bamboo and other lignocellulosic building materials

27. Unit weights of building materials


28. Waterproofing and damp–proofing materials


29. Welding electrodes and wires


30. Wire ropes and wire products

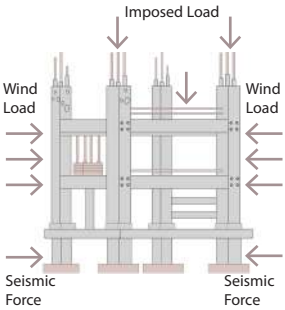
**For more details on Part 5, please refer to NBC 2016**

# Part 6 Structural Design

## Key Content

This Part provides for structural adequacy of buildings and usage of materials and technology for building design. It is divided into 8 Sections (Section 1 to Section 8).

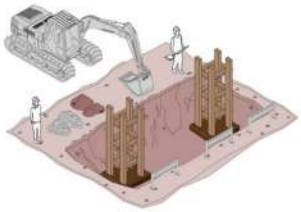
## Part 6 at a glance




### Section 1 Loads, forces and effects

This Section covers basic design loads to be considered for the structural design calculations of buildings. The imposed loads, wind loads, seismic forces, snow loads and other loads are minimum working loads which should be taken into consideration for purposes of design. This Section also covers:

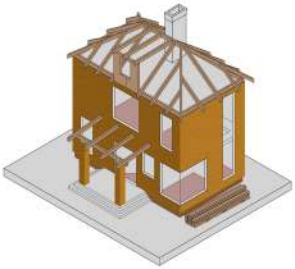
- Load calculation for rooftop helipads
- Load to be considered for parapets, balustrades, impacts and vibrations
- Imposed load due to fire tenders and emergency vehicles
- Maps on basic wind speed and seismic zones of India.



### Section 2 Soil and Foundation

This Section covers geotechnical design of building foundations, such as:

- Geotechnical investigation and exploration guidance
- Geotechnical design (principles) of building foundations
- 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
- Deep foundation including pile foundation
- Shallow foundation including raft foundation
- Ground improvement techniques.

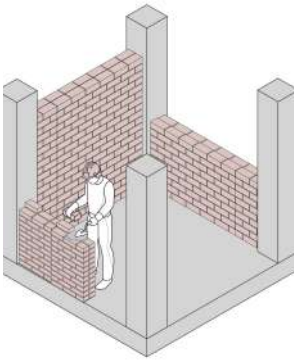


### Section 3 Timber and Bamboo

- 3A Timber– This Subsection covers the general principles involved in the design of structural timber in buildings, including elements of structures connected by fasteners/ fastening techniques. It also covers the engineering properties of various species of timber.

- 3B Bamboo– This Subsection covers the design of structural bamboo in buildings with regard to mechanical resistance and durability of structures. It also covers the engineering properties of various species of bamboo.

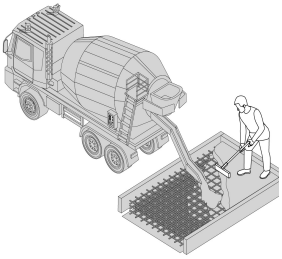
**For more details on Part 6, please refer to NBC 2016**



## Section 4 Masonry

This Section covers the structural design of unreinforced and reinforced masonry elements in buildings. This Section also covers:

- Materials
- General requirements
- Structural design of load bearing buildings.
- Reinforced brick and reinforced brick concrete floors and Roofs
- Special consideration from earthquake point of view
- Guidelines for improving earthquake resistance of low strength masonry buildings
- Confined masonry
- Guidelines for design of non–load bearing walls/partitions
- Masonry walls using rat–trap bond technology.

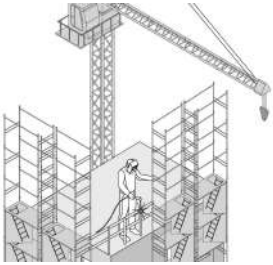


## Section 5 Concrete

This Section covers structural designing of plain, reinforced concrete and prestressed concrete. The Section has been subdivided into the following Subsections:

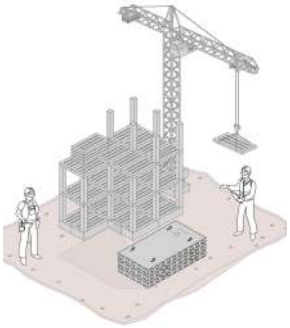
- 5A Plain and Reinforced Concrete– This Subsection covers:
  - General structural use of plain and reinforced concrete
  - Requirements of durable concrete production, fire safety and protection from environment
  - Detailed design consideration for concrete strength upto M60
  - Reinforcement requirements and detailing aspects for all type of structural elements
  - Special concretes like self–compacting concrete, high performance concrete and steel fibre reinforced concrete.

