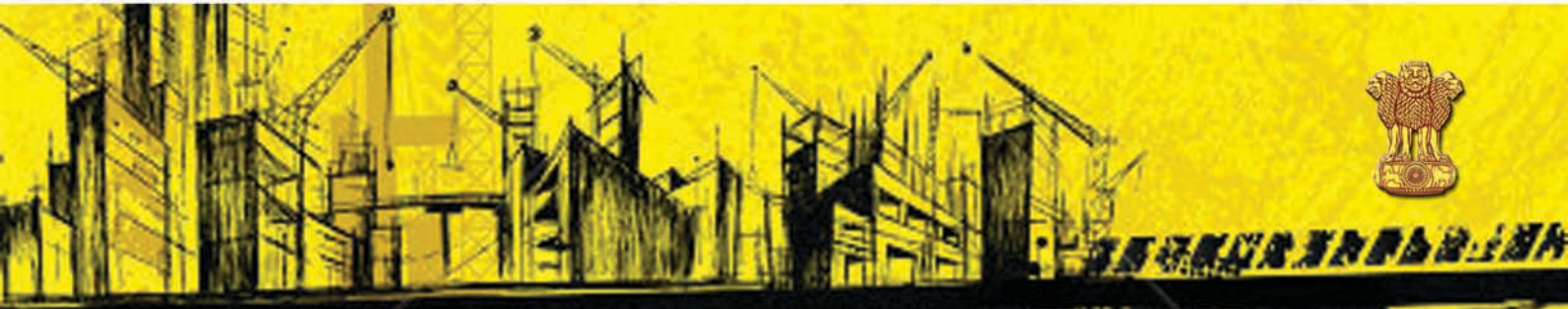
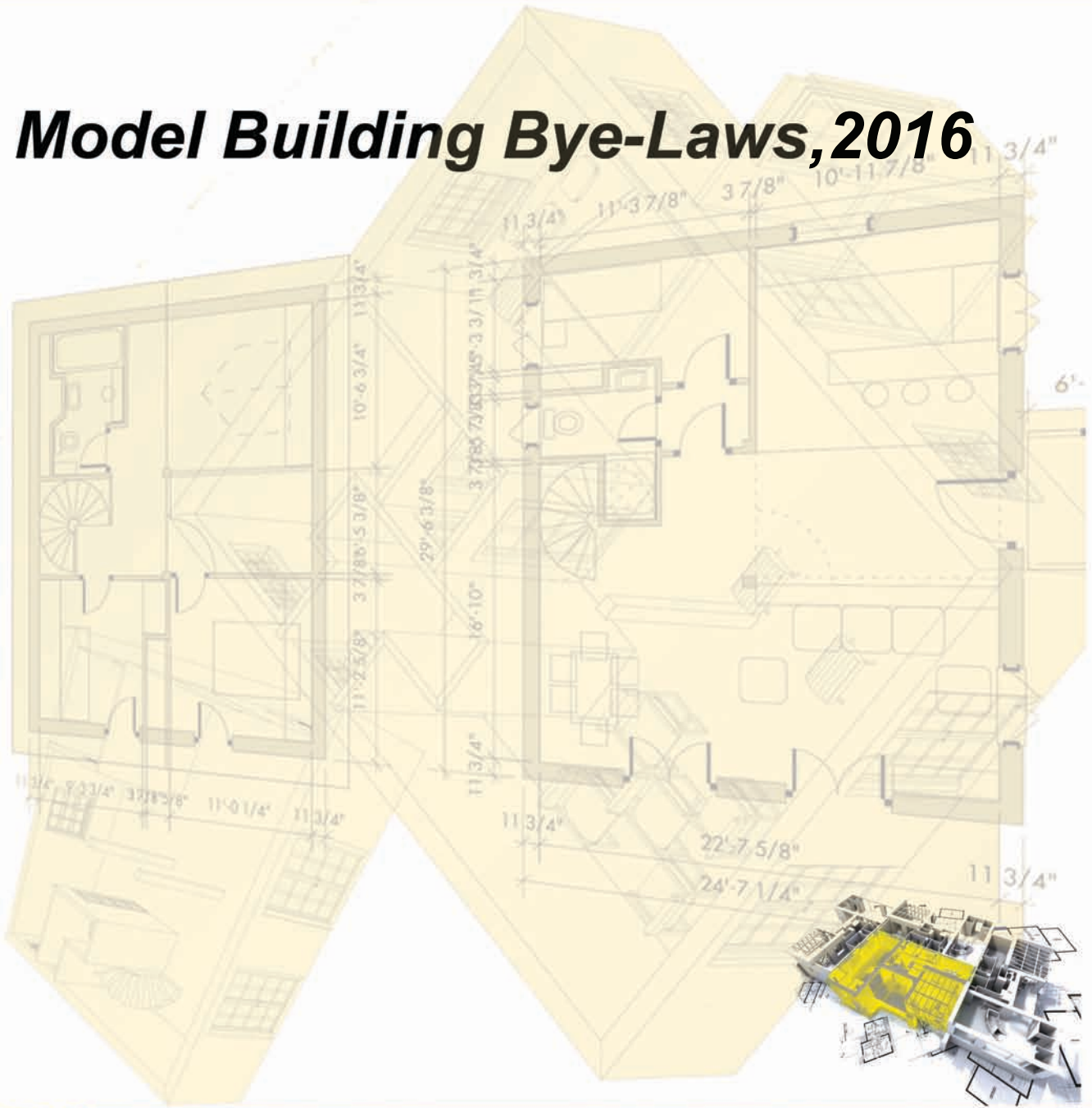
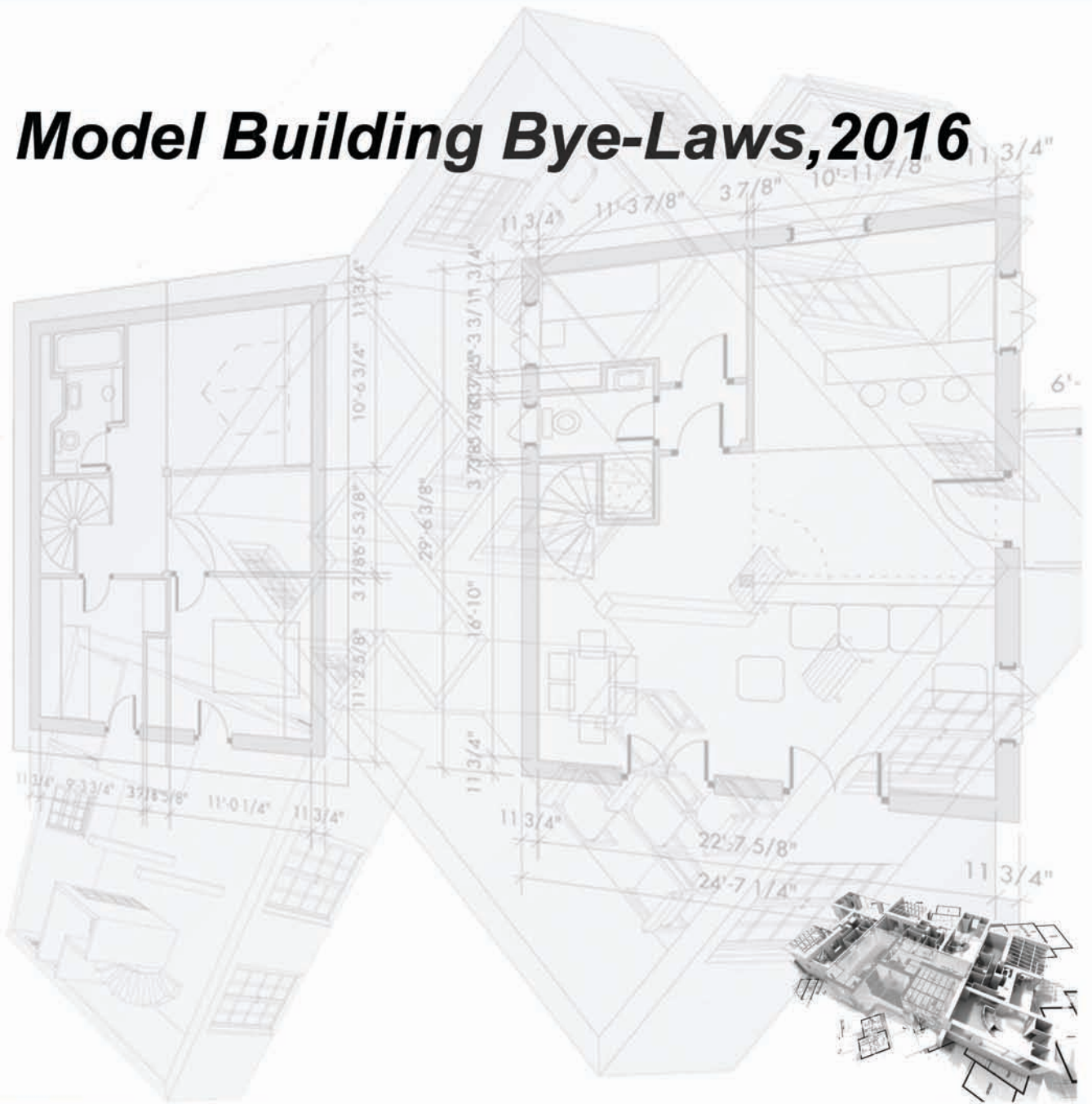


# ***Model Building Bye-Laws, 2016***





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Bureau of Indian Standards  
National Building Construction Corporation  
National Remote Sensing Centre  
Delhi Development Authority  
National Capital Region Planning Board  
Indian Institute of Public Administration  
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## PRELUDE

Building Bye-Laws are legal tools used to regulate coverage, height, building bulk, and architectural design and construction aspects of buildings so as to achieve orderly development of an area. They are mandatory in nature and serve to protect buildings against fire, earthquake, noise, structural failures and other hazards. In India, there are still many small and medium sized towns which do not have building bye-laws and in the absence of any regulatory mechanism, such towns are confronted with excessive coverage, encroachment and haphazard development resulting in chaotic conditions, inconvenience for the users, and disregard for building aesthetics, etc. It is in this context, TCPO has made an effort to prepare “**Model Building Bye-Laws- 2016**” for the guidance of the State Governments, Urban Local Bodies, Urban Development Authorities, etc which is an improvement over the previous *Model Building Bye Laws* brought out in 2004.

In 2003, the Ministry of Urban Development desired that Model Building Bye-Laws be prepared, in view of Bhuj Earthquake that occurred in 2001, to lay focus on structural safety of buildings and for the guidance of the State Governments. Accordingly, the MBBL 2004 incorporated the provisions of structural safety and other provisions like rainwater harvesting and waste water recycling, solar assisted heating, barrier free public buildings and fire safety. The Bye-Laws were circulated to all the State Governments and Union territories and out of 36 States and UTs, wherein 22 States and UTs have undertaken comprehensive revision of their respective Building Bye-Laws since 2004.

The *Raison d'être* for revising the Bye-Laws are as under:

1. Growing Environmental concerns
2. Increased Safety and Security measures
3. Technological Developments
4. Swachh Bharat Mission
5. Focus on Ease of Doing Business

In 2015, it was further desired by the Ministry of Urban Development that the Model Building Bye-Laws, 2004 needs to be revised and updated keeping in view the emerging issues like *Norms for Rooftop Solar PV Installation, Segregated sanitation facilities for visitors in public buildings, Additional provisions in Building regulations for natural hazard prone areas, Conservation of heritage sites including heritage buildings,*

*heritage precincts and natural feature areas, Bye-laws for safe use of glass, barrier free environment for disabled, children and old persons and Mitigation of the effects of electromagnetic radiation on built spaces.*

The Draft Model Building Bye-laws, 2016 were circulated to Central Governments agencies/ institutes like National Disaster Management Authority, Bureau of Indian Standards, National Building Construction Corporation, Delhi Development Authority, National Capital Region Planning Board, Indian Institute of Public Administration, Municipal Corporation of Delhi (South), Housing and Urban Development Corporation, Schools of Planning and Architecture, State Town and Country Planning Departments, selected Urban Development Authorities, selected Urban Local bodies and associations like CREDAI and NAREDCO for obtaining their comments and suggestions.

A National Workshop on Draft Model Building Bye Laws, 2016 was held on 18.2.2015 mainly to obtain comments / suggestions from the State Town and Country Planning Departments/Urban Development Authorities/ Municipal Corporations and Schools of Planning and other related stakeholders like Association of Real Estate Developers and private consultants. The workshop was attended by 110 participants and comments/suggestions on following issues emerged out in the day long deliberations-

- *Norms for High Rise Buildings (Chapter 5)*
- *Norms for differently abled, senior citizens and children (Chapter 8)*
- *Sustainability and Green buildings (Chapter 10)*
- *Streamlining building pla approvals, Ease of Doing Business (Chapter 13)*
- *Norms for Low income housing*
- *Parking Norms (public parking space for vehicles in CBD)*
- *Flexible FAR prescriptions*
- *Incorporation of new terms in definitions*
- *Updation of all IS Codes of BIS*
- *Updating fire provisions with respect to staircase and exits.*

A review meeting was held under the chairmanship of Secretary (UD) on 06.07.2015 wherein Joint Secretary (UD) made a presentation on the draft MBBL, 2016. In the meeting, it was decided that the draft may also be circulated to related Ministries involved in granting NOCs for construction projects. Comments were received from the Ministries of Culture, Consumer Affairs, Food and Public Distribution, Housing and

Urban Poverty Alleviation, Power, Water Resources and River development and Ganga Rejuvenation and Civil Aviation. The relevant comments received from all the concerned have been duly incorporated in the MBBL, 2016.

The salient features of MBBL- 2016 are given as under -

- **Safety and security** (Chapter-6): includes Structural Safety, Disaster management as per Prof. Arya Committee Report and BIS Codes including Structural Design Basis Report (SDBR) for various building types. Prevention measures against “*Soft Storeys*” in multi-storeyed buildings and Proof Checking of Structural Design for buildings.
- **Barrier Free Environment:** Provisions for Differently abled, Elderly and Children including Site development, Access Path/ Walk Way, Parking, Building requirements, Stair, Lifts, Toilets, Drinking Water, Refuge and signage.
- **Environmental Concerns:** Additional Chapter-10 incorporated for Green Buildings and Sustainability provisions, Rainwater Harvesting, Wastewater Reuse and Recycle and installation of Solar Roof Top PV norms.
- **Adoption for Modern Construction Technology:** Additional Chapter-5 incorporates Definitions, Structural Safety and other provisions for *Highrise Building regulations* with Parking, Peripheral Open Spaces including set-backs. Disaster Management & Fire Safety.
- **Swachh Bharat Mission:** Revised Norms for adequate toilet facilities for women and Public Conveniences in Public Buildings and Mandatory Provisions for Segregated toilet facilities for visitors in Public Buildings.
- **Ease of Doing Business:** Additional Chapter-14 includes Provision for Online Building plan approval process adopting automated systems of plan scrutiny, generation of reports/approvals and integrated systems of intimation of approval, Compliance report from drawings for automatic generation of Completion certificate and integration of various clearances at Master Plan levels and introduction of Integrating “Single Window” process, Empowering Architects, Outsourcing non discretionary verification jobs and formulation of Citizen’s Charter.
- **Rain Water Harvesting:** Additional Chapter-9 Indicative Provisions for harvesting in various types of buildings along with responsibility of ULBs for RWH in public spaces, provisions for Enforcement and Monitoring.

- **Effects of Communication Technology:** Additional Annexure –I, Draft Guidelines for mitigation of Electro Magnetic Radiations in built spaces by identifying emission appliances/ sources. Guidelines for safe spacing of indoor and outdoor appliances and equipment.

It is hoped that the document will be useful for State Governments, Urban Local Bodies, Development Authorities, State Town Planning Departments and other Planning Agencies in various parts of the country in revising their respective Building Bye Laws.

**Metro and Union Territory Division  
Town and Country Planning Organization**



<b>1. DEFINITIONS</b> .....	<b>1</b>
1.0 General.....	1
1.1 Definitions.....	1
<b>2. JURISDICTION / APPLICABILITY AND BUILDING DOCUMENTATION PROCEDURES</b> .....	<b>13</b>
2.1 Jurisdiction of Building Bye Laws .....	13
2.2 Applicability of Building Bye Laws .....	13
2.3 Development and part construction .....	13
2.4 In case of Part construction.....	13
2.5 Change of use / occupancy .....	13
2.6 Reconstruction .....	13
2.7 Existing approved building .....	13
2.8 Development.....	14
2.9 Procedure for obtaining building permit.....	14
2.10 All Plans.....	16
2.11 Signing of plans .....	20
2.12 Notice for alteration .....	20
2.13 Building permit fees.....	21
2.14 Sanction.....	21
2.15 Procedure during Construction Work .....	24
2.16 Notice of Completion.....	25
2.17 Completion and Permission for Occupation .....	26
2.18 Occupancy/ Part Completion Certificate .....	27
2.19 Connection to the municipal sewer / water mains .....	27
<b>3. DEVELOPMENT CODES</b> .....	<b>29</b>
3.1 Flexible FAR.....	29
3.2 Development norms and standards for hill towns.....	31
3.3 Parking standard.....	31
3.4 Specific premises .....	34
3.5 Non-residential premises .....	37
3.6 Commercial.....	37
3.7 Industrial plot.....	40
3.8 Transportation .....	41
3.9 Aerodromes.....	41
3.10 Public - Semi-public .....	42
3.11 Educational Facilities.....	44
3.12 Security Services.....	46
3.13 Post and telegraph office, head post office .....	47

3.14	Farm houses.....	47
3.15	Professional activity .....	47
3.16	Socio – cultural facilities .....	48
<b>4.</b>	<b>GENERAL BUILDING REQUIREMENTS AND SERVICES.....</b>	<b>51</b>
4.1	General .....	51
4.2	Requirements for Parts of Buildings .....	51
4.3	Habitable Rooms .....	51
4.4	Kitchen .....	52
4.5	Bathrooms and Water-Closets.....	52
4.6	Ledge or Tand/Loft.....	53
4.7	Mezzanine Floor.....	53
4.8	Store Room.....	54
4.9	Garage.....	54
4.10	Basement .....	54
4.11	Chimneys.....	55
4.12	Parapet.....	55
4.13	Cabin .....	55
4.14	Boundary Wall .....	55
4.15	Septic Tanks .....	55
4.16	Meter Rooms .....	57
4.17	Staircase/Exit Requirements.....	57
4.18	Roofs .....	57
4.19	Special Requirements of Low Income Housing.....	58
4.20	Special Requirements for Cluster Planning for Housing .....	58
4.21	Group housing .....	58
4.22	Non-residential buildings .....	58
4.23	Other general requirements .....	59
4.24	Means of access (Including Fire Safety- Ref Chapter 10) .....	60
4.25	Provision of exterior open spaces and height limitation around the building .....	63
4.26	Interior Open Space for Light and Ventilation.....	63
4.27	Joint Open Air Space.....	63
4.28	Provision of Podium for parking and landscaping .....	64
4.29	Exemption to Open Spaces/Covered area .....	64
4.30	Lighting and ventilation of rooms .....	66
4.31	Building Services .....	68
4.32	Plumbing and Sanitary Services.....	68
4.33	Segregated sanitation for Visitors in Public Buildings.....	68
4.34	Construction Site .....	79

4.35	Temporary Camp Toilets .....	80
4.36	Special / Contingency Toilets .....	80
4.37	General guidance for water supply arrangements .....	80
<b>5.</b>	<b>PROVISIONS FOR HIGH RISE DEVELOPMENT .....</b>	<b>81</b>
5.1	High Rise .....	81
5.2	Peripheral Open Spaces including set backs.....	81
5.3	Parking Spaces .....	81
5.4	Building components .....	82
5.5	Building Services .....	87
<b>6.</b>	<b>PROVISIONS FOR STRUCTURAL SAFETY.....</b>	<b>91</b>
6.1	Structural design and safety .....	91
6.2	Structural requirements of low income housing .....	96
6.3	Inspection.....	96
6.4	Alternative Materials, Methods of Design and Construction and Tests .....	99
<b>7.</b>	<b>SPECIAL REQUIREMENTS FOR OCCUPANCY/LAND DEVELOPMENT AND OTHER.....</b>	<b>101</b>
7.1	Industrial Buildings (Factories, Workshops, etc.) .....	101
7.2	Educational Building (School/Colleges).....	101
7.3	Assembly Building (Cinema, Theaters, etc.).....	102
7.4	Petrol filling station.....	102
7.5	Burial and cremation grounds.....	102
7.6	Building in mining area .....	103
7.7	Poultry farms (wherever allowed as per master plan) .....	103
7.8	Special buildings not covered.....	104
7.9	Provisions in the public buildings for handicapped persons.....	104
7.10	Resettlement and Slum insitu upgradaion.....	104
7.11	Rules for development of land.....	104
7.12	Penal action for violation of master plan/zonal plan regulation/bye- laws.....	104
7.13	Signs and outdoor display structus .....	104
<b>8.</b>	<b>PROVISIONS FOR DIFFERNTLY-ABLED, ELDERLY AND CHILDREN.....</b>	<b>105</b>
8.1	Applicability .....	105
8.2	Guidelines and Provisions.....	105
8.3	Types of buildings to adopt barrier free guidelines as notified by the state government .....	105
8.4	Building requirements.....	107
8.5	Stair-ways .....	107
8.6	Lifts.....	108

8.7	Toilets.....	108
8.8	Designing for Children.....	109
8.9	Drinking Water:.....	109
8.10	Refuge .....	109
8.11	Proper signage .....	110
8.12	Public Building regulations .....	110
<b>9.</b>	<b>RAINWATER HARVESTING .....</b>	<b>111</b>
9.1	The RWH system .....	111
9.2	Rainwater harvesting techniques:.....	111
9.3	Harvesting provisions in various Building categories:.....	112
9.4	Rain Water Harvesting Provisions for Open spaces in cities .....	112
9.5	Ground Water Recharge .....	113
9.6	Enforcement and Monitoring .....	113
<b>10.</b>	<b>GREEN BUILDINGS AND SUSTAINABILITY PROVISIONS.....</b>	<b>115</b>
10.1	Provisions and Applicability .....	115
10.2	Provisions for Sanction.....	116
10.3	Various Guidelines for Green Rating systems .....	120
<b>11.</b>	<b>FIRE PROTECTION AND FIRE SAFETY REQUIREMENTS .....</b>	<b>121</b>
11.1	Scope .....	121
11.2	Procedure for clearance from fire service .....	121
11.3	Renewal of fire clearance .....	122
11.4	Fee .....	122
11.5	Fire consultant .....	122
11.6	Terminology .....	122
11.7	General .....	122
11.8	Fire Escapes or External Stairs:.....	123
11.9	Provision of lifts .....	124
11.10	Basement .....	126
11.11	Provision of helipad.....	128
11.12	Service ducts/refuge chute.....	128
11.13	Electrical services.....	128
11.14	Staircase and corridor lights .....	129
11.15	Air-conditioning .....	129
11.16	Boiler room.....	130
11.17	Alternate source of electric supply .....	131
11.18	Safety measures in electric sub-station.....	131
11.19	Fire protection requirements.....	134
11.20	Static water storage tank.....	135

11.21	Automatic sprinklers .....	135
11.22	Fixed carbon di-oxide /foam/dco water spray extinguishing system.....	136
11.23	Fire alarm system.....	136
11.24	Control Room.....	137
11.25	Fire drills and fire orders.....	137
11.26	Material used for construction of building.....	137
11.27	Liquefied Petroleum Gas (LPG) .....	138
11.28	House keeping.....	138
11.29	Fire prevention .....	139
11.30	Occupancy restrictions.....	141
<b>12.</b>	<b>CONSERVATION OF HERITAGE SITES INCLUDING HERITAGE BUILDINGS, HERITAGE PRECINCTS AND NATURAL FEATURE AREAS .....</b>	<b>143</b>
12.1	Applicability .....	143
12.2	Responsibility of the owners of heritage buildings.....	144
12.3	Restrictions on development / re-development / repairs etc.....	144
12.4	Penalties .....	145
12.5	Preparation of list of heritage sites including heritage buildings, heritage precincts and listed natural feature areas.....	145
12.6	Alteration / modification / relaxation in development norms .....	145
12.7	Heritage precincts / natural feature areas.....	146
12.8	Road widening .....	146
12.9	Incentive uses for heritage buildings .....	146
12.10	Maintaining skyline and architectural harmony .....	146
12.11	Restrictive covenants .....	147
12.12	Grading of the listed buildings / listed precincts .....	147
12.13	Opinion of the Heritage Conservation Committee .....	148
12.14	Approval to preserve the beauty of the area .....	148
12.15	Signs and outdoor display structures / including street furniture on heritage sites ...	148
12.16	Composition of heritage conservation committee .....	149
12.17	Implications of listing as heritage buildings .....	150
12.18	Ownership not affected.....	150
<b>13.</b>	<b>STREAMLINING OF BUILDING PLAN APPROVALS .....</b>	<b>151</b>
13.1	Streamlining the building approval/sanction procedure (Ease of doing business) ....	151
13.2	Clearances at Master Plan level .....	152
13.3	Clearances at the Local Authorities .....	154
13.4	Options for reducing the timelines for approvals: .....	154
13.5	Risk Based Classification of building proposals .....	156

13.6	Other Suggestions to enhance ease of doing business: .....	158
<b>14.</b>	<b>CLIMATE RESILIENT CONSTRUCTION: INTEGRATION OF ENVIRONMENTAL CLEARANCES WITH SANCTION.....</b>	<b>161</b>
14.1	Environmental conditions for compliance during Building approvals.....	161

**ANNEXURE AND APPENDICES**

Appendices to MBBL 2016	169
Annexure I: Guidelines for mitigation of effects of E M R in Built spaces	235
Annexure II: Technical Aspects and Options of RWH in built and open spaces	245



**List of Tables:**

Table 2.1 Drawing Sheet sizes .....	16
Table 2.2 Colouring of Plans.....	16
Table 2.3 Clearances from Electric Supply Lines .....	18
Table 3.1 Parking standards .....	32
Table 3.4 Net residential density of group housing, controls.....	36
Table 3.5 Development Controls on Service and Light Industrial Plots.....	40
Table 3.7 Development controls on Transport Terminals.....	41
Table 3.8 Development Controls on Health Centers and Nursing Homes.....	43
Table 3.9 Development Controls for Other Education Facilities.....	45
Table 3.10 Development Controls for Education Facilities .....	46
Table 3.12 Development control for other services .....	47
Table 3.13 Development control for farm house.....	47
Table 3.14 Development Control for Distributive Services.....	48
Table 3.15 Development Controls for Socio- Cultural Facilities.....	48
Table 4.1 Occupant Load .....	51
Table 4.2 Minimum height requirement for educational and industrial buildings.....	52
Table 4.3 Occupants per unit Exit width.....	61
Table 4.4 Provision of Exterior Open Spaces around the buildings.....	64
Table 4.5 Size of ventilation Shaft .....	67
Table 4.6 Per Capita water requirement for various Occupancies/Uses .....	70
Table 4.7 Flushing Storage Capacities .....	71
Table 4.8 Domestic Storage Capacities.....	71
Table 4.9 Sanitation requirements for Shops and Commercial Offices .....	71
Table 4.10 Sanitary Requirements for Hotels .....	72
Table 4.11 Sanitation Requirements for Educational Occupancy.....	73
Table 4.12 Sanitation Requirements for Institutional (Medical) Occupancy- Hospital.....	74
Table 4.13 Sanitation Requirements for Institutional (Medical) (staff quarters and Hostels) .....	74
Table 4.14 Sanitation Requirements for Governmental and Public Business and Offices .....	75
Table 4.15 Segregated sanitation facilities for Visitors in Public Buildings.....	75
Table 4.16 The recommended enclosure-sizes for different facilities at visitors' toilets.....	76
Table 4.17 The recommended areas for different facilities at visitors' toilets.....	76
Table 4.18 Sanitation Requirements for Assembly Occupancy Buildings (Cinema, Theaters, Auditoria. Etc.).....	76
Table 4.19 Sanitation Requirements for Assembly Buildings .....	77
Table 4.20 Sanitation Requirements for Restaurants .....	77
Table 4.21 Sanitation Requirements for Factories .....	78
Table 4.22 Sanitary Requirements for Large Stations and Airports .....	79
Table 4.23 General Standards/Guidelines for Public Toilets in Public Area.....	79
Table 4.24 Contingency Toilet facilities for Special Events.....	80
Table 5.1 Minimum width of staircase for different types of buildings.....	84
Table 5.2 Travel Distance for Occupancy and Type of Construction.....	84
Table 5.3 Glass quality and Use of Glass in buildings .....	84
Table 6.1 Proof Checking requirements of Structural Design .....	94
Table 7.1 Setback for farm building.....	103
Table 9.1 Provisions for Rainwater harvesting by building types.....	112
Table 10.1 Provisions and applicability for various plot sizes (all use premises).....	115
Table 10.2 Norms for Roof Top Solar PV Installation and generation.....	117
Table 12.1 Grading of Listed heritage.....	147
Table 13.1 Clearances from various agencies proposed to be integrated in Master Plans.....	152
Table 13.2 Timelines of clearances from various agencies.....	153
Table 13.3 Risk Matrix for different residential buildings.....	156



Table 13.4 Risk Matrix for Storage/Warehouses..... 156  
Table 14.1: Environmental Conditions Category “A”: 5000–sqmt - 20000 sqmt..... 163  
Table 14.2: Environmental Conditions Category “B”: 20000–sqmt - 50000 sqmt ..... 164  
Table 14.3: Environmental Conditions Category “C”: 50000 sqmt - 150000 sqmt ..... 165



# 1. DEFINITIONS

## 1.0 General

In these Bye-Laws, unless the context otherwise requires the definition given shall have the meaning indicated against each term.

All mandatory Master Plan/Zonal Plan regulations regarding use, land use, coverage, FAR, set-back, open space, height, number of stories, number of dwelling units, parking standards etc. for various categories of buildings including modification therein made from time to time shall be applicable mutatis mutandis in the Building Bye-Laws regulations under this clause. All amendments / modifications made in the aforesaid regulations shall automatically stand deemed to have been included as part of these Bye-laws.

## 1.1 Definitions

1. **“Access”** - A clear approach to a plot or a building.
2. **“Act”**- The Act of the Local Body/Authority concerned.
3. **“Addition and/or Alteration”**- A change from one occupancy to another, or a structural change including an addition to the area or change in height or the removal of part of building, or any change to the structure, such as the construction or removal or cutting into of any wall or part of a wall, partition, column, beam, joist, floor including a mezzanine floor or other support, or a change to or closing of any required means of access ingress or egress or a change to fixtures or equipment" as provided in these Bye-Laws.
4. **“Advertising Sign”**- Any surface or structure with characters, letters or illustrations applied thereto and displayed in any manner whatsoever outdoors for the purpose of advertising or giving information or to attract the public to any place, person, public performance, article, or merchandise, and which surface or structure is attached to, forms part of, or is connected with any building, or is fixed to a tree or to the ground or to any pole, screen, fence or hoarding or displayed in space, or in or over any water body included in the jurisdiction of the Authority.
5. **“Air-conditioning”**- The process of treating air so as to control simultaneously its temperature, humidity, purity, distribution and air movement and pressure to meet the requirements of the conditioned space.
6. **“Amenity”**- Includes roads, street, open spaces, parks, recreational grounds, play grounds, gardens, water supply, electric supply, street lighting, sewerage, drainage, public works and other utilities, services and conveniences.
7. **“Application”**- An application made in such form as may be prescribed by the Authority from time to time.
8. **“Approved”**- As approved/sanctioned by the Authority under applicable Bye-Laws.
9. **“Architect”**- A person holding a graduate degree in Bachelor of Architecture from any institute recognized by the Council of Architecture (COA) and has his/her name entered in the register of COA for the time being, with a valid COA Registration number. (Please see Appendix “E”- Qualification and Competence of Technical Personnel for Preparation of Schemes for Building Permit and Supervision).
10. **“Architect/Professional on record”**- An architect/Competent professional who is brought on record to represent his/her client for a construction project, to act on their behalf regarding building permits and process of construction (as detailed at Section

6.3.8 and competence given as per Appendix 'E'). He/She may be registered with the Authority for the cause.

11. **“Area”**- In relation to a building means the superficies of a horizontal section thereof made at the plinth level inclusive of the external walls and of such portions of the party walls as belong to the building
12. **“Authority”**- The Authority which has been created by a statute and which, for the purpose of administering the Code/Part, may authorize a committee or an official or an agency to act on its behalf; hereinafter called the ‘Authority’. Authority can be any Urban Local Body/Urban Development Authority/Industrial Development Authority or any other authority as notified by the State Government as the case may be.
13. **“Balcony”**- A horizontal projection, cantilevered or otherwise including a parapet" handrail, balustrade, to serve as a passage or sit out place.
14. **“Barsati”**- A habitable room/rooms on the roof of the building with or without toilet / kitchen.
15. **“Basement or Cellar”**- The lower storey of a building, below or partly below the ground level, with one or more than one levels.
16. **“Building”**- A structure constructed with any materials whatsoever for any purpose, whether used for human habitation or not, and includes:-
  - i) Foundation, plinth, walls, floors, roofs, chimneys, plumbing and building services, fixed platforms etc.
  - ii) Verandahs, balconies, cornices, projections etc.
  - iii) Parts of a building or anything affixed thereto;
  - iv) Any wall enclosing or intended to enclose any land or space, sign and outdoor display structures; etc.,
  - v) Tanks constructed or fixed for storage of chemicals or chemicals in liquid form and for storage of water, effluent, swimming pool, ponds etc.,
  - vi) All types of buildings as defined in (a) to (q) below, except tents, shamianas and tarpaulin shelters erected temporarily for temporary purposes and ceremonial occasions, shall be considered to be "buildings".

#### **Types of Buildings based on use of premises or activity:**

- a. **“Residential Building”**- includes a building in which sleeping and living accommodation is provided for normal residential purposes, with cooking facilities and includes one or more family dwellings, apartment houses, flats, and private garages of such buildings.
- b. **“Educational Building”**- Includes a building exclusively used for a school or college, recognized by the appropriate Board or University, or any other Competent Authority involving assembly for instruction, education or recreation incidental to educational use, and including a building for such other uses as research institution. It shall also include quarters for essential staff required to reside in the premises, and building used as a hostel captive to an educational institution whether situated in its campus or outside.
- c. **“Institutional Building”**- Includes a building constructed by Government, Semi-Government Organizations or Registered Trusts and used for medical or other treatment, or for an auditorium or complex for cultural and allied activities or for an hospice, care of persons suffering from physical or mental illness, handicap, disease or infirmity, care of orphans, abandoned women, children and infants, convalescents,

destitute or aged persons and for penal or correctional detention with restricted liberty of the inmates ordinarily providing sleeping accommodation and includes dharamshalas, hospitals, sanatoria, custodial and penal institutions such as jails, prisons, mental hospitals, houses of correction, detention and reformatories etc.

- d. **“Assembly Building”**- A building or part thereof, where groups of people (not < 50) congregate or gather for amusement, recreation, social, religious, patriotic, civil, travel and similar purposes and this includes buildings of drama and cinemas theatres, drive-in-theatres, assembly halls, city halls, town halls, auditoria, exhibition halls, museums, "mangal karyalayas", skating rinks, gymnasia, restaurants, eating or boarding houses, places of worship, dance halls, clubs, gymkhanas and road, railways, air, sea or other public transportation stations and recreation piers.
- e. **“Business Building”**- Includes any building or part thereof used principally for transaction of business and/or keeping of accounts and records including offices, banks, professional establishments, court houses etc., if their principal function is transaction of business and/or keeping of books and records.
- f. **“Mercantile Building”**- Includes a building or part thereof used as shops, stores or markets for display and sale of wholesale and or retail goods or merchandise, including office, storage and service facilities incidental thereto and located in the same building
- g. **“Industrial Building”**- Includes a building or part thereof wherein products or material are fabricated, assembled or processed, such as assembly plants, laboratories, power plants, refineries, gas plants, mills, dairies and factories etc.,
- h. **“Storage Building”**- A building or part thereof used primarily for storage or shelter of goods, wares, merchandise and includes a building used as a warehouse, cold storage, freight depot, transit shed, store house, public garage, hanger, truck terminal, grain elevator, barn and stables.
- i. **“Hazardous Building”**- Includes a building or part thereof used for-
  - i. Storage, handling, manufacture or processing of radioactive substances or highly combustible or explosive materials or of products which are liable to burn with extreme rapidity and/or producing poisonous fumes or explosive emanations.
  - ii. Storage, handling, manufacture or processing of which involves highly corrosive, toxic or noxious alkalis, acids, or other liquids, gases or chemicals producing flame, fumes and explosive mixtures etc. or which result in division of matter into fine particles capable of spontaneous ignition
- j. **“Mixed Land Use Building”**- A building partly used for non-residential activities and partly for residential purpose.
- k. **“Wholesale Establishment”**- An establishment wholly or partly engaged in wholesale trade and manufacture, wholesale outlets, including related storage facilities, warehouses and establishments engaged in truck transport, including truck transport booking agencies.

