



NATIONAL BUILDING CODE OF INDIA 2016 & INDIAN STANDARDS ON WATER SUPPLY, DRAINAGE AND SANITATION

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NEED FOR BUILDING REGULATION AND CONSTITUTIONAL POSITION

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Subjects relating to land and buildings fall under the State List
(**Seventh Schedule**)

35. Works, lands and buildings vested in or in the possession of the State.

49. Taxes on lands and buildings.

Schedule (referred to under Article 243W) added by the Constitution (74th Amendment) Act, 1992 (w.e.f 01.06.1993),

1. **Urban planning** including town planning.
2. **Regulation of land-use and construction of buildings.**
3. Planning for **economic and social development.**
4. **Roads and bridges.**
5. **Water supply** for domestic, industrial and commercial purposes.
6. **Public health**, sanitation conservancy and solid waste management.
7. **Fire services.**

NEED FOR BUILDING REGULATION AND CONSTITUTIONAL POSITION

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8. Urban forestry, protection of the environment and promotion of ecological aspects.
9. Safeguarding the interests of weaker sections of society, including the handicapped and mentally retarded.
10. **Slum improvement** and upgradation.
11. Urban poverty alleviation.
12. Provision of urban amenities and facilities such as parks, gardens, playgrounds.
13. Promotion of cultural, educational and aesthetic aspects.
14. Burials and **burial grounds**; cremations, **cremation grounds**; and **electric crematoriums**.
15. Cattle ponds; prevention of cruelty to animals.
16. Vital statistics including registration of births and deaths.
17. **Public amenities** including street lighting, parking lots, bus stops and public conveniences.
18. Regulation of slaughter houses and tanneries.

AUTHORITIES HAVING JURISDICTION

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- 1) Municipal Corporation
- 2) Municipality
- 3) Notified Area Committee
- 4) Town Area Committee
- 5) Cantonment Board
- 6) Township
- 7) Port Trust
- 8) Special Purpose Agency like:
 - Town improvement trusts.
 - Urban development authorities.
 - Water supply and sewerage boards.
 - Housing boards.
 - Pollution control boards.
 - Electricity supply boards.
 - City transport boards.

INSTRUMENTS FOR BUILDING REGULATION 5

- Town and Country Planning Act/ Development Act
- Master Plan, Zonal Plans and Layout Plans
- Municipality/Municipal Corporation Act
- Building Bye-Laws

AUTHORITIES FOR ADDITIONAL CLEARANCES THAT MAY BE REQUIRED

- Approvals from **Fire Authorities** under Fire Regulations, particularly in case of high rise and special (fire vulnerable) buildings;
- Approvals from **Chief Inspectorate of Factories** in case of industrial buildings;
- NOC from **Pollution Control Board** of respective State;
- Approval from **Chief Controller of Explosives**, Nagpur in case of hazardous buildings;
- Approval of **Urban Art Commission** required under relevant Act;
- Approvals from **Archaeological Survey of India** in case of plot falling within 300m distance from any protected monument;
- NOC from **Railway/Metro-rail Authority** in case plot is falling within railway corridor;
- NOC from **AAI** in case plot is falling in proximity of airport; etc.

HISTORICAL

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Year	History
1965	Panel of Experts <u>appointed by Planning Commission</u> to study the whole gamut of operations involved in construction such as: Administrative, Organizational, Financial, Technical
1968	'Report on Economies in Construction Costs' <u>recommended</u> : <ul style="list-style-type: none">• One of the important steps towards achieving economy is through <u>formulation of Unified Building Code at national level</u>.• For this NBC to be brought out unifying building regulations throughout the country• Job entrusted to the then ISI (now BIS)
1970	NBC (first version)
1983	NBC (first revision)
1987	Amendment No. 1 & 2 to NBC 1983
1997	Amendment No. 3 to NBC 1983
2005	NBC (second revision)
2015	Amendment No. 1 & 2 to NBC 2005
2016	NBC (third revision)