- 5B Prestressed Concrete– This Subsection covers:
  - Structural design aspects of prestressed concrete.
  - Works carried out on site and the manufacture of precast prestressed concrete units
  - Updated provisions on end–zones, ultimate shear resistance, etc.



### Section 6 Steel

This Section 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. This Section covers the design by limit state method and plastic theory, and also enables design by working stress method.

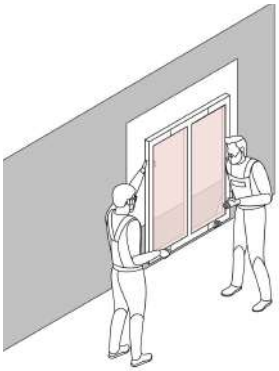


### Section 7 Prefabrication, Systems Building and Mixed/ Composite Construction

The Section has been subdivided into the following Subsections:

- 7A Prefabricated Concrete– This Subsection gives:
  - Recommendations regarding modular planning, component sizes, prefabrication systems
  - Design considerations, joints & testing
  - Manufacture, storage, transportation and erection
  - Other related requirements for prefabricated concrete.

- 7B Systems Buildings and Mixed/Composite Construction– This Subsection covers:
  - Recommendations regarding modular planning, component sizes
  - Joints, manufacture, storage, transport and erection of prefabricated elements
  - Other related requirements for systems building and mixed/composite construction.



### Section 8 Glass and Glazing

This Section covers:

- Selection and application of glass in buildings
- Types of glass, its requirements and associated glazing materials
- Glazing in buildings with respect to its effect on energy, visual (light) and solar environments
- Design of glass in buildings, subject to wind loading, seismic loading
- Selection, manifestation of glass in buildings, subject to safety with respect to human impact of the occupants
- Selection, design, fabrication, installation, testing and maintenance of glazing systems.

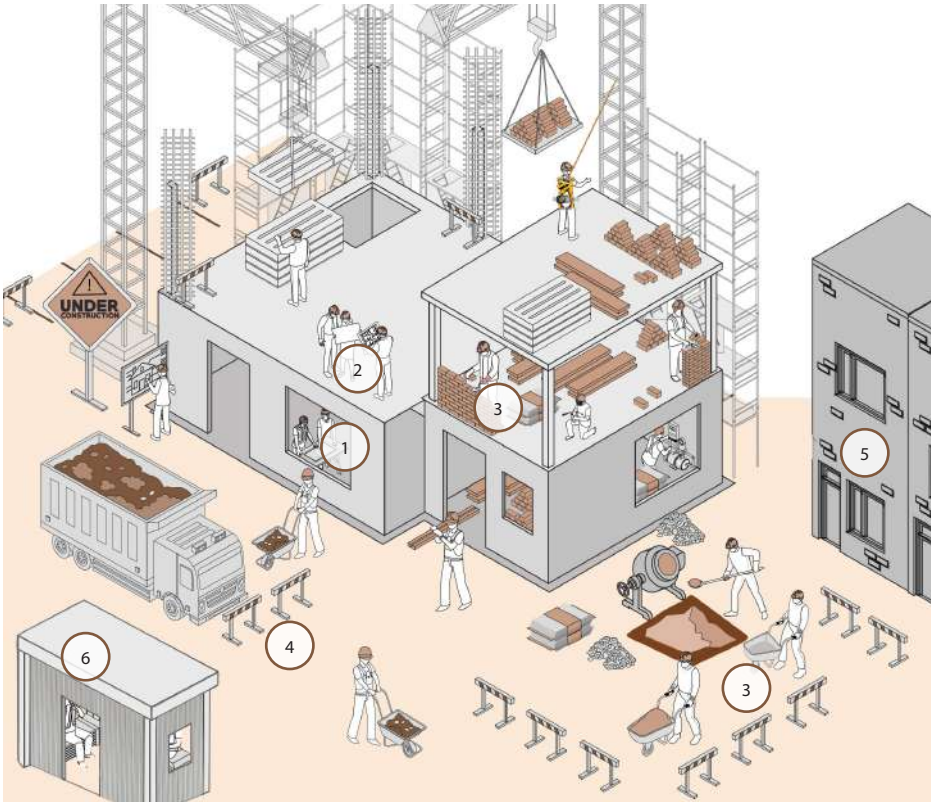
**For more details on Part 6, please refer to NBC 2016**