#### **Types of buildings based on design and height:**

- a. **“Detached Building”**- Includes a building with walls and roofs independent of any other building and with open spaces on all sides within the same plot.
- b. **“Multi-Storeyed Building or High Rise Building”**- A building above 4 stories, and/or a building exceeding 15 meters or more in height (without stilt) and 17.5M (including stilt).
- c. **“Semi-detached Building”**- A building detached on three sides with open space as specified in these regulations.

**Types of buildings based on other features:**

- a. **“Special Building”**- Includes all buildings like assembly, industrial, buildings used for wholesale establishments, hotels, hostels, hazardous, mixed occupancies with any of the aforesaid occupancies and centrally air conditioned buildings having total built up area exceeding 500 sq m.
- b. **“Multi Level Car parking”**- A building partly below ground level having two or more basements or above ground level, primarily to be used for parking of cars, scooters or any other type of light motorized vehicle.

**Types of buildings based on safety due to use/ maintenance level:**

- a. **“Slum”** – Buildings that are in poor condition of maintenance or have compromised habitability due to poor ventilation, sanitation or otherwise are termed slums. These are generally declared or notified as slums under relevant legislation by competent authority
- b. **“Unsafe Building”**- Includes a building which:
  - i) Is structurally unsafe, or
  - ii) Is insanitary, or
  - iii) Is not provided with adequate means of ingress or egress or
  - iv) Constitutes a fire hazard or
  - v) Is dangerous to human life or
  - vi) In relation to its existing use, constitutes a hazard to safety or health or public welfare by maintenance, dilapidation or abandonment.

*Note: All unsafe buildings /structure will require to be restored by repairs, demolition or dealt with as directed by the Authority. The relevant provisions of the Act shall apply for procedure to be followed by the Authority in taking action against such buildings.*

17. **“Building Height”**- The vertical distance measured
  - i) In the case of flat roofs from the average level of the front road and continuance to the highest point of the building.
  - ii) In case of pitched roofs upto the point where the external surface of the outer wall intersects the finished surface of the sloping roof and
  - iii) In the case of gables facing the road midpoint between the eaves level and the ridge.

Architectural features serving no other function except that of decoration shall be excluded for the purpose of measuring heights. The height of the building shall be taken upto the terrace level for the purpose of fire safety requirement.

18. **“Building Envelope”** - The horizontal spatial limits up to which a building may be permitted to be constructed on a plot.
19. **“Building Line”**- The line upto which the plinth of building adjoining a street or an extension of a street or on a future street may lawfully extend and includes the lines prescribed, if any, in any scheme and/or development plan. The building line may change from time-to-time as decided by the Authority.
20. **“Cabin”**- A non-residential enclosure constructed of non-load bearing partitions.
21. **“Canopy”**- shall mean a cantilevered projection from the face of the wall over an entry to the building at the lintel or slab level provided that:
  - i) It shall not project beyond the plot line.

- ii) It shall not be lower than 2.3 m. or 7' - 6" when measured from the ground.
- iii) There shall be no structure on it and the top shall remain open to sky.
22. **“Carpet Area”** - The covered area of the usable rooms of a dwelling unit / at any floor (excluding the area of the walls).
23. **“Chajja”**- A sloping or horizontal structural overhang provided over openings on external walls for protection from the weather.
24. **“Chimney”**- A construction by means of which a flue is formed for the purpose of carrying products of combustion to the open air and includes a chimneystack and flue pipe.
25. **“Construction”** - Any erection of a structure or a building, including any addition or extension thereto either vertically or horizontally, but does not include, any reconstruction, repair and renovation of an existing structure or building, or, construction, maintenance and cleansing of drains and drainage works and of public latrines, urinals and similar conveniences, or, the construction and maintenance of works meant for providing supply of water for public, or, the construction or maintenance, extension, management for supply and distribution of electricity to the public; or provision for similar facilities for publicity.
26. **“Conversion”**- The change from one occupancy to other occupancy or any change in building structure or part thereof resulting in a change of space and use requiring additional occupancy certificate.
27. **“Cornice”**- means a sloping or horizontal structural overhang usually provided over openings or external walls to provide protection from sun and rain.
28. **“Courtyard”**- A space permanently open to sky, enclosed fully or partially by buildings and may be at ground level or any other level within or adjacent to a building.
29. **“Covered Area”**- The Ground area covered immediately above the plinth level covered by the building but does not include the space covered by:
- Garden, rockery, well and well structures, plant nursery, water pool, swimming pool (if uncovered), platform round a tree, tank, fountain, bench, chabutra with open top and unenclosed on sides by walls and the like;
  - Drainage culvert, conduit, catch-pit, gully-pit, chamber, gutter and the like;
  - Compound wall, gate, slide/ swing door, canopy, and areas covered by chajja or similar projections and staircases which are uncovered and open at least on three sides and also open to sky.
30. **“Damp Proof Course”**- A course consisting of some appropriate water proofing material provided to prevent penetration of dampness or moisture.
31. **“Density”**- The residential density expressed in terms of the number of dwelling units per hectare.

*Note:* Where such densities are expressed exclusive of community facilities and provision of open spaces and major roads (excluding incidental open spaces), these will be net residential densities. Where these densities are expressed taking into consideration the required open space provision and community facilities and major roads, these would be gross residential densities at neighbourhood level, sector level or town level, as the case may be. The provision of open spaces and community facilities will depend on the size of the residential community. Incidental open spaces are mainly open spaces required to be left around and in between two buildings to provide lighting and ventilation.

32. **“Development”** - ‘Development’ with grammatical variations means the carrying out of building, engineering, mining or other operations, in, or over, or under land or water, on the making of any material change, in any building or land, or in the use of any building, land, and includes re-development and layout and subdivision of any land and ‘to develop’ shall be construed accordingly.
33. **“Development Plan”**- See “Master Plan”
34. **“Drain”**- A conduit or channel for the carriage of storm water, sewage, waste water or other waterborne wastes in a building drainage system.
35. **“Drainage system”** - A system or a line of pipes, with their fittings and accessories, such as manholes, inspection chambers, traps, gullies, floor traps used for drainage of building or yards appurtenant to the buildings within the same cartilage; and includes an open channel for conveying surface water or a system for the removal of any waste water.
36. **“Dwelling”**- A building or a portion thereof which is designed or used wholly or principally for residential purposes for one family.
37. **“Empanelled Architect”**- A person empanelled by the Authority as per rules under the bye-laws as an authorized person to sanction building plans of residential buildings upto 15 m. in height and for plot sizes upto 500 sqm, forming part of any approved lay-out plan.
38. **“Encroachment”**- means an act to enter into the possession or rights either of permanent or temporary nature on a land or built up property of local body or state/ central Government.
39. **“Enclosed Staircase”**- means a staircase separated by fire resistant walls and doors from the rest of the building.
40. **“Existing Building”**- A building or structure existing authorisedly with the approval of the Authority before the commencement of these Bye-Laws.
41. **“Existing Use”**- Use of a building or structure existing authorisedly with the approval of the Authority before the commencement of these Bye-Laws.
42. **“Exit”**- A passage channel or means of egress from the building, its storey or floor to a street or, other open space of safety; whether horizontal, outside and vertical exits meaning as under:-
- i) Horizontal exit means an exit, which is a protected opening through or around a fire well or bridge connecting two or more buildings.
  - ii) Outside exit mean an exit from building to a public way to an open area leading to a public way or to an enclosed fire resistant passage leading to a public way.
  - iii) Vertical exit means an exit used for ascending or descending between two or more levels including stairway, fire towers, ramps and fire escapes.
43. **“External Wall”**- An outer wall of a building not being a party wall even though adjoining to a wall of another building and also means a wall abutting on an interior open space of any building.
44. **“Floor”**- The lower surface in a storey on which one normally walks in a building, and does not include a mezzanine floor. The floor at ground level with direct access to a street or open space shall be called the ground floor; the floor above it shall be termed as floor- 1, with the next higher floor being termed as floor- 2, and so on upwards.
45. **“Floor Area Ratio (FAR)”**- The quotient obtained by dividing the combined covered area (plinth area) of all floors, excepting areas specifically exempted under these regulations, by the total area of the plot, viz.: -



$$\text{Floor Area Ratio (FAR)} = \frac{\text{Total Covered Area on All Floors}}{\text{Plot Area}}$$

- 46. “Fire and/or Emergency Alarm System”**- Fire alarm system comprises of components for manually or automatically detecting a fire, initiating an alarm of fire and initiating other actions as appropriate.
- 47. “Fire Hazard Industries”**-
- i) "Low Fire Hazard Industries" includes engineering industries using/processing or assembling non-combustible materials i.e. lathe machines, steel works, steel components etc.
  - ii) "Moderate Fire Hazard Industries" includes industries using / processing combustible materials but not flammable liquid etc., plastic industries, rubber, and PVC industries, textile, paper, furniture, flour mills etc.
  - iii) "High Fire Hazard Industries" includes industries using/processing flammable liquids, gases, chemicals petroleum products, plastic or thermo setting group etc.
- 48. “Fire Lift”**- Means a special lift designed for the use of fire service personnel in the event of fire or other emergency.
- 49. “Fire Proof Door”**- Means a door or shutter fitted to a wall opening, and constructed and erected with the requirement to check the transmission of heat and fire for a period.
- 50. “Fire Pump”**- Means a machine, driven by external power for transmitting energy to fluids by coupling the pump to a suitable engine or motor, which may have varying outputs/capacity but shall be capable of having a pressure of 3.2 kg/cm<sup>2</sup> at the topmost level of multi-storey or high rise building.
- 51. “Fire Pump-Booster Fire Pump”**- Means a mechanical/electrical device that boots up the water pressure at the top level of a multi-storeyed / high-rise building and which is capable of a pressure of 3.2 kg/cm<sup>2</sup> at the nearest point.
- 52. “Fire Resistance”**- Fire resistance is a property of an element of building construction and is the measure of its ability to satisfy for a stated period some or all of the following criteria:
- a. resistance to collapse,
  - b. resistance to penetration of flame and hot gases, and
  - c. resistance to temperature rise on the unexposed face up to a maximum of 180°C and/or average temperature of 150°C.
- Fire Resistance Rating** - The time that a material or construction will withstand the standard fire exposure as determined by fire test done in accordance with the standard methods of fire tests of materials/structures.
- 53. “Fire Separation”**- Means the distance in meters measured from any other building on the site or from another site, or from the opposite side of a street or other public space to the building.
- 54. “Fire Service Inlet”**- Means a connection provided at the base of a building for pumping up water through in built fire-fighting arrangements by fire service pumps in accordance; with the recommendation of the Chief Fire Officer.
- 55. “Fire Tower”**- Means an enclosed staircase that can only be approached from the various floors through landings or lobbies separated from both the floor area and the staircase by fire resistant doors and open to the outer air.

56. **“Fire Resisting Building”**- means a building in which material, which has, appropriate degree of fire resistance is used.
57. **“Footing”**- A foundation unit constructed in brickwork, stone masonry or concrete under the base of a wall or column for the purpose of distributing the load over a larger area.
58. **“Foundation”**- A substructure supporting an arrangement of columns or walls in a row or rows transmitting the loads to the soil
59. **“Front Air Plane”**- The plane contained between the ground in front of the building and the straight lines drawn downwards and outwards from the line of intersection of the outer surface of any front wall of the building with the roof perpendicular to that line, and at an angle of 63-1/2 degrees to the horizontal;
- Note: The 63-1/2 degrees angle has a tangent of 2:1 so that if the ground is the level, the air plane reaches the ground at a distance from the exterior wall equal to half the height of the above level of that ground.*
60. **“Gallery”**- An intermediate floor or platform projecting from a wall of an auditorium or a hall providing extra floor area, and/additional seating accommodation and includes the structures provided for seating in stadia.
61. **“Garage-Private”**- A building or a portion thereof designed and used for the parking of vehicle.
62. **“Garage-Public”** - A building or portion thereof, designed other than as a private garage, operated for gain, designed and/or used for repairing, servicing, using, selling or storing or parking motor driven or other vehicles.
63. **“Ground Floor”**- shall mean storey, which has its floor surface nearest to the ground around the building.
64. **“Group Housing”**- means a building unit constructed or to be constructed with one or more floors having more than two dwelling units having common service facilities where land is owned jointly (as in the case of co-operative societies or the public agencies, such as local authorities or housing boards, etc) and the construction is undertaken by one Agency..
65. **“Habitable Room”**- A room occupied or designed for occupancy by one or more persons for study, living, sleeping, eating, kitchen if it is used as a living room, but not including bathrooms, water-closet compartments, laundries, serving and store pantries, corridors, cellars, attics, and spaces that are not used frequently or during extended periods.
66. **“Illuminated Exit Signs”**- A device for indicating the means of escape during normal circumstances and power failure.
67. **“Jhamp”**-A downward, vertical or sloping projection hanging below any horizontal projection like balcony, canopy, verandah, passage etc, to provide protection from direct sun and rain.
68. **“Jhot”** -A strip of land permanently left open for drainage purposes. It is not to be used as an access way or a street and is not to be included as a part of setbacks.
69. **“Katra or Chawl”**-A building so constructed as to be suitable for living in separate tenements each consisting a single room, or of two, but not of more than two rooms and with common sanitary arrangements.
70. **“Layout Plan”** – means a Plan indicating configuration and sizes of all Use Premises. Each Use Zone may have one or more than one Layout Plan depending upon the extensiveness of the area under the specific Use Zones and vice versa. A layout plan

shall have at least two use premises (apart from Recreational, utilities and transportation) and a minimum area of 1 hectare.

- 71. “Ledge or Tand”**- A shelf-like projection, supported in any manner whatsoever, except by means of vertical supports within a room itself but not having projection wider than 1 m.
- 72. “Licensed Architect / Town Planner / Engineer / Supervisor / Plumber”**- Qualified professionals who have been registered with the Authority as per the Qualification and competence given in Appendix ‘E’ / by the body governing such profession and therefore possess the license to provide professional services in Building construction.
- 73. “Lift”**- An appliance designed to transport persons or materials between two or more levels in a vertical or substantially vertical direction by means of a guided car or platform. The word ‘elevator’ is also synonymously used for ‘lift’.
- 74. “Lobby”**- means a covered space in which all the adjoining rooms open.
- 75. “Loft”**- An intermediate floor between two floors or a residual space in a pitched roof above normal level constructed for storage with maximum clear height of 1.5 meters.
- 76. “Light Plane”**- The plane lying between the line of intersection of the floor of any room in a building with the outer surface or an exterior wall of the building and the straight lines drawn upwards and outwards from those lines drawn upward and outwards from lines perpendicular thereto at an angle of  $63\frac{1}{2}^{\circ}$  to the horizontal.
- Note: For the purpose of the definition of light plane, the outer surface of any verandah abutting on an interior or side open space shall be considered to be the exterior wall of the building.*
- 77. “Masonry”** - An assemblage of masonry units properly bound together by mortar.
- 78. “Masonry Unit”** - A unit whose net cross-sectional area in every plane parallel to the bearing surface is 75% or more of its gross cross-sectional area measured in the same plane. It may be either of clay, brick, stone, concrete, sand lime brick or any other construction material.
- 79. “Master Plan”**- A Master Plan formulated under any relevant Act (Town and Country Planning or Development Act or Municipal Act) for any town, approved and notified by the State Government.
- 80. “Means of Escape”**- An escape route provided in a building for safe evacuation of occupants.
- 81. “Mezzanine Floor”**- An intermediate floor between two floors of any storey forming an integral part of floor below.
- 82. “Mumty or Stair Cover”**- A structure with a covering roof over a staircase and its landing built to enclose only the stairs for the purpose of providing protection from weather and not used for human habitation.
- 83. “MCB/ELCB”**- Devices for tripping of electrical circuits in event of any fault in the circuit/installation.
- 84. “Non Combustible Material”**- A material which is not liable to burn or add heat to a fire when tested for combustibility in accordance with the latest code of Bureau of Indian Standards Method of Test for combustibility of Building Materials.
- 85. “Occupancy or use”**-

The principal occupancy/ use for which a building or a part of a building is intended to be used. For the purposes of classification of a building according to occupancy, an occupancy shall be deemed to include the subsidiary occupancies which are contingent upon it.

“**Mixed occupancy**” buildings being those in which more than one occupancy is present in different portions of the buildings.

86. “**Open space**”- An area forming an integral part of a site left open to the sky.
87. “**Owner**”- Person or body having a legal interest in land and/or building thereon. This includes free holders, leaseholders or those holding a sub-lease which both bestows a legal right to occupation and gives rise to liabilities in respect of safety or building condition.
- In case of lease or sub-lease holders, as far as ownership with respect to the structure is concerned, the structure of a flat or structure on a plot belongs to the allottee/ lessee till the allotment/lease subsists.
88. “**Parapet**”- A low wall or railing built along the edge of a roof or a floor.
89. “**Parking space**”- An enclosed or unenclosed covered or open area sufficient in size to park vehicles. Parking spaces shall be served by a driveway connecting them with a street or alley and permitting ingress and egress of vehicles.
90. “**Partition**”- An interior non-load bearing barrier, one storey or part-storey in height.
91. “**Partition Wall**” includes-
- i) A wall forming part of a building and being used or constructed to be used in any part of the height or length of such wall for separation of adjoining buildings belonging to different owners or constructed or adopted to be occupied by different persons; or
  - ii) A wall forming part of a building and standing in any part of the length of such wall, to a greater extent than the projection of the footing on one side or ground of different owners.
92. “**Permanent Open Air Space**”- Air space permanently open:
- i) If it is a street.
  - ii) If its freedom from encroachment is protected by any law or contract ensuring that the ground below it is either a street or is permanently and irrevocably appropriated as an open space.
93. “**Permission or Permit**”- A valid permission or authorization in writing by the competent Authority to carryout development or a work regulated by the Bye-Laws.
94. “**Plinth**”- The portion of a structure between the surface of the surrounding ground and surface of the floor immediately above the ground.
95. “**Plinth Area**”- The built up covered area measured at the floor level of the basement or of any storey.
96. “**Plot/ Site**”- A parcel or piece of land enclosed by definite boundaries.
97. “**Plotted Development**” – Type of development layout wherein a stretch of developed land is divided into regular sized plots for uniform controlled building volumes.
98. “**Porch**”- A covered surface supported on pillars or otherwise for the purpose of a pedestrian or vehicular approach to a building.
99. “**Prohibited area**” means any area specified or declared to be a prohibited area under section 20A of the AMASR Act, 2010.
100. “**Protected monument**” means an ancient monument which is declared to be of national importance by or under the AMASR Act, 2010.
101. “**Regulated area**” means any area specified or declared under section 20B under the AMASR Act, 2010.

- 102. “Retention Activity”-** An activity or use which is allowed to continue, notwithstanding its non-conforming nature in relation to the use permitted in the adjoining or surrounding area.
- 103. “Road/Street”-** Any highway, street, lane, pathway, alley, stairway, passageway, carriageway, footway, square, place or bridge whether a thorough-fare or over which the public have a right of passage or access or have passed and have access uninterruptedly for specified period, whether existing or proposed in any scheme and includes all bends, channels, ditches, storm water drains, culverts, sidewalks, traffic islands, roadside trees and hedges, retaining walls, fences, barriers and railing within the street lines .
- 104. “Road/Street Level or Grade”-** The officially established elevation or grade of the centerline of street upon which a plot fronts, and if there is no officially established grade, the existing grade of street at its mid-point.
- 105. “Road/Street Line” -**The line defining the side limits of a road/street.
- 106. “Road Width or Width of Road/Street” -** The whole extent of space within the boundaries of a road when applied to a new road/street as laid down in the city survey or development plan or prescribed road lines by any act of law and measured at right angles to the course or intended course of direction of such road.
- 107. “Row Housing” -**A row of houses with only front, rear and interior open spaces.
- 108. “Rear Air Plane” -** The plane contained between the ground behind the building and the straight line drawn downwards and outwards from the line of intersection of the outer surface of any rear wall of the building with the roof perpendicular to that line and at an angle 63-1/2 degree to the horizontal.
- 109. “Room Height”-** The vertical distance measured from the finished floor surface to the finished ceiling surface. Where a finished ceiling is not provided, the underside of the joists or beams or tie beams shall determine the upper point of measurement for determining the head room.
- 110. “Service Road”-** A road/lane provided at the front, rear or side of a plot for service purpose.
- 111. “Set-back Line”-** A line usually parallel to the plot boundaries or center line of a road and laid down in each case by the Authority or as per recommendations of Master/Zonal Plan, beyond which nothing can be constructed towards the plot boundaries excepting with the permission of the Authority.
- 112. “Settlement”-** A human settlement, whether urban or rural in character. It includes habited villages, towns, townships, cities and the areas notified under the control of the Authority.
- 113. “Site”-** See “Plot”
- 114. “Site Corner”-** A site at the junction of and fronting on two or more intersecting roads or streets.
- 115. “Site Depth”-** The mean horizontal distance between the front and rear site boundaries.
- 116. “Site Plan” –** A detailed Plan showing the proposed placement of structures, parking areas, open space, landscaping, and other development features, on a parcel of land, as required by specific sections of the development code.
- 117. “Site with Double Frontage”-** A site having frontage on two streets other than corner plot.

- 118. “Site, Interior or Tandem”**- A site, access to which is by a passage from a street whether such passage forms part of the site or not.
- 119. “Spiral Staircase”**- A staircase forming continuous winding curve round a central point or axis provided in a open space having tread without risers.
- 120. “Storey”**- The portion of a building included between the surface of any floor and the surface of the floor next above it, or if there be no floor above it, then the space between any floor and the ceiling next above it.
- 121. “To abut”**- To be positioned juxtaposed to a road, lane, open space, park, building etc.
- 122. “To Erect”**- in relation to a building means:
- To erect a new building on any site whether previously built upon or not;
  - To re-erect any building of which portions above the plinth level have been pulled down, burnt or destroyed.
- 123. “Un-authorized Construction”**- means the erection or re-erection, addition or alternations which is not approved or sanctioned by the Authority.
- 124. “Underground/Overhead Tank”**- An installation constructed or placed for storage of water.
- 125. “Ventilation”**- Supply of outside air into, or the removal of inside air from an enclosed space.
- Natural Ventilation** - Supply of outside air into a building through window or other openings due to wind outside and convection effects arising from temperature or vapour pressure differences (or both) between inside and outside of the building.
  - Positive Ventilation** - the supply of outside air by means of a mechanical device, such as a fan.
  - Mechanical Ventilation** - Supply of outside air either by positive ventilation or by infiltration by reduction of pressure inside due to exhaust of air, or by a combination of positive ventilation and exhaust of air.
- 126. “Verandah”** — A covered area with at least one side open to the outside with the exception of 1m high parapet on the upper floors to be provided on the open side.
- 127. “Water Closet (W.C)”**- A water flushed plumbing fixture designed to receive human excrement directly from the user of the fixture. The term is used sometimes to designate the room or compartment in which the fixture is placed.
- 128. “Window”**- An opening to the outside other than a door, which provides all or part of the required natural light or ventilation or both to an interior space and not used as a means of egress/ingress.
- 129. “Zonal Plan”**- A plan detailing out the proposals of Master Plan and acting as a link between Master Plan and the Layout Plan. It may contain a site plan and land use plan with approximate location and extent of land uses such as public & semi public buildings/works, utilities, roads, housing, recreation, industry, business, markets, schools, hospitals open spaces etc. It may also specify standards of population density and various components of development of the zone.

## 2. JURISDICTION / APPLICABILITY AND BUILDING DOCUMENTATION PROCEDURES

### 2.1 Jurisdiction of Building Bye Laws

The Building Bye-Laws shall apply to the building activity in the State/Urban Center/Town for which they are framed and the same shall be unambiguously specified in the Building Bye Laws.

It is desirable that the jurisdiction of building bye laws includes all contiguous urban settlements in an urban agglomeration<sup>1</sup>

### 2.2 Applicability of Building Bye Laws

These building byelaws shall be applicable to all building activities and read in conjunction with the master plan/development plan/regional plan/any other statutory plan in force, if any, and notifications, if any, with regard to the same and as amended from time to time and shall be applicable for a period of FIVE years after which they shall be reviewed. Till such time the reviewed building byelaws are notified, these building byelaws will continue to be in force.

### 2.3 Development and part construction

Except hereinafter or otherwise provided, these Bye-Laws shall apply to all development, redevelopment, erection and/or re-erection of a building etc. as well as to the design, construction of, or reconstruction and additions and alterations to a building.

### 2.4 In case of Part construction

Where the whole or part of a building is demolished or altered or reconstructed, except where otherwise specifically stipulated, these Building Bye-Laws shall apply only to the extent of the work involved.

### 2.5 Change of use / occupancy

Where use of a building is changed, except where otherwise specifically stipulated, these Building Bye-Laws shall apply to all parts of the building affected by the change.

### 2.6 Reconstruction

The reconstruction in whole or part of a building which has ceased to operate due to fire, natural collapse or demolition having been declared unsafe, or which is likely to be demolished by or under an order of the Authority as the case may be and for which the necessary certificate has been given by the Authority.

### 2.7 Existing approved building

Nothing in these Bye-Laws shall require the removal, alteration or abandonment, nor prevent continuance of the lawfully established use or occupancy of an existing approved building unless, in the opinion of the Authority such a building is unsafe or

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<sup>1</sup> Interpretation

In these Bye-Laws, the use of present tense includes the future tense, the masculine gender includes the feminine and the neutral, the singular number, includes the plural and the plural includes the singular. The word person includes a corporation as an individual, writing includes printing and typing and signature includes thumb impression made by a person who cannot write, if her/ his name is written near to such thumb impression.

constitutes a hazard to the safety of adjacent property or to the occupants of the building itself.

## **2.8 Development**

### **2.8.1 Development Permission:**

No person shall carry out any development or redevelopment including sub-division on any plot or land (not forming part of any approved layout plan or scheme) or cause to be done without obtaining approval from the Authority for the layout plan.

### **2.8.2 Building Permit:**

No person shall erect, re-erect or make addition/ alterations in any building or cause the same to be done without, first obtaining a separate building permit for each such building from the Authority.

### **2.8.3 Pre-Code Building Permit:**

Where any building permit which has been issued by the Authority before the commencement of the Building Bye-Laws and where construction is in progress and has not been completed within the specified period from the date of such permit, the said permission shall be deemed to be sanctioned under these Bye-Laws and shall only be eligible for revalidation thereunder. Accordingly, where the validity of sanction has expired and construction has not commenced, construction shall be governed by the provisions of these Building Bye-Laws.

## **2.9 Procedure for obtaining building permit**

### **2.9.1 Notice:**

Every person who intends to erect, re-erect or make alternation in any place in a building or demolish any building shall give notice in writing to the Authority of his intention in the prescribed form (See Appendix 'A' and 'A1') and such notice shall be accompanied by plans and statements in sufficient copies. The plans may be ordinary prints on ferro-paper or any other type, one set of which shall be laminated. One set of such plans shall be released and the rest retained in the office of the Authority for record after the issue of permit or refusal as the case may be.

### **2.9.2 Copies of Plans and Statements:**

Normally 4 copies of plan and statement shall be made available along with the notice. In case of building schemes where the clearance is required from Chief Fire Officer, the number of copies of the plans and statements accompanying the notice shall be 6. In case of sites requiring the clearance of lessor, extra copies of the plan shall be made available.

### **2.9.3 Information Accompanying Notice:**

The notice shall be accompanied by the location plan, site plan, subdivision / layout plan, building plan, services plan, specifications and certificate of supervision, ownership title and other documents as prescribed by the Authority.

### **2.9.4 Documents:**

Application for building permit shall be accompanied by the following documents:

Ownership Documents-lease-deed/sale-deed etc. duly accompanied by an annexed site plan; giving the physical description of the plot/property. In such cases where lease-deed has not been executed, no objection certificate from the Authority/lessor. Also an affidavit/undertaking for handing over of the land required for road widening as in **Appendix 'B'**.



In case of any deviation from the terms and conditions stipulated in the lease deed/ownership document, necessary clearance from the Authority shall be obtained.

Documents required to be attached shall be as follows:

- i. No objection certificate from the Authority regarding land use as per Master/Zonal Plan, if required.
- ii. Approval from the Chief Inspector of Factories in case of Industrial Buildings; as well as from the Pollution Control Board, wherever required.
- iii. Approval from Chief Controller of Explosives, Nagpur and Chief Fire Officer, in case of hazardous buildings.
- iv. Indemnity Bond in case of proposal for the construction of a basement as given in **Appendix- 'B-1'**.
- v. Approval from Chief Fire Officer, in case of building defined under clause 1.16. vi (a to k) shall be required.
- vi. The notice shall also be accompanied by an attested copy of house tax receipt/NOC from the Assessment Department of the local body concerned.
- vii. No objection certificate from the Civil Aviation Department wherever required.
- viii. Undertaking as at **Appendix 'A-5'** on non-judicial stamp paper of the amount prescribed by the Authority.
- ix. In case the site falls in the built-up area declared as slum under any Act NOC from the Competent Authority, from slum clearance and land use points of view.
- x. In case the application is for a Farmhouse, Motel, approval/NOC from the Competent Authority from land acquisition point of view.
- xi. In case of the leasehold plots, clearance from the lessor with regard to the lease conditions shall be obtained wherever required.
- xii. For individual plot, wherever required, approval of the site from the Competent Authority, if not the part of already approved layout plan.
- xiii. Any other information/document, which the Authority may require in case of listed buildings or otherwise.

**Other documents to be submitted in special cases shall be as follows:**

- xiv. For projects proposed within the ***Prohibited and Regulated areas*** as defined by AMASR Act 2010, permission /NOC from Competent Authority (NMA) shall have to be obtained as per Rules 2011 framed under the Act by submission of required documents as per rules.
- xv. Additional documents required for conservation of Heritage sites including Heritage Buildings, Heritage/Precincts and Natural Features Areas (wherever required) – as per ***Chapter 12***.

Note: Based on the technical and support capacity, the ULB shall adopt online process of applications for building approvals along with digital formats of documents and drawings for faster and transparent process of building approvals.

### 2.9.5 Size of Drawing Sheets and Colouring of Plans

The size of drawing sheets shall be any of those specified in Table 2.1.

**Table 2.1 Drawing Sheet Sizes**

Sl. No.	Designation	Trimmed Size, (mm.)
1	A0	841 x 1189
2	A1	594 x 841
3	A2	420 x 594
4	A3	297 x 420
5	A4	210 x 297
6	A5	148 x 210

### 2.9.6 Colouring Notations for Plans:

The plans shall be coloured as specified in Table 2.2 Further, prints of plans shall be on one side of paper only.

### 2.9.7 Dimensions:

All dimensions shall be indicated in metric units.

**Table 2.2 Colouring of Plans**

Sl	Item	Site Plan			Building Plan		
		White Plan	Blue Print	Ammonia	White Plan	Blue Print	Ammonia
a	b	c	d	e	f	g	h
1	Plot Lines	Thick black	Thick black	Thick black	Thick black	Thick black	Thick black
2	Existing street	Green	Green	Green	—	—	—
3	Future street, if any	Green dotted	Green dotted	Green dotted	—	—	—
4	Permissible building lines	Thick dotted black	Thick dotted black	Thick dotted black	—	—	—
5	Open spaces	No colour	No colour	No colour	No colour	No colour	No colour
6	Existing work	Black	White	Blue	Black	White	Blue
7	Work proposed to be	Yellow	Yellow	Yellow		Yellow	Yellow
8	Proposed work (see Note 1)	Red filled in	Red	Red	Red	Red	Red
9	Drainage and sewerage	Red dotted	Red dotted	Red dotted	Red dotted	Red dotted	Red dotted
10	Water supply work	Black dotted thin	Black dotted thin	Black dotted thin	Black dotted thin	Black dotted thin	Black dotted thin

Notes:

1 For entirely new construction this need not be done; for extension of an existing work this shall apply.

2 For land development, subdivision, layout, suitable colouring notations shall be used which shall be indexed.

## 2.10 All Plans

**2.10.1 i) Key Plan:** A key plan drawn to a scale of not less than 1: 10,000 shall be submitted along with notice showing boundary and location of the site with respect of neighborhood land marks, in area where there is no approved layout plans.

**ii) Site Plan:** The site plan to be sent along with the application for permit shall be drawn to a scale of 1: 100 for plots upto 500 sq. mt. in size and on a scale of 1:500 for plots above 500 sq. mt. in size. The plan shall show as below:

- The boundaries of the site and any contiguous land belonging to the owner thereof.
- The position of the site in relation to neighboring street.
- The names of the streets on which the building is proposed to be situated, if any.
- All existing buildings standing on, over or under the site.
- The position of the building and of all other buildings, if any, which the applicant intends to erect upon his contiguous land referred to in (a) in relation to.

- i) The boundaries of the site and in case where the site has been partitioned, the boundaries of the portion; owned by the applicant and also of the portions owned by others.
- ii) All adjacent streets / buildings (with number of storeys and height) and premises within a distance of 12m. of the site and of the contiguous land, if any, referred to in (a); and
- iii) If there is no street within a distance of 12 mt. of the site, the nearest existing street.
- f) The means of access from the street to the building, and to all other buildings, if any which the applicant intends to erect upon his contiguous land, referred to in (a).
- g) Space to be left about the building to secure a free circulation of air, admission of light and access.
- h) The width of the street, if any, in front, at the sides or rear of building.
- i) The direction of north point relative to the plan of the buildings.
- j) Any existing physical features such as well, drains, trees, over head electric supply lines etc.
- k) The ground area of the whole property and the breakup of covered area on each floor with the calculation for percentage covered in each floor in terms of the total area of the plot as required under the Bye-Laws governing the coverage of the area.
- l) Parking plans indicating the parking spaces wherever required.
- m) Such other particulars as may be prescribed by the Authority; and
- n) Building number or plot number of the property on which the building is intended to be erected.

### 2.10.2 Requirement in respect of building sites

#### a) Damp Sites

Wherever the dampness of a site or the nature of the soil renders such precautions necessary, the ground surface of the site between the walls of any building erected thereon shall be rendered damp-proof to the satisfaction of the Authority.

#### b) Corner Site

When the site front on two streets, the frontage would be on the street having the larger width. In cases, where the two streets are of same width, then the larger depth of the site will decide the frontage and open spaces. In such case the location of a garage (on a corner plot) if provided within the open spaces shall be located diagonally opposite the point of intersection.

#### c) Minimum Size of Site

The minimum size of sites for the construction of different types of building or different use groups, shall be in accordance with provisions of the Master Plan and any land development Rules and Regulations of the Authority.

#### d) Distance from Electric Line

The distance in accordance with the current electricity rules and its amendments from time to time is to be provided between the building and overhead electric supply line.

Table 2.3 Clearances from Electric Supply Lines

Type of Supply Line	Vertical clearance	Horizontal clearance
a) Low and medium voltage lines and service lines	2.50 m.	1.20 m.
b) High voltage lines upto and including 11,000 volts	3.70 m.	1.20 m.
c) High voltage lines above 11,000 volts and upto and including 33,000 volts	3.70 m.	2.00 m.
d) Extra high voltage lines additional 33,000 volts	3.70m. Plus 0.3 m. for every additional 33,000 V or part thereof.	2.0m. Plus 0.3 m. for every additional 33,000 V or part thereof.

### 2.10.3 Layout Plan:

The layout plan shall be formulated as per the norms of Master Plan and shall be approved as per the procedure followed by the Authority, under the provisions of relevant Act.

### 2.10.4 Landscape Plan:

Landscape plan is to be to the scale of 1:100 for plot upto 500 sq.m in size and for plots above 500 sq.m., the scale shall be 1:500, indicating the circulation and parking spaces, pathways (hard surface), greenery and plantation (soft area) etc.

### 2.10.5 Building Plan:

The plans of the building, elevations and sections accompanying the notice with dimensions shall be drawn to a scale of 1:50 for plots measuring upto 250 sq.m., for plots measuring above 250 sq.m. to a scale of 1:100, and for plots measuring 2000 sq.m. and above to a scale of 1:200 with details on a scale of 1:100 and shall:

- a) Include floor plans of all floors together with the covered area clearly indicating the size and spacing of all frame members and sizes of rooms and the position and width of staircases, ramps and other exit ways, lift ways, lift machine room and lift pit details.
- b) Show the use or occupancy of all parts of the building.
- c) Show exact location of essential services, for example W.C., Sink. Bath etc.
- d) Include sectional drawing showing clearly the sizes of the footings, thickness of basement wall, wall construction, size and spacing of framing members, floor slabs and roof slabs with their materials. The section shall indicate the heights of building and rooms and also the heights of the parapet and drainage and the slope of the roof. At least one section shall be taken through the staircase, kitchen and toilet, bath and W.C.
- e) Show all elevations.
- f) Indicate details of service privy, if any.
- g) Give dimensions of the projected portions beyond the permissible building line.
- h) Include terrace plan indicating the drainage and the slope of the roof.
- i) Give indications of the north point relative to the plan.
- j) Details of parking spaces provided.
- k) Give indication of all doors, windows and other openings including ventilators with sizes in proper schedule.

- l) Such other particulars as may be required to explain the proposal clearly and as prescribed by the Authority.

*Notes* – The requirement of 1:100 is permitted to be flexible for specific details needed for further illustration; and also for drawings for these in electronic form.