Salient Features of NBC 2016

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- Dealt by National Building Code Sectional Committee, **CED 46 of BIS**
- Revision of the Code initiated in **2014**
- **22 Expert Panels** involved in which around **1000 experts** contributed
- Around **50 Meetings** of the Experts Panels were organized
- Involves **stakeholder engagement and wide consultation process**
- Revised Code is a **culmination of the untiring efforts of above Experts and BIS**
- **A voluminous document** published in two volumes

Salient Features of NBC 2016

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- Substantial **improvements** incorporated, particularly for
 - ❖ Ensuring **structurally safe** and **disaster resistant** buildings
 - ❖ **Accessibility** of buildings and built environment for persons with disabilities and the elderly
 - ❖ **Fire safety of modern** complex and high-rise buildings
 - ❖ Use of **new/innovative** building materials and technologies
 - ❖ Ensuring **speedier construction** through prefab technology
 - ❖ Installation of **modern plumbing** and building **services**
 - ❖ Ensuring **IT enabled** buildings
 - ❖ **Sustainability** and conducive outdoor built environment
 - ❖ **Management** of constructed building **assets and facilities**

Salient Features of NBC 2016

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- Expected to be extensively used by,
 - ❖ **the local bodies** for framing and revamping the existing local building byelaws
 - ❖ **the Govt. and private construction agencies** in their construction activities
 - ❖ **the building professionals** like architects, engineers, structural engineers, town planners, building services engineers and consultants in the design of building and built environment
 - ❖ building **material suppliers** and **technology providers**
 - ❖ **research institutions** for their research purposes
 - ❖ **faculty and students** of academic institutions for imparting technical education to architectural and engineering students by using the Code as part of their curriculum

CONTENTS OF NBC 2016

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Part No.	Title
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
Part 7	Constructional Management, Practices and Safety
Part 8	Building Services
Part 9	Plumbing Services (including Solid Waste Management)
Part 10	Landscape Development, Signs and Outdoor Display Structures
Part 11	Approach to Sustainability
Part 12	Asset and Facility Management

SECTIONS UNDER PART

12

9: PLUMBING SERVICES INCLUDING SOLID WASTE MANAGEMENT

Section 1 Water Supply

Section 2 Drainage and Sanitation

Section 3 Solid Waste Management **(New)**

Section 4 Gas Supply

Scope of Part 9/Sec 1

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- ▶ **covers** the basic requirements of water supply for residential, business and other types of buildings, including traffic terminal stations.
- ▶ **also deals** with general requirements of plumbing connected to public water supply and design of water supply systems, and swimming pools.
- ▶ **Excludes** the requirements of water supply for industrial plants and processes,
- ▶ the requirements of water supply for other purposes, such as firefighting and street cleaning.

Basis of Provisions

- ▶ IS 1172:1993 Code of basic requirements for water supply, drainage and sanitation (*fourth revision*)
- ▶ IS 2065:1983 Code of practice for water supply in buildings (*second revision*)
- ▶ IS 6295:1986 Code of practice for water supply and drainage in high altitudes and or sub-zero temperature regions (*first revision*)
- ▶ IS 7558:1974 Code of practice for domestic hot water installations
- ▶ IS 12183(Part 1) :1987 Code of practice for plumbing in multi-storeyed buildings: Part 1 Water supply

Major Modifications in Part 9/Sec 1

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- ▶ Water supply requirements for buildings based on estimated occupancy in the chosen type of building.
- ▶ Updation of water requirements for non-residential buildings with **separate domestic and flushing requirements**.
- ▶ Updation of number of various water supply fixture unit and **probable simultaneous demand**, with demand values up to 10,000 fixture units.
- ▶ Updated provisions for water supply distribution systems in **multi-storeyed buildings** with illustrations therefor.
- ▶ Inclusion of provisions relating to **swimming pools**.

Coverage

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- Covers basic principles of **design** of water supply considering,
 - No. of occupants,
 - Minm water requirement for different purposes;
 - Treatment of water based on the quality of water;
 - Quantity of water stored; and
 - Sizing of pipes.
- Water sources and quality: supply of potable water conforming to requirements of IS 10500:2012
- Prevention of contamination by connection with unsafe water resources and backflow

Coverage

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- Water Efficiency and Water Reuse (waste water reclamation)
- Safety Devices/norms to safeguard against dangers from contamination, overheating, etc
- Minimum residual head = 0.018 N/mm^2
- Minimum Water Amenities for meeting basic requirements of sanitation and personal hygiene.
- Requirements for accessible toilet for persons with disabilities and the elderly

Coverage

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- Water supply connection through licensed/registered plumbers
- Forms for applying for a new water supply connection/extension and completion certificate to be submitted to the Authority
- Water supply requirements : estimation of total quantity of water per day based on the proposed occupancy and activities catered.