# Part 7 Construction Management, Practices and Safety

## Key Content

This Part covers construction project management, construction planning, site management and building construction practices, storage, stacking and handling of materials. It also deals with safety of personnel during construction operations, demolition of buildings, habitat and welfare requirements for workers. The guidelines relating to repairs, retrofitting and strengthening of buildings are covered under this Part.

## Part 7 at a glance




1) Construction management (time, cost, quality, health and safety)
2) Construction planning and site management
3) Construction practices
4) Safety in construction
5) Repairs, retrofitting and strengthening of buildings
6) Habitat and welfare requirements for workers

**Standards** relating to construction project management functions and construction practices are also refered in this Section.

**For more details on Part 7, please refer to NBC 2016**

# Part 8 Building Services

## Key Content

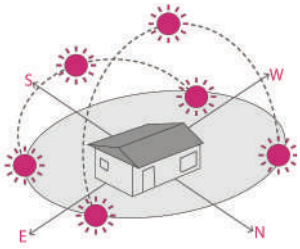
All buildings meant for human habitation must be provided with adequate building services. This Part prescribes requirements for building services, and is divided into 6 Sections.

| | | |
|---|---|---|
| Section 1 Lighting and Natural Ventilation | Section 2 Electrical and Allied Installations | Section 3 Air–conditioning, Heating and Mechanical Ventilation |
| Section 4 Acoustics, Sound Insulation and Noise Control | Section 5 Installation of Lifts, Escalators and Moving Walks | Section 6 Information and Communication Enabled Installation |

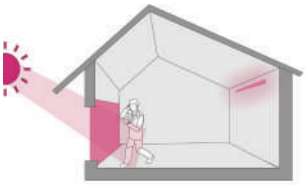
## Part 8 at a glance

### Section 1 Lighting and Natural Ventilation

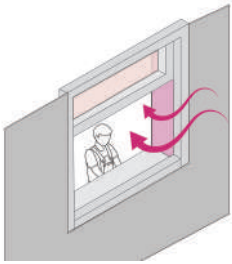
This Section covers requirements and methods for lighting and natural ventilation of buildings; design for both daylighting and artificial lighting. It also has provisions on energy conservation in lighting.




Orientation of building



Lighting



Ventilation

This Section also includes the following important aspects:

- Climatic classification map of India
- Table on solar radiation as per seasons for determining heat intake
- Recommended level of illuminance for different spaces/activities in different buildings (refer Table 4)
- Recommended values for air changes for different buildings/spaces
- Maximum allowable contaminant concentrations for fresh/ventilation air
- Optimum size/number of fans for rooms of different sizes.

## Section 2 Electrical and Allied Installations

This Section 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 provisions on certain allied installations.

Planning of electrical installations include planning spaces for substation, switch rooms, emergency power back up system, distribution panels, overhead lines, wires and cables.

The electric and allied installations are to be carried out in conformity with the requirements of the Electricity Act, 2003 and the Central Electrical Authority (measures relating to safety and electric supply) regulations, 2010, as amended from time to time.

Key aspects covered under the Section are as follows:


Planning of electric installation


Distribution of supply and cabling


Wiring (including selection of size of conductors)


Fittings and accessories


Earthing (including maintenance free earthing)


Inspection, testing and verification of installation


Allied/ miscellaneous services


Lightning protection of buildings


Electrical installation for construction and demolition sites


Protection of human beings from electrical hazards

This Section also includes provisions on:

- Location of energy meters, centralized metering system and smart metering
- Requirements for electrical supply system for life and safety services
- Discrimination, cascading and limitation concepts for the coordination of protective devices in electrical circuits
- Solar photovoltaic system
- Aviation obstacle lights
- Electrical supply for electric vehicle charging and car park management system
- Typical formats for checklists for handing over and commissioning of substation equipment and earthing pit.

## Section 3 Air conditioning, Heating and Mechanical Ventilation

This Section covers planning, selection, design considerations, installation, testing and commissioning of air conditioning, heating and mechanical ventilation systems for buildings. Planning includes equipment room for central AC plant , air handling units and package units, pipe shafts, supply/return air ducts and cooling tower.