### **2.10.6 Building Plans for Multi-Storeyed/Special Buildings:**

For multi-storeyed buildings, which are above 4 storeyed and buildings above 15 m. in height and for special buildings like assembly, institutional, industrial storage and hazardous occupancies as defined under clause 1.1. 16 (a to k) the following additional information shall be furnished/ indicated in the building plans in addition to the item (a) to (l) of Building Bye-Laws 2.10.4.

- a) Access to fire appliances/vehicles with details of vehicular turning circle/and clear motorable access way around the building.
- b) Size (width) of main and alternate staircase along with balcony approach, corridor, ventilated lobby approach.
- c) Location and details of lift enclosures.
- d) Location and size of fire lift.
- e) Smoke stop lobby/door where provided.
- f) Refuse chutes & chamber, services duct (sanitation, electric & telecommunication)
- g) Vehicular parking spaces.
- h) Refuge area if any.
- i) Details of building services-air conditioning system with position of dampers, mechanical ventilation system, electrical services, boilers, gas pipes etc.
- j) Details of exits including provision of ramps, etc. for hospitals and special risks.
- k) Location of generator, transformer and switchgear room.
- l) Smoke exhaust system if any.
- m) Details of fire alarm system network.
- n) Location of centralized control, connecting all fire alarm systems, built-in fire protection arrangements and public address system, etc.
- o) Location and dimension of static water storage tank and pump room.
- p) Location and details of fixed fire protection installations such as sprinklers, wet risers, hose reels, drenchers, CO<sup>2</sup> installation etc.
- q) Location and details of first aid firefighting equipment/installation.
- r) The proper signs/symbols and abbreviation of all fire fighting systems shall be shown as per the relevant B.I.S. Codes.

### **2.10.7 Services Plan and Water Supply Provisions**

- a) Plans, elevations and sections of private water supply, sewage disposal system and details of building services, where required by the Authority, shall be made available to a scale not less than 1: 100.
- b) For residential plots more than 2000 sq.m. and non-residential plots more than 1 hectare in size, the following provisions shall be made:
  - i) Separate conveying system to be provided for sewerage and sullage to facilitate reuse of sullage water for gardening and washing purposes. This may require suitable storage facilities that are to be indicated on the building plans
  - ii) For recharging ground water, rainwater-harvesting provisions are to be provided within the plot, which are to be indicated on the building plans.

- 2.10.8** Besides the normal drawings, which are submitted for the sanction of any building, a proper landscape plan, a circulation plan indicating vehicular and pedestrian movement and parking and an urban design scheme where necessary, shall be submitted for sanction by the Authority
- 2.10.9** Specifications: General specification of the proposed construction giving type and grade of material proposed to be used in the form given in Appendix 'A-2' duly signed by the engaged Competent Professional for building plan design (as per Appendix 'E') may be shown accompanying the notice as the case may be.
- 2.10.10** Supervision and Execution of Drainage / Sanitary works: A certificate of supervision and execution of drainage/sanitary works shall further accompany notice in the prescribed form given in Appendix 'A-3', by the engaged Competent Professional for building plan design (as per Appendix 'E') as the case may be.

## **2.11 Signing of plans**

### **2.11.1 Signing the Building Plans:**

All plans before submission to the Authority shall be signed by the owner(s) and by-

- a. A qualified *Architect* who has valid registration with Council of Architecture, or
- b. An *Engineer* (in case of plots upto 500 sq.m. only).

(Note : except for Standard Designs/Building Plans as shown at 2.14.1 d)

### **2.11.2 Layout Plans:**

All layout plans before submission to the Authority shall be signed by the owner(s) (except for 2.12.1 d) and by one of the following:

- a) *Architect* holding a valid registration with the Council of Architecture for Layout Plans of plots measuring upto 1 Ha. in size.
- b) Town Planner holding valid registration with the Institute of Town Planners, India for plots measuring beyond 1 Ha.

## **2.12 Notice for alteration**

When the notice is only for an alteration of the building only such plans and statement as may be necessary, shall accompany the notice.

**2.12.1** No notice and building permit, is necessary for the following alterations, which do not otherwise violate any provisions regarding general building requirements, structural stability and fire safety requirements of these Bye-Laws;

- a) Plastering and patch repairs;
- b) Re-roofing or renewals of roof including roof of intermediate floors at the same height;
- c) Flooring and re-flooring;
- d) Opening and closing of windows, ventilators and doors not opening towards other's properties and / or public road/property;
- e) Replacing fallen bricks, stones, pillars, beams etc.
- f) Construction or re-construction of sunshade not more than 75cms. in width within one's land and not overhanging over a public street;
- g) Construction or re-construction of parapet not more than 1.5 m. in height and also construction or re-construction of boundary wall as permissible under these Bye-Laws;

- h) White-washing, painting, etc. including erection of false ceiling in any floor at the permissible clear height provided the false ceiling in no way can be put to use as a loft etc;
- i) Reconstruction of portions of buildings damaged by storm, rains, fire, earthquake or any other natural calamity to the same extent and specification as existed prior to the damage provided the use conforms to provisions of Master Plan/Zonal Plan;
- j) Erection or re-erection of internal partitions provided the same are within the purview of the Bye-Laws.

### 2.13 Building permit fees

Building fees for covered area in plotted development/group housing; additions/alterations/revised plan; revalidation of plans; plan submission fee; for NOC/occupancy; for use of city infrastructure during the construction and other charges may be as determined by the Authority. Appendix “A-4”

### 2.14 Sanction

#### 2.14.1 a) Planning Permission/Norms with respect to the Provisions of Master Plan/ Development Plan:

The Owner, if she/he so desires, may apply to the Authority in a format (Appendix – ‘C’) for planning permission/Norms through his engaged Competent Professional for building plan design (as per Appendix ‘E’), submitting (i) Title documents; (ii) Development Code/Zoning Regulations of Master Plan/ Development Plan and (iii) Building Bye-Laws, which she / he intends to follow.

The Owner/engaged Competent professional (as per Appendix ‘E’) shall indicate the Development Code interpretation of Master Plan/Development Plan and may support this through schematic drawings/sketches.

The Authority shall verify the title document and scrutinize the interpretation of Development Code / Zoning Regulations and accord planning permission within 30 days of submission of the application to the Owner/ engaged Competent Professional as per Appendix ‘E’. Procedure may however, be prescribed by the Authority in this behalf.

**b) Sanction by Empanelled Professionals:** *Competent Professionals* (as per Appendix ‘E’) empanelled with the Authority, under the rules, shall be authorized to issue building permit subject to the various provisions of the said rules.

#### c) Instant Sanction / Deemed sanction by Certification:

- i. Deemed building permit shall be applicable only in such cases where, a Competent Professional for building plan design as per Appendix ‘E’, has planned the building on an individual plot (forming part of an approved Layout Plan) and has certified that the building plans are within applicable building bye laws and Master plan Regulations.

This shall be applicable for buildings of height upto 15 mts / upto 17.5 mts with stilts of 2.5mts to be processed for instant sanction, if it is certified by 3 architects (including the architect who planned and designed the building), one structural engineer, one proof consultant and one services engineer, who are registered on a

panel, maintained by the Local Body/Authority, that the plans have been prepared within the framework of provisions of the Master Plan and applicable Building Bye Laws/ Regulations and the construction shall be carried out in accordance with Master Plan and BBL provisions under compoundable limits.

*Proof check certification* of design and detailed construction specification shall be mandatory. Drawings submitted shall be working drawings and no changes shall be permissible at site during construction.

- ii. Procedure: The application along with the building plans, documents, fees and charges etc to be submitted to the Local Body/Authority for their records and after submission of all the requisite charges and documents it will issue instant sanction and owner can start the construction as per these plan which will be considered under Deemed building clause.

The Authority shall examine plans and documents within a period of 10 days and in case observes any deficiency, the owner/ engaged competent professional for building plan design (as per Appendix 'E') may be asked to rectify the same.

*Notes – for proposals falling within the Prohibited and Regulated areas as defined by AMASR Act 2010, permission /NOC from Competent Authority shall have to be obtained as per Rules 2011 framed under the Act in addition to the given documentations required for “Deemed Sanction”*

**d) Standard Building Plans:** In case of standard building plans prepared by the Authority for residential plots *upto 105 sq.mt.* in size and forming part of the approved layout plan, the owner shall be entitled to sign such standard plans and the required documents for sanction. In such cases, certificate from professionals would not be necessary and the owner shall be bound to follow the approved standard plan in detail. The Authority shall explore options of EWS/LIG/MIG plotted housing schemes to develop *pre-approved Standardized building plans of Housing Units* for variable plots sizes/carpet area (in the range 30sqm-105sqm). The owner shall undertake construction of the so formed standard housing units in compliance to clause d) above.

#### 2.14.2 Grant of Permit or Refusal

- a) The Authority shall either sanction or refuse sanction to the plans and specifications or may sanction them with such modification or directions as it may deem necessary and thereupon shall communicate its decision to the person giving the notice in the prescribed form given in Appendix “A-6” and Appendix "A- 7".
- b) The building plans for buildings identified in Bye-Laws no. 2.10.5. shall be subject to the scrutiny of the Chief Fire Officer and building permit shall be given by the Authority only after the clearance from the Chief Fire Officer is obtained.
- c) In case where the building scheme requires the clearance of an Urban Art Commission, if constituted for the city then the Authority shall issue the building permit only after getting the clearance from the Urban Art Commission.
- d) If, within 15 days of the receipt of notice under 2.9.1 of the Bye-Laws, the Authority fails to intimate in writing to the person who has given the notice, of its refusal or sanction to the notice with its plans and statements, the same shall be deemed to have been sanctioned provide the fact is immediately brought to the notice of the Authority in writing by the person who has given notice and having not received any intimation from the Authority within 15 days of giving such notice subject to the conditions



mentioned in these Bye-Laws, nothing shall be construed to authorize any person to do anything in contravention or against the terms of the lease or title of the land or against any regulations, Bye-Laws or ordinance operating at the time of execution of the work at site.

- e) Once the plan has been scrutinized and objections have been pointed out, the Owner who has given the notice under Section 2.9.1 shall modify the plan to comply with the objections raised and resubmit the modified plans. The Authority shall scrutinize the resubmitted plans and if, there are still some objections that shall be intimated to the applicant for compliance. Only thereafter the plans shall be sanctioned. It is further clarified that:
- i) The above provision of deemed sanction shall be applicable only in those cases where construction is to be carried on plot forming part of an approved layout plan of the Authority.
  - ii) No notice under Section 2.9.1 shall be valid unless the information required by the Authority under these Bye-Laws or any further information which may be required has been furnished to the satisfaction of the Authority.
  - iii) The Owner/ engaged Competent Professional for building plan design (as per Appendix 'E') and others shall be fully responsible for any violation of Master Plan/Zonal Plan/ Building Bye-Laws, architectural controls, lease deed conditions etc. In case of any default they shall be liable for action. Any construction so raised shall be deemed to be unauthorized and shall be liable for action.

#### **2.14.3 Duration of Sanction/Revalidation:**

Once a building permit is sanctioned, it shall remain valid for three years from the date of sanction for residential, industrial and commercial buildings (4 storeyed) and for a period of four years from the date of sanction for multi-storeyed buildings of 15 m. and above in height. However, the validity period of sanction in case of additions/alterations in both the cases, shall be two years from the date of sanction. The building permit shall be got revalidated in the prescribed form (Appendix- 'A-8') before the expiry of this period on year-to-year basis. Revalidation shall be subject to the Master Plan/Zonal Plan regulation and building Bye-laws, as in force, for the area where construction has not started.

#### **2.14.4 Revocation of Permit:**

The Authority shall revoke any building permit issued under the provisions of the Bye-Laws, wherever there has been any false statement, mis-representation of material facts in the application on which the building permit was based. Or If during construction it is found that the Owner has violated any of the provisions of the Building Bye-Laws or sanctioned plan or compoundable limits.

Fresh sanction of building plans and occupancy certificate shall be taken from the Authority after bringing the building within the framework of Master Plan/ Zonal Plan/ Building Bye-Laws.

### 2.14.5 Qualification and Competence

Qualification and competence of all professionals including Architect/ Engineer/ Structural Engineer/ Town Planner/ Landscape Architect/ Urban designer/ Supervisor/ Plumber/ Electrician/ Fire Consultant shall be as given in Appendix -"E".

### 2.14.6 Penal Action

- a) The Authority reserves the right to take action and to debar/blacklist the Town Planner, Architect, Engineer, Supervisor or Plumber, if found to have deviated from professional conduct or to have made any false statement or on account of misrepresentation of any material facts or default either in authentication of a plan or in supervision of the construction against the building Bye-Laws and the sanctioned building plans.
- b) If the sanctioning Authority finds at any time any violation of the building Bye-Laws or misrepresentation of facts, or construction at variance with the sanction or building Bye-Laws, inclusive of the prescribed documents, the Authority shall revoke the sanction and take appropriate action against such professional and such professional shall not be authorized to submit fresh plans till finalization of the case. Before debarring or blacklisting such professional if found to be indulging in professional misconduct or where she/he has misrepresented any material facts, the Authority shall issue a show cause notice with an opportunity of a personal hearing and shall pass an order to debar her/him for submission and supervision of the construction with full justification for the same. An appeal against this order shall lie with the Authority with whom she/he is registered.

### 2.14.7 Unauthorized Development

In case of unauthorized development, the Authority shall take suitable action, which may include demolition of unauthorized works, sealing of premises, prosecution and criminal proceeding against the offender in pursuance of relevant laws in force.

## 2.15 Procedure during Construction work

### 2.15.1 a) Construction to be in Conformity with Bye-Laws –

Owners' liability: Neither the granting of the permission nor the approval of the drawings and specification, nor inspection by the Authority during erection of the building, shall in any way relieve the Owner of the building from full responsibility for carrying out work in accordance with these Bye-Laws.

**b) Commencement of work:** The owner, within the validity period of the building plan sanction given, shall start the construction work at the site for which building permit has been granted under the supervision of the Architect / Engineer as per the competence given in Appendix "E".

The owner does not have to submit notice for the commencement of construction after sanction but shall be required to submit notices to the Authority as per Section 2.15.3 and 2.16 for stages of construction.

*[The practice of submitting Notice of Commencement of Work to the Authority is to be done away with.]*

### 2.15.2 Documents at Site:

The person to whom a permit is issued shall, during construction keep, posted in a conspicuous place on the property in respect of which the permit was issued

- a) A copy of the building permit;
- b) A copy of the approved drawings and specifications referred in Bye-Laws 2.14 of the property in respect of which the permit was issued.
- c) Where tests of any materials are made to ensure conformity with the requirements of the Bye-laws, records of test data shall be kept available for inspection during the construction of the building and for such a period thereafter as required by the Authority.

### 2.15.3 Checking of Building during Construction

The Owner through his engaged Competent Professional for building plan design (as per Appendix 'E') shall give notice to the Authority in the proforma given in Appendix-'A-10' on completion of the work up to plinth level to enable the Authority to ensure that work conforms to the sanctioned building plans and Building Bye-laws. It will be obligatory on the part of the Authority to inspect the work and submit objections, if any, to the owner and the engaged Professional for building plan design (as per Appendix 'E') within 15 days from the receipt of such notice in Appendix 'A-11' failing which work will be deemed to be cleared for further construction. It will be the responsibility of the Owner/Architect/Engineer/ Supervisor to ensure further construction of the building in accordance with the sanctioned building plan.

It will also be obligatory on the part of the Authority to carry out periodic inspection as may be determined by the Authority during further construction. A report of each inspection shall be prepared in duplicate by the Authority in the proforma as per Appendix 'A-11' and a copy of the same duly signed by the Authority shall be given to the Owner or to his engaged Competent Professional for building plan design.

### 2.16 Notice of Completion

Every Owner shall submit a notice of completion of the building (prescribed in Appendix-'A-12') to the Authority regarding completion of the work described in the building permit. The notice of completion shall be submitted by the Owner through the engaged Competent Professional for building plan design (as per Appendix 'E') as the case may be who has supervised the construction, in the proforma given in Appendix-'A-12' accompanied by three copies of completion plan (as in case of sanctioned plan including one cloth mounted copy) and the following documents along with the prescribed fee:

- i) Copy of all inspection reports of the Authority.
- ii) Clearance from Chief Fire Officer, whenever required.
- iii) Clearance from Chief Controller of Explosives, Nagpur, wherever required.
- iv) Clearance from Electricity Department (Municipal Council / Corporation for areas falling in the jurisdiction of Municipal Council / Corporation) regarding provision of transformers / sub-station / ancillary power supply system etc. wherever required.
- v) Structural stability certificate duly signed by the Structural Engineer.
- vi) Certificate of fitness of the lift from concerned Department wherever required.

- vii) Two sets of photographs from all sides duly signed by Owner/ hired Competent Professional for building plan design (as per Appendix 'E'), as the case may be.
- viii) Any other information/document that the Authority may deem fit.
- ix) A certificate by the Owner and engaged Competent Professional for building plan design (as per Appendix 'E'), for covering up the underground drain, sanitary and water supply work, under their supervision and in accordance with Building Bye-laws and sanctioned building plans stipulated in the Appendix 'A-13' as applicable.
- x) In case of large campus/complex, completion of individual block/building will be issued by the local body in accordance with the construction work completed phase wise in the proforma given in Appendix 'A-13'.
- xi) The extension of time up to the date of applying for completion certificate. In case, if the completion certificate is refused due to deviation, which cannot be compounded, the completion will be rejected and extension of time will be required accordingly.
- xii) No Objection Certificate for regular water supply and electricity may be issued only after the completion certificate is obtained.

## **2.17 Completion and Permission for Occupation**

### **2.17.1 General**

The Authority on receipt of the notice of completion shall inspect the work and communicate the approval or refusal or objection thereto, in the proforma given in Appendix 'A-14' and 'A-15' within 15 days in case of plotted development and 20 days for Group Housing Schemes from the receipt of notice of completion. Approval to occupancy certificate shall not be refused for the residential buildings as defined under clause 1.16 vi (a) unless the Authority is satisfied that major deviations have been carried out after the last inspection of the Authority. If nothing is communicated within this period, it shall be deemed to have been approved by the Authority for occupation provided the fact is immediately brought to the notice of Authority in writing by the person, who had given the notice and has not received any intimation from the Authority within 15 days. Where the occupancy certificate is refused, the reasons shall be intimated for rejecting in the first instance itself.

### **2.17.2 Deemed-Completion / Occupancy Certificate**

Owner/ engaged Competent Professional for building plan design of the project may be authorized by the Competent Authority to issue completion/Occupancy Certificate for such buildings/projects where Deemed Building Permit/Instant Sanction were followed, provided owner/ engaged Competent Professional certify that the construction has been in accordance to the sanctioned building plan and all the Rules/Regulations and Bye-laws have been followed while constructing the Building.

### **2.17.3 Procedure**

The procedure to be followed shall be –

The owner/ engaged Professional for building plan design, shall submit the application along with all the documents, completion plans and the processing fees/charge. The Plans shall have to be certified by the Owner/ engaged Professional for building plan design and also by two Architects and a structural engineer, a service engineer with minimum 10 years' experience from a panel of such professionals maintained by the

Authority, certifying that the completion plans are in accordance to the sanctioned building plans and in accordance to building bye laws

**2.17.4 In case of buildings as defined in clause 1.16. vi (b) to (k)**

The work shall also be subject to the inspection of the Chief Fire officer, and the occupancy certificate shall be issued by the Authority only after the clearance from Chief Fire Officer regarding the completion of work from the fire protection point of view. Except ‘Group Housing’ all residential proposals are exempt from this clause.

**2.17.5 Special Cases**

In case, where the building scheme requires the clearance of an Urban Art Commission, then the Authority shall issue the occupation certificates only after getting clearance from the Urban Art Commission.

**2.17.6** Time limit of days as described in clause 2.17.1 for completion of project shall not apply to buildings as described in clause 2.17.3 & 2.17.4

**2.18 Occupancy/ Part Completion Certificate**

**2.18.1 Phased Project**

In such cases where a project has not been completed at one stretch but constructed in different stages, part occupancy/completion certificate for the building otherwise complete in all respects, may be issued subject to the condition that such a part occupancy/completion certificate would apply to an independent block/building of the sanctioned project. In case of a residential house part occupancy/completion may be issued for an independent floor.

For projects referred to in clause 2.18.1, the rest of the construction which forms part of the sanctioned plan/scheme shall be completed in the remaining sanctioned or extended period after revalidation as the case may be. Thus the remaining sanction will not lapse if the part completion certificate is issued. The remaining construction shall be completed in the validity period.

**2.19 Connection to the municipal sewer / water mains**

- a) Temporary connection for water, electricity or sewer, permitted for the purpose of facilitating the construction, shall not be allowed to continue in the premises without obtaining completion/occupancy certificate.
- b) No connection to the Municipal water mains or to the Municipal sewer line with a building shall be made without the prior permission of the Authority and without obtaining occupancy /completion certificate.
- c) In case the use is changed or unauthorized construction is made, the Authority is authorized to discontinue such services or cause discontinuance of such services.



### 3. DEVELOPMENT CODES

The provisions contained in Master Plan/Zonal Plan/Development Code or as per the Urban and Regional Development Plan Formulation and Implementation Guidelines, 2014 shall apply and where these are silent on such issues or which require interpretation the norms as decided by the Authority, shall apply. The provisions include but are not limited to the use/ activity of premises, ground coverage, FAR, setbacks, open space, height, density and number of dwelling units and parking standards for Residential premises on plotted development, Group housing, Resettlement colonies, Slums, In-situ upgradation ,Non-residential premises

The permission of uses/use activities in use premises shall permitted in accordance with provisions of Master Plan/Zonal Plan/ Local Area Plan/ Layout Plan.

The object of these regulations is to provide control for building/buildings within use premises excluding the internal arrangement, which is covered and controlled by Building Bye-Laws.

**Notes:**

*The premises for which building regulations have not been given shall be examined by the Authority on the basis of actual requirements and other relevant factors.*

- i) *Wherever there is a need for relaxation in height for achieving urban form, the same may be permitted with the recommendation of the Authority.*
- ii) *The provision of minimum setbacks for different sizes of plots for all categories of the plots shall be as per the Master Plan/Development Plan or as per simplified Development Promotion Regulations of the Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines.*

#### 3.1 Flexible FAR

##### 3.1.1 Additional FAR

Additional FAR, as provided in the Master Plan may also be examined with a view to provide flexibility and also to utilize the scarce urban land optimally. Flexible range of FAR on a site may be based upon its Additional FAR Factor which is a product of 'creativity' and 'context'. Creativity can be defined by design parameters such as urban form, parking provision, pedestrian safety, concern for the poor through induced informal activities, and provisions for evacuation during an emergency due to disaster (for example, Delhi falls in the Zone 5). It also includes the impact of the design on essential services and environment. As a principle, the additional FAR should not result in a negative impact on the essential services and environment.

Locational attributes, of the site being assigned additional FAR, refer to its location with respect to land use as given in the approved Master/Zonal/Layout Plan (as the case may be), accessibility, level of congestion on the approach road and nearness to a heritage building if any.

<p>Additional FAR Factor = Creativity x context          = Design parameters x Locational attributes          = <math>\frac{(a+b+c+d+e)}{x+y}</math> m.n.o.p.</p>
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Where, a = Parking provision value  
 b = Disaster emergency provision value  
 c = Urban Form value  
 d = Pedestrian Safety value

- e = Induced informal activities value
- x = Impact on essential services value
- y = Impact on environment value
- m = Land Use value
- n = Accessibility (Right of way of the approach road) value
- o = Congestion (Mobility index in terms of travel speed) value
- p = Heritage Value

### 3.1.2 Purchasable FAR

Provision of purchasable FAR in Group Housing, Commercial, Institutional, and Industrial, Sport and amusement complex, recreational greens and Low Density Sports plot may be considered, where:

- (i) The Plots exist on '24mtrs. and above' wide road.
- (ii) The construction has not started, or
- (iii) The allottee wants to construct a new additional building within the limits of permissible ground coverage, or
- (iv) The allottee wants to construct new building on the vacant plot, or
- (v) The allottee has already constructed building within purchasable F.A.R limits, or
- (vi) Purchaseable F.A.R may be allowed on minimum 18.0mtrs. road width and above road width for institutional and industrial use.

Explanation: The Purchasable FAR shall be allowed up to the maximum limit of the applicable FAR in the Building Regulations.

#### **Purchasable may FAR be allowed with the following provision/ conditions:**

- (i) No construction shall be allowed beyond the limit of maximum permissible ground Coverage.
- (ii) Parking facilities shall be provided within the plot as per the provisions of the building bylaws.
- (iii) No objection certificate from the Airport Authority of India/ Competent Authority shall be obtained for the height of the building.
- (iv) Structure design duly checked and verified by the I.I.T/ N.I.T./ Government Engineering College shall be submitted along with the proposal in case where additional floors are being proposed.
- (v) No objection certificate for Fire Safety and Environmental Clearance shall be obtained from the Competent Authorities.
- (vi) Purchasable FAR shall be applicable only on the basis of assessment of planned and available physical infrastructure.
- (vii) Use of purchaseable FAR shall be governed by the terms and conditions of lease deed.
- (viii) In case where purchasable FAR is allowed, the Authority shall permit increase in the height of building as per requirement.
- (ix) Additional proportionate residential units shall be allowed on purchaseable FAR for Group Housing.

#### **Note:**

- (i) Purchasable FAR is an enabling provision. It shall not be allowed to any Allottee as a matter of right.
- (ii) With the consideration of Traffic density, conditions of approach road, availability of physical infrastructure, distance from the protected area and heritage sites or in the light of planning the Authority may identify the zones/ areas where purchasable FAR shall not be allowed.
- (iii) In case of mixed land use permitted in any pocket/plot:  
Permissible FAR for various uses shall be as applicable for respective use including the purchasable FAR  
The total FAR in the pocket/plot shall be subject to the overall permissible FAR for the pocket/plot.  
Purchasable FAR shall be calculated on the basis of the FAR of the individual uses within that pocket/plot.



### 3.1.3 Floating FAR

The Authority shall allow development by restricting / regulating height of the building width of abutting road and plot sizes. This method is based on the carrying capacity analysis of the infrastructure planned. In keeping with the norm in the provision of infrastructure adjusted to the percentage, plot owners shall be permitted to use the additional FAR on payment basis.

**Basis for increasing FAR:** Carrying Capacity analysis tool is useful to rationalise fixation of FAR including increase in given FAR. Two major determining factors should be considered:

1. **V/C (V= volume, C= capacity)**

V/C: optimum level is 0.8; it can be relaxed upto 0.9. Above 0.9 is dysfunctional and 1.0 is not desirable.

2. **LPCD of piped water supply**

The planned LPCD should be as per the minimum of norm i.e. 135 litres. However, the density is to be capped by the Development/ Master Plan as per the threshold.

*Note: Assignment of Values for flexible FAR and other calculations may be referred from URDPFI Guidelines, 2014*

### 3.2 Development norms and standards for hill towns

The suggested norms and standards are only indicative and can be suitably modified depending upon the local conditions both physical and environmental. In hill areas, the space standards are affected by the topography and environment and therefore the following factors shall be considered while setting norms in such areas:

- i) Exposure to sunlight
- ii) Degree of slopes and accessibility in the form of distance traveled.
- iii) Basic needs of the people
- iv) The conservation principle.
- v) Alternative modes of transportation Communication network.
- vi) Mobile facilities and emergency facilities.

### 3.3 Parking standard

Parking space shall be provided for different types of development as per norms given in Master Plan/Development Plan or as given below:

- 3.3.1** The following Table 3.1 may be referred to for deciding the parking norms for different use zone/activities only minimum required value of ECS and NOT a range should be specified in the development plan. It can be changed in subsequent plan depending upon need based upon local vehicle ownership, mass transportation and consequent parking needs.

Table 3.1 Parking standards

S.No.	Land use	Parking Standards	Remark
1	Residential		
	Residential Plot-Plotted Housing	2 Equivalent Car Space (ECS) in plots of size 250-300 sqm and 1ECS for every 100 sqm. built up area, in plots exceeding 300 sqm.	--
	Residential Plot - Group Housing	2.0 ECS/100 sqm built up area	--
	Cluster Court Housing	2.0 ECS/100 sqm built up area	--
	Guest House / Lodging & Boarding House / Dharamshala	2 ECS per 100 sqm. of built up area	--
2	Commercial Centres		
	Convenience Shopping Centre/Local Shopping Centre / Local Level Commercial areas	2 ECS / 100 sqm of floor area	--
	Service Market	2 ECS / 100 sqm of floor area	--
	Community Centre / Non- hierarchical Commercial Centre	3 ECS / 100 sqm of floor area	--
	District Centre/ Sub-Central Business District/Sub-City Level Commercial areas	3 ECS / 100 sqm of floor area	--
	Commercial Plot: Retail & Commerce Metropolitan City Centre	3 ECS / 100 sqm of floor area	--
	Hotel	3 ECS / 100 sqm of floor area	For Population between 2- 10 lakh – 1 car parking space for every 4 guest room. For Population between 10-50 lakh – 1 car parking space for every 3 guest room. For Population more than 50 lakh – 1 car parking space for every 2 guest room <sup>2</sup> .
	Service Apartments	3 ECS / 100 sqm of floor area	--
	Any other commercial centre including commercial component along with Railway/MRTS and ISBT	3 ECS / 100 sqm of floor area	--
	Integrated Freight Complex/ Wholesale Market	3 ECS / 100 sqm of floor area	In case of plots up to 300 sqm. common parking is to be provided
3	Socio-Cultural Facilities		
	Community Hall	3.0 ECS / 100 sqm of floor area	--
	Recreational Club	2 ECS / 100 sqm of floor area	--
	Socio-cultural activities such as auditorium, music, dance & drama, centre / meditation, spiritual centre etc.	2 ECS / 100 sqm of floor area	--
	Science Centre	2 ECS / 100 sqm of floor area	--
	International Convention centre	2 ECS / 100 sqm of floor area	--

<sup>2</sup> National Building Code, 2005.

S.No.	Land use	Parking Standards	Remark
	Old Age Home / Care Centre for Physically / Mentally challenged / Working women / men hostel /Adult Education Centre / Orphanage / Children's Centre / Night Shelter	1.8 ECS / 100 sqm of floor area	--
	Sport facility for international sports event	2 ECS / 100 sqm of floor area.	--
4	Public-Semi Public		
	Integrated Office Complex	1.8 ECS / 100 sq m of floor area	The norms for Local Government offices / Public Sector Undertakings under Government Land use shall be as per Integrated office complex
	District Court	1.8 ECS / 100 sqm of floor area	--
	Head Post Office with Administrative office & with / without delivery office	1.33 ECS / 100 sqm. of floor area	--
	Amusement Park	3 ECS / 100 sqm. of floor area	--
	ISBT/Metro	2 ECS / 100 sqm. of floor area	--
	Hospitals	2 ECS / 100 sqm. of floor area	--
	Veterinary Hospital	1.33 ECS / 100 sqm. of floor area	--
	Veterinary Dispensary	1.33 ECS / 100 sqm. of floor area	--
	Nursing and Paramedic institute	2 ECS / 100 sqm. of floor area	--
	Medical College	As per norms of Medical Council of India / Regulatory Body	--
5	Industry		
	Industrial Plot up to 50 sqm area	2 ECS / 100 sqm of floor area	--
	Industrial Plot 51sqm -400 sqm area	2 ECS / 100 sqm of floor area	--
	Industrial Plot 401 sqm and above	2 ECS / 100 sqm of floor area	--
	Flatted group Industry (Min Plot size 400 sqm)	2 ECS / 100 sqm of floor area	--
6	Mixed Land use	Parking @ 2.0 ECS / 100 sqm built up area shall be provided within the premises.	Where this is not available, cost of development of parking, shall be payable by the plot allottee / owner to the local body concerned or Multi-level parking to be provided as an option. This condition shall apply even if residential premises are used only for professional activity.

Parking standards are prescribed in above table, however, the following Table 3.2 could be followed for different types of land use.

**Table 3.2 Permissible ECS for different land uses**

S.No.	Use Premises	Permissible Equivalent Car Spaces (ECS) per 100 sqm. of floor area
1	Residential	2.0
2	Commercial	3.0
3	Industrial	2.0
4	Public Building	1.8
5	Semi-Public Facilities	2.0
6	Mixed Land use	2.0

### 3.3.2 Multi storeyed parking

Special permission shall be sought for development of buildings specifically for parking. Permission shall be granted based on width of road, requirement for parking space, FAR available and other parameters as specified by the competent authority.

Minimum Area of plot: 2000 sq. mt. in plain areas  
1000 sq. m. in hilly areas

Minimum number of car parking spaces: 50

Development of such parking lots may be undertaken by offering tradable FAR to the developer in lieu of development of parking lots which may be surrendered to competent authority on completion.

## 3.4 Specific premises

### 3.4.1 Residential Use Zone

The residential areas are developed either as

- Plotted development or
- Group housing/flatted development.

The density pattern i.e. (high density, high medium density, low medium density or low density) are followed for working out the pattern of development with respect to:

- Size of the plot
- Number of dwelling units on each plot
- Setbacks
- FAR
- Number of storeys/ height of the building

The municipal and social infrastructure as per the norms and standards specified in the Master Plan shall be provided. The various sites/plots required for social and municipal infrastructure are to be indicated in the layout plans. The development norms for different use/activities and on different sizes of plots are applied for sanctioning of the plans. These are based on development control rules applicable to the city/town.

### 3.4.2 Buildings within the Residential Use Zone

Buildings for various uses/activities within the residential use zone forming part of the residential layout plan are to be constructed with the norms of the coverage, FAR, height and others as applicable to that size of a residential plot.

### 3.4.3 Residential Premises – Plotted Housing

The layout plans for residential scheme shall be formulated keeping in view:

- i) that there should be sufficient daylight and fresh air in the habitable areas within the buildings, when constructed.
- ii) that there would be protection against noise, dust and local hazards
- iii) that there should be sufficient open space for various family needs and in accordance with the provisions of clause 4.26, 4.27 and 4.28.
- iv) that the circulation and access is easy and is safe from accident point of view
- v) that, as far as possible, the plots are of regular shape and size and
- vi) these are logically arranged in a systematic manner so as to give a regular pattern of development in the form of row houses, detached and semi-detached houses and if necessary the regular bungalow type plots.

The plot size may vary depending upon the type of the housing, needed for a particular city based on general affordability of the people. The size of the plot would also depend on the number of dwelling units to be permitted on each plot. Normally, a plot should be built for two dwelling units on each plot. However, on bigger size plots, more than one dwelling unit per plot can be built. For low-income group, the minimum plot size should not be less than 30 sq.mt. The following Table 3.3 is suggested for different size of the plots applicable, ground coverage, FAR, height and number of dwelling units for a residential area:

**Table 3.3 Building control in Residential Premises**

Sl.No.	Plot Area (sq.mt)	Maximum Ground Coverage %	FAR	No. of DUs.	Maximum Height (mt.)
1.	30	75	150	1	8
2.	Above 30 upto 50	75	150	2	8
3.	Above 50 upto 100	65	180	3	12
4.	Above 100 upto 250	65	180	3	12
5.	Above 250 upto 500	55	165	6	15
6.	Above 500 upto 1000	45	120	8	15
7.	Above 1000 upto 1500	40	100	8	15
8.	Above 1500 upto 3000	33.3	100	12	15

**Note:**

1. In the already developed plots the pattern of development should conform to the existing regulations.
2. Basement, if constructed, may be used for incidental use such as parking, servicing and household storage. It is not to be used as a dwelling unit.
3. The area of the basement should not be more than the ground coverage.
4. Parking as per the prescribed norms should be provided with the plot or provision should be made in the layout plan without affecting the circulation pattern.
5. 50% of the open area of the plot should be used for proper landscaping and for plantation.

### 3.4.4 Group Housing

The number of dwelling units are calculated on the basis of the density pattern given in the development plan, taking into consideration a population of 4.5 persons per dwelling unit.

Minimum size of the plot	3000 sq m.
In hill towns	5000 sq m.
Maximum ground coverage	25% to 35%
Maximum FAR	50 to 175 (higher FAR may be given depending on the pattern of development)
In hill areas	

	50 (higher FAR may be given depending on the pattern of development and should not exceed 150)
Maximum Height	15 m. (for plot sizes upto 4000 sq m.) 26 m. for plots above 4000 sq m.
In hill areas	15 m. for all size of plots.
Number of dwelling units	To be calculated on the basis of the net plot area of a particular neighbourhood. This may vary between 25 DUs. to 175 DUs. per ha

**Note:**

1. Basement, if constructed, is to be used for parking, services and for essential household storage and for providing facilities without counting in FAR.
2. The quantum of basement may vary between 33 % to 50% of the plot area.

**3.4.5 Resettlement and Slum in-situ upgradation**

- i) Maximum net density 250 tenements per hectare.
- ii) Plot size- minimum 25 sq m. However it may be reduced to 18 sq m. with 100% coverage provided an area @ 7 sq m. per plot/tenement is clubbed with the cluster open space.
- iii) Path ways:
  - a) 2 m. upto 30 m. in length
  - b) 3 m. upto 50 m. in length

**Table 3.4 Net residential density of group housing, controls**

S.N.	Net Residential Density (DU/ha)	Maximum Ground Coverage (%)	FAR
1	25	25	0.50
2	50	30	0.75
3	75	33	0.90
4	100	35	1.00
5	125	35	1.25
6	150	35	1.50
7	175	35	1.75

The size of the habitable room shall be minimum of 9.5 sqm, where there is only one room with a minimum width of 2.4m. Where there are two rooms, one of these shall be minimum of 9.5 sqm and other 7.5 sqm, with a minimum width of 2.1 m.