Coverage

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Residential buildings:

Accommodation

Population Requirements

1 bedroom dwelling unit	4
2 bedroom dwelling unit	5
3 bedroom dwelling unit	6
4 bedroom dwelling unit and above	7

➤ (EWS = 4, studio apartments = 2)

Coverage

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Rates per capita per day for domestic and non-domestic needs:

- ▶ For communities with population up to 20 000:
 - Water supply through stand post 40 lphd (Min)
 - Water supply through house service 70 to 100 lphd connection

- ▶ For communities with population 100 to 135 lphd
20 000 to 100 000 together with full
flushing system

Rates per capita per day for domestic and non-domestic needs:

- ▶ For communities with population above 100 000 together with full flushing system 150 to 200 lphd

(The value of water supply given as 150 to 200 litre per head per day may be reduced to 135 litre per head per day for houses for Medium Income Group (MIG) and Lower Income Groups (LIG) and Economically Weaker Section of Society (EWS), depending upon prevailing conditions and availability of water.)

Coverage

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- Water Storage: OHT & UGT- capacity, connections, accessibility , prevention of contamination
- Protection of Water Supply
- Materials, Fittings and Appliances
- Design of Distribution Systems: Discharge Computation and design of consumers' pipes based on water supply fixture units F
- Distribution system in multi-storeyed buildings including zoning
 - directly from mains
 - gravity
 - pressurized
 - combined

Coverage

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- Jointing of pipes
- Backflow prevention
- Hot water supply installations: storage temperature for various uses, rate of hot water flow, maximum permissible lengths of hot water draw-off pipes (IS 7558)
- Systems in high altitude/sub-zero temperatures (IS 6295)
- Inspection and Testing
- Cleaning and Disinfection
- Maintenance
- Swimming Pools (IS 3328)
- Allowance for expansion of Pipes
- Colour Coding of pipes (IS 2379)

Scope of Part 9/Sec 2

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- **covers** the design, layout, construction and maintenance of drains for foul water, surface water, 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, cess-pool, soakaway or to other approved point of disposal/treatment work

(A sanitary drainage system consists of a building sewer, a building drain, a soil and/or waste stack, horizontal branches or fixture drain, and vents. The sanitary drainage of a large building may have a number of primary and secondary branches, and several soil and/or waste stacks, each of them in turn may have a number of horizontal branches.)

Basis of Provisions

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- ▶ IS 1742:1983 Code of practice for building drainage (*second revision*)
- ▶ IS 4111 (Part 1):1986 Code of practice for ancillary structures in sewage system : Part 1 Manholes (*first revision*)
- ▶ IS 5329:1983 Code of practice for sanitary pipe work above ground for buildings (*first revision*)
- ▶ IS 6295:1986 Code of practice for water supply and drainage in high altitudes and or sub-zero temperature regions (*first revision*)

Major Modifications in Part 9/Sec 2

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- ▶ Various additional requirements relating to layout of drainage and sanitation system have been added.
- ▶ Inclusion of provisions on **venting system for high rise buildings**.
- ▶ Updation of **number** of various drainage **fixture unit**.
- ▶ Revised **sizes of rainwater pipes** for efficient roof drainage.
- ▶ Updated provisions on **rainwater harvesting** and artificial ground water recharge.