Key aspects covered in the Section are as follows:


Refrigerants


Planning


Outdoor and indoor design conditions


Design of air conditioning


Specialized application


Refrigeration for cold stores


Heating


Mechanical ventilation


Installation of HVAC system


Symbols, units, colour code and identification of services


Building automation system for HVAC control, monitoring and verification


Testing, commissioning and performance validation

This Section also includes provisions on:

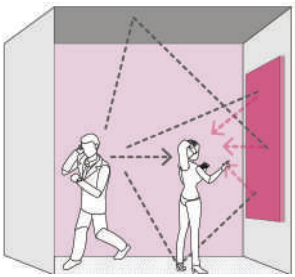
- Design of indoor conditions as per adaptive thermal comfort model
- Minimum ventilation rates in breathing zone
- Energy efficient air conditioning systems such as variable refrigerant flow system, inverter technology, district cooling system, hybrid central plant using chilled beams and radiant floor components
- Envelope utilization using energy modelling, day light simulation, solar shade analysis and wind modelling software
- Weather data of 60 cities of India
- Direct/indirect evaporative cooling units and geo–thermal cooling and heating
- HVAC systems for healthcare facilities, data centres and underground metro stations
- Energy efficient strategies for winter heating, using reverse cycle operation, solar heating systems, electric heat pump and ground source heat pump
- Modern system of mechanical ventilation for industries, commercial kitchens, underground parking and for open tunnel connecting underground metro stations
- Demand control ventilation and axial flow fans with aerofoil profile blades.

### Section 4 Acoustics, Sound Insulation and Noise Control

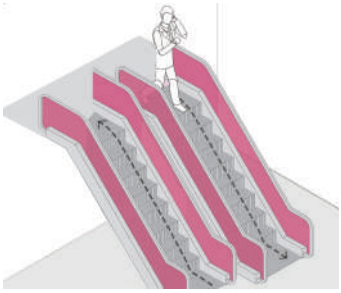
This Section covers requirements and guidelines with regards to planning against outdoor and indoor noise, acceptable noise levels and sound insulation in buildings with different occupancies, such as residential, educational, hospital, industrial, office buildings, hotels, hostels, laboratories, test houses and other miscellaneous buildings.

This Section also includes the following aspects:

- Design techniques for noise control of building services
- Guide for noise calculation, specifications for sound insulation and noise rating
- Examples of special problems requiring expert advice.



## Section 5 Installation of Lifts, Escalator and Moving Walks



This Section covers requirements for planning, design, installation, operation, maintenance and inspection of lifts (passenger, goods, hospital, service, dumb waiter lifts), escalators and moving walks so as to ensure safe movement of people with satisfactory performance. This Section has been subdivided into two Subsections namely, 5A Lifts and 5B Escalators and Moving Walks.

The two Subsections include the following:

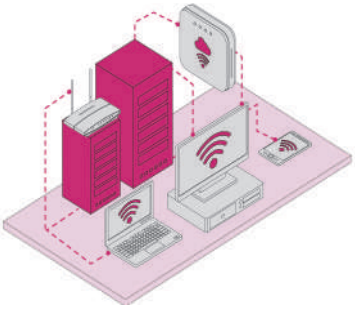
- Design arrangements and planning
- Civil and electrical requirements
- Fire protection requirements
- Minimum technical and safety requirements
- Performance requirements
- Inspection and maintenance
- Typical checklists for inspection.

Additional requirements specific to lifts include the following:

- Planning of lifts for specific building features (such as special building facilities, basement service, multiple entry levels, non smoking buildings, reserve lifts and zoning/sky lobbies in very tall buildings) and for different building types
- Specific requirements for lifts in high rise buildings and evacuation lifts
- Technical requirements for lifts in super high rise buildings
- Special lifts such as lifts without conventional machine rooms (MRL lifts), lifts used in private apartments (home lifts), hydraulic lifts, lifts with seismic resistance features.

The installation of lifts are carried out in conformity with Lift Acts and Rules, as amended from time to time.

## Section 6 Information and Communication Enabled Installations



This Section covers the essential requirements for information and communication enabled installations, technology systems and cabling installations in a building. It also covers the basic design and integration requirements for telecommunication spaces within building(s) along with their cabling infrastructure, their pathway components and passive connectivity hardware.