**3.4.6 Low Income Housing**

The minimum plot size shall not be less than 30 sqm.

- i) It is recommended to provide cluster housing instead of single room dwelling.
- ii) The minimum plot size with ground coverage not exceeding 75%, shall be minimum 40 sqm in small and medium towns and minimum 30 sqm in metropolitan cities.
- iii) Plot sizes below 30 sqm and not less than 15 sqm may be permitted in case of cluster planning. In such a case the ground coverage and FAR can be 100 and 200 respectively.
- iv) Size of room: Every dwelling unit should have at least two habitable rooms, first room of minimum 9 sqm and width of 2.5 m. Other room shall be min 6.5 sqm with minimum width of 2.1 m provided the total area of both the rooms shall not be less than 15.5 sqm.

**3.4.7 Studio Apartments:**

Minimum size of plot	2000 sqm.
Maximum Ground Coverage	33.3%
Maximum FAR	2.00
Height	NR (Subject to clearance from AAI/Fire Department and Other Statutory bodies)
Parking	2.0 ECS/100 sqm built up area
Other controls for studio apartments:	
i.	The maximum size of the apartment shall be 60 sqm built-up.
ii.	The plots shall be located on road facing minimum width of 12m.
iii.	Basement, if constructed, and used only for parking, utilities and services shall not be counted towards FAR.

**3.5 Non-residential premises****3.5.1 Foreign Mission**

Maximum ground coverage	25%
Maximum floor area ratio	0.75
Maximum height	15 m.

**Other Controls:**

- i) *Basement up to the building envelope to the maximum extent of 50% plot area shall be allowed if used for parking and services and should not be counted in FAR.*

**3.5.2 Guest House, Boarding House and Lodging House, Hostel**

Minimum plot size	500 sq m.
Maximum ground coverage	30%
Maximum floor area ratio	1.20
Maximum height	15 m.

**Other Controls:**

- i) *Minimum R/W in front 20 m.*  
ii) *Basement upto the building envelope to the maximum extent of 50% of plot area shall be allowed and if used for parking and services should not be counted in FAR.*

**3.5.3 Dharmshala, Baratghar, and Night Shelter**

Minimum plot size	1000 sq m.
Maximum ground coverage	30%
Maximum floor area ratio	1.20
Maximum height	26 m.

**Other Controls:**

- i) *Minimum R/W in front 16 m.*  
ii) *Basement upto the building envelope to the maximum extent of 50% plot area shall be allowed and if used for parking and services should not be counted in FAR.*

**3.6 Commercial****3.6.1 Convenience Shopping**

Maximum ground coverage	40%
Maximum floor area ratio	0.60
Maximum Height	15 m.
In hills	6 m.

**3.6.2 Local Shopping/ Neighbourhood Shopping Centre**

Maximum ground coverage	30%
In hills	35%
Maximum FAR	1.00
Maximum Height	15 m.
In hills	9 m.

**3.6.3 Community Centre**

Maximum ground coverage	25%
In hills	30%
Maximum FAR	1.00
Maximum Height	26 m.
In hills	15 m.

**3.6.4 District Centre**

Maximum ground coverage	25%
Maximum FAR	1.25
In hills	1.25
Maximum Height	37m.(upto 50 as per requirement)
In hills	15 m.

**Other Controls:**

- i) Some of the buildings in a district centre in non-hill towns could be permitted upto 50 m. height with the approval of the Government for achieving interesting urban form.

**3.6.5 Central Business District/ City Centre**

Maximum ground coverage	25%
Maximum floor area ratio	3.00
Maximum height	As per requirement

**3.6.6 Sub-Central Business District**

Same regulations as for district center and flexible at discretion of competent authority

**3.6.7 Other commercial centre**

Maximum ground coverage	25%
Maximum floor area ratio	1.00
Maximum height	As per requirement

**3.6.8 Wholesale Trade/Ware Housing/Integrated Freight complex**

Maximum ground coverage	30%
Maximum floor area ratio	0.80
Maximum height	As per requirement

**Other Controls:**

- i) Basement upto the building envelope to the maximum extent of 50% plot area shall be allowed and if used for parking and services should not be counted in FAR.
- ii) Further, for Risk based approval of types of Warehouses / IFC refer clause 13.5, Table 13.4

**3.6.9 Informal Bazaar/market**

Maximum ground coverage	40%
Maximum floor area ratio	0.40
Maximum Height	8m



### 3.6.10 Petrol Pumps

The following regulations are recommended for locating the petrol pump cum service stations-

- i) Minimum distance from the road intersections.
  - a) For minor roads having less than 30 m. R/W 50 m.
  - b) For major roads having R/W 30 m. or more 100 m.
- ii) The minimum distance of the property line of pump from the center line of the Road should not be less than 15 meters on roads having less than 30 m. R/W. In case of roads having 30 m. or more R/W, the R/W of the road should be protected.
- iii) Plot Size
  - a) Only filling stations 30 m. x 17 m. and small size 18 m. x 15 m. (for two and three wheelers)
  - b) Filling-cum-service station minimum size 36 m. x 30 m. and maximum 45 m. x 33 m.
  - c) Frontage of the plot should not be less than 30 m.
  - d) Longer side of the plot should be the frontage.
- iv) New Petrol Pump shall not be located on roads having less than 30 m. R/W.

#### Other Controls:

- a) Filling-cum-service station size 36 m. x 30 m. and 45 m. x 33 m.)
  - i) Ground coverage 20%
  - ii) FAR 0.20
  - iii) Max. Height 6 m.
  - iv) Canopy Equivalent to permissible ground coverage within setback line.
  - v) Front Setback Min. 6 m.
- b) Filling Station (size 30 mt. x 17 mt. and 18 mt. x 15 mt.)
  - i) Ground coverage 10%
  - ii) FAR 0.10
  - iii) Max. Height 6 m.
  - iv) Canopy Equivalent to permissible ground coverage within setback line.
  - v) Front Setback Min. 3 m.
- c) Other Regulations
  - i) Shall be approved by Explosives/Fire Deptt.
  - ii) Ground coverage will exclude canopy area.
  - iii) Mezzanine if provided will be counted in FAR
  - iv) Wherever the plot is more than 33 m. x 45 m. development norms shall be restricted to as applicable to the size i.e. 33 m. x 45 m. both in urban and rural areas.
- d) Compressed Natural Gas (CNG) Mother Station
  - i) Plot Size (Max.) 36 m. x 30 m.
  - ii) Maximum ground coverage 20%
  - iii) Maximum Height 4.5 m. (single storey)
  - iv) Building Component Control room/office/Dispensing room, store, pantry and W.C.

### 3.6.11 Hotels

Maximum ground coverage	40%
Maximum floor area ratio	3.00
In hills	1.75
Maximum height	As per requirement

#### Other Controls:

- i) 5% of the FAR can be used the commercial space related to hotel function.
- ii) Basement(s) up to the building envelope to the maximum extent of plot area shall be allowed and if used for parking and services should not be counted in FAR.

### 3.6.12 Motels

Motels are permitted in Rural Zone/ Green Belt and in commercial zones on National Highways and Inter-State roads.

The following norms and building standards are recommended.

Minimum plot size	1.0 Ha
Minimum Setbacks	front 15 m.
Rear and sides	9 m.
Maximum FAR	0.15
Maximum Ground Coverage	15%
Maximum Height	9 m.

Basement equivalent to the ground coverage shall be allowed free of FAR to the extent necessary for air conditioning plant, filtration plant, electric sub- station, parking and other essential services.

Parking space shall be provided on a minimum scale of 1.67 ECS per 100 sq m. of floor area, including the provision made in this regard in the basement.

Retail and service shops shall be limited to a maximum of 5% of the floor area.

### 3.6.13 Service Apartments

Maximum ground coverage	30%
Maximum FAR	1.50
In hills	1.50
Maximum Height	As per requirement

*Parking space shall be provided on a minimum scale of 2 ECS per 100 sq m. of floor area, including the provision made in this regard in the basement.*

## 3.7 Industrial plot

### 3.7.1 Flatted Group Industry and Service Centre

Minimum plot size	2000 sq m.
Maximum ground coverage	30%
Maximum floor area ratio	1.20
In hills	1.00
Maximum height	15 m.
In hills	15 m.

#### Other Controls:

- i) *Basement upto the building envelope line to the maximum extent of 50% plot area shall be allowed and if used for parking and services should not be counted in FAR*

### 3.7.2 Light and Service Industry

**Table 3.5 Development Controls on Service and Light Industrial Plots**

Sl.No.	Plot Size (Sq m.)	Maximum Ground Coverage	Maximum FAR in		Maximum height in (m)	
			Plains	Hills	Plains	Hills
1.	Less than 400	60%	1.25	1.00	12	9
2.	Above 400 & upto 4000	50%	1.25	1.00	12	12
3.	Above 4000 & upto 12000	45%	1.25	1.00	12	12
4.	Above 12000	40%	1.00	0.75	12	9

**Other Controls:**

- i) Maximum floors allowed shall be basement, ground floor and first floor; basement should be below ground floor and to the maximum extent of ground coverage shall be counted in FAR. In case the basement is not constructed, the permissible FAR can be achieved on the second floor.
- ii) In case of roof trusses, height of buildings could be adjusted/ relaxed.

**3.7.3 Extensive Industry****Table 3.6 Development Controls on Extensive Industrial Plots**

Sl.No.	Plot Size (Sq m.)	Maximum Ground Coverage	Maximum FAR in		Maximum height in (m.)
			Plains	Hills	
1.	400 to 4000	50%	1.00	0.75	9
2.	Above 4000 & upto 12000	45%	0.90	0.60	9
3.	Above 12000 & upto 28000	40%	0.80	0.50	9
4.	Above 28000	30%	0.60	0.45	9

**Other controls:**

- i) Single Storey building with basement is allowed. Basement shall be below the ground floor and the maximum extent of ground coverage and shall be counted in FAR.
- ii) In case of roof trusses, height of building could be adjusted/relaxed.

**Note:**

- i) A new planned industrial area to have minimum 100 – 300 sqm size of plot and its width shall not be < 15 m.
- ii) For industrial plots upto 1000 sq.m, 5% of the total area shall be reserved as amenity open space which shall also serve as general parking space. When such amenity open space exceeds 1500 sq.m, the excess area could be utilised for construction of buildings for banks, canteen, welfare centre and such other common purposes.
- iii) For industrial plots more than 1000 sq m, 10% of the total area to be reserved as amenity/ open space to a maximum of 25 sq. m.

**3.8 Transportation****Table 3.7 Development controls on Transport Terminals**

Sl.No.	Use Premises	Development Controls			
		Area under Operation (%)	Area under building (%)	FAR*	Floor area that can be utilized for passenger accommodation
1.	Rail Terminal/ Integrated Passenger Terminal Metropolitan Passenger Terminal	70	30	1.00	15%
2	Bus Terminal	50	50	1.00	25
3	ISBT	25	Max 50	1.00	As per requirement
4	Metro Yards	80%	20%	1.00	15%

\* The FAR is to be calculated on the Building plot. Area under Bus Shelter not to be included in FAR

**Other Controls:**

- i) The space on first and second floor shall be essentially used for public services like post office, police post and other essential services.
- ii) Bus queue shelters are not to be included in the coverage and FAR.
- iii) In order to integrate the supporting commercial uses around the transportation zone, FAR can be more for promoting mixed use.

**3.9 Aerodromes**

The following restrictions in vicinity of aerodromes shall be applicable

- i) The buildings or structures in the vicinity of the ARP shall be dealt by the local Authority as per the CCZM as mentioned under clause 4.30.2 c) and by NOCAS from AAI.
- ii) In case of buildings to be located in the vicinity of defence aerodromes, the maximum height of such buildings shall be decided by the defence Authority.
- iii) No new chimneys or smoke producing factories shall be constructed within a radius of 8 km from the Aerodrome Reference Point (ARP).
- iv) Overhead high voltage/ medium voltage lines or telephone & other communication lines shall not be permitted in the approach/ take off climb areas (funnel zone) within 3000 m of the inner edge of these areas.
- v) A margin of 3 m shall be allowed in new constructions for wireless/ TV antennas, cooling towers and munties.
- vi) For height Restrictions with respect to Approach Funnels and Transitional areas the NOCAS from AAI as mentioned under clause 4.30.2 c) shall be followed.

### 3.10 Public - Semi-public

#### 3.10.1 General

Maximum ground coverage	30%
In hills	25%
Maximum floor area ratio	2.00
In hills	1.00
Maximum height	26 m.
In hills	15 m.

#### 3.10.2 Government offices integrated office complex

Maximum ground coverage	30%
Maximum floor area ratio	2.00
In hills	1.00
Maximum height	37 m.
In hills	15 m.

**Other Control:**

- i) *The integrated office complex shall include Central Government Office, Local Government Office, Public Undertaking Offices and Courts.*
- ii) *Basements up to the building envelope line to the maximum extent of plot area shall be allowed and if used for parking and services should not be counted in FAR.*

#### 3.10.3 DISTRICT COURT (if at all this needs to be added)

Maximum ground coverage	30%
Maximum floor area ratio	2.00
In hills	1.25
Maximum height	NR.
In hills	6m.

## 3.10.4 Health Services

Table 3.8 Development Controls on Health Centers and Nursing Homes

Sl. No	Category	Maximum			Other Controls						
		Ground Coverage	FAR	Height							
1.	Hospital/*Tertiary Health care Centre	*Ground coverage to be decided by interse building to building distances as per Building Bye Laws and fire tender movement requirements, subject to a maximum 40% excluding 5% additional ground coverage for muti-level parking Minimum plot area 6000 sq.m.	*FAR on plot facing ROW should be subject to NOC from all concerned agencies depending on locations shall be as under: <table border="1"> <tr> <td>a. Row less than 24m</td> <td>2.50</td> </tr> <tr> <td>b. Row 24m up to 30m</td> <td>3.00</td> </tr> <tr> <td>c. Row 30m and above</td> <td>3.75</td> </tr> </table>	a. Row less than 24m	2.50	b. Row 24m up to 30m	3.00	c. Row 30m and above	3.75	*No height restriction subject to clearance from AAI, FS, DMA, NMA.  NBC to process the proposed revision of NBC as soon as possible. Till date the NBC is revised, fire services may allow no restriction of height for health care facilities with commensurate fire and life safety measures, subject to clearance from AAI, FS, DMA, NMA and other statutory provisions	<p>1. *Upto 25% of the permitted FAR can be utilized for residential use for essential staff, dormitory/hostel for attendents of the patients, Creche etc.</p> <p>2. *Parking standard @ 2.0 ECS/100 sqm of floor area.</p> <p>3. *Maximum 10% ground coverage shall be allowed for providing atrium. In case, the permissible additional ground coverage for atrium is utilized, 25% of the utilized ground coverage shall be counted toward FAR</p> <p>4. *Multi Level Podium parking shall be permissible to the extent of building envelope lines, free from FAR and ground coverage to facilitate ample parking in spaces, subject to structural safety.</p> <p>5. *Common areas such as waiting halls, reception and fire stairs cases shall be allowed free from FAR</p> <p>6. *Service floor of height 1.8m shall not be counted in FAR Parking Standard @ 2.0 ECS/100 sq.mt. of floor area.</p>
a. Row less than 24m	2.50										
b. Row 24m up to 30m	3.00										
c. Row 30m and above	3.75										
2.	Other Health Facilities a. Maternity Home Nursing Home/ Polyclinic / Dispensary i) Family Welfare Centre ii) Pediatric Centre Geriatric Centre Diagnostic Centre.	30%	1.50	26 mt.	Parking Standard @ 2.0 ECS/100 sq.mt. of floor area.						
3.	a. Veterinary Hospital for pet animals and birds. b. Dispensary for pet animals and birds.	30% 35%	1.50 1.00	26 mt. 26 mt.	Parking standard @ 1.33 ECS / 100 sq. mt. of floor area. Parking standard @ 1.33 ECS / 100 sq. mt. of floor area.						
4.	a. Medical College	As per norms of Medical Council of India / Regulatory Body									
	b. Nursing and Paramedic Institute	30%	1.50	26 mt.	Parking Standard @ 2.0 ECS/100 sq.mt. of floor area.						
	c. Veterinary Institute	As per the Veterinary Council of India/Ministry norms.									

\*^ Natural sky light condition is exempted for Atrium and construction over the Atrium may be allowed.

\*# Height restriction of 30 mts. In Hospital Buildings should be reviewed in consultation with Fire Deptt. of State Govt.

**Notes:**

1. Plot area for all \*Hospital/Tertiary Health Care Centre would be worked out @ 80 sq.mt. of gross floor area per bed. However, for other health facilities like Maternity/Nursing homes, family Welfare and other centers, the plot area would be worked out @ 60 sq.mt. of gross floor area per bed.
2. Maximum up to 300 sq. mt. of floor area shall be allowed to be used for community space / religious shrine / crèche / chemist shop/ bank counter on Hospital sites and also Medical College/ Nursing and Paramedic institutes sites.

**Other Controls:**

- a. In case of super specialty medical facilities/hospitals duly certified as such by the competent authority, the gross area shall be worked out @ upto 125 sq. mt. per bed.
- b. In case of existing premises/sites, the enhanced FAR shall be permitted, subject to payment of charges as may be prescribed by the Authority / land owning agency and other clearances.
- c. \*Basement after utilization for Parking; Services Requirements such as air conditioning plant and equipment, water storage, boiler, electric sub-station, HT & LT panel rooms, transformer compartment, control room, pump house, generator room; staff locker room, staff changing room, staff dining facilities without kitchen facility, Central sterile supply deptt., back end office; Other Mechanical Services; Installation of Electrical and fire fighting equipment's; and other services like kitchen, laundry and radiology lab and other essential services required for the maintenance/functioning of the building may be used for healthcare facilities with prior approval of the concerned agencies.
- d. Other controls related to basements etc. are given in end of this chapter.
- e. \*The bed count of a Health Facility may be allowed as per permissible FAR, needs of the Community and demand studies.
- f. \*Environment clearances shall be made mandatory considering that bio-wastes are generated. Environment clearances are mandatory as per the prevailing regulations related to the environment.
- g. \*Zero discharge for sewerage shall be enforced at the cost of the promoters and post treatment water can be used by premises for its needs of horticulture, flushing, coolant tower, washing or disposal to other construction sites. These issues concerned the local bodies and can be dealt accordingly as per existing regulations as the time of sanctioning the plan.
- h. The additional power requirements shall be met by power supply from grid and till such time by means of suitable captive generation.

**3.11 Educational Facilities**

**3.11.1 Nursery School**

Maximum ground coverage	33.33%
Maximum floor area ratio	1.00
In hills	0.67
Maximum height	8 m.
In hills	6 m.

*Note:* Basement below the ground floor and to the maximum extent of ground coverage, and if constructed shall be counted in FAR.

**3.11.2 Primary School**

Maximum ground coverage	33%
Maximum floor area ratio	1.20
In hills	1.00
Maximum height	15 m.

**3.11.3 Higher Secondary School**

Maximum ground coverage	35%
In hills	30%
Maximum floor area ratio	1.50
In hills	1.00
Maximum height	15 m.

### 3.11.4 College

Maximum ground coverage	35%
In hills	25%
Maximum floor area ratio	1.50
In hills	0.75
Maximum height	15 m.

**Note:**

- In case of the above premises the total area of the plot shall be divided in
  - School/college building area
  - Play field area
  - Parking area
  - Residential and hostel area
- The maximum ground coverage and FAR shall be calculated only on the areas meant for building.

**Table 3.9 Development Controls for Other Education Facilities**

Sl. No	Category	Maximum		
		Ground Coverage	FAR	Height
1.	Play School, Coaching Centre, Computer Training Institute, Physical Education Centre etc.	N.A.	N.A.	N.A.
2	School for Mentally Challenged.	50%	1.20	18 mt.
3	School for *differently abled persons.	50 %	1.20	18 mt

**Notes:**

*Pre-Primary Schools/Nursery Schools/Montessori Schools/Creche, Play Schools, may be permissible in residential use premises as per Mixed use policy.*

**Other Controls:**

- In case of new schools, the front boundary wall shall be recessed by 6 mt. to accommodate visitors parking within setback area.
- Playground shall be developed on pool basis in different areas at neighborhood level.
- Practice of providing dedicated Nursery School plots in the layout plan discontinued as same is permissible in Mixed use.
- In case of schools for mentally / \*differently abled persons, 20% of the maximum Far can be utilized for residential use of essential staff and student accommodation.

### 3.11.5 Education and Research Centre (large campus i.e. above 8 Ha.)

Large campuses of universities, medical and engineering colleges and other education and research institutes shall be covered under these regulations. The campus will be divided into three parts and the regulations shall apply, as given below:

*i) Academic, including administration (45% of the total land area)*

Maximum ground coverage	30%
In hills	20%
Maximum floor area ratio	1.20
In hills	0.80
Maximum height	37 m.
In hills	15 m.

Basement below the ground floor and to the maximum extent of ground coverage shall be allowed and if used for parking and services should not be counted in FAR.

*ii) Residential (25% of total land area)*

This will be developed at a density of 400 PPHa gross. The land shall be reserved for residential facilities @ 9.2 sqmt. per person. Sub-division regulations as given for group housing shall apply.

*iii) Sports and Cultural Activities (15% of the total area)*

Maximum ground coverage	10%
Maximum FAR	15

iv) *Parks and landscape* (15% of the total land area): Suitable landscape plan to be prepared for this area.

### 3.11.6 Sports

**Table 3.10 Development Controls for Education Facilities**

Sl.No	Category	Maximum		
		Ground Coverage	FAR	Height
1.	Sports and amenity structures	20% including amenity structures	0.40	NR (Subject to clearance from all other statutory bodies)
2.	Parking	2 ECS/100 sq. mt of floor area.		

**Other Development Controls:**

- i. To incentives development of sports facilities and swimming pool (upto maximum 100 sq. mt.) Within the group housing areas, schools, clubs, etc. shall not be counted towards ground coverage and FAR.
- ii. All these various sports facilities shall have layout plan, landscape plan, and parking plan, etc.

### 3.12 Security Services

#### 3.12.1 Police Post

Maximum ground coverage	35%
Maximum floor area ratio	1.50
Maximum height	15 m.

**Other controls:**

- i) Basement below the ground floor to the maximum extent of ground coverage shall be allowed and if used for parking and services should not be counted in FAR.

#### 3.12.2 Police Station

Maximum ground coverage	30%
Maximum floor area ratio	1.50
Maximum height	26 m.

**Other Controls:**

- i) Basement upto the envelope lines and to the maximum extent of 50% of the plot area shall be allowed and if used for parking and services should not be counted in FAR.
- ii) 25 % of the plot area may be used for housing the staff and the regulations of group housing shall be applicable to the area meant for housing.

**Table 3.11 Development control for police station**

Sl. No	Category	Maximum			Other Controls
		Gr. Cov.	FAR	Height	
1.	District Office & Battalion	30%	1.20	26 mt.	1. Up to 30% of maximum FAR can be utilized for residential use of essential staff ***(except Police Station 3) 2. Additional space available in police station due to increased development controls shall be used for locating Civil Defence and Home Guards etc. 3. Up to 15% of maximum FAR can be utilized for residential use/hostel for essential staff and student accommodation, in Police Training Institute/ College. 4. Other controls related to basements etc. are as per regulations
2.	Police Lines i) Administration ii) Residential iii) Sports & Facilities iv) Open Spaces	Land Distribution: - 20% - 30% - 10% - 40%			
3.	District Jail	30%	1.20	26 mt.	
4.	Police Training Institute/College*	30%	1.20	26 mt.	
5.	Police Firing Range	12.5%	0.25	9 mt.	
6.	Police camp including Central Police Organization/Security Forces*	12.5%	2.55	9 mt.	
7.	Traffic and Police Control Room	1. As per requirement on major road junctions/ stretches etc. as part of road right of way based on site feasibility. 2. Maximum are – 25 Sq. mt.			



**Table 3.12 Development control for other services**

Sl. No	Category	Maximum			Other Controls
1.	Disaster Management Centre	30% (on building area only)	1.20	26 mt.	1. Upto 25% of maximum FAR can be utilized for residential use of essential staff in fire station.
4.	Fire Post/ Fire Station/ Fire Training Institute/College	30%	1.20	26 mt.	2. Upto 15% of maximum FAR can be utilized for residential use/hostel for essential staff and student accommodation, in Fire Training Institute/College. 3. Other controls related to basements etc. are as per regulations.

### 3.13 Post and telegraph office, head post office

Maximum ground coverage	25%
Maximum floor area ratio	1.00
Maximum height	15 m.

**Other Controls:**

- i) Basement up to the building envelope line and to the maximum extent of 50% of the plot area shall be allowed and if used for parking and services should not be counted in FAR.

### 3.14 Farm houses

**Table 3.13 Development control for farm house**

Sl. No.	Size of Farm	Maximum FAR	Maximum Height
1	Above 1.0 Ha and upto 2.0 Ha	1.00 (including mezzanine floor)	Single storeyed maximum height 6 m.
2	2.0 Ha and above	1.50 (including floor)	Single storeyed maximum height 6 m.

**Other Controls:**

- i) Setback in dwelling house should be 15 m. away from any boundary line of the property.  
ii) Where a property abuts an urban road, the dwelling house building should be setback from the centre line of that road by 60 m. Where the property abuts a village road, the building setback from the centre line of that road should be 30 m.  
iii) No dwelling units should be built within 400 m. of the right of way of any National Highway.

### 3.15 Professional activity

Professional activity shall be allowed in residential plot and flats on any floor on the following condition:

Part of the premises shall be permitted to be used upto a maximum of 25 % of FAR or 100sqm. whichever is less, for non-residential but non-nuisance activities for rendering service based on professional skills.

Table 3.14 Development Control for Distributive Services

Sl.No	Category	Maximum			Other Controls
		Ground Coverage	FAR	Height	
1.	Milk booth/Milk and fruit & vegetable booth	Permitted in all zones as per approved layout plan.			
2.	LPG godown including booking office.	i. Plot size- upto 600sqm including booking office and security hut. ii. Permitted in all use zones except in residential and recreational use zones subject to statutory clearances.			
3.	SKO/ LDO outlets	i. Permitted in all use zones except in residential and recreational use zones subject to statutory clearances.			

### 3.16 Socio – cultural facilities

Table 3.15 Development Controls for Socio- Cultural Facilities

Sl.No	Category	Maximum			Other Controls
		Ground Coverage	FAR	Height	
1.	a. Multipurpose Community Hall.	30%	1.20	26m	1. Parking standard @3.0ECS/100sq m of floor area. 2. Other controls related to basements etc. are given at end of this chapter.
	b. Banquet hall	30%	1.20	26m	
2.	a. Community Recreational Club.	30%	1.20	26m	Parking standard @2ECS/100sq.m of floor area.
	b. Recreational Club	25%			
3.	Socio- cultural activities such as auditorium, music, dance & drama centre/mediation & spiritual centre etc.	35%	1.20	26m	1. Parking standard @ 2ECS/100sq.m of floor area. 2. A proper scheme for visitors parking and parking adequacy statement shall be prepared taking into consideration large number of visitors.
4.	Exhibition cum Fair Ground	20%	0.20	26m	Subject to statutory clearances.
5.	Science centre	30%	1.20	NR,	Parking standard @2ECS.
6.	International Convention Centre	30%	1.20	Subject to approval of AAI, Fire Department and other statutory bodies	Parking standard @2ECS.

#### Notes:

- i. In case of community recreational clubs, 0.50 FAR shall be admissible on the area beyond 2000 sqm.
- ii. In the open area apart from outdoor games/sport facilities, swimming pool would be permissible upto an area of 300sqm. Free from ground coverage.
- iii. Basement within the ground envelope shall be allowed for parking, stilt floor for parking is permissible.
- iv. 30% of basement area for services, storage shall not be counted in FAR.

**Other community facilities:**

Development Controls for old age homes, religious facilities, etc shall be as follows:

**Table 3.16 Development Controls for other community facilities**

Sl.No	Category	Maximum			Other Controls
		Ground Coverage	FAR	Height	
1	Old Age Home/Care Centre for *Differently Abled Persons /Mentally Challenged/Working Women/Men Hostel/ Adult Education Centre/Orphanage/Children's Centre/Night Shelter.	30%	1.20	26m.	1. Parking standard@ 1.8 ECS/100 sqm of floor area. 2. Other controls related to basement etc. are as given in Chapter 17,Development Code , MPD - 2021
2.	Religious a) At neighbourhood level b) At sub city level in urban extension*	35% 25%	0.70 0.50	15m. including shikhara 26m.	
3.	Anganwari c) At Housing area/Cluster level	30%	0.60	15m.	
*4.	Service Apartment	30%	2.25	NR* (Subject to approval of AAI, Fire Department and Other Statutory Bodies)	Parking @ 2ECS per 100 Sqm. of floor area.  Other controls related to basements etc. are given in the Development Code Chapter.

\*Amended Vide S.O. No. 2895(E) dated 23<sup>rd</sup> September, 2013.

These facilities should be developed in a composite manner to accommodate a number of religious institutes/premises with common facilities.

**Note:** - sites of dhobi Ghats/laundry shall be provided in residential use zone/PSP facilities areas as per the norms of local body.

**3.16.1 Creche/Day Care facilities**

As per factories Act, 1948 a Creche/Day care facility has to be provided for any organization/establishment employing more than 15 women for their kids upto the age of 5.

- The height of the rooms shall be not less than 3.6 metres from the floor to soffit and there shall not be less than 1.86 sqm of floor area / child to be accommodated and maintaining adequate ventilation by the circulation of fresh air.
- There is a minimum of one toilet and one wash hand basin for every 10 children over the age of two years. (refer notes under Table 4.21)
- The minimum staffing ratios for care shall be 1:4 children
- Monitoring- There is a necessity of minimum two supervisor on continuous duty.

**Chapter Note:**

For projects proposed within the **Prohibited and Regulated areas** as defined by AMASR Act 2010, the Development regulations of Height, FAR, Coverage and any other controls stipulated in Chapter-3 and Chapter-5 shall be superseded by **site specific Heritage Bye-Laws** prepared and notified by the Competent Authority (NMA) under the AMASR Act. NOC shall have to be obtained as per the Rules framed under the said Act by submission of required documents as may be necessary vide rules, including "**Heritage Impact Assessment**" report, if so necessitated by the NMA.



## 4. GENERAL BUILDING REQUIREMENTS AND SERVICES

### 4.1 General

This part sets out the standard space requirements of various parts of a building (for all types of buildings – low/ high rise).

**Table 4.1 Occupant Load**

Sl.No.	Type of Occupancy	Occupant Load per 100 sq. m. of Plinth or Covered Area
1	Residential	8.0
2	Educational	25.0
3	Institutional	6.60
4	Assembly with fixed or loose seats and dance floor without seating facilities including dining rooms	166.6 66.6
5	Mercantile street floor and sales basement upper sale floor	33.3 16.6
6	Business and industrial	10.0
7	Storage	3.3
8	Hazardous	10.0

\* The occupant load in dormitory portions of homes for the aged, orphanages or mental hospitals etc. where sleeping accommodation is provided shall be calculated at not less than 13.3 persons per 100 sq.m.

\*\* The plinth or covered area shall include, in addition to the main assembly room or space, any occupied connecting room or space in the same storey or in the storeys above or below where entrance is common to such rooms and space and the area available for use by the occupants of the assembly place. No deduction shall be made in the plinth/covered area for corridors, closets and other sub-divisions; that area shall include all space serving the particular assembly occupancy.

### 4.2 Requirements for Parts of Buildings

#### 4.2.1 Plinth

##### 4.2.1.1 Main Buildings

The plinth or any part of a building or outhouse shall be so located with respect to the surrounding ground level that adequate drainage of the site is assured. The height of the plinth shall be not less than 450 mm from the surrounding ground level.

##### 4.2.1.2 Interior Courtyards and Covered Parking

Every interior courtyard shall be raised at least 150 mm above the determining ground level and shall be satisfactorily drained.

### 4.3 Habitable Rooms

#### 4.3.1 Height

The height of all rooms for human habitation shall not be less than 2.75 m measured from the surface of the floor to the lowest point of the ceiling (bottom of slab) provided that the minimum clear headway under any beam shall not be less than 2.4 m. In the case of pitched roof, the average height of rooms shall not be less than 2.75 m. The minimum clear head room under a beam, folded plates or eaves shall be 2.4 m. In the case of air-conditioned rooms, a height of not less than 2.4 m measured from the

surface of the floor to the lowest point of air-conditioning duct or the false ceiling shall be provided.

**4.3.1.1** The requirements of clause 4.3.1 apply to residential, business and mercantile buildings. For educational and industrial buildings, the following minimum requirements apply:

**Table 4.2 Minimum height requirement for educational and industrial buildings**

Sl.No	Types of building	Ceiling height
1	Educational Buildings	Ceiling height 3.6 m for all regions; in cold regions, 3 m
2	Industrial Buildings	Ceiling height 3.6 m, except when air-conditioned, 3 m ( <i>Factory Act 1948</i> and Rules therein shall govern such heights, where applicable).

#### 4.3.1.2 Size

The area of habitable room shall not be less than 9.5 m<sup>2</sup>, where there is only one room with a minimum width of 2.4 m. Where there are two rooms, one of these shall not be less than 9.5 m<sup>2</sup> and the other not less than 7.5 m<sup>2</sup>, with a minimum width of 2.1 m.

### 4.4 Kitchen

#### 4.4.1 Height

The height of a kitchen measured from the surface of the floor to the lowest point in the ceiling (bottom of slab) shall not be less than 2.75 m, except for the portion to accommodate floor trap of the upper floor.

#### 4.4.2 Size

The area of a kitchen where separate dining area is provided, shall be not less than 5.0 m<sup>2</sup> with a minimum width of 1.8 m. Where there is a separate store, the area of the kitchen may be reduced to 4.5 m<sup>2</sup>. A kitchen, which is intended for use as a dining area also, shall have a floor area of not less than 7.5 m<sup>2</sup> with a minimum width of 2.1 m.

#### 4.4.3 Other Requirements

Every room to be used as kitchen shall have:

- unless separately provided in a pantry, means for the washing of kitchen utensils which shall lead directly or through a sink to a grated and trapped connection to the waste pipe;
- an impermeable floor;
- a flue, if found necessary; and
- a window or ventilator or opening of size not less than as specified in clause 4.31.1 subject to increase in area of opening in accordance with Note 3.

### 4.5 Bathrooms and Water-Closets

#### 4.5.1 Height

The height of a bathroom or water-closet measured from the surface of the floor to the lowest point in the ceiling (bottom of slab) shall not be less than 2.1 m.

#### 4.5.2 Size

The area of a bathroom shall not be less than 1.8 m<sup>2</sup> with a minimum width of 1.2 m. The floor area of water-closet shall be 1.1 m<sup>2</sup> with a minimum width of 0.9 m. If bath and water-closet are combined, its floor area shall not be less than 2.8 m<sup>2</sup> with a minimum width of 1.2 m.

### 4.5.3 Other Requirements

Every bathroom or water-closet shall:

- a) be so situated that at least one of its walls shall open to external air;
- b) not be directly over or under any room other than another water-closet, washing place, bath or terrace, unless it has a water-tight floor;
- c) have the platform or seat made of water-tight non-absorbent material;
- d) be enclosed by walls or partitions and the surface of every such wall or partition shall be finished with a smooth impervious material to a height of not less than 1 m above the floor of such a room;
- e) be provided with an impervious floor covering, sloping towards the drain with a suitable grade and not towards VERANDAH or any other room; and
- f) have a window or ventilator, opening to a shaft or open space, of area not less than  $0.3 \text{ m}^2$  with side not less than 0.3 m.

**4.5.4** No room containing water-closets shall be used for any purpose except as a lavatory and no such room shall open directly into any kitchen or cooking space by a door, window or other opening. Every room containing water-closet shall have a door completely closing the entrance to it.

## 4.6 Ledge or Tand/Loft

### 4.6.1 Height

The minimum head-room of ledge or *TAND*/loft shall be 2.2 m. The maximum height of loft shall be 1.5 m.

### 4.6.2 Size

A ledge or *TAND*/loft in a habitable room shall not cover more than 25 percent of the area of the floor on which it is constructed and shall not interfere with the ventilation of the room under any circumstances.

## 4.7 Mezzanine Floor

### 4.7.1 Height

It shall have a minimum height of 2.2 m.

### 4.7.2 Size

The minimum size of the mezzanine floor, if it is to be used as a living room, shall not be less than  $9.5 \text{ m}^2$ .

The aggregate area of such mezzanine floor in a building shall in no case exceed one-third the plinth area of the building.

### 4.7.3 Other Requirements

A mezzanine floor may be permitted over a room or a compartment provided:

- a) it conform to the standard of living rooms as regards lighting and ventilation in case the size of mezzanine floor is  $9.5 \text{ m}^2$  or more (see 4.31.1);
- b) it is so constructed as not to interfere under any circumstances with the ventilation of the space over and under it;
- c) such mezzanine floor is not sub-divided into smaller compartments;
- d) such mezzanine floor or any part of it shall not be used as a kitchen; and
- e) in no case shall a mezzanine floor be closed so as to make it liable to be converted into unventilated compartments.