Coverage

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- ▶ Various types of systems with illustrative figures
 - Single stack system
 - One pipe - partially ventilated system
 - One pipe – fully ventilated system
 - Two pipe system
- ▶ Systems of Drainage
 - Combined
 - Separate
 - Partially separate
- ▶ Preparation and Submission of site plan, drainage plan and completion certificate

Coverage

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- ▶ Types of Sanitary Appliances : Soil and Waste
- ▶ Drainage and Sanitation Requirements: Minimum requirements for dwellings with and without individual conveniences
- ▶ Table 1 to 15 for Buildings other than Residential (Offices, factories, hospitals, hotels, hostels, educational institutions, etc)
- ▶ Materials, Fittings and Appliances
- ▶ Planning and Design of Drainage System including guidance on choice of system (drainage fixture units for different fixtures with minimum pipe size), rainwater pipes for roof drainage
- ▶ Rain water harvesting

Coverage

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Coverage

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- ▶ Rain water harvesting
- ▶ Waste Disposal System in high altitude and/or sub-zero temperature regions
- ▶ Construction relating to conveyance sanitary waste
- ▶ Construction relating to conveyance of rain water and storm water
- ▶ Selection and Installation of Sanitary Appliances
- ▶ Refuse Chute System
- ▶ Inspection, Testing and Maintenance
- ▶ Pumping of Sewage and Sewage Treatment Plants

New Chapter Part 9/Sec 3

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- This new chapter on **solid waste management** covers
 - various 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.
- ▶ References to latest applicable statutory Rules and Regulations have been included.
- ▶ An informative Annex relating to municipal solid waste generation has been included, covering quantity, type, description and sources of solid waste generation.
- ▶ An Annex relating to treatment of food waste has also been included.

Major Modifications in Part 9/Sec 4

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- ▶ Revised provisions on **LPG supply** in buildings
- ▶ Detailed provisions on **PNG supply** in buildings
- ▶ New provisions on **medical gas pipeline system**

STRUCTURED APPROACH FOR ENSURING COMPLIANCE TO PROVISIONS OF NBC 2016 IN THE CODE

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Stages in Building Permit Process

- 1. Submission of application by owner along with**
 - Building plan
 - Service plan
 - Specifications
 - **Structural design sufficiency certificate** by engineer/ structural engineer and owner
 - **Certificate of engagement of builder/constructor(s)**
 - **Certificate of supervision** by architect/engineer
- 2. Verification of building plans and specifications by the Authority with respect to building byelaws**

STRUCTURED APPROACH FOR ENSURING COMPLIANCE TO PROVISIONS OF NBC 2016 IN THE CODE....

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3. **Sanction by the Authority including approvals from statutory authorities**
 - **Two stage approval for vulnerable buildings**
4. **Construction activity**
5. **Step-wise inspection by local authority**
6. **Completion of construction activity**
7. **Notice of completion by owner along with**
 - **Certification for execution of work** as per structural safety requirements by engineer/ structural engineer
8. **Inspection by Authority**
9. **Issue of Occupancy Permit by Authority.**

ENORMOUS NATIONAL INVOLVEMENT AND RESPONSE IN REVISION

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IMPLEMENTATION DRIVE

- Central Government
- States Government
- State Local Bodies
- State Fire Authorities
- Planning Commission
- Housing Finance Institutions (RBI, HUDCO, NHB)
- Academic Institutions

ADOPTION OF NBC - WAY FORWARD

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Mega Cities (8)	Population of over 50 Lakhs – Delhi, Mumbai, Kolkata, Chennai, Bangalore, Hyderabad, Ahmedabad, Pune
Metro Cities (45)	10 to 50 Lakhs
Municipal Corporations (121)	5 Lakhs and above
City Municipalities (A class)	1 Lakh and above
Town Municipalities (B & C class) / Town Panchayats	5,000 – 1,00,000
Rural Areas	

53 million plus cities/urban agglomerations – 70 by 2021

ENFORCEMENT

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The Building Regulatory Media consist of



These regulatory documents have to be brought in line with NBC 2016

- Building Byelaws
- Building Rules
- Planning Standards
- Development Control Rules
- Fire Regulations
- Town Planning Rules
- Hazard Mapping Rules
- Water Supply Byelaws
- Drainage Byelaws

THE PUBLICATION

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Volume 1 and 2	Comprehensive version	(Parts 0 to 12 – all sections included)	Rs. 13,760/-
Group 1	For Planning, Building/ Land Development work	(Parts 0, 1, 2, 3, 4, 5, 10 – Sections 1 & 2 and Part 11)	Rs. 4,650/-
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Program of Work

Foreword

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All

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