**For more details on Part 8, please refer to NBC 2016**

# Part 9 Plumbing Services (including Solid Waste Management)

## Key Content

This Part has 4 Sections; for water supply, drainage and sanitation, solid waste management and gas supply. All buildings meant for human habitation shall be provided with potable water supply and adequate sanitary facilities.

Section 1 Water Supply | Section 2 Drainage and sanitation

Section 3 Solid Waste Management | Section 4 Gas Supply

Based on local Authority's Occupancy Permit for a building, connection from the Water Supply Board and Drainage Board are obtained.

## Part 9 at a glance

### Section 1 Water Supply

This Section covers basic water supply requirements for different building occupancies along with provisions of plumbing, design, inspection and maintenance of water supply systems. It also includes provisions of water supply systems in high altitude and/or sub–zero temperature regions. Water supply requirements for firefighting, street cleaning and industrial plants are not included in this Section.


Basic principles for designing water supply system


Water supply requirements for different building types


Water sources and quality


Estimate of demand load


Storage of water


Protection of water supply


Materials, fittings and appliances


Design of distribution system


Distribution systems in multi–storeyed buildings


General requirements for pipe work


Jointing of pipes


Backflow prevention


Conveyance and distribution of water within premises


Laying of mains and pipes on site


Hot water supply installations


Inspection and testing


Cleaning and disinfection of supply system


Water supply system in high altitudes and/ or sub–zero temperature

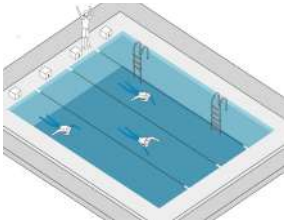

Guidelines to maintenance


Requirement for Swimming pools


Allowance for expansion

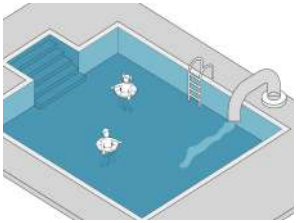
### Swimming Pools

Swimming pools covered in National Building Code of India (NBC 2016) are of 3 types.



Recirculation

The Recirculation System is based on the nature of usage such as private, public, wading and competition pools. This system is provided to minimize water wastage. Disinfection shall be invariably done to ensure water of potable quality.



Flow Through

Flow Through type of pools require more water for replenishment and so cautious decision of usage of such pools should be made to ensure clear water of potable quality.

Fill and Draw

Fill and Draw type of pool is not recommended considering water conservation. Clear water of potable quality is retained till it becomes turbid or unfit for use. Thereafter, the pool is drained, cleaned and refilled with clear water.

## Section 2 Drainage and Sanitation

This Section covers drainage and sanitation requirements for buildings including design, layout, construction, maintenance and connection up to point of disposal such as public sewer, private sewer, individual sewerage disposal system, cesspool or any other approved point of disposal/ treatment. It also includes requirements of drainage system for high altitude and sub–zero temperature regions.

Tables 1– 15 cover drainage and sanitation requirements for different types of buildings.

Basic principles of drainage and sanitation

Drainage and sanitation requirements for different building occupancies

Materials, fittings and accessories

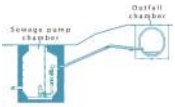
Planning and design considerations

Consideration relating to conveyance of sanitary wastes

Construction relating to conveyance of rain and storm water

Inspection and testing

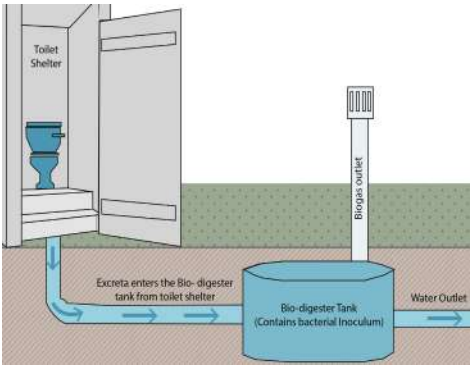
Maintenance




Pumping of sewage

Sewage treatment system

### Bio– toilet (or Eco–toilet)




Bio–toilet involves sludge free disposal of human waste. It decomposes solid waste into water and bio–gas. It is eco–friendly, hazard free, requiring least maintenance and is capable of functioning efficiently at sub–zero temperatures.

Bio–toilet is mainly a prefabricated type structure, above the ground with a bio–digester tank below the ground.

It is useful in situations where sewerage system is not available.