## 4.8 Store Room

### 4.8.1 Height

The height of a store room shall be not less than 2.2 m.

### 4.8.2 Size

The size of a store room, where provided in a residential building, shall be not less than 3 m<sup>2</sup>.

## 4.9 Garage

### 4.9.1 Height

The height of a garage shall be not less than 2.4 m.

### 4.9.2 Size

The size of garages shall be as below:

- a) Private Garage - 3.0 m × 6.0 m, minimum; and
- b) Public Garage - Based on the number of vehicles parked by ECU.(Appendix 'A-1')

## 4.10 Basement

**4.10.1** The basement shall not be used for residential purposes.

**4.10.2** The construction of the basement shall be allowed by the Authority in accordance with the land use and other provisions specified under the Development Control Rules.

**4.10.3** The basement to be constructed within the building envelope and subject to maximum coverage on floor 1 (entrance floor) may be put to only the following uses:

- a) Storage of household or other goods of ordinarily non-combustible material;
- b) Strong rooms, bank cellars, etc;
- c) Air-conditioning equipment and other machines used for services and utilities of the building; and
- d) Parking spaces.

**4.10.4** The basement shall have the following requirements:

- a) Every basement shall be in every part at least 2.4 m in height from the floor to the underside of the roof slab or ceiling;
- b) Adequate ventilation shall be provided for the basement. The ventilation requirements shall be the same as required by the particular occupancy according to byelaws. Any deficiency may be met by providing adequate mechanical ventilation in the form of blowers, exhaust fans, air-conditioning systems, etc;
- c) The minimum height of the ceiling of any basement shall be 0.9m and the maximum, 1.2 m above the average surrounding ground level;
- d) Adequate arrangements shall be made such that surface drainage does not enter the basement;
- e) The walls and floors of the basement shall be watertight and be so designed that the effects of the surrounding soil and moisture, if any, are taken into account in design and adequate damp proofing treatment is given; and
- f) The access to the basement shall be separate from the main and alternative staircase providing access and exit from higher floors.
- g) Where the staircase is continuous in the case of buildings served by more than one staircase, the same shall be of enclosed type serving as a fire separation from the basement floor and higher floors. Open ramps shall be permitted if they are constructed within the building line subject to the provision of (d). The exist requirements in basements shall comply with the provisions of Part 4 'Fire and Life Safety'



#### 4.11 Chimneys

The chimneys shall be built at least 0.9 m above flat roofs, provided the top of the chimneys is not below the top of the adjacent parapet wall. In the case of sloping roofs, the chimney top shall not be less than 0.6 m above the ridge of the roof in which the chimney penetrates.

#### 4.12 Parapet

Parapet walls and handrails provided on the edges of roof terraces, balcony, verandah, etc shall not be less than 1.0 m and not more than 1.2 m in height from the finished floor level.

**Note:**

- i. *The above shall not apply where roof terrace is not accessible by a staircase.*
- ii. *However on terrace floor in the portion where installations like DG Set, Water Tank and other, screening parapet of a suitable height may be constructed to hide such equipment's etc and there is no need to have uniformly increased the height of the parapet.*

#### 4.13 Cabin

The size of cabins shall not be less than 3.0 m<sup>2</sup> with a minimum width of 1.0 m. The clear passages within the divided space of any floor shall not be less than 0.75 m and the distance from the farthest space in a cabin to any exit shall not be more than 18.5 m. In case the sub-divided cabin does not derive direct lighting and ventilation from any open spaces/ mechanical means, the maximum height of the cabin shall be 2.2 m.

#### 4.14 Boundary Wall

The requirements of the boundary wall shall be as follows:

- a) Except with the special permission of the Authority, the maximum height of the compound wall shall be 1.5 m above the centre line of the front street. Compound wall up to 2.4 m height may be permitted if the top 0.9 m is of open type construction of a design to be approved by the Authority.
- b) In the case of a corner plot, the height of the boundary wall shall be restricted to 0.75 m for a length of 10 m on the front and side of the inter-sections and the balance height of 0.75 m if required in accordance with (a) may be made up of open type construction (through railings) and of design to be approved by the Authority.
- c) However, the provisions of (a) and (b) are not applicable to boundary walls of jails. In industrial buildings, electric sub-stations, transformer stations, institutional buildings like sanatoria, hospitals, industrial buildings like workshops, factories and educational buildings like schools, colleges, including hostels, and other uses of public utility undertakings and strategically sensitive buildings, a height up to 2.4 m may be permitted by the Authority.

#### 4.15 Septic Tanks

Where a septic tank is used for sewage disposal, the location, design and construction of septic tank shall conform to requirements of Part 9 'Plumbing Services, Section 1 Water Supply, Drainage and Sanitation (Including Solid Waste Management)' of NBC, 2005.

##### 4.15.1 Location of the Septic Tanks and Subsurface Absorption Systems

A sub-soil dispersion system shall not be closer than 18 m from any source of drinking water, such as well, to mitigate the possibility of bacterial pollution of subsurface water. It shall also be as far removed from the nearest habitable building as economically feasible but not closer than 6 m, to avoid damage to the structures.

#### 4.15.2 Requirements

- a) *Dimensions of septic tanks* - Septic tanks shall have a minimum width of 750 mm, a minimum depth of 1 m below the water level and a minimum liquid capacity of 1 m<sup>3</sup>. The length of tanks shall be 2 to 4 times the width;
- b) Septic tanks may be constructed of brickwork, stone masonry, concrete or other suitable materials as approved by the Authority;
- c) Under no circumstances shall effluent from a septic tank be allowed into an open channel drain or body of water without adequate treatment;
- d) The minimum nominal diameter of the pipe shall be 100 mm. Further, at junctions of pipes in manholes, direction of flow from a branch connection shall not make an angle exceeding 45° with the direction of flow in the main pipe;
- e) The gradients of land drains, under-drainage as well as the bottom of dispersion trenches and soakways shall be between 1:300 and 1:400;
- f) Every septic tank shall be provided with ventilating pipe of at least 50 mm diameter. The top of the pipe shall be provided with a suitable cage of mosquito-proof wire mesh. The ventilating pipe shall extend to a height which would cause no smell nuisance to any building in the area. Generally, the ventilating pipe may extend to a height of about 2 m, when the septic tank is at least 15 m away from the nearest building and to a height of 2 m above the top of the building when it is located closer than 15 m;
- g) When the disposal of septic tank effluent is to a seepage pit, the seepage pit may be of any suitable shape with the least cross sectional dimension of 0.90 m and not less than 1.00 m in depth below the invert level of the inlet pipe. The pit may be lined with stone, brick or concrete blocks with dry open joints which should be backed with at least 75 mm of clean coarse aggregate. The lining above the inlet level should be finished with mortar. In the case of pits of large dimensions, the top portion may be narrowed to reduce the size of the RCC cover slabs. Where no lining is used, specially near trees, the entire pit should be filled with loose stones. A masonry ring may be constructed at the top of the pit to prevent damage by flooding of the pit by surface runoff. The inlet pipe may be taken down a depth of 0.90 m from the top as an anti-mosquito measure; and
- h) When the disposal of the septic tank effluent is to a dispersion trench, the dispersion trench shall be 0.50 m to 1.00 m deep and 0.30 m to 1.00 m wide excavated to a slight gradient and shall be provided with 150 mm to 250 mm of washed gravel or crushed stones. Open jointed pipes placed inside the trench shall be made of unglazed earthenware clay or concrete and shall have a minimum internal diameter of 75 mm to 100 mm. Each dispersion trench shall not be longer than 30 m and trenches shall not be placed closer than 1.8 m.

#### 4.15.3 Office-cum-Letter Box Room

In the case of multi-storeyed multi-family dwelling apartments constructed by existing and proposed Cooperative Housing Societies or Apartment Owners Associations, limited companies and proposed societies, an office-cum-letter box room of dimension 3.6 m × 3 m shall be provided on the ground floor. In case the number of flats is more than 20, the maximum size of the office-cum-letter box room shall be 20 m<sup>2</sup>.

#### 4.15.4 Business Buildings

Provision shall be made for letter boxes on the entrance floor as per the requirements of the postal department.

#### 4.16 Meter Rooms

For all buildings above 15 m in height and in special occupancies, like educational, assembly, institutional, industrial, storage, hazardous and mixed occupancies with any of the aforesaid occupancies having area more than 500 m<sup>2</sup> on each floor, provision shall be made for an independent and ventilated meter (service) room, as per requirements of electric (service) supply undertakings on the ground floor with direct access from outside for the purpose of termination of electric supply from the licensee's service and alternative supply cables. The door/doors provided for the service room shall have fire resistance of not less than two hours.

#### 4.17 Staircase/Exit Requirements

**4.17.1** The minimum clear width, minimum tread width and maximum riser of staircases for buildings shall be as given as below (*see also* Part 4 'Fire and Life Safety of NBC 2005).

##### 4.17.2 Minimum width

The minimum width of staircase shall be as follows:

A	Residential buildings (dwellings) NOTE — For row housing with 2 storeys, the min. width of shall be 0.75	1.0 m
B	Residential hotel buildings	1.5 m
C	Assembly buildings like auditoria, theatres and cinemas	2.0 m
D	Educational building	1.5 m
E	Institutional buildings	2.0 m
F	All other buildings	1.5 m

##### 4.17.3 Minimum tread

The minimum width of tread without nosing shall be 250 mm for residential buildings. The minimum width of tread for other buildings shall be 300 mm.

##### 4.17.4 Maximum riser

**4.17.4.1** The maximum height of riser shall be 190 mm for residential buildings and 150 mm for other buildings and these shall be limited to 12 per flight.

**4.17.4.2** The minimum head-room in a passage under the landing of a staircase shall be 2.2 m. The minimum clear head-room in any staircase shall be 2.2 m.

##### 4.17.5 Exit Requirements

All aspects of exit requirements for corridors, doors, stair cases, ramps, etc in respect of widths, travel distance shall be as per Part 4 'Fire and Life Safety' of NBC,2005.

#### 4.18 Roofs

**4.18.1** The roof of a building shall be so designed and constructed as to effectively drain water by means of sufficient rain-water pipes of adequate size, wherever required, so arranged, jointed and fixed as to ensure that the rain-water is carried away from the building without causing dampness in any part of the walls, roof or foundations of the building or an adjacent building.

- 4.18.1.1** The Authority may require rain-water pipes to be connected to a drain or sewer to a covered channel formed beneath the public footpath to connect the rainwater rainwater pipe to the road gutter or in any other approved manner.
- 4.18.1.2** Rain-water pipes shall be affixed to the outside of the external walls of the building or in recesses or chases cut or formed in such external walls or in such other manner as may be approved by the Authority.
- 4.18.1.3** It is desirable to conserve rain water using suitable rain water harvesting techniques including by roof water collection. In this context, reference may be made to Part 9 'Plumbing Services, Section 1 Water Supply, Drainage and Sanitation (Including Solid Waste Management)' of NBC, 2005.

#### **4.19 Special Requirements of Low Income Housing**

Special requirements of low income housing shall be as given in relevant Section of this Model Building Bye-Law. For detailed information in this regard, reference may be made to the accepted standards.

#### **4.20 Special Requirements for Cluster Planning for Housing**

Special requirements for cluster planning for housing shall be as given in relevant sections of the Model Building Bye-Law.

#### **4.21 Group housing**

- a) Building requirement in respect of dwelling units upto 45 sq.mt. in size will correspond to Table 3.3 and as applicable to plots upto 50 sq m.
- b) Building requirement in respect of dwelling units above 45 sq m. may be referred from the Table 3.3 applicable to above 50 sq m. plot size.
- c) Projection into Open Spaces without counting towards FAR.
  - i) All open spaces provided either in interior or exterior shall be kept free from any erections thereon and shall open to the sky. Nothing except cornice, chhajja or weather shade (not more than 0.75 m. wide) shall overhang or project over the said open space so as to reduce the width to less than minimum required.

*Note:* Such projections shall not be allowed at height less than 2.2 m. from the corresponding finished floor level:

- ii) One canopy per block on the ground floor not exceeding 4.5 m. in length and 2.4 m. in width
- iii) Balcony at roof slab level of 1.2 m. width and area not exceeding 3.5 sq m. per bedroom but not exceeding 3 in number per flat.
- iv) Balcony having entrance from the toilet/bathroom and width as 1.2 m. for drying clothes.

#### **4.22 Non-residential buildings**

The minimum area for office room/shop or any other space to be used as workspace shall not be less than 6.0 sq m. with a minimum width of 2.1 m.

## 4.23 Other general requirements

### 4.23.1 Swimming Pool

- 1) *Definition*: A constructed pool or a tank indoor or outside the building, used for the purpose of swimming, bathing, aquatic sports or games, training, treatment (Therapy) or recreation, meant exclusively for human being, having a depth of water not less than that 60 cm. and the surface area exceeding 23.25 sq m. both for the use of public or the institution concerned.
  - i) *“Capacity of Pools in Relation to Bathers”*: The maximum number of persons in bathing attire within the pool enclosures of the bathing area shall not exceed one person per 20 sq ft. (1.86 sq m.) of pool i.e. the area of the water surface.
- 2) *“Hand Rail”*: A side handrail extending up above and returning to the horizontal surface of the pool deck curb or coping shall be provided at each side of each ladder.
- 3) *“Depth Markers”*: Depth of water shall be clearly marked at or above the water surface on the vertical pool wall and on the edge of the deck or walk-way next to the pool, at maximum points and at the points of break between the deep and shallow portions and at intermediate increments of depth, spaced at not more than 2.5” (7.62 cm) intervals. Depth markers, contrasting with background shall be on both sides of the pool.
- 4) *“Lighting and Wiring”*: Where submarine lightning is used, not less than 0.5 watts shall be employed per sq. ft. of pool area.
- 5) *“Area Lightning”*: Where submarine lightning is employed, area lightning shall be provided for the deck areas and directed towards the deck areas and away from the pool surface so far as practicable, in a total capacity of not less than 0.6 watt per sq. ft of deck area.

Where submarine lighting is not provided and night swimming is not permitted combined pool lightning shall be provided in an amount of not less than 2 watts per sq. ft. of total area. All submarine lightning shall be individually earthed and must be water tight and damp proof.

- 6) *“Over Head Wiring”*: No electrical wiring for electrical or power shall be permitted to pass over within 20 feet of the pool enclosure.
- 7) *“Shallow Minimum Depth”*: Every swimming pool shall have a minimum depth in the shallow area of the main swimming area of not less then 0.9 mt. (3 feet), but not more than 1.07mt. (3'-6") from the overflow level to the floor
- 8) *“Shallow Areas”*: In a swimming pool with a diving area, the shallow area of the pool shall be defined as the portion between the shallow end and the break point between the shallow area and the diving area. The slope of the floor shall be uniform from the break point between the diving area and the shallow portion to the outside edge of the shallow portion and shall not be greater than 1 in 2 m.
- 9) *“Vertical Wall Depth”*: The pool walls shall be vertical at all points for a depth of not less than 2 ft 6" (0. 76 m.)

**4.24 Means of access** (including Fire Safety- Ref Chapter 11)

**4.24.1** No Building shall be erected as to deprive any other building of its means of access.

**4.24.2** Every person who erects a building shall not at any time erect or cause or permit to erect or re- erect any building, which in any way encroaches upon or diminishes the area set apart as means of access.

**4.24.3** For buildings identified in clause 11.1 the following provisions of means of access shall be applicable.

- a) The width of the main street on which buildings abut shall not be less than 12.0 m.
- b) If there are any bends or curves in the approach road, sufficient width shall be permitted at the curve to enable the fire tenders to turn, the turning circle shall be at least of 9.0 m. radius.
- c) The approach to the building and open spaces on its all sides (see Building Bye-Laws 4.8 and 4.9) upto 6.0 m. width and the layout for the same shall be done in consultation with the Chief Fire Officer and the same shall be of hard surface capable of taking the weight of fire tender, weighing upto 22 tones for low rise building and 45 tones for building 15 m., and above in height. The said open space shall be kept free of obstructions and shall be motorable.
- d) Main entrance to the premises shall be of adequate width to allow easy access to the fire tender and in no case it shall measure less than 5 m. The entrance gate shall fold back against the compound wall of the premises, thus leaving the exterior access way within the plot free for movement of the fire service vehicles. If archway is provided over the main entrance, the height of the archway shall not be of height less than 5.0 m.
- e) For multi-storeyed group housing schemes on one plot, the approach road shall be 20.0 m. or as per Master Plan/Development Plan provisions and between individual buildings, there shall be 6.0 m. space around.
- f) In case of basement extending beyond the building line, it shall be capable of taking load of 45 tones for a building of height 15.0 m. and above and 22 tones for building height less than 15.0 m.
- g) The external window shall not be blocked by louvres etc. In such case provisions shall be made so that one can enter the building to be rescued through the window by using hydraulic platform etc.

**4.24.4 Number and size of Exits**<sup>4</sup>

The requisite number and size of various exits shall be provided, based on the occupants in each room and floor based on the occupant load, capacity of exits, travel distance and height of buildings as per provisions of Section 4.2 to 4.12 & 6.1 to 6.9 of Part 4- Fire and Life Safety, NBC 2005.

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<sup>4</sup>Types of Exits

- a) Exits shall be either horizontal or vertical type. An exit may be doorway, corridor and passage to an internal staircase or external staircase, ramp to a verandah and/or terraces that have access to the street or to roof of a building. An exit may also include horizontal exit leading to an adjoining building at the same level.
- b) Lifts escalators and revolving doors shall not be considered as exits.

At least one primary entrance to each building shall be usable by individuals in wheelchairs and shall be indicated by a sign

At least one entrance usable by individuals in wheelchairs shall be on a level that would make the elevators accessible.

#### 4.24.5 Arrangement of Exits

- a) Exits shall be so located so that the travel distance on the floor shall not exceed 22.50 m. for residential, educational, institutional and hazardous occupancies and 30.0 m. for assembly, business, mercantile, industrial and storage occupancies. Whenever more than one exit is required for a floor of a building they shall be placed as remote from each other as possible. All the exits shall be accessible from the entire floor area at all floor levels.
- b) The travel distance to an exit from the remote point shall not exceed half the distance as stated above except in the case of institutional occupancy in which case it shall not exceed 6.0 m.

#### 4.24.6 Capacity of Exits

The capacity of exits (staircase, ramps and doorways) indicating the number of persons could be safely evacuated through a unit exit width of 50 cm shall be as given below:

**Table 4.3 Occupants per unit Exit width**

Sl. No.	Group of Occupancy	Number of Occupants		
		Stairways	Ramps	Doors
1	Residential	25	50	75
2	Educational	25	50	75
3	Institutional	25	50	75
4	Assembly	40	50	60
5	Business	50	60	75
6	Mercantile	50	60	75
7	Industrial	50	60	75
8	Storage	50	60	75
9	Hazardous	25	30	40

#### 4.24.7 Minimum Width Provisions for Passageway/Corridors

The following minimum width provisions shall be made for each passage way/corridor.

- a) Residential buildings, dwelling unit type. 1.00 m.
- b) Residential buildings, e.g., hostels, etc. 1.25 m.
- c) Assembly buildings like auditorium theatres and cinemas. 2.00 m.
- d) All other buildings including hotels. 1.50 m.
- e) Hospital, Nursing Homes, etc. 2.40 m.

##### 4.24.7.1 Ramps

- a. The ramp to basement and parking floors shall not be less than 7.2m wide for two way traffic and 4 m wide for one way traffic, provided with Gradient of 1:10 for cars and 1:15 for heavy vehicles. At curved portions of the ramp or for circular ramps the slope should not be more than 1:12.
- b. Ramps may also be provided in the setbacks which can be sloped considering unhindered movement of fire engine and in no case the gradient shall be less than 1:10.

- c. All structural design/safety aspects as per latest BIS Codes & NBC, 2005 shall be complied along with consideration of weight of Fire Engine & its maneuverings.
- d. The minimum width of the ramps in hospitals shall be 2.4 m for stretcher and not for vehicular movement
- e. In this case Handrails shall be provided on both sides of the ramp.
- f. Ramps shall lead directly to outside open space at ground level or courtyards or safe place

### Ramps with Gradients

- a. Where ramps with gradients are necessary or desired, they shall conform to the following requirements.
- b. A ramp when provided should not have a slope greater than 1 in 20 or maximum of 1 in 12 for short distance up to 9 000 mm.
- c. A ramp shall have handrails on at least one side, and preferably two sides, that are 900 mm high, measured from the surface of the ramp, that are smooth, and that extend 300 mm beyond the top and bottom of the ramp. Where major traffic is predominantly children, the handrails should be placed 760 mm high.

### Notes

- i. Where handrails are specified to be of heights other than 80 cm, it is recommended that two sets of handrails be installed to serve all people. Where major traffic is predominantly children, particularly physically disabled children, extra care should be exercised in the placement of handrails, in accordance with the nature of the facility and the age group or groups being serviced
- ii. Care should be taken that the extension of the handrails is not in itself a hazard. Extension up to 300 mm may be made on the side of a continuing wall.
- iii. A ramp shall have a surface that is non-slip surface and if length is 3 500 mm, the minimum width shall be 1 500 mm. greatly assists the challenged persons with semi-ambulatory and ambulatory disabilities. Non-slip surfaces are provided by many finishes and materials. The surfaces of the concrete ramps can be made nonskid by brooming the surface or by finishing with an indenting roller.
- iv. A ramp shall have a level platform at the top which is at least 1 800 mm long, if a door swings out onto the platform or toward the ramp. This platform shall extend at least 300 mm beyond each side of the doorway.
- v. Each ramp shall have at least 1 800 mm of straight clearance at the bottom.
- vi. Ramps shall have level platforms at 10 m to 12 m intervals for purposes of rest and safety, and shall have platforms minimum 1.5 m length wherever they turn.
- vii. For visually impaired people, ramps may be colour contrasted with landing.
- viii. To minimize rise to wheelchair users, ramps should be equipped with kerbs approximately 50 mm high at exposed sides.

### 4.24.7.2 Doorways

- a. Every doorway shall open into an enclosed stairway, a horizontal exit, on a corridor or passageway providing continuous and protected means of egress.
- b. No exit doorways shall be less than 1m in width except assembly and institutional buildings where Doorway shall not be less than 2 m.
- c. Exit doorways shall open outwards, that is away from the room but shall not obstruct the travel along any exit. No door when opened shall reduce the required width of stairway or landing to less than 0.90 m Overhead or sliding door shall not be installed.

*Note: In the case of buildings where there is a central corridor, the doors of rooms shall open inwards to permit smooth flow of traffic in the corridor*



- d. Exit door shall not open immediately upon a flight of stairs. A landing equal to at least, the width of the door shall be provided in the stairway at each doorway. Level of landings shall be the same as that of the floor, which it serves.
- e. Exit doorways shall be openable from the side, which they serve without the use of a key.
- f. Revolving doors shall not to be provided as means of fire exit.
- g. Mirrors shall not be placed in exit ways or exit doors to avoid confusion regarding the direction of exit.

#### **4.25 Provision of exterior open spaces and height limitation around the building**

- 4.25.1** The open spaces / setbacks covered area, FAR shall be as per Master Plan/Zonal Plan requirements as given in the development controls of Master Plan. (Building Bye Laws-Annexure VI)/ NBC, 2005
- 4.25.2** Every room that is intended for human habitation shall abut on an interior or exterior open space or on to a verandah open to such interior or exterior open space.
- 4.25.3** In case of High rise the exterior open spaces around a building as in Building Bye Laws No. shall be of green or hard surface capable of taking load of fire engine weighing up to 45 tonnes.
- 4.25.4** In case, kitchen and toilets do not abut either interior or exterior open spaces, mechanical ventilation would be accepted.
- 4.25.5** Up to 25% of the total setback area can be sunk for light, ventilation and access to basement, provided fire tender movement is not hindered.

#### **4.26 Interior Open Space for Light and Ventilation**

- 4.26.1** The whole or part of one side of one or more rooms intended for human habitation and not abutting on either the front, rear or side open spaces shall abut on an interior open space whose minimum width in all directions shall be 3.0 m in case of buildings not more than 15 m/ 17.5 m (with stilts) in height, and in case of buildings above 15 m/ 17.5 m (with stilts) it shall have mandatory mechanical ventilation in addition.

##### **4.26.2 Sunken Courtyard:**

Sunken courtyard up to 3mt in depth from the ground level as 'light well' within building envelop shall be permitted for light and ventilation for basement area.

##### **4.26.3 Skylight:**

Skylight in interior open space (courtyard) shall be permitted subject to the fact that it may not act as a covered space on the ground floor and does not violate the maximum/ minimum ground coverage rules.

#### **4.27 Joint Open Air Space**

- 4.27.1** Every interior or exterior or air space, unless the latter is a street, shall be maintained for the benefit of such building exclusively and shall be entirely within the owner's own premises.

If such interior or exterior open air space is intended to be used for the benefit of more than one building belonging to the same owner; then the width of such open air space shall be the one specified for the tallest building as specified in clause 4.10.3 and 4.10.4 abutting on such open air space.

**Table 4.4 Provision of Exterior Open Spaces around the Buildings**

Sl. No.	Height of the Building (m.)	Exterior open spaces to be left on all sides in m. (front rear and sides in each plot) As per prescribed set backs
1	10	3
2	15	5
3	18	6
4	21	7
5	24	8
6	27	9
7	30	10
8	35	11
9	40	12
10	45	13
11	50	14
12	55 and above	16

**Note:** On sides where no habitable rooms face, a minimum space of 9.0 m. shall be left for heights above 27.0 m.

- c) In case of multi storeyed buildings the exterior open space around a building shall be of hard surface capable to taking load of fire engine weighting upto 45 tonnes.

#### 4.28 Provision of Podium for parking and landscaping

In case the buildings are to be constructed with stilt floor on individual plot for providing parking space and where basement could not be approached for parking, in such cases a podium may be constructed on ground floor in continuation of the stilt floor having access from the front for the parking after leaving minimum 3m setback from the plot line. The terrace of podium may be used for plantation & landscaping.

For low rise development, the maximum height permitted is 15mts. However where the stilt floor is to be constructed for parking the height may be increased to 17.5 mtr.

#### 4.29 Exemption to Open Spaces/Covered area

The following exemption to open space shall be permitted.

##### 4.29.1 Projections into Open Spaces

- a) Every interior or exterior open space shall be kept, free from any erection thereon and shall be open to the sky. Nothing except cornice, chajja or weather shade (not more than 0.75 m. wide) shall overhang or project over the said open spaces so as to reduce the width to less than the minimum required.

**Note:** Such projections shall not be allowed at a height less than 2.20 m. from the corresponding finished floor level

- b) A canopy or canopies each not exceeding 4.50 m. in length and 2.40 m. in width in the form of cantilever or cantilevers, over the main entrance/entrances, providing a minimum clear height of 2.2 m. below the canopy.

In single storeyed residential building, only one such canopy shall be permitted for each individual detached block. In more than one storeyed residential building, two canopies shall be permitted over ground floor/higher floor entrances.

In buildings of other occupancies, the permissibility of canopy, canopies shall be as decided by the Authority on its merits.

- c) In case of residential building only, a balcony or balconies at roof level of a width of 1.20 m. overhanging in set-backs within one's own land and courtyards provided the minimum area required shall not be reduced by more than 30% of such open spaces.
- d) The projections (cantilever) of cupboards and shelves shall be permitted and are exempted from covered area calculations in case of residential buildings only. Such projection shall be upto 0.75 m. depth provided.
  - i) That no cupboard shall project in the side set back on the ground floor.
  - ii) That outer length of cupboard overhanging in the set-backs shall not exceed 2.0 m. per habitable room. In addition to this, cupboard under the above and windows can be provided.

*Note: Cupboard means a space used for storage of household goods/clothes, having shelves/partitions not more than 1.5 m. apart.*

- iii) Only one pergola on each floor shall be permitted in a residential building if constructed in the exterior open spaces or terrace.

Such pergola shall not exceed 3.50 sq m. in area on which 40% shall be void and shall have a clear height 2.20 m.

**4.29.1.1** In addition to above, the following shall not be included in covered area for FAR calculations.

- a) Machine room for lift on top floor as required for the lift machine installation (see Appendix 'L1' and 'L2').  
*Note: The shaft provided for lift shall be taken for covered area calculations only on one floor.*
- b) Rockery, well and well structures, plant nursery, water pool, swimming pool (if uncovered), platform round a tree, tank, fountain, bench, chabutara with open top and / or unenclosed sides by walls, open ramps, compound wall, gate, slide swing door, uncovered staircase (uncovered and unclosed on three sides except for a 0.90 m. high railing/wall, overhead water tank on top of building/open shafts.
- c) A mumty over staircase on top floor.
- d) Culvert on Municipal drains.

#### **4.29.2 Height Limit**

The Height and number of storeys shall be related to provisions of FAR as given in **Chapter-3** and the provisions of open spaces given in Building Bye-Laws and the following:

- a) The maximum height of building shall not exceed 1.5 times the width of road abutting plus the front open spaces.
- b) If a building abuts on two or more streets of different width, the building shall be deemed to face upon the street that has the greater width and the height of the building shall be regulated by the width of that street. Height shall however, not exceed the maximum height as provided in the Master Plan.
- c) For buildings in the vicinity of the aerodromes the maximum height of such buildings shall be in accordance with regulations of "critical" and "non-critical" zones as identified by the AAI in its Colour-Coded Zoning Maps (CCZM). The

application for Building plan approval shall be processed by the Authority as per the CCZM for 'non-critical' areas.

*Note: The location of slaughter house/butcher house and other areas for activities like depositing of garbage dumps which would attract high flying birds like eagles/hawks etc. shall not be permitted within a radius of 10 km. from aerodrome reference point.*

### 4.29.3 Height Exemptions

The following appurtenant structures shall not be included in the height of building covered under Building Bye-Laws 4.9.7.

Roof tanks and their supports not exceeding 1.0 m. in height,

Ventilating, air conditioning and lift rooms and similar service equipments,

Stair covered with Mumty not exceeding 3.00 m. in height.

Chimneys and parapet wall and architectural features not exceeding 1.50 m. in height, unless the aggregate area of such structures exceeds 1/3 of the roof area of the building on which they are erected. All such appurtenant structures shall be camouflaged to achieve streamlined aesthetics.

### 4.30 Lighting and ventilation of rooms

**4.30.1** Rooms shall have, for the admission of light and air, one or more openings, such as windows and ventilators, opening directly to the external air or into an open VERANDAH.

Lighting and ventilation requirements of all types of buildings shall be designed and approved in accordance with the provisions of the following two IS Codes –

- i. SP 32 (1986): Hand book on Functional Requirements of Industrial Buildings (Lighting and Ventilation) [CED 12:Functional Requirements in Buildings] and
- ii. SP 41 (1987): Hand book on Functional Requirements of Buildings (Other than Industrial Buildings) [CED 12: Functional Requirements in Buildings]

Lighting loads of various spaces of –

- i. Industrial buildings shall be determined as per Clause 1, Section 1 of SP 32 (1986)
- ii. Non-Industrial buildings shall be determined as per Clause 2, Part 4 of SP 41 (1987)

Thermal comfort levels and design requirement of various spaces of –

- i. Industrial buildings shall be determined as per Section 2 of SP 32 (1986)
- ii. Non-Industrial buildings shall be determined as per Part 2 of SP 41 (1987)

Minimum Fresh Air requirement for –

- i. Industrial buildings shall be determined as per Clause 13 of Section 2 of SP 32 (1986)
- ii. Non-Industrial buildings shall be determined as per Clause 4 of Part 3 of SP 41 (1987)

**4.30.1.1** Notwithstanding the area of openings obtained through the minimum aggregate area (see Notes 1 to 3) of such openings, excluding doors inclusive of frames, shall be not less than:

- a) one-tenth of the floor area for dry hot climate;
- b) one-sixth of the floor area for wet hot climate;
- c) one-eighth of the floor area for intermediate climate; and
- d) one-twelfth of the floor area for cold climate.

#### Notes

1. If a window is partly fixed, the openable area shall be counted.
2. No portion of a room shall be assumed to be lighted, if it is more than 7.5 m away from the opening assumed for lighting that portion.
3. The area of openings as given in (a) to (d) above shall be increased by 25 percent in the case of a kitchen.

All habitable rooms shall have for the admission of light and air, one or more apertures, such as window, glazed door and fan lights, opening directly to the external air or into an open verandah not more than 2.40 mt. in width. In case light and ventilation to habitable space area are through an internal courtyard, the minimum dimensions of such courtyard shall not be less than 3.0 m. x 3.0 m. for buildings upto 12.50 m. in height. For buildings with higher heights, the minimum dimensions of the internal courtyard shall be as given in Building Bye-Laws 4.27

Where the lighting and ventilation requirements are not met through day lighting and natural ventilation, the same shall be ensured through artificial lighting and mechanical ventilation as given in part-VII building services Section-1 lighting and Ventilation of National Building Code of India published by the Bureau of Indian Standards. The latest version of the National Building Code of India shall be taken into account at the time of enforcement of the Building Bye-Laws.

**4.30.1.2** Notwithstanding the above, the minimum aggregate area of openings of habitable rooms and kitchens excluding doors shall be not less than 1/10 of the floor area.

**4.30.1.3** No portion of a room shall be assumed to be lighted if it is more than 7.50 m. from the opening assumed for lighting that portion.

#### **4.30.2 Ventilation Shaft**

For ventilating the spaces for water closets and bathrooms, if not opening on the front side, rear and interior open spaces, shall open on the ventilation shaft, the size, of which shall not be less than the values given below:

**Table 4.5 Size of Ventilation Shaft**

Height of Building (m)	Size of ventilation shaft (sq m)	Minimum size of shaft (m)
Upto 10.0	1.2	0.9
Upto 12.0	2.8	1.2
Upto 18.0	4.0	1.5
Upto 24.0	5.4	1.8
Upto 30.0	8.0	2.4
Above 30.0	9.0	3.0

**Notes:**

- i. For buildings above 30.0 m. height, mechanical ventilation system shall be installed besides the provision of minimum ventilation shaft.
- ii. For fully air-conditioned residential buildings for lodging purposes, the ventilation shaft need not be insisted upon, provided the air-conditioning system works in an uninterrupted manner, also, provided there is an alternative source of power supply. However, it is not mandatory in case of buildings where ventilation is mechanized.

### 4.31 Building Services

- 4.31.1** The Planning design and installation of electrical installations, air conditioning installation of lifts and escalators can be carried out in accordance with Part-VIII Building Services, section-2 electrical installation, section-3 air conditioning and heating, section-5 installation of lifts and escalators of National Building Code of India. However deviations from National Building Code may be done as per good Engineering practices.
- 4.31.2** The number and type of lifts to be provided in different buildings shall be as given in Appendix-‘D’ & ‘D-1’.
- 4.31.3** The requirements of electric sub-station are given in Appendix-‘D2’. The provision of electric sub-station shall also require approval from Electricity Board concerned.

### 4.32 Plumbing and Sanitary Services

- 4.32.1** The planning, design, construction and installation of water supply, drainage and sanitation and gas supply system shall be in accordance with Part-9: Plumbing Services, Section-1 Water supply, Drainage and sanitation (including Solid Waste Management) and Section-2 Gas supply of NBC, 2005.
- 4.32.2** Requirement of water supply for various occupancies in buildings shall be as given in Table 4.6, 4.7, and 4.8.
- 4.32.3** Requirement of sanitary fittings and installations for different occupancies in buildings shall be as given in Table 4.9 to 4.22 for calculation of occupancy.
- 4.32.4** Sewage treatment plant of capacity of treating 100% waste water to be installed. (Ref Table 14)

### 4.33 Segregated sanitation for Visitors in Public Buildings

- 4.33.1** Special requirement of segregated sanitation for Visitors in Public Buildings (Government Buildings, Hospitals, Educational Institutions, Commercial Building etc). Provisions and occupancies shall be referred at Table 4.15

\*\* This section is provided for *Segregated toilet facilities for visitors in Public Buildings (within the premises of the building, but outside the building block)*.

Public toilets are meant for floating population, usually located near railway stations, bus stands, market places, government hospitals, religious centers etc. These toilets have a greater demand for urinals than community toilets.

The key considerations for siting such facilities on the site are-

- i. Size of the toilet block (i.e. number of seats) and
- ii. Location of the toilet block with respect to the main building block.
- iii. Convenience of the visitors in accessing and using the facility.

**4.33.2** Surveys conducted by the central government show that people, especially women and aged, are unlikely to use the facility if it beyond 500 meters. The preferable location shall be within 200-500 mt from the main entry of the building.

**4.33.3** The site shall be earmarked on Site Plan or a Layout plan. The Authority shall clearly state advantages and disadvantages of the location for the owner/ engaged Competent Professional for building plan design (as per Appendix 'E') to make an informed decision on the siting.

**4.33.4** It must be accessible to visitors and general public during the operational hours of the building. However, fiscal generation for maintenance may be planned w.r.t user charges from visitors and general public.

(Experience in sample cities has shown that toilet blocks are more likely to remain clean if they are centrally located; those on periphery sooner fall into disrepair.)