## Section 3 Solid Waste Management

This Section comprehensively covers solid waste management system for buildings including assessment of waste generation and its treatment. Additionally, other rules and regulations in force shall be complied with for treatment and handling of solid waste. These rules and regulations are also briefly covered in this Section.


Classification of solid waste based on sources of generation, characteristics, etc.

Considerations and requirements for designing a municipal solid waste management system

Refuse chute system

Assessment of per capita waste quantities for different type of solid wastes

Methods of treatment and disposal

## Section 4 Gas Supply

This Section prescribes safety requirements of persons and property for all piping uses and for all types of gases; for usages like fuel, lighting and medical purposes.


Requirements for safe installation of LPG, PNG and medical gas

Requirements for pressure


Rules for turning gas on


Rules for shutting gas off

Installation of gas pipes

Inspection of services

Leakage check

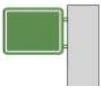
**For more details on Part 9, please refer to NBC 2016**

# Part 10 Landscape Development, Signs and Outdoor Display Structures

## Key Content

This Part covers provisions related to landscape planning, design and development and the requirements of signs and outdoor display structures with regard to public safety, structural safety and fire safety. It is divided into following two Sections:

Section 1 Landscape Planning, Design and Development



Section 2 Signs and Outdoor Display Structures

## Part 10 at a glance

**Section1 Landscape Planning, Design and Development**

This Section 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.

### Statutory Approvals

Details of documents required for statutory approval of landscape development such as Landscape Master Plan, Irrigation Plan, Planting Plan, Grading Plan, etc.

### Landscape Site Planning Requirements

Assessment of the landscape requirements for the site including location, site factors, brief, user groups and landscape development for special conditions.

### General Landscape Development Guidelines

Design aspects such as structural stability, waterproofing, drainage, soil fill and location of planting for landscaping roof.

## Compoments of Landscape Planning, Design and Development

### 1. Planting Design

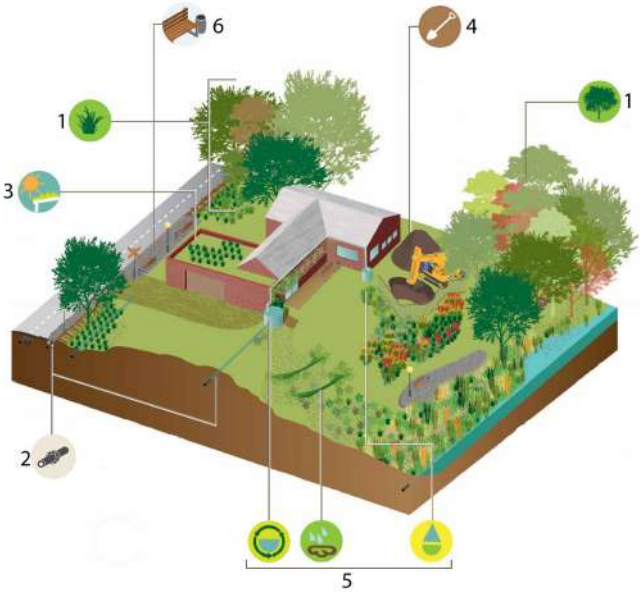
Aspects of planting such as ecology, botany, horticulture, aesthetic value, growth and survival patterns which would enable integrated landscape designing.

### 2. Service/Utilities in Landscape Development

Design integration of structures and elements related to external services (underground and overground utilities).

### 3. Design Guidelines for Roof Landscape

Aspects such as structural stability, waterproofing, drainage, soil fill and location of planting for landscaping roof.




### 4. Protection of Landscape during construction

Measures to put in place for minimum disturbance to existing soil conditions and overall micro–climatic pattern during development.

### 5. Soil & Water Conservation

Post construction practices to be followed with respect to vegetative measures, stormwater management, filtration techniques and conservation & reuse of water for irrigation.

### 6. Street Furniture

Elements for outdoor spaces such as pavement–pedestrian movement spaces, parking and vehicular movement corridor, traffic management units, public conveniences, shelter and kiosks, illumination, etc.

## Section 2 Signs and Outdoor Display Structures

This Section covers the requirements of all signages and outdoor display structures for public safety, structural safety and fire safety.