**4.33.5 Other factors to be considered:**

**a) Wastewater conveyance/treatment and prevention of contamination-**

Since sewers may not be available in many cities, in most cases the toilet blocks will have on-site sanitation, which would require periodic cleaning of tanks / pits. Location on site should allow easy and hygienic emptying of the pits / tanks and ensure that ground water table is not contaminated by wastewater percolation.

**b) Adequacy in provision-**

The size of the block (i.e. on number of seats) must meet visitors' need. Inadequacy results in long queues and encourages open urination. Care is to be taken for *balancing problems and other special needs* of children and the elderly.

**c) Design considerations-**

- i. Adequate Ventilation.
- ii. Door Design / Direction of swing of the door (preferred outwards),
- iii. Adequate Waiting area and
- iv. Adequate volumes of water storage.

**d) The facilities should include:**

- i. Separate toilet blocks for men and women with separate entries.
- ii. Seats for children to be provided in both sections for men and women.
- iii. Waiting / Holding area.
- iv. Space for Facility caretaker and maintenance staff – from where they can monitor and maintain both facilities for men and women.
- v. Urinal facilities for men
- vi. Waste water disposal system
- vii. Janitor / Store room for cleaning material / equipments.

*Note: Table 4.17 may be referred for number of seats / urinals for this section.*

**4.33.6 Norms for differently-abled within segregated toilets:**

- i. One special W.C. in a set of toilet shall be provided for the use of differently abled persons, with essential provision of wash basin near the entrance.
- ii. Minimum clear opening of the door shall be 900 mm. and the door shall swing out.
- iii. Suitable arrangement of vertical/horizontal handrails with 50 mm. clearance from wall shall be made in the toilet.
- iv. The W.C. seat shall be 500 mm. from the floor.

#### 4.33.7 Water requirement and facilities:

Water requirement for the facility may be worked out and enough storage for ½ day operation is to be kept in storage. If municipal water supply is reliable, the toilet blocks may have underground sump that can store half a day's requirement and overhead tanks for another half. If municipal water supply is not available, toilet block may have its own bore well and pump with no underground sump. Alternatively a hand tube well can be used for storing water in an elevated (not overhead) tank. To minimize the wastage of water, self-closing water taps should be used.

The pans must be of Pour Flush (PF) design i.e. with a steep slope. Traps should be of a 20 mm water seal. (Use of 50 mm water seal traps will require more water for flushing.) If toilet is to be linked to city sewer, a master trap has to be provided at the sewer connection.

Urinals may not be fitted with urinal pots as their replacement is expensive.

*\*\* The proposed norms are based on Guidelines on Community & Public toilets Government of Odisha Housing and Guidelines for Community Toilets, 1995; Ministry of Urban Affairs & Employment (However, they shall be further refined, once comments and suggestions are received from the State Governments after the circulation of Draft Model Building Bye-laws 2014).*

**Table 4.6 Per Capita water requirement for various Occupancies/Uses**

Sl. No.	Type of Occupancy	Consumption per head per day (in lt.)
1.	Residential a) In living units b) Hostels c) Hotels with lodging accommodation (per bed) d) Hotels (5 star and above)	135 135 180 340
2.	Educational a) Day schools b) Boarding Schools	45 135
3.	Institutional (Medical Hospitals) a) No. of beds not exceeding 100 b) No. of beds exceeding 100 c) Medical quarters and hostels	340 450 135
4.	Assembly- Cinema theatres, auditoria, etc. (per seat accommodation)	15
5.	Government or Semi public business	45
6.	Segregated toilet facilities for Visitors in Public Buildings a) Each use of toilet (including washing hands and floors) b) Flushing urinals	7 0.20
7.	Mercantile (Commercial) a) Restaurants (per seat) b) Other business building	70 45
8.	Industrial a) Factories where bath-rooms are to be provided b) Factories where bath-rooms are not to be provided	45 30
9.	Storage ( including Warehouses )	30
10.	Hazardous	30
11.	Intermediate Stations (excluding mail and express stops).	45 (25)*
12.	Junction Station	70 (45)*
13.	Terminal Stations	45
14.	International and Domestic Airports	70



\* The values in parenthesis are for such stations, where bathing facilities are not provided.

**Note:** The number of persons for Sl. No. 11 to 14 shall be determined by the average number of passenger handled by the station daily with due consideration given to the staff and workers likely to use the facilities.

**Table 4.7 Flushing Storage Capacities**

Sl. No.	Classification of Building	Storage Capacity
1.	For tenements having common convenience	900 lt. net per w.c. seat
2.	For residential premises other than tenement having common conveniences	270 lt. net for one w.c. seat each and 180 lt. for each additional seat in the same flat.
3.	For factories and workshops	900 lt. per w.c. seat and 180 lt. per urinal.
4.	For cinemas, public assembly hall, etc.	900 lt. per w.c. seat and 350 lt. per urinal.

**Table 4.8 Domestic Storage Capacities**

Sl. No.	No. of Floors	Storage Capacity	Remarks
For premise occupied tenements with common conveniences:			
1.	Ground floor	Nil	Provided down take fittings are installed
2.	Floors 2, 3,4, 5 and upper floors	500 litre per tenement	
For premises occupied as flats or blocks			
1.	Ground floor	Nil	Provided down take fittings are installed
2.	Floors 2, 3, 4, 5 and upper floors	500 litre per tenement	

**Note:** 1. If the premises are situated at a place higher than the road level in front of the premises, storage at ground level shall be provided on the same lines as on floors.

2. The above storage may be permitted to be installed provided that the total domestic storage calculated on the above basis is not less than the storage calculated on the number of down take fittings according to scale given below:

Down take taps	70 l. each
Showers	135 l. each
Bathtubs	200 l. each

**Table 4.9 Sanitation requirements for Shops and Commercial Offices**

Sl. No.	Sanitary Unit / Fittings	For Personnel
1.	Water closet	One for every 25 persons or part thereof exceeding 15 (including employees and customers). For female personnel 1 for every 15 persons or part thereof exceeding 10.
2.	Drinking Water Fountain	One for every 100 person with a minimum of one on each floor.
3.	Wash Basin	One for every 25 persons or part thereof.
4.	Urinals	Same as Sl. No. 3 of Table 4.14
5.	Cleaners' Sink	One per floor minimum, preferably in or adjacent to sanitary rooms.

**Note:** Number of customers for the purpose of the above calculation shall be the average number of persons in the premises for a time interval of one hour during the peak period. For male-female calculation a ratio of 1: 1 may be assumed.

**Table 4.10 Sanitary Requirements for Hotels**

Sl. No.	Sanitary Unit	For Residential Public staff	For non residential Staff	
			For male	For female
1.	Water Closet (W.C.)	One per 8 Persons omitting occupants of the attached water closet minimum of 2 if both sexes are lodged	1 for 1-15 persons 2 for 16-35 persons 3 for 36-65 persons 4 for 66-100 persons	2 for 1-12 persons 4 for 13-25 persons 6 for 26-40 persons 8 for 41-57 persons 10 for 58-77 persons 12 for 78-100 persons Add 1 for every 6 persons or part thereof.
2.	Ablution Taps	One in each W.C.	One in each W.C.	One in each W.C.
3.	Urinals	Nil	Nil upto 6 persons 1 for 7-20 persons 2 for 21-45 persons 3 for 40-70 persons 4 for 71-100 persons	Nil
4.	Wash Basins	One per 10 persons omitting each basin installed in the room / suite	1 for 15 persons 2 for 16-35 persons 3 for 36-65 persons 4 for 66-100 persons	1 for 1-12 2 for 13-25 3 for 26-40 4 for 41-57
5.	Baths	One per 10 persons, less occupants of room with bath in suite	Nil	Nil
6.	Cleaner's Sinks	One per 30 Bed rooms (one per floor minimum)	Nil	Nil
7.	Kitchen Sink	One in each Kitchen	One in each Kitchen	One in each Kitchen

**Table 4.10 contd: For Public Rooms**

Sl.No	Sanitary Unit	For Male	For Female
1.	Water Closet	One per 100 persons upto 400 persons; for over 400 add at the rate of one per 250 persons or part thereof.	Two for 100 persons upto 200 persons; over 200 add at the rate of one per 100 persons or part thereof.
2.	Ablution Taps	One in each W.C.	One in each W.C.
3.	Urinals	One for 50 persons or part thereof.	Nil, upto 6 persons 1 for 7-20 persons 2 for 21-45 persons 3 for 46-70 persons 4 for 71-100 persons
4.	Washbasins	One per WC/Urinal	One per WC
5.	Kitchen Sink	One in each Kitchen	One in each Kitchen
6.	Baths (showers)	One per 10 persons	
7.	Cleaner's Sinks	One per 30 Bed rooms (one per floor minimum)	

- Note:**
- It may be assumed that the two-thirds of the number are males and one-third females.
  - One water tap with drainage arrangements shall be provided for every 50 persons or part thereof in the vicinity of water closet and urinals.

**Table 4.11 Sanitation Requirements for Educational Occupancy**

Sl. No.	Sanitary Unit	Boarding Institution		Other Educational Institution	
		For Boys	For Girls	For Boys	For Girls
1.	Water Closet (W.C.)	One for 8 boys or part thereof	One for 6 girls or part thereof	One for 40 boys or part thereof	One for 25 girls or part thereof
2.	Ablution Taps	One in each W.C.	One in each W.C.	One in each W.C.	One in each W.C.
3.	Urinals	One per every 25 pupils or part thereof	--	One per every 20 pupils or part thereof	--
4.	Wash Basins	One for every 8 pupils or part thereof	One for every 6 pupils or part thereof	One for every 60 pupils or part thereof	One for every 40 pupils or part thereof
5.	Baths	One for every 8 pupils or part thereof	One for every 6 pupils or part thereof	--	--
6.	Drinking Water Fountains	One for every 50 pupils or part thereof	One for every 50 pupils or part thereof	One for every 50 pupils or part thereof	One for every 50 pupils or part thereof
7.	Cleaner's Sink	One per Floor minimum	One per Floor minimum	One per Floor minimum	One per Floor minimum

**Table 4.11 Contd: Nursery Schools**

Sl. No.	Sanitary Unit	Requirement
1.	Water Closet	One for 15 boys, one for 6 girls
2.	Ablution Taps	One in each W.C.
3.	Urinals	One for 12 boys
4.	Wash Basins	One for every 15 pupils or part thereof
5.	Baths	One bath per 40 pupils
6.	Drinking Water Fountains	One for every 50 pupils or part thereof
7.	Cleaner's Sink	One per Floor minimum

**Note:**

1. One water tap with draining arrangements shall be provided for every 50 persons or part thereof, in the vicinity of water closets and urinal.
2. For teaching staff, the schedule of sanitary units to be provided shall be the same as in case of office buildings (Table 5.10).

**Table 4.12 Sanitation Requirements for Institutional (Medical) Occupancy- Hospital**

Sl. No.	Sanitary Unit	Hospitals With indoor Patient Ward For Males & females	Hospitals With outdoor Patient Wards	
			For Males	For Females
1.	Toilet Suite (1WC+1Washbasin+ 1shower)	Private room upto 4 persons	For upto 4 patients	
2.	Water Closet (W.C.)	One for every 8 beds or part thereof	One for every 100 persons or part thereof	One for every 25 persons or part thereof
3.	Ablution taps	One in each W.C.	One in each W.C.	One in each W.C.
4.	Wash Basins	Two upto 30 bed; add one for every additional 30 beds; or part thereof	One for every 100 persons or part thereof	One for every 25 persons or part thereof.
5.	Baths with Shower	One bath with shower for every 8 beds or part thereof.	--	--
6.	Bed pan washing sink	One for each ward	--	--
7.	Cleaner' Sinks	One for each ward	One per floor minimum	One per floor minimum
8.	Kitchen sinks & dish Washers (where Kitchen is provided)	One for each ward	--	--
9.	Urinals	One for 30 beds (male wards)	One for every 50 persons or part thereof	--
10.	Drinking water fountain	One for each ward	One for 500 persons or part thereof	

**Table 4.12 contd. Administrative Buildings**

Sl. No.	Sanitary Unit	For Males	For Females
1.	Toilet Suite (1WC+1Washbasin+ 1shower)	For individual doctor's/officer's rooms	
2.	Water Closet (W.C.)	One for every 25 persons or part thereof	Two for every 25 persons or part thereof
3.	Ablution Taps	One in each W.C.	One in each W.C.
4.	Wash Basins	One for every 25 persons or part thereof	One for every 25 persons or part thereof
5.	Baths with Shower	One on each floor	One on each floor
6.	Cleaner's Sink	One per floor minimum	One per floor minimum
7.	Kitchen sinks & dish Washers (where Kitchen is provided)	One for each floor	One for each floor
8.		Nil upto 6 persons 1 for 7-20 persons 2 for 21-45 persons 3 for 46-70 persons 4 for 71-100 persons From 101 to 200 persons add at the rate of 3%; for over 200 persons add at the rate of 2.5%.	--
9.	Drinking water fountain	One for 100 persons or part thereof	

**Table 4.13 Sanitation Requirements for Institutional (Medical) Occupancy- (staff quarters and Hostels)**

Sl. No.	Sanitary Unit	Doctor's Dormitories		Nurses Hostel
		For Male Staff	For female staff	
1.	Water Closet	One for 4 persons	One for 2 persons	One for 2 persons or part thereof Two for 13-25
2.	Ablution Taps	One in each W.C.	One in each W.C.	One in each W.C.
3.	Wash Basins	One for every 8 persons or part thereof	One for every 8 persons or part thereof	One for every 8 persons or part thereof
4.	Bath (with shower)	One for every 4 persons or part thereof	One for every 4 persons or part thereof	One for every 4 persons or part thereof
5.	Cleaner's Sink	One per floor minimum	One per floor minimum	One per floor minimum
6.	Drinking water fountain	One for 100 persons or part thereof		One for 100 persons or part thereof

**Table 4.14 Sanitation Requirements for Governmental and Public Business Occupancy and Offices**

Sl. No.	Sanitary Unit	For Male Personnel	For female Personnel
1.	Water Closet (W.C.)	One for 25 persons or part thereof	Two for 15 persons or part thereof
2.	Ablution taps	One in each W.C.	One in each W.C.
3.	Urinals	Nil upto 6 persons 1 for 7-20 persons 2 for 21-45 persons 3 for 46-70 persons 4 for 71-100 persons From 101 to 200 add @ 3%; For over 200 persons add @ 2.5%.	--
4.	Wash Basins	One for every 25 persons or part thereof	One for every 25 persons or part thereof
5.	Drinking water fountains	One for every 100 persons with a minimum of one on each floor	One for every 100 persons with a minimum of 1 on each floor
6.	Cleaner's Sinks	One per floor minimum; preferably in or adjacent to sanitary rooms.	--
7.	Executive Room / Conference Halls	Toilet Suite (1 WC, 1 washbasin, optional shower for 24 hr usages) Unit could be common for Male/Female or separate depending on the number of user of each facility	

*Note:* One water tap with drainage arrangements shall be provided / 50 persons or part thereof in the vicinity.

**Table 4.15 Segregated sanitation facilities for Visitors in Public Buildings**

S. No	Sanitary Unit	For Male Personnel	For Female Personnel
1.	Public toilet near Railway Stations (24x7) a) Water Closet(W.C) b) Urinals c) Ablution taps	a) One for 100 users b) One unit per 300-500 users c) One in each W.C.	a) One for 50 users b) -- c) One in each W.C.
2.	Public Toilet near market place/offices (for working hours) a) Water Closet b) Urinals c) Ablution taps	a) One for 100 users b) One unit per 200-300 users c) One in each W.C.	a) One for 50 users b) -- c) One in each W.C.
3.	Public toilets near Public Buildings a) Water Closet b) Urinals c) Ablution taps	a) One for 100 users b) One unit per 200-300 users c) One in each W.C.	a) One for 50 users b) -- c) One in each W.C.

*Per Capita Volume of Water required may be referred at item 6, Table 4.6*

*Area and sizes of seats/units may be referred at Table 4.16*

**Table 4.16 The recommended enclosure-sizes for different facilities at visitors' toilets**

Sl. No.	Description	Optimum (mm)	Minimum (mm)*
1.	Water Closet enclosures	900x1200	750x900
2.	Urinals (divided by partition walls)	575x675	500x600

\*In case of space constraint, the minimum sizes may be adopted

**Table 4.17 The recommended areas for different facilities at visitors' toilets**

Sl. No.	Sanitary Unit	Dwelling with individual conveniences	Dwelling without individual conveniences
1.	Bath Room	One provided with water tap	One for every two tenement
2.	Water Closet (W.C.)	One	One for every two tenement
3.	Sink (or Nahani) in the Floor	One	--
4.	Water Tap	One	One with drainage arrangement in each tenement One in common bath rooms and common water closet.

**Note:** Where only one water closet is provided in a dwelling, the bath and water closet shall be separately accommodated.

**Table 4.18 Sanitation Requirements for Assembly Occupancy Buildings (Cinema, Theaters, Auditoria, Etc.)**

Sl. No.	Sanitary Unit	For Public		For Staff	
		Male	Female	Male	Female
1	Water Closet	One for 100 persons upto 400 persons. For over 400 persons, add at the rate of 1 per 250 persons or part thereof	Four for 100 persons upto 200 persons. For over 200 persons add at the rate of 1 per 50 persons or part thereof	One for 15 persons. Two for 16-35 persons	Two for 1-12 persons. Four for 13-25 persons add at the rate of 1 per 6 persons or part thereof
2	Ablution Taps	One in each W.C.	One in each W.C.	One in each W.C	One in each W.C
3	Urinals	One for 50 persons or part thereof	--	Nil upto 6 persons One for 7-20 persons Two for 21-45 persons	--
4	Wash Basins	One for every 200 persons or part thereof	One for every 200 persons or part thereof	One for 1-15 persons Two for 16-35	One for 1-12 persons Two for 13-25 persons
5	Drinking Water Fountain	One per 100 persons or part thereof			
6	Cleaner's sink	One per floor			
7	Shower/Bathing	As per trade requirements			

**Note:** i) One water tap with draining arrangements shall be provided for every 50 persons or part thereof in the vicinity of water closets and urinals.  
ii) It may be assumed that two thirds of the number is males and one third females.

**Table 4.19 Sanitation Requirements for Assembly Buildings (Art, Galleries, Libraries and Museums)**

Sl. No.	Sanitary Unit	For Public		For Staff	
		Male	Female	Male	Female
1	Water Closet (W.C.)	One for 200 persons upto 400 persons. For over 400 persons, add at the rate of 1 per 250 persons or part thereof	Four for 100 persons upto 200 persons. For over 200 persons, add at the rate of 1 per 50 persons or part thereof	One for 1-15 persons. Two for 16-35 persons.	Two for 1-12 persons. Four for 13-25 persons, add at the rate of 1 per 6 persons.
2	Ablution Taps	One in each W.C.	One in each W.C.	One in each W.C	One in each W.C
3	Urinals	One for 50 persons or part thereof	--	Nil upto 6 persons One for 7-20 persons Two for 21-45 persons	--
4	Wash Basins	One for every 200 persons or part thereof. For over 400 persons, add at the rate of 1 per 250 persons or part thereof.	One for every 200 persons or part thereof. For over 200 persons, add at the rate of 1 per 150 persons or part thereof	One for 1-15 persons Two for 16-35	One for 1-12 persons Two for 13-25 persons
5	Cleaner's Sink	One per floor, minimum			
6	Drinking Water Fountain	One per 100 persons or part thereof			
7	Shower/Bath	As per trade requirements			

*Note: It may be assumed that two thirds of the numbers are males and one third females.*

**Table 4.20 Sanitation Requirements for Restaurants**

Sl. No.	Sanitary Unit	For Public		For Staff	
		Male	Female	Male	Female
1.	Water Closet (W.C.)	One per 50 seats upto 200 seats. For over 200 seats, add at the rate of 1 per 100 seats or part thereof	One per 25 seats upto 200 seats. For over 200 seats, add at the rate of 1 per 50 seats or part thereof	1 for 15 persons. 2 for 16-35 persons. 3 for 36-65 persons. 4 for 66-100 persons.	2 per 1-12 persons. 4 for 13-25 persons. 6 for 26-40 persons. 8 for 41-57 persons. 10 for 58-77 persons. 12 for 78-100 persons.
2.	Ablution Taps	One in each W.C.	One in each W.C.	One in each W.C.	One in each W.C.
3.	Urinals	One for 50 persons or part thereof	--	Nil upto 6 persons. 1 for 7-20 persons. 2 for 21-45 persons. 3 for 46-70 persons. 4 for 71-100 persons.	--
4.	Wash Basins	One for every water closet			
5.	Kitchen Sinks & Dish Washer	One per each Kitchen			
6.	Service Sink	One in the restaurant			

**Note:**

- i) *It may be assumed that two thirds of the numbers are males and one-third females.*
- ii) *One water tap with draining arrangements shall be provided for every 50 persons or part thereof in the vicinity of water closets and urinal.*

**Table 4.21 Sanitation Requirements for Factories**

Sl. No.	Sanitary Unit	For Male Personnel	For female Personnel
1.	Water Closet	1 for 15 persons 2 for 16-35 persons 3 for 36-65 persons. 4 for 66-100 persons. For 101 to 200 persons add at rate of 3%. From over 200 persons, add at the rate of 2.5%.	2 for 1-12 persons 4 for 13-25 persons. 6 for 26-40 persons. 8 for 41-57 persons. 10 for 58-77 persons. 12 for 78-100 persons. For 101 to 200 persons, add at the rate of 3%. From over 200 persons add at the rate of 2%.
2.	Ablution Taps	One in each W.C	One in each W.C.
3.	Urinals	Nil upto 6 persons 1 for 7-20 persons 2 for 21-45 persons 3 for 46-70 persons 4 for 71-100 persons From 101 to 200 persons add at the rate of 3%; for over 200 persons add at the rate of 2.5%.	--
4.	Washing Taps with draining arrangement	One for every 25 persons or part thereof	
5.	Drinking Water Fountains	One for every 100 persons with a minimum of one on each floor	
6.	Baths Preferably Showers	As required for particular trade or occupation	
7.	Emergency shower and eye wash fountain	1 per every shop floor per 500 person	

**Note:**

- i) For many trades of a dirty or dangerous character, more extensive provisions are required.
- ii) One water tap with draining arrangement shall be provided for every 50 persons or part thereof in the vicinity of water closet and urinal
- iii) Creche where provided shall be fitted with water closets (One for 10 persons or part thereof), wash basins (1 for 15 persons or part thereof) and drinking water tap with drinking arrangement for every 50 persons or part thereof



**Table 4.22 Sanitary Requirements for Large Stations and Airports**

Sl. No.	Place	W.C. for Males	W.C. for Females	Urinals for Males only
1.	Junction Stations, Intermediate Stations and Substations	3 for first 1000 persons, add 1 for subsequent 1000 persons or part thereof.	8 for first 1000 persons, add 1 for every additional 1000 persons or part thereof.	4 for every 1000 person, add 1 for every additional 1000 persons or part thereof.
2.	Terminal Stations and Bus Terminals	4 for first 1000 persons and 1 for every additional 1000 persons or part thereof.	10 for every 1000 person and 1 for every additional 1000 persons or part thereof.	6 for every 1000 person and 1 for every additional 1000 persons or part thereof.
3.	Domestic Airports Minimum. For 200 persons For 400 persons For 600 persons For 800 persons For 1000 persons	2* 5 9 12 16 18	4* 16 30 40 52 58	1 per 40 persons or part thereof.
4.	International Airports For 200 persons For 600 persons For 1000 persons	6 12 18	20 40 58	1 per 40 persons or part thereof.

**Note:**

i) Provision for wash basins, baths including shower stalls, shall be in accordance with part ix section 2- Drainage and Sanitation of National Building Code of India.

\* At least one Indian style water closet shall be provided in each toilet. Assume 60 % males and 40 % females in any area.

\* At least 50 % of female WCs may be Indian pan and 50% EWC.

**Table 4.23 General Standards/Guidelines for Public Toilets in Public Area**

Public Toilet	On roads and for open areas: At every 1 km, including in parks, plaza, open air theatre, swimming area, car parks, fuel stations. Toilets shall be disabled-friendly and in 50-50 ratio (M/F). Provision may be made as for Public Rooms (Table 4.10 Contd)
Signage	Signboards on main streets shall give directions and mention the distance to reach the nearest public convenience. Toilets shall have multi-lingual signage for the convenience of visitors. Helpline number shall be pasted on all toilets for complaints/queries.
Modes	Pay and use or free. In pay and use toilets entry is allowed on payment to the attendant or by inserting coin and user gets 15 minutes.
Maintenance/ Cleaning	The toilet should have both men and women attendants. Alternatively automatic cleaning cycle covering flush, toilet bowl, seat, hand wash basin, disinfecting of floor and complete drying after each use can be adopted, which takes 40 seconds. Public toilet shall be open 24 hours.

**4.34 Construction Site**

- At construction job sites, one toilet must be provided per 20 employees. In a work zone with between 21 and 199 employees, a toilet seat and one urinal must be provided for every 40 employees. For 200 or more workers, regulations call for a toilet seat and a urinal per 50 workers. The toilet must be located within 200 m or 5 minute walk.
- Job sites that are not equipped with a sanitary sewer must, unless prohibited by local codes, provide privies, in locations where their use will not contaminate either ground or surface water. Other alternatives to a privy could be chemical toilets, re-circulating toilets, or combustion toilets.
- Toilets should be cleaned regularly and maintained in good order, running water, must be provided along with soap and individual hand towels.

### 4.35 Temporary Camp Toilets

Toilet facilities shall be provided within 60 m of the, site, which shall not be closer than 15 m of dining area or kitchen. Make sure that toilet area is cleaned at least once per day, it is sanitary, adequately lighted and is employee safe.

### 4.36 Special / Contingency Toilets

A) For *Special events* like open air theater, religious/political gatherings, mela, etc. for which there are no permanent toilet facilities, contingency toilets/PSUs shall be provided. The following considerations shall determine the number of toilets to be provided for particular event:

- i) Duration of the event
- ii) Type of crowd
- iii) Weather conditions
- iv) Whether finishing times are staggered if the event has multi-functions and the following guidelines shall be applied with minimum 50 percent female toilets.

**Table 4.24 Contingency Toilet facilities for Special Events**

Sl.No.	Patrons	For Males			For Females	
		Toilets	Urinals	Sinks	Toilets	Sinks
1.	<500	1	2	2	6	2
2.	<1000	2	4	4	9	4
3.	<2000	4	8	6	12	6
4.	<3000	6	15	10	18	10
5.	<5000	8	25	17	30	17

Source: i) FEMA "Special Events Contingency Planning", Toilets Page 39  
 ii) Jain. AK, "Spatio Economic Development Record", Clauses 5.16-5.20  
 iii) "Public Toilets for Women in India", Volume 18 No 5, September-October, 2011

B) *Special Purpose* Toilets: *Special toilet facilities* shall be adequately provided in public projects (transport terminals/ healthcare and other public spaces) in million plus cities for the *Third gender* with appropriate cleanliness arrangements.

### 4.37 General guidance for water supply arrangements

1. *For new construction*: Provision shall be made for underground tank for the storage of water, having capacity at 200 l. per person with adequate pumping arrangements to supply water to upper floors. Filtered water connection will be allowed only for use of drinking and bathing needs. For other purposes i.e. flushing and gardening etc., the individual shall be required to have own arrangements of tube well water within the premises. While according sanction to Layout Plan, the Authority shall make a special mention that provision for space shall be kept for the construction of underground reservoir of adequate capacity along with booster pumping station.
2. Arrangements as given in 1 above shall also be provided in Group Housing Societies.
3. The plumbing arrangement in case of new constructions shall be made in a way that the potable water shall be used for drinking, cooking & bathing only and for rest of the uses, provision for ground water can be made with dual piping system.
4. Low capacity cistern should preferably be provided instead of normal 12.5 L capacity.
5. Provisions for sustainable methods of Water and Wastewater management, and Water harvesting may be referred from Section 9.2 in the Bye-Laws.

## 5. PROVISIONS FOR HIGH RISE DEVELOPMENT

### 5.1 High Rise

Buildings higher than 15m of height without stilts and above 17.5m of height with stilts shall be considered as high rise building.

*Note: These provisions shall be in addition to the Chapter 3 for plan sanction procedure, general building requirements (low/high) given in Chapter 4 of this document and structural safety given in Chapter 6.*

#### 5.1.1 Plot Area

Plots to be used for high rise development should be located in an approved Layout plan, Comprehensive plans or sub division plans as prepared and approved by competent authorities/ as per policy of the Government of India / State Governments.

#### 5.1.2 Means of access

- a. A building shall abut on a street or streets or upon spaces directly connected from the street by a hard surface approach road, width of approach road is not less than 9 meters,
- b. If there are any bends or curves on the approach road, a sufficient width shall be provided at the curve to enable the fire appliances to turn, the turning circle being at least of 9.0 m radius. Where entry to the plot is through a slip road the gate width shall not be less than 6 m for entry of the firefighting appliance.
- c. The approach road to the building and open spaces on its all sides up to 6 m width and the layout for the same shall be done in consultation with Chief Fire Officer, Fire Service and the same shall be reinforced to ensure safety of the fire equipment and capable of taking the weight of Fire engine, weighing up to 45 tonnes) The said open space shall be kept free of obstructions and shall be motorable.
- d. Main entrances to the premises shall be of adequate width to allow easy access to the fire engine and in no case it shall measure less than 6 m. The entrance gate shall fold back against the compound wall of the premises, thus leaving the exterior access way within the plot free for movement of fire service vehicles. If archway is provided over the main entrance the height of the archway shall not be at a height less than 5m.
- e. For multistoried group housing schemes on one plot, the approach road to the site shall be minimum 18 m in width.

### 5.2 Peripheral Open Spaces including set backs

There shall be a space of 6 m all around up to 40m height and after that a space of 9m all around should be provided

### 5.3 Parking Spaces

- a. The parking spaces shall be provided as per the provisions of Master Plan or Zonal plan as prevalent. The location of parking spaces shall be well ventilated.
- b. In case of high-rise buildings parking will be permitted at any / all of the following:
  - i. Basements
  - ii. Stilts
  - iii. Podium
- c. Stacked/ Multi-level/ Automated parking is also permitted.

## 5.4 Building components

### 5.4.1 Doorways

- a. Every doorway shall open into an enclosed stairway, a horizontal exit, on a corridor or passageway providing continuous and protected means of egress.
- b. No exit doorway shall be less than 1m in width. Doorways shall be not less than 2 m in height. Doorways for bathrooms, water closet, stores etc. shall be not less than 0.75m wide.
- c. Exit doorways shall open outwards, that is, away from the room but shall not obstruct the travel along any exit. No door, when opened, shall reduce the required width of stairway or landing to less than 0.9m, overhead or sliding doors shall not be installed.
- d. Exit door shall not open immediately upon a flight or stairs, a landing equal to at least the width of the door shall be provided in the stairway at each doorway, level of landing shall be the same as that of the floor which it serves.
- e. Exit doorways shall be openable from the side which they serve without the use of a key.
- f. Mirrors shall not be placed in exit ways or exit doors to avoid confusion regarding the direction of exit.

### 5.4.2 Revolving Doors

Revolving door shall not be provided as a means of fire exit.

### 5.4.3 Stairways

- a. A staircase shall not be arranged round a lift shaft.
- b. The staircase shall be ventilated to the atmosphere at each landing and a vent at the top; the vent openings shall be of 0.5 sq.m in the external wall and the top. If the staircase cannot be ventilated, because of location or other reasons, a positive pressure 50 Pa shall be maintained inside. The mechanism for pressurizing the staircase shall operate automatically with the fire alarm. The roof of the shaft shall be 1 m above the surrounding roof. Glazing or glass bricks if used in staircase, shall have fire resistance rating of minimum 2 hour.
- c. The minimum width of staircase shall be as table given below:

**Table 5.1 Minimum width of staircase for different types of buildings**

Types of Building	Width
Residential buildings (dwellings)	1.0m
Residential hotel buildings	1.5m
Assembly buildings like auditorium, theatres and cinemas	2.0m
Educational buildings up to 30 m in height	1.5m
Institutional buildings like hospitals	2.0m
All other buildings	1.5m

- d. The minimum width of treads without nosing shall be 0.25m for staircase for residential buildings. In the case of other buildings the minimum tread shall be 0.3m. The treads shall be constructed and maintained in a manner to prevent slipping. The maximum height of riser shall be 0.19m in the case of residential buildings and 0.15m in the case of other buildings and shall be limited to 15 risers per flight.
- e. Handrails shall be provided with a minimum height of 0.9m from the center of the tread.
- f. The minimum headroom in a passage under the landing of a staircase and under the staircase shall be 2.2m.

- g. Access to main staircase shall be gained through adequate fire resistance rating (clause 11.7.1 of **Chapter 11**) Automatic closing doors placed in the enclosing walls of the staircases. It shall be a swing type door opening in the direction of the escape.
- h. No living space, store or other fire risk shall open directly into the staircase or staircases.
- i. External exit door of staircase enclosure at ground level shall open directly to the open spaces or can be reached without passing through any door other than a door provided to form a draught lobby.
- j. The exit sign with arrow indicating the way to the escape route shall be provided at a height of 0.5m from the floor level on the wall and shall be illuminated by electric light connected to corridor circuits. All exit way marking signs should be flushed with the wall and so designed that no mechanical damage shall occur to them due to moving of furniture or other heavy equipment's. Further all landings of floor shall have floor indication boards indicating the number of floor. The floor indication board shall be placed on the wall immediately facing the flight of stairs and nearest to the landing. It shall be of size not less than 0.5x 0.5m and it shall be prominently on the wall facing the staircase.
- k. In case of single staircase it shall terminate at the ground floor level and the access to the basement shall be by a separate staircase. However, the second staircase may lead to basement levels provided the same is separated at ground level by either a ventilated lobby with discharge points at two different ends or through enclosures with fire resistance rating door (clause 11.7.1 of **Chapter 11**) or through a fire protected corridor.

#### 5.4.4 Lifts

General requirements of lifts shall be as follows:

- a. All the floors shall be accessible for 24 hours by the lifts. The lifts provided in the buildings shall not be considered as a means of escape in case of emergency. In a dual line arrangement (lifts opposite to each other) the lobby may be between 1.5 times to 2.5 times the depth of one car. For in-line (single line) arrangements the lobby may be typically half of the above recommendations.
- b. Grounding switch, at ground floor level, to enable the fire service to ground the lift shall also be provided.
- c. The lift machine room shall be separate and no other machinery shall be installed there in.
- d. Walls of lift enclosures and lift lobby shall have fire rating of 2 hour; (Refer Section 11.7.1 of **Chapter 11**); lifts shall have a vent at the top of area not less than 0.2 sq.m
- e. Lift car door shall have a fire resistance rating of 1 hour.
- f. Lift lobby doors in lift enclosures shall have fire resistance as per Section 11.7.1 of **Chapter 11**.
- g. Collapsible gates shall not be permitted for lifts and shall have solid doors with fire resistance of at least 1 hour.
- h. If the lift shaft and lobby is in the core of the building, a positive pressure between 25 and 30 Pa shall be maintained in the lobby and a positive pressure of 50 Pa shall be maintained in the lift shaft. The mechanism for pressurization shall act automatically with the fire alarm; it shall be possible to operate this mechanically also.
- i. Lifts if communicating with the basement, the lift lobby of the basements shall be pressurized as suggested in clause 11.9.1(g) and 11.9.1(h) with self-closing door with fire resistance rating (Refer Section 11.7.1 of **Chapter 11**). Telephone or other communication facilities shall be provided in lift cars and to be connected to fire control room for the building.

- j. Exit from the lift lobby, if located in the core of the building, shall be through a self closing fire door of half an hour fire resistance.
- k. Suitable arrangements such as providing slope in the floor of lift lobby shall be made to prevent water used during firefighting, etc., at any landing from entering the lift shafts.
- l. A sign shall be posted and maintained on every floor at or near the lift indicating that in case of fire, occupants shall use the stairs unless instructed otherwise. The sign shall also contain a plan for each floor showing the locations of the stairways. Alternate source of power supply shall be provided for all the lifts through a manually operated changeover switch.
- m. For Pressurization Specifications of various building components refer NBC Chapter 4 Fire and Life Safety Clause 4.10 Pressurization of Staircases (Protected Escape Routes)

#### 5.4.5 Basements

- a. Basement shall be permitted within the setback lines subject to clearance from local bodies/departments concerned, Municipal Corporation and Fire Department. Where there are no setbacks, basement should be permitted after leaving 2 m and where there is setback, it should be after leaving required 6 m from plot boundary ( as per provisions of development control norms of Master Plan of Delhi).
- b. Each basement shall be separately ventilated. Vents with cross-sectional area (aggregate) not less than 2.5 percent of the floor area spread evenly round the perimeter of the basement shall be provided in the form of grills or breakable stall board lights or pavement lights or by way of shafts. Alternatively, a system of air inlets shall be provided at basement floor level and smoke outlets at basement ceiling level. Inlets and extracts may be terminated at ground level with stall board or pavement lights as before, but ducts to convey fresh air to the basement floor level have to be laid. Stall board and pavement lights should be in positions easily accessible to the fire brigade and clearly marked 'SMOKE OUTLET' or 'AIR INLET' with an indication of area served at or near the opening.
- c. The staircase of basements shall be of enclosed type having fire resistance rating (Refer Section 11.7.1 of *Chapter 11*). The staircase shall be situated at the periphery of the basement to be entered at ground level only, from outside open air. The staircase shall communicate with basement through a lobby with self-closing doors with fire resistance rating as per relevant NBC code mentioned above.
- d. For travel distance Table 5.2 given below shall be followed. If travel distance exceeds that given in the table below, additional staircases shall be provided.

**Table 5.2 Travel Distance for Occupancy and Type of Construction**

Sl. No	Group of Occupancy	Maximum Travel Distance Construction	
		Type 1 & 2	Type 3 & 4
i.	Residential(A)	30.0	22.5
ii.	Educational(B)	30.0	22.5
iii.	Institutional	30.0	22.5
iv	Assembly(D)	30.0	30.0
v	Business(E)	30.0	30.0
vi	Mercantile(F)	30.0	30.0
vii	Industrial(G)	45.0	Construction type 3 and 4 not permitted.
viii	Storage(H)	30.0	Construction type 3 and 4 not permitted.
ix	Hazardous(J)	22.5	Construction type 3 and 4 not permitted.

**Notes:**

1. For fully sprinkled building, the travel distance may be increased by 50% of the values specified above
2. Ramps shall be counted as one of the means of escape wherever permitted in National Building Code 2005.

- e. In multi-story basements, intake ducts may serve all basement levels, but each basement level and basement compartment shall have separate smoke outlet duct or ducts. Ducts so provided shall have the same fire resistance rating as the compartment itself. Fire rating may be taken as the required smoke extraction time for smoke extraction ducts.
- f. Mechanical extractors for smoke venting system from lower basement levels shall also be provided. The system shall be of such design as to operate on actuation of heat / smoke sensitive detectors or sprinklers, if installed, and shall have a considerably superior performance compared to the standard units. It shall also have an arrangement to start it manually.
- g. Mechanical extractors shall have an internal locking arrangement, so that extractors shall continue to operate and supply fans for HVAC shall stop automatically with the actuation of fire detectors.
- h. Mechanical extractors shall be designated to permit 30 air changes per hour in case of fire or distress call. However, for normal operation, air changes schedule shall be as given in Part 8, Building Services, Section 3, Air-conditioning, Heating and Mechanical Ventilation of National Building Code, 2005.
- i. Mechanical extractors shall have an alternative source of supply.
- j. Ventilating ducts shall be integrated with the structure and made out of brick masonry or reinforced cement concrete and when this duct crosses the transformer area or electrical switchboard, fire dampers shall be provided.
- k. Use of basements for kitchens working on gas fuel shall not be permitted, unless air conditioned. The basement shall not be permitted below the ward block of a hospital/nursing home unless it is fully sprinkled. Building services such as electrical sub-stations, boiler rooms in basements shall comply with the provisions of the Indian Electricity Act / Rules. Boiler room shall be provided at the first basement along the periphery wall with fire resistance rating (Refer Section 11.7.1 of *Chapter 11*) or shall be separated with the blast wall.
- l. If cutouts are provided from basements to the upper floors or to the atmospheres, all sides cutout openings in the basements shall be protected by sprinkler head at close spacing so as to form a water curtain in the event of a fire.
- m. It is essential to make provisions for drainage of any such water on all floors to prevent or minimize water damage of the contents. The drain pipes should be provided on the external wall for drainage of water from all floors. On large area floors, several such pipes may be necessary which should be spaced 30 m apart. Care shall be taken to ensure that the construction of the drain pipe does not allow spread fire / smoke from floor to floor.

#### 5.4.6 Compartmentation

The building shall be suitably compartmentalized so that fire/smoke remains confined to the area where fire incident has occurred and does not spread to the remaining part of the building.

Compartmentation and Pressurization method shall be adopted (as per clause 4.10 of Part 4 of NBC, 2005) to protect escape routes against ingress of smoke, or toxic gases into the escape routes will be prevented. Pressurization shall be adopted for high rise buildings and building having mixed occupancy/multiplexes having covered area more than 500 m<sup>2</sup>.

#### 5.4.7 Ramps

- a. The ramp to basement and parking floors shall not be less than 7.2m wide for two way traffic and 4 m wide for one way traffic, provided with Gradient of 1:10 for

- cars and 1:15 for heavy vehicles. At curved portions of the ramp or for circular ramps the slope should not be more than 1:12.
- b. Ramp may also be provided in setback area which can be sloped considering unhindered movement of fire Engine and in no case the gradient shall be less than 1: 10.
  - c. All structural design/safety aspects as per latest BIS Codes & NBC, 2005 shall be complied along with consideration of weight of Fire Engine & its maneuverings.
  - d. The minimum width of the ramps in hospitals shall be 2.4 m for stretcher and not for vehicular movement
  - e. In this case Handrails shall be provided on both sides of the ramp.
  - f. Ramps shall lead directly to outside open space at ground level or courtyards or safe place.

#### 5.4.8 Corridors

- a. Exit corridors and passageways shall be of width not less than the aggregate required width of exit doorways leading from them in the direction of travel to the exterior.
- b. The minimum width of a corridor in a residential building shall be 1.0 m for single loaded and 1.8 m for double loaded and in all other buildings shall be 1.5m.
- c. Where stairways discharge through corridors and passageways, the height of corridors and passageways shall be not less than 2.4 m.
- d. All means of exit including staircases lifts lobbies and corridors shall be ventilated.

#### 5.4.9 Glass Façade/ Service Ducts/Shafts/ Refuge Area/ Vents

- a. An Opening to the glass façade of min. width 1.5 m and height 1.5m shall be provided at every floor at a level of 1.2 m from the flooring facing compulsory open space as well as on road side. Construction that complies with the fire rating of the horizontal segregation and has any gap packed with a non-combustible material to withstand thermal expansion and structural movement of the walling without the loss of seal against fire and smoke.
- b. Mechanism of Opening: The openable glass panel shall be either left or right shall have manual opening mechanism from inside as well as outside. Such openable panels shall be marked conspicuously so as to easily identify the openable panel from outside.
- c. Fire seal to be provided at every floor level between the external glazing and building structure.
- d. The glazing used for the façade shall be of toughened (tempered) safety glass as per I.S.2553.
- e. To avoid fire propagation vertically from one floor to another floor, a continuous glass I must be separated internally by a smoke/ fire seal which is of noncombustible material having a fire resistance rating of not less than 2 hours.
- f. Service ducts and shafts shall be enclosed by walls and doors with fire resistance rating (Refer Section 11.7.1 of Chapter 11). All such ducts/shafts shall be properly sealed and stopped fire ingress at all floor levels.
- g. A vent opening at the top of the service shaft shall be provided having an area between one- fourth and one-half of the area of the shaft.
- h. The openable vent of minimum 2.5% of the floor area shall be provided. The openable vent can be pop out type or bottom hinged provided with fusible link opening mechanism and shall also be integrated with automatic Smoke Detection System.

or



- i) Alternate vertical glass panels of the façade shall be openable type with the mechanism mentioned above in order to ventilate the smoke.
- ii) Refuge areas covered with the glass façade shall have all the panels fully openable (either left or right hinged) both from inside as well as outside.

Glass quality and Practice of use of Glass in buildings shall have to be in conformity with the BIS codes as given in Table 5.3 below:

**Table 5.3 Glass quality and Use of glass in buildings**

IS Code	Specifications
2553 (Part 1):1990	Specification for safety glass: Part 1 General purpose ( <i>third revision</i> )
2835:1987	Specification for flat transparent sheet glass ( <i>third revision</i> )
438:1994	Specification for silvered glass mirrors for general purposes ( <i>second revision</i> )
5437:1994	Specification for figured rolled and wired glass ( <i>first revision</i> ).
14900:2000	Specification for transparent float glass.
16231 Part 1	General methodology for selection
16231 Part 2	Energy and Light
16231 Part 3	Fire and Loading
16231 Part 4	Safety related to Human Impact

## 5.5 Building Services

### 5.5.1 Staircase and Corridor Lighting

- a. The staircase and corridor lighting shall be on separate service and shall be independently connected so as it could be operated by one switch installation on the ground floor, easily accessible to firefighting staff at any time irrespective of the position of the individual control of the light points, if any.
- b. Staircase and corridor lighting shall also be connected to alternate supply from parallel high-tension supply or to the supply from the stand-by generator.
- c. Emergency lights shall be provided in staircase and corridor/ passageway, horizontal exits, refuge area; and all wires and other accessories used for emergency light shall have fire retardant property.

### 5.5.2 Electrical Services

- a. The electric distribution cables/wiring shall be laid in separate duct the duct shall be sealed at every floor with non-combustible materials having the same fire resistance as that of the duct. Low and medium voltage wiring running in shaft and in false ceiling shall run in separate conduits.
- b. Water mains, telephone cables, intercom cables, gas pipes or any other service line shall not be laid in the duct for electric cables. Use of bus ducts/solid rising mains instead of cables is preferred.
- c. The provision of dedicated telecommunication ducts for all new building proposals is mandatory for conveyance of telecommunication and other data cables.
- d. Separate circuits for water pumps lifts, staircases and corridor lighting and blowers for pressurizing system shall be provided directly from the main switchgear panel (for detailed specifications refer NBC 2005, chapter 4 Fire and Life Safety).

### 5.5.3 Alternate Source of Electric Supply

A stand-by electric generator shall be installed to supply power to staircase and corridor lighting circuits, fire lifts, the stand-by fire pumps, pressurization fans and blowers, smoke extraction and damper system in case of failure of normal electric supply. The generator shall be capable of taking starting current of all the machines

and circuits stated above simultaneously. If the stand-by pump is driven by diesel engine, the generator supply need not be connected to the stand-by pump.

#### 5.5.4 Air-conditioning

Air-conditioning shall conform to the following:

- a. Escape routes like staircases, common corridors, lift lobbies, etc. shall not be used as return air passage.
- b. The ducting shall be constructed of substantial gauge metal in accordance with good practice.
- c. Wherever the ducts pass through fire walls or floors, the opening around the ducts shall be sealed with materials having fire resistance rating of the compartment.
- d. Where duct crosses a compartment which is fire rated, the ducts shall be fire rated for same fire rating. Further depending on services passing around the duct work, which may get affected in case of fire temperature rising, the ducts shall be insulated.
- e. Metallic ducts shall be used even for the return air instead of space above the false ceiling.
- f. Where plenum is used for return air passage, ceiling and its fixtures shall be of noncombustible material.
- g. The materials used for insulating the duct system (inside or outside) shall be of noncombustible material; glass wool shall not be wrapped or secured by any material of combustible nature.
- h. Air ducts serving main floor areas, corridors, etc. shall not pass through the staircase enclosure.
- i. The air-handling units shall be separate for each floor and air ducts for every floor shall be separated and in no way inter-connected with the ducting of any other floor.
- j. If the air-handling unit serves more than one floor, the recommendations given above shall be compiled with in addition to the conditions given below:
  - i. Proper arrangements by way of automatic fire dampers working on smoke detector / or fusible link for isolating all ducting at every floor from the main riser shall be made.
  - ii. When the automatic fire alarm operates, the respective air-handling units of the air-conditioning system shall automatically be switched off.
  - iii. The vertical shaft for treated fresh air shall be of masonry construction.
  - iv. The air filters of the air-handling units shall be of non-combustible materials or fire rated (Refer Section 10.7.1 of Chapter 10)
  - v. The air-handling unit room shall not be used for storage of any combustible materials.
  - vi. Inspection panels shall be provided in the main trunking to facilitate the cleaning of ducts of accumulated dust and to obtain access for maintenance of fire dampers.
  - vii. No combustible material shall be fixed nearer than 150 mm to any duct unless such duct is properly enclosed and protected with non-combustible material (glass wool or spyglass with neoprene facing enclosed and wrapped with aluminum sheeting) at least 3.2 mm thick and which would not readily conduct heat.

#### 5.5.5 Transformers

- a. If transformers are housed in the building below the ground level it shall be necessarily in the first basement in separate fire resistance room of 4 hours rating. Transformer shall be dry type and shall be kept in an enclosure with walls, doors and cut-outs having fire resistance rating of 4 hour. The room shall necessarily be at the periphery of the basement having separate and direct access from open area at ground floor through a fire escape staircase. The entrance to the room shall be

- provided with a steel door of 2 hours fire rating. A curb of a suitable height shall be provided at the entrance in order to prevent the flow of oil from ruptured, transformer into other parts of the basement. The switchgears shall be housed in a separate room separated from the transformer bays by a fire-resisting wall with fire resistance not less than 4 hours.
- b. The transformer shall be protected by an automatic foam sprinkler system. When housed at ground floor level it/they shall be cut-off from the other portion of premises by Fire Resisting Walls of 4 hours rating.
  - c. A tank of RCC construction of adequate capacity shall be provided at lower basement level, to collect the oil from the catch pit in case of emergency. The pipe connecting the catch-pit to the tank shall be of non-combustible construction and shall be provided with a flame-arrester.
  - d. The electric sub-station shall be located in a separate building in accordance to I.E. Rules 68(I) and 64(I) (a).
  - e. If this is not possible due to site conditions, the sub-station shall be located on the ground floor. As far as possible sub-station shall not be installed in a basement, for such situations special provisions like mechanical ventilation, wherever required, cable ducting, cable trays, top/bottom entry of HV/LV cable, hooks on Transformer(s) & HV panels, adequate fire detection and fire fighting arrangement, adequate drainage, effective measures to prevent flooding etc. shall be provided. Adequate precautions shall also be taken for water proofing to prevent seepage of water. A ramp shall also be provided with a slope, not steeper than 1 in 7, for easy movement of equipments to and from sub-station.
  - f. Fire regulations – The installations shall be carried out in conformity with the local regulations and rules there under wherever they are in force. At other places NBC guidelines shall be followed.

### 5.5.6 Gas supply

- a. Town Gas / L.P. Gas Supply Pipes – Where gas pipes are run in buildings, the same shall be run in separate shafts exclusively for this purpose and these shall be on external walls, away from the staircases. There shall be no interconnection of this shaft with the rest of the floors.
- b. LPG distribution pipes shall always be below the false ceiling. The length of these pipes shall be as short as possible. In the case of kitchen cooking range area, apart from providing hood, covering the entire cooking range, the exhaust system should be designed to take care of 30 cu.m per minute per sq.m of hood protected area. It should have grease filters using metallic grill to trap oil vapors escaping into the fume hood.
 

*Note: For detailed information on gas pipe installations, reference may be made to Para.9 'Plumbing Services, Section 3 Gas Supply', of National Building Code of India.*
- c. For large/commercial kitchens all wiring in fume hoods shall be of fiberglass insulation. Thermal detectors shall be installed into fume hoods of large kitchens for hotels, hospitals and similar areas located in high rise buildings. Arrangements shall be made for automatic tripping of the exhaust fan in case of fire.
- d. If LPG is used, the same shall be shut off. The voltage shall be of 24 V or 100 V DC operated with the external rectifier. The valve shall be of the hand re-set type and shall be located in an area segregated from cooking ranges. Valves shall be easily accessible. The hood shall have manual facility for steam or carbon dioxide gas injection, depending on duty condition; and Gas meters shall be housed in a suitably constructed metal cupboard located in a well-ventilated space, keeping in view the fact that LPG is heavier than air and town gas is lighter than air.

### 5.5.7 Boiler Room

Further, the following additional aspects may be taken into account in the location of Boiler/Boiler Room:

- a. The boiler shall not be allowed in sub-basement but be allowed in the first basements away from the escape routes.
- b. The boilers shall be installed in a fire resisting room of 4 hours fire resistance rating, and this room shall be situated on the periphery of the basement. Catch pit shall be provided at the low level. Entry to this room may be provided with a composite door of two hour fire resistance.
- c. The boiler room shall be provided with fresh air inlets and smoke exhausts directly to the atmosphere.
- d. Foam inlets shall be provided on the external walls of the building at the ground floor level to enable the fire services to use foam in case of fire.
- e. The furnace oil tank for the boiler, if located in the adjoining room shall be separated by fire resisting wall of 4 hour rating. Entry to this room shall be provided with a composite door of 2 hour fire resistance. A curb of suitable height shall be provided at the entrance in order to prevent the flow of oil into the boiler room in case of tank rupture.

### 5.5.8 Helipad

Buildings above 200 m in height, helipad may be provided.

### 5.5.9 Disaster Management / Fire Safety

Refer *Chapter 11* of this document.

### 5.5.10 Sustainable Environment and Buildings

Refer *Chapter 10* of this document.

### 5.5.11 General

- a. Architectural elements such as louvers, pergolas, other sunshine materials should be free from FAR.
- b. Any architectural roof top structures would also be permitted out of FAR if not used for habitable or commercial purposes.
  - c. Building elements such as sky bridges and landscape terraces which are meant for community purposes only shall be permitted free of FAR
  - d. Services can be permitted on roofs with adequate screening for the same.
  - e. Service floors shall not be counted in FAR. Service area on habitable floors may be considered free from FAR.
  - f. Atrium/ Atria at any floor will be counted only once in the FAR. Atrium may be enclosed by light roofing or R.C.C as per development control norms provided in the Master Plan of Delhi
  - g. Scissor staircase would be permitted provided all travel distance and fire norms are adhered to.
  - h. Stilts in high-rise will not be restricted to height of 2.4m as long as it is used for parking.
  - i. Multilevel car parking with car lifts would be permitted with adequate fire safety.

### 5.5.12 Structural Safety

As per provisions made for Structural Safety in *Chapter 6*

## 6. PROVISIONS FOR STRUCTURAL SAFETY

### 6.1 Structural design and safety

For any building under the jurisdiction of these regulations structural design/ retrofitting shall only be carried out by a Structural Engineer on Record (SER) or Structural Design Agency on Record (SDAR). Proof checking of various designs/ reports shall be carried out by competent authority as per Table 6.1 wherever applicable.

#### 6.1.1 Additional provisions in building regulations/ bye-laws for natural hazard prone areas

Generally, the structural design of foundations, elements of masonry, timber, plain concrete, reinforced concrete, pre-stressed concrete and structural steel shall conform to the provisions of Part 6: Structural Design -

Section- 1 Loads, Forces and Effects

Section- 2 Soils and Foundations,

Section- 3 Timber and Bamboo,

Section- 4 Masonry,

Section- 5 Concrete &

Section- 6 Steel

Section- 7 Prefabrication Systems, Building and Mixed /Composite Construction of National Building Code of India (NBC), taking into consideration the Indian Standards as given below:

#### For General Structural Safety

- 1) IS: 456:2000 “Code of Practice for Plain and Reinforced Concrete.
- 2) IS: 800-2007 “Code of Practice for General Construction in Steel.
- 3) IS: 801-1975 “Code of Practice for Use of Cold Formed Light Gauge Steel Structural Members in General Building Construction.
- 4) IS 875 (Part 2):1987 Design loads (other than earthquake) for buildings and structures Part 2 Imposed Loads.  
(Reference to Table 4.1- “Occupant Load” may be considered for design load)
- 5) IS 875 (Part 3):1987 Design loads (other than earthquake) for buildings and structures Part 3 Wind Loads.
- 6) IS 875 (Part 4):1987 Design loads (other than earthquake) for buildings and structures Part 4 Snow Loads.
- 7) IS 875 (Part 5):1987 Design loads (other than earthquake) for buildings and structures Part 5 special loads and load combination.
- 8) IS: 883:1994 “Code of Practice for Design of Structural Timber in Building.
- 9) IS: 1904:1986 (R 2005) “Code of Practice for Structural Safety of Buildings: Foundation”
- 10) IS 1905:1987 “Code of Practice for Structural Safety of Buildings: Masonry Walls.
- 11) IS 2911(Part 1): Section 1: 2010 “Code of Practice for Design and

## Construction of Pile Foundation Section 1

- Part 1: Section 2 Bored Cast-in-situ Piles
- Part 1: Section 3 Driven Precast Concrete Piles
- Part 1: Section 4 Bored Precast Concrete Piles
- Part 2: Timber Piles
- Part 3: Under Reamed Piles
- Part 4: Load Test on Piles

**For Cyclone/Wind Storm Protection**

- 12) IS 875 (3):1987 "Code of Practice for Design Loads (other than Earthquake) for Buildings and Structures, Part 3, Wind Loads"
- 13) Guidelines (Based on IS 875 (3)-1987) for improving the Cyclonic Resistance of Low rise houses and other building.

**For Earthquake Protection**

- 14) IS: 1893 (Part 1)-2002 "Criteria for Earthquake Resistant Design of Structures (Fifth Revision)"
- 15) IS:13920-1993 "Ductile Detailing of Reinforced Concrete Structures subjected to Seismic Forces - Code of Practice"
- 16) IS:4326-2013 "Earthquake Resistant Design and Construction of Buildings - Code of Practice (Second Revision)"
- 17) IS:13828-1993 "Improving Earthquake Resistance of Low Strength Masonry Buildings - Guidelines"
- 18) IS:13827:1993 "Improving Earthquake Resistance of Earthen Buildings-Guidelines"
- 19) IS:13935-2009 "Seismic Evaluation, Repair and Seismic Strengthening of Buildings -Guidelines"

**For Protection of Landslide Hazard**

- 20) IS 14458 (Part 1): 1998 Guidelines for retaining wall for hill area: Part 1 Selection of type of wall.
- 21) IS 14458 (Part 2): 1997 Guidelines for retaining wall for hill area: Part 2 Design of retaining/breast walls
- 22) IS 14458 (Part 3): 1998 Guidelines for retaining wall for hill area: Part 3 Construction of dry stone walls
- 23) IS 14496 (Part 2): 1998 Guidelines for preparation of landslide – Hazard zonation maps in mountainous terrains: Part 2 Macro-zonation.

**Note:** Whenever an Indian Standard including those referred in the National Building Code or the National Building Code is referred, the latest revision of the same shall be followed except specific criteria, if any, mentioned above against that code.

### 6.1.2 Structural Design Basis Report (SDBR)

In compliance of the design with the above Indian Standard, the Structural Engineer on Record will submit a structural design basis report in the Proforma attached herewith covering the essential safety requirements specified in the Standard.

The “Structural Design Basis Report (SDBR)” consists of four parts (Form No.6, MHA Expert Committee Report)

Part 1: General Information/ Data

Part 2: Load Bearing Masonry Buildings

Part 3: Reinforced Concrete Buildings

Part 4: Steel Buildings

- i) Drawings and Documents to be submitted for approval of appropriate authorities shall include SDBR as detailed below:

Part 1: Completed

Part 2: (if applicable) – completed

Part 3: (if applicable) – undertaking that completed Part 3 will be submitted before commencement of construction.

Part 4: (if applicable) – undertaking that completed Part 4 will be submitted before commencement of construction.

- ii) SDBR as detailed below shall be submitted to the appropriate authority as soon as design of foundation is completed, but not later than one month prior to commencement of construction.

Part 1: Completed

Part-2, Part-3 or Part-4: (if applicable) Completed

### 6.1.3 Seismic strengthening/retrofitting

Prior to seismic strengthening/retrofitting of any existing structure, evaluation of the existing structure as regards structural vulnerability in the specified wind/seismic hazard zone shall be carried out by a RSE/RSDA. If as per the evaluation of the RSE/RSDA the seismic resistance is assessed to be less than the specified minimum seismic resistance as given in the note below, action will be initiated to carry out the upgrading of the seismic resistance of the building as per applicable standard guidelines.

*Note:*

1. For masonry buildings reference shall be made to IS 4326 and IS 13935

2. For concrete buildings and structures reference shall be made to IS15988: 2013 Seismic evaluation and strengthening of existing RCC buildings.

### 6.1.4 Buildings with Soft Storey

In case buildings with a flexible storeys, such as the ground storey consisting of open spaces for parking that is “*Stilt buildings*” or any other storey with open halls, special arrangements are to be made to increase the lateral strength and stiffness of the soft/open storey such as Steel bracing / Shear walls / Brick infills between columns.

Dynamic analysis of building is to be carried out including the strength and stiffness effects of infills and inelastic deformations in the members, particularly, those in the *soft storey*, and the structural members are to be designed accordingly.

Alternatively, the following design criteria are to be adopted after carrying out the earthquake analysis, neglecting the effect of infill walls in other storeys:

- a. The columns and beams of the soft storey shall be designed for 2.5 times the storey shears and moments, calculated under seismic loads specified in the other relevant clauses; or,
- b. Besides the columns designed and detailed for the calculated storey shears and moments, shear walls shall be placed symmetrically in both directions of the building as far away from the centre of the building as feasible; to be designed exclusively for 1.5 times the lateral storey shear force calculated as before.

For details of design and provisions, IS 1893, Part 1 shall be referred.

### 6.1.5 Review of structural design

- i) The Competent Authority shall create a Structural Design Review Panel (SDRP) consisting of senior SER's and SDAR's whose task will be to review and certify the design prepared by SER or SDAR whenever referred by the competent authority.
- ii) The Reviewing Agency shall submit addendum to the certificate or a new certificate in case of subsequent changes in structural design.
- iii) Table-6.1 gives requirements of SDRP for different seismic zones namely III, IV and V and for structures of different complexities.
- iv) In seismic Zone II, buildings & structures greater than 40m in height will require proof checking by SDRP as per detail at Sl. no.3 of Table 6.1

**Table 6.1 Proof Checking Requirements for Structural Design**

Sl. No.	Type of Structure	Submission from SER or SDAR	To be Proof Checked
1.	Load Bearing Buildings upto three storeys	SDBR*	Not to be checked
2.	Buildings upto seven storeys (R.C.C/Steel framed structure)	SDBR	To be checked
		Preliminary design	To be checked
3.	Building greater than seven storeys (R.C.C/Steel framed structure)	SDBR	To be checked
		Preliminary design	To be checked
		Detailed structural design and structural drawings	To be checked
4.	Special Structures	SDBR	To be checked
		Preliminary design	To be checked
		Detailed structural design and structural drawings	To be checked

\* SDBR – Structural Design Basis Report

**Notes:**

1. Table 4.1 may be referred for Occupant Load/Live load for different building types.
2. At the preliminary proposal stage of a project, the objective is to undertake feasibility study/comparison of a number of possible alternatives of structural schemes and determine the most cost effective one, detailed structural calculations are not necessary for each alternative scheme. However, it is necessary to determine the member sizes and reinforcement content in order to determine the cost. By making conservative assumptions it is possible to derive simplified calculations for both analysis and design. **This is called “Preliminary or approximate analysis, and design”.**

After the most cost effective scheme is selected and signed-off by the Client, the detailed calculations are performed on the selected scheme to determine the precise structural members and composition (size, dimension and stress behavior), and this is called the “**Detailed structural design**”.

In the aforesaid, the design of structural members is typically assumed to account for all the stress loads identified from section xx to be applicable in the given project.

3. Special structure means large span structures such as stadium, assembly halls, or tall structures such as water tanks, TV tower, chimney, etc.



It will be seen from the Table 6.1 above that there is a wide range of structure typology, and the requirement by the Competent Authority for third party verification will depend on the type of structure.

#### **6.1.6 Certification regarding structural safety in design**

Structural Engineer on Record (SER) or Structural Design Agency on Record (SDAR) shall give a certificate of structural safety of design as per proforma given in **Form-3** and **Form 14** (of the MHA Expert Committee Report) at the time of completion.

#### **6.1.7 Constructional safety**

##### **6.1.7.1 Supervision**

All construction except load bearing buildings upto 3 storeys shall be carried out under supervision of the Construction Engineer on Record (CER) or Construction Management Agency on Record (CMAR) for various seismic zones.

##### **6.1.7.2 Certification of structural safety in construction**

CER/ CMAR shall give a certificate of structural safety of construction as per proforma given in **Form-13** (of the MHA Expert Committee Report) at the time of completion.

#### **6.1.8 Quality control and inspection**

All material and workmanship shall be of good quality conforming generally to accepted standards of Public Works Department and Indian standard specification and codes as included in Part-V Building Materials and Part-VII Construction practices and safety of National Building Code of India.

##### **6.1.8.1 Inspection**

All the construction for high-rise buildings higher than seven storeys, public buildings and special structures shall be carried out under quality inspection program prepared and implemented under the Quality Auditor on Record (QAR) or Quality Auditor Agency on Record (QAAR) in seismic zones IV & V.

##### **6.1.8.2 Certification of safety in quality of construction**

Quality Auditor on Record (QAR) or Quality Auditor Agency on Record (QAAR) shall give a certificate of quality control as per proforma given in Form-15.

Quality Inspection Programme to be carried on the site shall be worked out by QAR/ QAAR in consultation with the owner, builder, CER / CMAR.

*Note: Sections 6.1.7 and 6.1.8 shall not be applicable for Government buildings that are designed and constructed under the supervision of in-house architects/engineers.*

#### **6.1.9 Control of signage & outdoor display structures, cellphone towers and telephone towers.**

Following provisions shall apply for telecommunication infrastructure-

- a) Location: The Telecommunication Infrastructure shall be either placed on the building roof tops or on the ground or open space within the premises subject to other regulations.
- b) Type of structure
  - i) Steel fabricated tower or antennae's on M.S. pole.

- ii) Pre-fabricated shelters of fibre glass or P.V.C. on the building roof top / terrace for equipment.
  - iii) Masonry Structure/ Shelter on the ground for equipment.
  - iv) D.G. Set with sound proof cover to reduce the noise level.
- c) Requirement:
- i) Every applicant has to obtain/ procure the necessary permission from the “Standing Advisory Committee on Radio Frequency Allocation” (SACFA) issued by Ministry of Telecommunications.
  - ii) Every applicant will have to produce the structural safety & stability certificate for the tower as well as the building from the Structural Engineer on Record (SER) which shall be the liability of both owner and SER.
  - iii) Applicant has to produce / submit plans of structure to be erected.
- d) Projection: No Pager and/or Telephone Tower shall project beyond the existing building line of the building on which it is erected in any direction.

## 6.2 Structural requirements of low income housing

Notwithstanding anything contained herein, for the structural safety and services for development of low income housing, the relevant provisions of applicable IS:8888 Part 1 shall be enforced alongwith Annex C of Part 3 NBC, 2005.

## 6.3 Inspection

The general requirement for inspection of the development shall also include the following regulation.

### 6.3.1 General Requirements

The building unit intended to be developed shall be in conformity with Regulation on requirement of site. Generally all development work for which permission is required shall be subject to inspection by the Competent Authority as deemed fit.

The applicant shall keep a board at site of development mentioning the survey No, city survey No, Block No, Final Plot No., Sub plot No., etc. name of owner and name of Architect on Record, Engineer on Record, Developer, Structural Engineer on Record, Construction Engineer on Record.

### 6.3.2 Record of Construction Progress

- a) Stages for recording progress certificate and checking:-
  - i) Plinth, in case of basement before the casting of basement slab.
  - ii) First storey.
  - iii) Middle storey in case of High-rise building.
  - iv) Last storey.
- b) At each of the above stages, the Owner / Developer / Builder shall submit to the designated officer of the Competent Authority a progress certificate in the given

formats (Form No. 7-10, of the MHA Expert Committee Report). This progress certificate shall be signed by the Construction Engineer on Record.

- c) The progress certificate shall not be necessary in the following cases:
  - i) Alteration in Building not involving the structural part of the building.
  - ii) Extension of existing residential building on the ground floor upto maximum 15 sq mt. in area.
- d) Completion Report
  - i) It shall be incumbent on every applicant whose plans have been approved, to submit a completion report in **Form No.11** (of the MHA Expert Committee Report)
  - ii) It shall also be incumbent on every person / agency who is engaged under this Development Control Regulations to supervise the erection or re-erection of the building, to submit the completion report in **Form No.12 and 13** (of the MHA Expert Committee Report) prescribed under these Development Control Regulations.
  - iii) No completion report shall be accepted unless completion plan is approved by the Competent Authority.
- e) The final inspection of the work shall be made by the concerned Competent Authority within 21 days from the date of receipt of notice of completion report.

### 6.3.3 Permission for Building Occupancy and Certification

The Authority issuing occupancy certificate before doing so shall ensure that following are compiled from consideration of safety against natural hazard:

- i) Certificate of lift Inspector has been procured & submitted by the owner, regarding satisfactory erection of Lift.
- ii) The Certificate of Competent Authority and or fire department for completion and or fire requirements as provided in these regulations has been procured and submitted by the owner.
- iii) If any project consists of more than one detached or semi detached building/buildings in a building unit and any building / buildings thereof is completed as per provisions of D.C.R. (Such as Parking, Common Plots, Internal Roads, Height of the Building, Infrastructure facilities, lift and fire safety measures), the competent authority may issue completion certificate for such one detached or semi detached building / buildings in a building unit.
- iv) The occupancy certificate shall not be issued unless the information is supplied by the Owner and the Architect on Record/ Engineer on Record concerned in the schedule as prescribed by the Competent Authority from time to time.

### 6.3.4 Maintenance of Buildings

In case of building older than fifty years, it shall be the duty of the owner of a building, to get his building inspected by a Registered Structural Engineer (RSE) within a year from the date of coming into force of these regulations. The Structural Inspection Report (Form No.16, of the MHA Expert Committee Report) shall be produced by the

Owner to the Appropriate Authority. If any action, for ensuring the structural safety and stability of the building is to be taken, as recommended by SER, it shall be completed within five years. For other buildings, the owner shall get his building inspected after the age of building has crossed forty years. The procedure shall be followed as per above regulation.

### 6.3.5 Protective Measures in Natural Hazard Prone areas

In natural hazard prone areas identified under the land use zoning regulations, structures buildings and installations which cannot be avoided, protective measures for such construction/development should be properly safeguarded based on the suggestion given in the Report of the MHA Expert Committee - Volume I.

### 6.3.6 Registration of Professionals

Presently, the legislation for the profession of architecture is applicable in the country in the form of Architects Act 1972, an Act of the Parliament of India. Accordingly, the qualifications, competence and service conditions followed in the profession of architecture are in accordance with the provisions of the said Act and the rules made thereunder. For other professions and professionals like engineers, structural engineers, landscape architects, urban designers, building supervisors, electrical engineers, developers/promoters there is no legislative frame available/applicable. Therefore, for appropriate qualifications, competence and responsibilities of professional involved in different types of development proposals shall be applicable as per *Appendix 'E' Registration: Qualifications and Competence of Professionals* and methods of determination of professional fees are suggested in clause 6.3.7.

### 6.3.7 Professional fees for SER/SDAR and CER/CMAR

Selection of professionals and determination of professional charges shall be done by the Authority, considering the following:

- i) Structural safety of a building is the responsibility of the “SER/SDAR” for proper design and the “CER/CMAR” for proper construction, therefore it is imperative that selection and appointment of these professionals is made after verification of their antecedents.
- ii) The fees to be paid to SER/SDAR for structural design may be specified keeping in view the size and complexity of the project.
- iii) Similarly, fees for construction management to CER/CMAR may be specified keeping in view the size and complexity of the project and the duration for which construction management services have to be provided on the basis of the total cost of the project.
- iv) Proof checking: Fees for Proof checking where carried out may vary based on the cost of the structural items enumerated in (ii) above.

### 6.3.8 Appointment of Professionals

The Owner/Developer shall appoint Town Planner on Record (TPR), Architect on Record (AR), Engineer on Record (ER), Structural Engineer on Record (SER), Structural Design Agency on Record (SDAR), Geotechnical Engineer on Record (GER), Construction Engineer on Record (CER), (CMAR), and Quality Auditor on

Record (QAR) and Quality Audit Agency on Record (QAAR) as required. Details of qualification and requirement of registration shall be as given in Appendix 'E'. Proper written agreement(s), in standard format(s), shall be entered upon with such professional(s) engaged.

#### **6.4 Alternative Materials, Methods of Design and Construction and Tests**

The provision of the Bye-Laws are not intended to prevent the use of any material or method of design or construction not specifically prescribed by the bye-law provided any such alternative has been approved. The building materials approved by B.I.S. or any statutory body will form part of the approved building material and technology as part of the Bye-Laws.

The Authority shall promote and encourage use of Pre-fabricated factory made building components for medium to large scale projects that have significant impact. The use of ready mix concrete (RMC) shall also be encouraged for in-situ concrete constructions.

Section 10.2.5 may be referred for further aspects of Sustainability and incentivized promotion of alternative materials, methods in construction.

*Note: MHA Expert Committee Report on Structural Safety, 2005 is available at the NDMA website. URL: <http://www.ndma.gov.in/images/disaster/earthquake/volume4.PDF>*



## 7. SPECIAL REQUIREMENTS FOR OCCUPANCY/LAND DEVELOPMENT AND OTHER

### 7.1 Industrial Buildings (Factories, Workshops, etc.)

1. The relevant provisions contained in the Factory Act, 1948 shall apply for the construction of factory buildings. The minimum internal height of workrooms shall not be less than 4.5 m. measured from the floor level to the lowest point in the ceiling provided that this bye-law shall not apply to room intended for storage, godowns and the like purposes but only in rooms occupied by workers for purposes of manufacture.  
In case of small factories, employing less than 50 workers for purposes of manufacturing and carrying on a class of manufacturing covered under the flatted factories and service industries, as given in the Master Plan/Development Plan, the Authority may allow minimum height upto 3.66 m.
2. Parking space provisions as provide in development code of Master Plan/Development Plan.
3. Requirements of water supply, drainage and sanitary installation shall be as per Table 4.2, 4.3 and 4.17 of **Chapter-4**, but in no case less than 1 W.C. and one urinal shall be permitted.
4.
  - a) Notwithstanding the provision of exits requirements as per Bye-law No. 11.8 (**Chapter-11**) each working room shall be provided with adequate number of exits not less than two in number.
  - b) No exit shall be less than 1.2 m. in width and 2.1 m. in height and doors of such exit shall be so arranged that it can be opened easily from inside.
  - c) No staircase, lobby corridors or passage shall be less than 1.2 m. in width.