Electric & Illuminated signs | Ground signs | Roof signs | Verandah signs | Wall signs | Projecting signs

Marquee signs | Sky signs | Miscellaneous and temporary signs

The signage requirements for Accessibility in Public Buildings and Public Spaces and, Fire safety are covered in Part 3 and Part 4 respectively of NBC 2016.

**For more details on Part 10, please refer to NBC 2016**

# Part 11 Approach to Sustainability

## Key Content

This Part covers the parameters required for planning, design, construction, operation and maintenance of buildings and those relating to land development from the point of view of sustainability.

| | | | |
|---|---|---|---|
| Approach to Sustainability | Siting, Form and Design | External Development and Landscape | Materials |
| Waste Water Management | Building Services Optimization | Construction Practices | Commissioning, Operation, Maintenance and Building Performance Tracking |

## Part 11 at a glance

**Approach to Sustainability**

**Planning level**

- Assessment of natural resources and protected areas
- Water conservation and irrigation practices
- Integration of masterplan and transport plan
- Public and private transportation plan
- Bicycle lanes and pedestrian access
- Discourage subsidized parking in public realm
- Neighbourhood connectivity, walkability and safety
- Ecology of streets
- Planning of water and waste management system

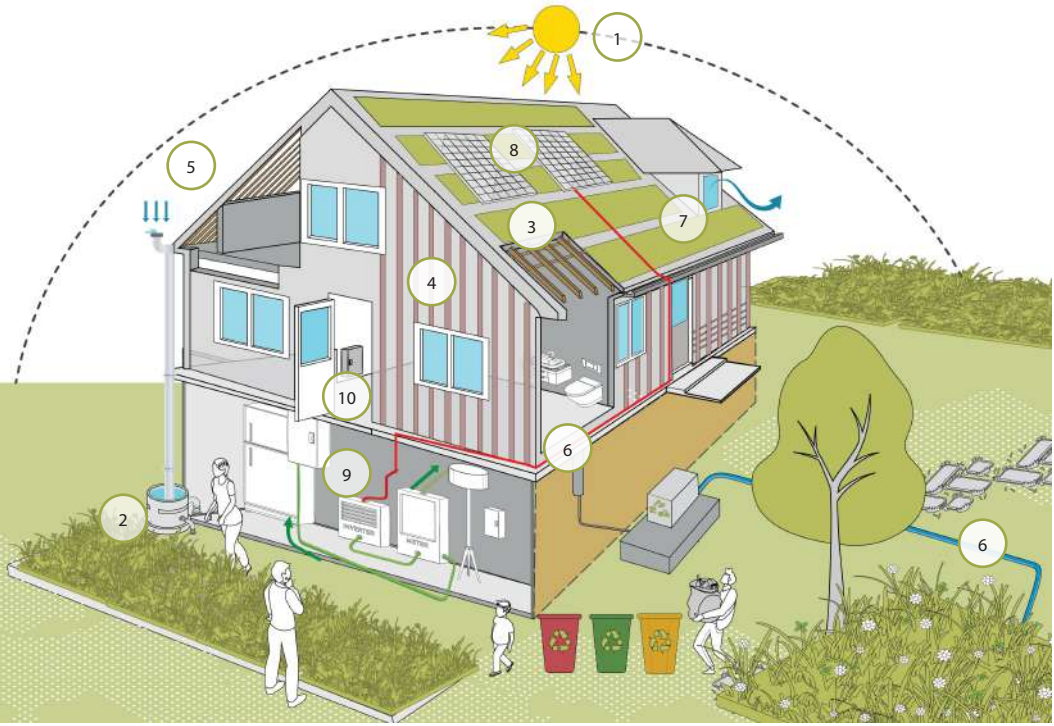
**Layout level**

- Topsoil preservation
- Environmental Management Plan
- Inclusion of sustainable construction through material and construction management plan
- Landscape development & drainage
- Water conservation
- Rainwater harvesting
- Wastewater management
- Solar energy utilization
- Wind energy
- Undertaking sustainable measures to curb onsite pollution

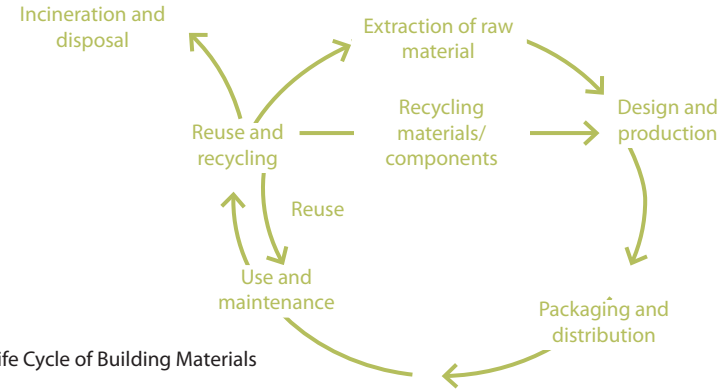
**Building level**

- Building siting and orientation
- Envelope optimization
- Building services optimization
- Lighting and ventilation
- Sustainable materials– use of alternate and local construction materials embodying low energy consumption
- Maintenance and safe construction
- Solar energy

Commissioning, Operation, Maintenance and Building Performance Tracking




1) Siting, form and design–building oriented optimally based on sun–path analysis
2) External development and landscape–use of vegetation that promotes a regional identity and a sense of place
3) Enhancement on thermal performance of envelope
4) Sustainable building materials
5) Rainwater harvesting
6) Waste water recyclying
7) Natural ventilation strategies
8) Passive cooling/heating techniques
9) Energy efficient electrical system
10) Building performance tracking system




Life Cycle of Building Materials

**For more details on Part 11, please refer to NBC 2016**

# Part 12 Asset and Facility Management

## Key Content

This Part covers provisions relating to management of building assets and associated facilities, such as building and building services. It also covers responsibility of facility managers and of occupants for maintenance of facilities, such as structures, equipment and exterior property.

Asset/Facility Management | Building Maintenance – Methods and Management | Building Fabric Maintenance

Systems Maintenance | Services Maintenance

## Part 12 at a glance

Asset management is integration of processes within an organization to maintain and develop the agreed services which support and improve the effectiveness of its primary activities.

The organizational strategic plan is the starting point for development of the asset/facility management policy, strategy, objectives and plans.

Guiding factors for organizational setup of Asset/Facility Management System

Scope of Work

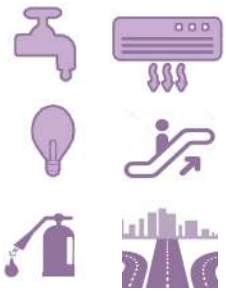
Competence of Staff at Various Levels

Organization Roles at Various Levels

Facility Manager

Outsourcing

Asset/Facility management can be classified under 2 services

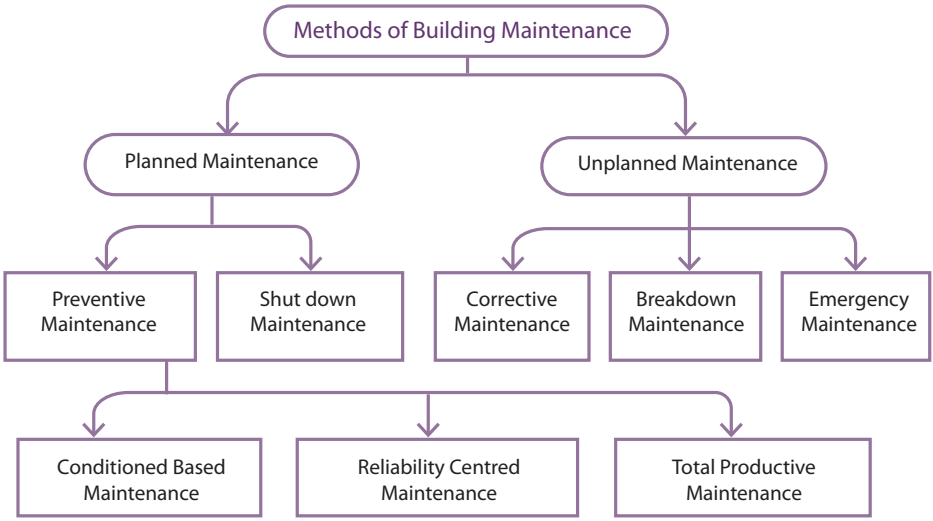


### Hard Services

- Building fabric maintenance
- Building services maintenance that includes
  - Plumbing and drainage
  - Air conditioning
  - HVAC services
  - Electrical installations
  - Lifts and escalator
  - Fire fighting–detection and suppression
  - Roads and pathways.

### Soft Services

- Landscaping and horticulture waste management
- Housekeeping
- Pest control
- Security management
- Solid waste management.




**For more details on Part 12, please refer to NBC 2016**

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