In addition to the requirement in this part, provisions contained in chapter-3 will be followed.

5. There shall be provided at all time for each person employed in any room of factory at least 3.5 sq m. of floor space exclusive to that occupied by the machinery and a breathing space of at least 15 cum. (Further the provision of part VIII section 1 lighting and ventilation of National Building code of India shall be followed).
6. The effluent from industries (industrial and biological in nature) shall be treated and shall be of quality to the satisfaction of the concerned local bodies before letting out the same into a watercourse or municipal drain.

### 7.2 Educational Building (School/Colleges)

1. No basement or cellar room shall be designed, constructed, altered, converted or used for the purpose of study or instruction.
2. Every such building, exceeding two storeys in height shall be constructed of fire resisting material throughout.

3. The minimum size of a cellar room, study room or room used for purposes of instruction shall be 5.5 m. x 4.5 m. and no part of such room shall be distant more than 7.5 m. from an external wall abutting on the requisite open space. Every such room shall have minimum ventilation to the extent of 1/5<sup>th</sup> of its floor area.
4. A minimum of 1.0 sq m. of net floor space per student shall be provided. A central hall will not be counted in the accommodation, nor will a class room for cookery, laundry, manual instruction, drawing or science. The number of students in such building shall be calculated on this basis for the purpose of this clause.
5. Every assembly room, gymnasium shall have a clear height of 3.6 m. except under a girder which may project 0.6 m. below the required ceiling height.  
A clear internal height under balcony or a girder shall not be less than 3.0 m.  
A minimum room height for classroom in all schools and other institutions shall not be less than 3.0 m. The minimum head room under beams shall be 2.75 m.
6. Exit requirements shall conform to bye-law 4.2 (**Chapter-4**). No door shall be less than 1.2 m. in width and 2.20 m. in height.
7. Requirement of water supply, drainage and sanitary installation shall conform to Table 4.2, 4.3 and 4.7 of **Chapter-4**.
8. A playground shall be provided as per norms.

### **7.3 Assembly Building (Cinema, Theaters, etc.)**

1. The relevant provisions of the Cinematographic Rules/Acts of the particular States and IS: 4878 code for construction of Cinema Building shall apply for planning, design and construction of Cinema Building.
2. Parking spaces wherever not specifically given shall conform to clause 3.3, Table 3.1 in **Chapter 3**).
3. Requirements of water supply, drainage and sanitation shall conform to provisions of Table 4.6, 4.7, 4.18 and 4.19 of **Chapter 4**.
4. Buildings for religious worship shall not be erected on a site, which has not been previously approved by the Authority.

### **7.4 Petrol filling station**

The location of the petrol filling stations and its layout shall be approved by the Authority in consultation with the Commissioner of the Division depending upon width of roads and traffic generated location with respect of points of intersections and nearness to occupancies of educational, assembly, storage and hazardous uses.

### **7.5 Burial and cremation grounds**

The Authority shall under the provisions of their Regulations/Acts, regulate the location and area limits of the burial and cremation grounds, including cemetery. The Authority shall permit/prohibit burial and cremation grounds to be located in certain area layouts, after scrutiny of the proposal with respect to health and well being surrounding neighbourhood and shall follow the selection criteria given below:

- a) The proposed development in terms of land use has to be compatible with the ground;
- b) Compatible landuses have to be planned with regards to prevailing wind direction and



beyond the prescribed buffer zone as given in section 4.23.5. The likely direction of drift in the event of odour has to be accounted while planning the layout;

- c) Adequate land area is to be provided to house furnaces, and for internment of cremated remains;
- d) The site has to have proper accessibility by the local road network.

### 7.5.1 Buffer Zones

The location of such cremation grounds have to provide for buffer zones from the surrounding landuse to account for environmental impact of the operation:

- i. A buffer zone of the order of 200 mts (depending on the nature of prevailing winds and the natural topography of the site) between the emission stack and *neighbouring residential zone* shall be considered.
- ii. In any case any buffer zone shall not be less than 100 mts.

### 7.6 Building in mining area

Building in mining area shall not be constructed to a height more than one storey without the special prior approval of the Authority.

### 7.7 Poultry farms (wherever allowed as per Master Plan)

7.7.1 The coverage for poultry farms shall be as allowed in case of farmhouses.

7.7.2 Setback: The setback for farm building from the right of way shall be as under:

**Table 7.1 Setback for farm building**

Road	Front Setback
National Highway (90 m )	60 m.
Provincial Highway (60 m.)	37 m.
Major Urban Road (30 m.)	22 m.
Village Road (18 m.)	13 m.

### 7.7.3 Space Planning

- a) There should be a minimum distance of 6.0 mt. between sheds in the farm.
- b) The minimum distance of any farm building from the property line should be 4.5 m.
- c) The minimum distance of any farm shed or farm building from the dwelling unit should be 7.5 m.

### 7.7.4 Farm Shed

- a) Shed should be constructed on pillars with walls on two longer sides not higher than 1.2 mt.
- b) The remaining height of the farm sheds in respect of two longer sidewalls can be covered with netting or other similar material.
- c) The maximum height of the roof of the farm shed shall not exceed 6.0 m.

### 7.7.5 Dwelling Units as a Farm House

- a) The following norms shall be adopted for construction of dwellings in farmhouses: The maximum coverage for the dwelling unit shall be as per the provision of the Master Plan / Zonal Plan.
- b) The distance of parts of dwelling units from shed shall be as in Building Bye-Laws 7.7.3.

- c) The requirements of parts of dwelling shall be as in Building Bye-Laws 4.2 in *Chapter-4*.
- d) Any other special requirements as specified by the Authority.

### **7.8 Special buildings not covered**

In case of special buildings not covered above, norms will be followed as decided by the Authority.

### **7.9 Provisions in the public buildings for handicapped persons**

The building to be designed for Handicapped persons need special treatment and the provisions for site planning, building requirements etc. are given in Appendix- 'G'.

### **7.10 Resettlement and Slum insitu upgradation**

Regulations pertaining to resettlement and Slum In-situ upgradation are provided for in Appendix- 'H'.

### **7.11 Rules for development of land**

**7.11.1** The provisions of Master Plan/Development Plan and norms formulated by Authority shall apply regarding sub-division of a large parcel of land into plots, open areas, roads, spaces for services and community facilities.

**7.11.2** Regulations for Low Income Housing. The norms specified for Low-income housing as per NBC, 2005

### **7.12 Penal action for violation of Master Plan/Zonal plan regulation/bye- laws**

**7.12.1** The Authority under the provisions of their respective Acts shall take action for violation of Master Plan/Zonal Plan/regulations. The Authority may take penal action under respective Acts, which may include stopping of construction activity, demolition/ alteration and levying of penalties as given in Appendix- 'F'.

**7.12.2** The Authority may also take action as provided under Building Bye-Laws 2.14.6 in *Chapter-2*.

**7.12.3** In addition, action for discontinuance of services in building may also be taken.

### **7.13 Signs and outdoor display structures**

No advertising signs (including hoarding) on buildings or on land shall be displayed without the prior approval of the Authority. The standards specified in part X Signs and outdoor display structures of National Building Code of India published by Indian Standards Institution shall be applicable.

## 8. PROVISIONS FOR DIFFERENTLY-ABLED, ELDERLY AND CHILDREN

### 8.1 Applicability

These regulations shall be applicable to all buildings and facilities used by the public such as educational, institutional, assembly, commercial, business, mercantile buildings and group housing constructed on plots having an area of more than 2000 sq.m. It shall not apply to private residential buildings.

### 8.2 Guidelines and Provisions

Provisions in the following guidelines shall apply:

1. “*Guidelines and Space Standards for Barrier Free Built Environment for Disabled and Elderly Persons*”, (1998), Central Public Works Department, GoI <sup>5</sup>
2. “*Manual on Barrier Free Environment*”, (2002), O/o the Chief Commissioner for Persons with Disabilities, Ministry of Urban Development, GoI.
3. “*National Building Code*”, (2005), Bureau of Indian Standards,
4. “*National Policy for Persons with Disabilities*”, (2006), Ministry of Social Justice and Empowerment, GoI.
5. “*Harmonized Guidelines and Space Standards for Barrier Free Built Environment for Persons with Disabilities and Elderly Persons*”, (Draft 2014), Ministry of urban Development, GoI.<sup>6</sup>

### 8.3 Types of buildings to adopt barrier free guidelines as notified by the State Government

#### 8.3.1 Buildings to be designed for Ambulant Disabled People

Higher Secondary School, Conference Hall, Dance Halls, Youth Centers, Youth Clubs, Sport Centers, Sport Pavilions, Boat Club Houses, Ice Rinks, Bowling Centers, Swimming Pools, Police Stations, Law Courts, Courts Houses, Sport Stadiums, Theaters, Concert Halls, Cinemas, Auditoria, Small Offices (the maximum plinth area 1400 sq.mt) Snack Bars, Cafes and banqueting rooms (for capacity above 50 dinners).

**Note:**

- a. In sport stadiums provisions shall be made for non-ambulant spectators (small wheel chair)
- b. @ 1:1000 up to 10,000 spectators and @ 1:2000 for spectators above 10,000.
- c. In Theaters, Concert Halls, Cinemas and Auditoria provisions shall be made for non-ambulant spectators (Small Wheel Chairs) @ 1/250 up to 1000 spectators and 1/500 for spectators above 1000.

<sup>5</sup> <http://cpwd.gov.in>

<sup>6</sup> The finalized Harmonized guidelines published by the Ministry of Urban Development.

**8.3.2 Buildings to be designed for Non-Ambulant Disabled People**

Schools for differently abled and other buildings as mentioned in Sec 16, Chapter 1 and along with Botanical Gardens, Religious Buildings, Elderly People Clubs, Village Halls, Day Centers, Junior Training Centers, Post Offices, Banks, Dispensaries, Railway Stations, Shops, Super Markets, and Departmental Stores.

*Note: Large wheel chair criteria shall be applicable on ground floors of the following building, post offices, banks, dispensaries, railway station, shops, supermarkets, and departmental stores.*

**8.3.3 Buildings to be designed for Non-Ambulant People (using small wheel chairs)**

Public lavatories in Tourist Sports, Clubs Motels, Professional and Scientific Institution, Museum, Art Galleries, Public Libraries, Laborites, Universities, College for further Education, Teachers Training Colleges, Technical College, Exhibition Halls Dentist Surgeries, Administrative Department of the Hospitals, Service Stations, Car Parking, Buildings Airports Terminals, Bus Terminals, Factories Employing differently-abled for sedentary works, Large Offices, (with plinth area abode 1400 sq.mt.), Tax Offices, Passport Offices, Pension Offices, and Labour Offices, Cafes, Banqueting Rooms and Snack Bars (For capacity above 100 dinners).

**8.3.4 Site development**

Level of the roads, access paths and parking areas shall be described in the plan along with specification of the materials.

**8.3.4.1 Access Path / Walk Way**

Access path from plot entry and surface parking to building entrance shall be minimum of 1800 mm wide having even surface without any steps. Slope, if any, shall not have gradient greater than 5%. Selection of floor material shall be made suitably to attract or to guide visually impaired persons (limited to coloured floor material whose colour and brightness is conspicuously different from that of the surrounding floor material or the material that emits different sound to guide visually impaired persons; hereinafter referred "o as "guiding floor material". Finishes shall have a non-slip surface with a texture traversable by a wheel chair. Kerbs wherever provided should blend to a common level.

**8.3.4.2 Parking**

For parking of vehicles of differently-abled people, the following provisions shall apply:

- a) Surface parking for two car spaces shall be provided near entrance for the physically differently-abled persons with maximum travel distance of 30.0 m. from building entrance.
- b) The width of parking bay shall be minimum 3.6 meter.
- c) The information stating that the space is reserved for wheel chair users shall be conspicuously displayed.
- d) Guiding floor materials shall be provided or a device, which guides visually impaired persons with audible signals, or other devices, which serves the same purpose, shall be provided.

## 8.4 Building requirements

The specified facilities in buildings for differently abled persons shall be as follows:

### 8.4.1 Approach to plinth level

Every building should have at least one entrance accessible to the differently abled and shall be indicated by proper signage. This entrance shall be approached through a ramp together with the stepped entry.

a. **Ramped Approach:** Ramp shall be finished with non-slip material to enter the building. Minimum width of ramp shall be 1800mm with maximum gradient 1:12. Length of ramp shall not exceed 9.0 meter having 800mm high hand rail on both sides extending 300mm beyond top and bottom of the ramp. Minimum gap from the adjacent wall to the hand rail shall be 50mm.

b. **Stepped Approach:** For stepped approach size of tread shall not be less than 300mm and maximum riser shall be 150mm. Provision of 800mm high hand rail on both sides of the stepped approach similar to the ramped approach.

c. **Exit/Entrance Door:** Minimum & clear opening of the entrance door shall be 900mm and it shall not be provided with a step that obstructs the passage of a wheel chair user. Threshold shall not be raised more than 12mm.

d. **Entrance Landing:** Entrance landing shall be provided adjacent to ramp with the minimum dimension 1800mm x 2000mm. The entrance landing that adjoins the top end of a slope shall be provided with floor materials to attract the attention of visually impaired person's (limited to coloured floor material whose colour and brightness is conspicuously different from that of the surrounding floor material or the material that emits different sound to guide visually impaired persons. Finishes shall have a non-slip surface with a texture traversable by a wheel chair. Kerbs wherever provided should blend to a common level.

### 8.4.2 Corridor connecting the entrance/ exit for the differently abled

The corridor connecting the entrance / exit for differently abled leading directly outdoors to a place where information concerning the overall use of the specified building can be provided to visually impaired persons either by a person or by signs, shall be provided as follows:

- a) Guiding floor materials' shall be provided or device that emits sound to guide visually impaired persons.
- b) The minimum width shall be 1500mm.
- c) In case there is a difference of level, slope ways shall be provided with a slope of 1:12.
- d) Handrails shall be provided for ramps/slope ways.

## 8.5 Stair-ways

One of the stair-ways - near the entrance / exit for the differently abled shall have the following provisions:

- a) The minimum width shall be 1350 mm.

- b) Height of the riser shall not be more than 150 mm and width of the tread 300mm. The steps shall not have abrupt (square) nosing.
- c) Maximum number of risers on a flight shall be limited to 12.
- d) Handrails shall be provided on both sides and shall extend 300 mm on the top and bottom of each flight of steps.

## **8.6 Lifts**

Wherever lift is required as per bye-laws, provision of at least one lift shall be made for the wheel chair user with the following cage dimensions of lift recommended for passenger lift of 13 person's capacity of NBC 2005, BIS. Section 4.9.3 Table no1-Desirable Lift size

Clear internal width 1100 mm

Clear internal depth 2000 mm

Entrance door width 900 mm

- a) A hand rail not less than 600mm long at 1000mm above floor level shall be fixed adjacent to the control panel.
- b) The lift lobby shall be of an inside measurement of 1800 mm x 2000 mm or more.
- c) The time of an automatically closing door should be minimum 5 seconds and the closing speed should not exceed 0.25 m/ sec.
- d) The interior of the cage shall be provided with a device that audibly indicates the floor, the cage has reached indicates that the door of the cage of entrance/exit is either open or closed.
- e) Graphic/Braille signage, as per the Harmonized Guidelines, shall be provided in the lift lobby.

## **8.7 Toilets**

One special W.C. in a set of toilets shall be provided for the use of differently abled with essential provision of washbasin near the entrance for the differently abled.

- a) The minimum size shall be 1500 mm x 1750 mm.
- b) Minimum clear opening of the door shall be 900mm and the door shall swing out.
- c) Suitable arrangement of vertical/horizontal handrails with 50mm clearance from wall shall be made in the toilet.
- d) The W.C. seat shall be 500mm from the floor.

### **8.7.1 Provision of W.Cs in buildings without lift:**

Provision of special W.C. shall be made on all floors for buildings designed for ambulant disabled persons. For buildings designed for non-ambulant disabled special W.C. shall be provided at Ground Floor. Size of W.C. shall depend on the type of wheel chair used by the disabled.

### **8.7.2 Provisions of W.Cs in buildings with lift**

Provision of Special W.C. shall be made on all floors. Size will depend on the category of disabled for whom it has been provided.

### **8.7.3 Toilet Details: For Toilets Designed for Ambulant Disabled**

- a) The minimum size of W.C. shall be 1075 x 1650 mm with a minimum depth of 1450 mm from entry door 900 mm.

- b) Long handrail on the side closer to W.C. with a clear width between the handrails shall be 900 mm and height of handrails shall be 800 mm from floor level.
- c) Minimum size of the clear door opening shall be 780 mm.

#### **8.7.4 For Toilets Designed for Non-Ambulant Disabled Small Wheel Chair:**

The minimum size of W.C. shall be 1350 x 1500 mm with a minimum depth of 1500 mm from entry door. 900 mm long handrail on the side closer to W.C. shall be provided. To provide movement space for wheel chair, W.C. seat shall be fixed towards one side to the opposite adjacent wall. The centerline of W.C. from the adjacent wall shall be 400 mm and minimum 950 mm from the other wall. Minimum size of the clear door opening shall be 780 mm.

#### **8.7.5 For Toilets Designed for Non-Ambulant Disabled Using Large Wheel Chair:**

The minimum size of W.C. shall be 1500 X 1750 mm with a minimum depth of 1750 mm for entry door. 900 mm long handrail on the side wall closer to W.C. shall be provided. To provide movement space for wheel chair, W.C. seat shall be fixed towards one side of the opposite wall. The centerline of the W.C. from the adjacent wall shall be 400 mm and a minimum of 1100 mm from the other wall. Min. size of clear door opening shall be 860 mm.

### **8.8 Designing for Children**

In the buildings meant for the pre-dominant use of the children, it will be necessary to suitably alter the height of the handrail and other fittings & fixtures etc.

**Note:** Guiding / Warning Floor Material: The floor material to guide or to warn the visually impaired persons with a change of colour or material texture and easily distinguishable from the rest of the surrounding floor materials. The material with different texture gives audible signals with sensory warning when a person moves on this surface with walking stick. The guiding/warning floor material is meant to give the directional effect or warn a person at critical places. It should be provided in the following areas:

- a. The access path to the building and to the parking area.
- b. The landing lobby towards the information board, reception, lifts, staircases and toilets
- c. Immediately at the beginning/end of walkway where there is a vehicular traffic.
- d. At the location abruptly changing in level or beginning/end of a ramp.
- e. Immediately in front of an entrance/exit and the landing.

### **8.9 Drinking Water:**

Suitable provision of drinking water shall be made for the differently abled near the special toilet provided for them.

### **8.10 Refuge**

An alternative to immediate evacuation of a building via staircases and/ or lifts is the movement of disabled persons to areas of safety within a building. If possible, they could remain there until the fire is controlled and extinguished or until rescued by the fire fighters.

- a) It is useful to have the provisions of a refuge area, usually at the fire protected stair landing on each floor that can safely hold one or two wheelchairs.
- b) Hand Doorways with clear opening width of 900 mm and regular compliance
- c) Have an alarm switch installed between 900 mm and 1200 mm from floor level.

### **8.11 Proper signage**

- a) Appropriate identification of specific facilities within a building for the differently abled persons should be done with proper signals.
- b) Visually impaired persons make use of other senses such as hearing and touch to compensate for the lack of vision, whereas visual signals benefit those with hearing disabilities. Signs should be designed and located so that they are easily legible by using suitable letter size (not less than 20 mm high).
- c) For visually impaired persons, information board in brail should be installed on the wall at a suitable height and it should be possible to approach them closely.
- d) To ensure safe walking, there should not be any protruding sign which creates obstruction in walking.
- e) Public Address System may also be provided in busy public areas.
- f) The symbols/information should be in contrasting colour and properly illuminated because people with limited vision may be able to differentiate amongst primary colours.
- g) International Symbol Mark for wheel chair be installed in a lift, toilet, staircase, parking areas, etc., that have been provided for the differently abled.

### **8.12 Public Building regulations**

In case of design regulations in *Public buildings* (excluding domestic buildings), provisions for differently-abled shall be adopted as per *Appendix 'G'* of the bye-laws and according to the *Annex "D" of Part 3, NBC 2005*.



## 9. RAINWATER HARVESTING

### 9.1 The RWH system

The harvesting of rainwater simply involves the collection of water from surfaces on which rain falls, and subsequently storing this water for use. The rainwater collected can be stored for direct use or can be recharged into the underground aquifers. In scientific terms water harvesting (broadly) refers to collection and storage of rainwater from the rooftops. This also restricts evaporation and seepage into building foundations. *All buildings having a plot size of 100 sq.m. or more, while submitting the building plans for sanction, shall mandatorily include the complete proposal of rainwater harvesting.*

A rainwater harvesting system consists of:

- i. Roof catchment
- ii. Gutters
- iii. Down pipes
- iv. Rain water/ Storm water drains
- v. Filter Chamber
- vi. Storage Tanks/ Pits/ Sumps.
- vii. Ground Water recharge structures like pit, trench, tube well or combination of above structure.

Rainwater Harvesting is a way to capture the rain runoff, store that water above ground or charge the underground aquifers and use it later. This happens naturally in open rural areas. But in congested, over-paved metropolitan cities, there is a need to devise methods to capture the rain water. The rainwater that is incident on the surface/ roof top is guided to bore wells or pits or new/old/ abandoned wells through small diameter pipes to recharge the underground water which can be used later whenever required.

Rainwater can be harvested to the extent of 55,000 liters per 100sq. meters area per year from rooftops.

### 9.2 Rainwater harvesting techniques:

There are two main techniques of rain water harvestings.

- a. Storage of rainwater on surface for future use.
- b. Recharge to ground water.

The technical aspects and options of Rainwater harvesting from which the city authorities can assess and choose to adopt are placed at *Annexure III to the bye-laws.*

### 9.3 Harvesting provisions in various Building categories:

All buildings in a city contribute to the rainwater runoff during the monsoon and hence such runoff can be harvested for water reuse/recharge.

The indicative provisions of rainwater harvesting in various buildings types are:

**Table 9.1 Provisions for Rainwater harvesting by building types**

Category / Use	Area of Plot (sq.m.)	Provisions to be made	Other conditions
<b>Residential Plotted Houses</b>			
New Proposals	100 and above	Construction of Rain Water Harvesting Structure.	Shall have emphasis on both storage and reuse.
<b>Group Housing</b>			
New Proposals	All plot sizes	i. Construction of Rain Water Harvesting Structure. ii. Concrete paving to be avoided and permeable materials are to be used for all open parking spaces.	Should indicate the system of Storm Water Drainage, Rain Water Harvesting Structure and Recharging Well
<b>Public and semi public buildings</b>			
All Proposals	All plot sizes	i. Shall have Rain Water Harvesting Structure and storage ii. Shall have Recharge pits	Shall have emphasis on both storage and reuse.
<b>Commercial / Mixed use</b>			
All Proposals	All plot sizes	i. Construction of Rain Water Harvesting Structure. ii. Soft landscape provisions and open spaces with Percolation pits. iii. Common treatment plant to be made part of the integrated development, funded by sale of commercial space.	Should indicate the system of Storm Water Drainage, Rain Water Harvesting Structure and Recharging Well  Shall have emphasis on both storage and reuse.
<b>Industrial</b>			
All proposals	All plot sizes	i. Construction of Rain Water Harvesting Structure. ii. Soft landscape provisions and open spaces with Percolation pits. iii. Use of abandoned bore wells for recharging of ground water. iv. Common treatment plant to be made part of the integrated development funded by sale of commercial space.	Should indicate the system of Storm Water Drainage, Rain Water Harvesting Structure and Recharging Well. Provision should be made not to inject contaminated water into recharge structures in industrial areas and care is to be taken to keep such structures away from sewer lines, septic tanks, soak pits, landfill and other sources of contamination.
Other proposals	All plot sizes	Similar as above	Similar as above

*Note: The number of recharge bores to be provided in different plot sizes shall be accordance to Sl No 2 of Table Nos. 14.1 - 14.3 of Chapter 14.*

### 9.4 Rain Water Harvesting Provisions for Open spaces in cities

The open spaces/recreational land use generally constitute regional parks, district parks, play ground and stadium, sports complex, monument zones, public parking, Plaza and other public open space. This may be as high as 30% to 50% of the city's geographic area. All such public open spaces *above the size of 500 sq.m.* shall have arrangements for complete utilization and capture of storm water with scientific rain water harvesting arrangements.

Following ideas may also be included:

- i. Well cum Channel cum Percolation pits.
- ii. Use of abandoned bore wells for recharging of ground water
- iii. Artificial or natural Storage of storm water runoff from larger sites.

### 9.5 Ground Water Recharge

Recharging of ground water should be made mandatory not only for residential buildings but for all types of buildings, including Group Housing Societies having a plot area more than 500 sq.m. and above.

The Ground Water Recharge should also be mandatory for open spaces like parks, parking, plazas and playgrounds. The harvesting and recharge structures could be constructed by the Authority with the involvement of community based organizations like Resident Welfare Associations.

### 9.6 Enforcement and Monitoring

- a. The Authority shall constitute a **Rainwater Harvesting Cell** which will be responsible for enforcement and monitoring of the provisions of Rainwater Harvesting. The cell shall employ qualified persons who are well versed with the interpretation of Building Bye Laws and responsible for enforcement as well as monitoring the functioning of the Rainwater Harvesting System.
- b. The Authority shall include *inspection of Rainwater Harvesting Structures* before issuing Completion Certificates or NOCs for service connections to the property.
- c. Set an example in the city by ensuring that Rainwater is harvested in the properties /assets owned by them including public buildings, markets, community centers, parking spaces, roads and parks etc.
- d. The Authority shall also establish a mechanism to monitor 100% of RWH provisions in all the buildings above 1000 sq.m. with annual physical verification, while buildings less than 1000 sq.m. can be monitored on the basis of 10% random survey by competent authority.
- e. With regard to open public spaces viz., Parks, playgrounds etc. the implementation of provision rainwater harvesting may be done with the help of Residents Welfare Associations, Community Building Organization and Non-Governmental Organizations.
- f. The Authority shall ensure earmarking budgetary provision for the creation and maintenance of rainwater harvesting structures in public spaces owned and maintained by them, like parking spaces, parks, plazas etc.
- g. The practice of incentives and penalties to promote rain water harvesting shall be formulated by the local authority based on best practices. Authority shall design its own incentive and penalty systems, considering the water level and scarcity.



## 10. GREEN BUILDINGS AND SUSTAINABILITY PROVISIONS

Modern buildings consume about 25 to 30 % of total energy, and up to 30 % of fresh potable water, and generate approximately 40 % of total waste. Sustainable buildings have demonstrated reduction in energy and water consumption to less than half of the present consumption in conventional buildings, and complete elimination of the construction and operational waste through recycling.

*Thus, all buildings on various plot sizes above 100 sq.m. shall comply with the green norms and conform to the requirements mandatory for sanction as mentioned in this chapter.*

These provisions are not specific to any rating system and are not intended to provide a single metric indication of overall building performance. These provisions allows the practitioners to easily exercise their engineering judgment in holistically and objectively applying the underlying principles of sustainability to a development or building facility, considering its functionality and required comfort level.

### 10.1 Provisions and Applicability

The green building provisions on various plot sizes are indicated in the table below:

**Table 10.1 Provisions and applicability for various plot sizes (Residential and Non-Residential)**

Plot Category	Applicable plot area (sq.m)	Provisions for Residential	Provisions for Non- Residential
I	Up to 100	Nil	Nil
II	100 to 500	1(a), 2(a), 2(b), 4(a)	1(a), 2(b), 4(a)
	500 to 1,000	1(a), 1(c), 2(b), 3(c), 4(a)	1(a), 1(c), 2(a), 2(b), 3(c), 4(a)
	1,000 to 3,000	1(a), 1(c), 1(d), 2(a), 2(b), 3(b), 3(c), 4(a)	1(a), 1(c), 1(d), 2(a), 2(b), 3(b), 3(c), 4(a)
III	Above 3,000	1(a), 1(b), 1(c), 1(d), 2(a), 2(b), 3(a), 3(b), 3(c), 4(a), 4(b)	1(a), 1(b), 1(c), 1(d), 2(a), 2(b), 3(a), 3(b), 3(c), 4(a), 4(b)

**\*Note:** provisions marked 1(a), 2(b) etc are as per section 10.2.

*The schemes/ projects formulated on the basis of provisions given in Master plan/ Zonal Development Plan will require approval as indicated:*

*EIA/ ECC (as per MoEF), NBC (latest), ECBC 2007 or latest, BEE Star rating/ LEED of IGBC/ GRIHA of TERI Certification}*

**EIA**- Environmental Impact Assessment Study Report,

**ECC**- Environmental Clearance Certificate,

**MoEF** – Ministry of Environment and Forest,

**NBC** – National Building Code,

**ECBC** – Energy Conservation Building Code,

**BEE** – Bureau of Energy Efficiency,

**LEED** – Leadership in Energy and Environment Design,

**IGBC** – Indian Green Building Council,

**GRIHA** – Green Rating for Integrated Habitat Assessment,

**TERI** – The Energy and Resources Institute.

The prevailing provisions of the above shall be applicable. However if there are any modification in the same, the modified provisions shall become automatically applicable.

## 10.2 Provisions for Sanction

1. Water Conservation and Management
  - a) Rain Water Harvesting
  - b) Low Water Consumption Plumbing Fixtures
  - c) Waste Water Recycle and Reuse
  - d) Reduction of Hardscape
2. Solar Energy Utilization
  - a) Installation of Solar Photovoltaic Panels (detailed at section 10.2.3 below)
  - b) Installation of Solar Assisted Water Heating Systems
3. Energy Efficiency (Concept of *passive solar design of buildings*) (Ref. Table 14.1-3)
  - a) Low Energy Consumption Lighting Fixtures (Electrical Appliances – BEE Star and Energy Efficient Appliances)
  - b) Energy Efficiency in HVAC systems.
  - c) Lighting of Common areas by Solar energy/ LED devices.
4. Waste Management
  - a) Segregation of Waste
  - b) Organic Waste Management

In case owners of properties desire to procure green building ratings from one or more rating bodies, they may suitably incorporate any other provisions if required and additional incentive FAR as per Master Plan may be availed.

### 10.2.1 Provisions for City and Site level greening

In alignment with *National Sustainable Habitat Mission*, the Authority shall encourage augmentation of green cover in the city/plot, by following:

*The Urban Greening Guidelines, 2014* and other provisions as given below -

- i. Provision of minimum 1 tree / every 80sqmt of plot area for plot sizes > 100sqmt and planted within the setback of the plot.
- ii. Compensatory Plantation for felled/transplanted trees in the ratio 1:3 within the premises under consideration.
- iii. Choice of species for plantation in site and abutting the road to be adopted as per Section 8 of the *Urban Green Guidelines, 2014*.
- iv. The unpaved area shall be more than or equal to 20% of the recreational open spaces.

### 10.2.2 Water Re-use and Recycling

All building having a minimum discharge of 10,000 l. and above per day shall incorporate waste water recycling system. The recycled water should be used for horticultural purposes.

### 10.2.3 Roof Top Solar Energy Installations

Rooftop photovoltaic power station, or rooftop PV system, is a photovoltaic system that has its electricity-generating solar panels mounted on the rooftop of residential or commercial buildings. The various components of such a system include photovoltaic modules, mounting systems, cables, solar inverters and other

electrical accessories. Rooftop PV systems are faster than other types of renewable power plants. They're clean, quiet, and visually unobtrusive. Table 10.2 below stipulates the Norms for Roof Top Solar PV Installation-

**Table 10.2 Norms for Roof Top Solar PV Installation and generation**

S.No.	Category of buildings/area	Area standards	Generation requirement *
<b>Residential</b>			
1	<b>Plotted Housing</b>	For HIG Plots and above	Minimum 5% of connected load or 20W/sqft for "available roof space"**, whichever is less.
2	<b>Group Housing</b>	All proposals, as per Group Housing Norms	Minimum 5% of connected load or 20W/sqft for "available roof space", whichever is less.
<b>All other buildings</b> (Government or Private, defined as per clause 1.16 b to g) (mandatory for buildings having shadow free rooftop area > 50 sqmt)			
3	<b>Educational</b>	Plot size of <b>500 sqmt and above</b>	Minimum 5% of connected load or 20W/sqft for "available roof space", whichever is less.
4	<b>Institutional</b>		
5	<b>Commercial</b>		
6	<b>Industrial</b>		
7	<b>Mercantile</b>		
8	<b>Recreational</b>		

\* Area provisions on roof top shall be @12 sqmt per 1KWp, as suggested by Ministry of New and Renewable Energy.

\*\* "available rood area" = 70% of the total roof size, considering 30% area reserved for residents' amenities.

#### 10.2.4 Installation of Solar Assisted Water Heating System in Buildings

- I. No new building in the following categories in which there is a system of installation for supplying hot water shall be built unless the system of the installation is also having an auxiliary solar assisted water heating system:-
- Hospitals and Nursing Home.
  - Hotels, Lodges, Guest Houses, Group Housing with a plot area of 4000 sq m.
  - Hostels of Schools, Colleges and Training Centres with more than 100 Students.
  - Barracks of armed forces, paramilitary forces and police.
  - Individual residential buildings having more than 150 sq m. plinth area.
  - Functional Buildings of Railway Stations and Air Ports like waiting rooms, retiring rooms, rest rooms, inspection bungalows and catering units.
  - Community Centres, Banquet Halls, Barat Ghars, Mangal Karyalayas and buildings for similar use.

## II. Definitions

i)	“Solar Assisted Water Heating System”	A device to heat water using solar energy as heat source.
ii)	“Auxiliary back-up”	Electricity operated or fuel fired boilers/systems to heat water coming out from solar water heating system to meet continuous requirement of hot water.
iii)	“New Building”	Such buildings of above said categories for which construction plans have been submitted to the Authority for clearance.
iv)	“Existing building”	Such buildings, which are licensed to perform their respective business.

## III. Installation of Solar Water Heating System

- a) *New Buildings*: Clearance of plan for the construction of new buildings of the aforesaid categories shall only be given if they have a provision in the building design itself for an insulated pipeline from the rooftop in the building to various distribution points where hot water is required. The building must have a provision for continuous water supply to the solar water heating system. The building should also have open space on the rooftop, which receives direct sun light. The load bearing capacity of the roof should at least be 50 kg. per sq m. All new buildings of above said categories must complete installation of solar water heating systems before obtaining necessary license to commence their business.
- b) *Existing Buildings*: Installation of Solar Assisted Water Heating Systems in the existing building shall be made mandatory at the time of change of use to above said category provided there is a system or installation for supplying hot water.

IV. *Capacity*: The capacity of solar water heating system to be installed on the building of different categories shall be decided in consultation with the local bodies. The recommended minimum capacity shall not be less than 25 litres per day for each bathroom and kitchen subject to the condition that maximum of 50% of the total roof area is provided with the system.

V. *Specifications*: Installation of Solar Assisted Water Heating Systems shall conform to BIS specification IS 12933. The solar collectors used in the system shall have the BIS certification mark.

VI. *Auxiliary System*: Wherever hot water requirement is continuous, auxiliary heating arrangement either with electric elements or oil of adequate capacity can be provided.



### 10.2.5 Sustainable Waste Management

*Zero Waste* is a concept of waste management and planning approaches that emphasize waste prevention as opposed to end waste management. This means restructuring production and distribution systems, designing and managing products and processes to systematically follow the 3R rule of Reduce, Re-use and Re-cycle the volume of waste, to conserve and recover all used resources, and therefore eliminating all discharges to landfills, and prevent air, water and land pollution.

Zero Waste/ land-fill can be achieved by adopting systematic approach of segregation at source by planning, by collection facilitation and most importantly by creating public awareness.

The green waste can be converted into fuel cakes, kitchen waste into manure, construction & demolition waste into bricks, plastic waste into oil, paper, glass and steel back into the same and all residual inert materials can also be converted into bricks. Achieving zero land-fill is more conveniently possible, if

- a) The collection is made from house to house and some segregation is done at household level and
- b) Separate wet and dry bins must be provided at the ground level.
- c) The recycling is done at decentralized, say, ward or even lower levels.

### 10.2.6 Sustainability of Building Materials

Sustainability of natural resources for building materials shall be ensured through conservation of available natural resources and use of supplementary materials such as industrial/agricultural by-products, renewable resources, factory made building components and recycled construction and demolition waste.

Supplementary building materials (derived or processed waste) shall be suitably used in combination with conventional resources offers dual advantages in purview of health & environmental benefits.

Use of Factory made pre-fab/pre-cast and recycled components with *Green benefits*:

- a) Panels, hollow slabs, hollow blocks–etc. - conservation of materials, less water requirement.
- b) Fly Ash bricks, Portland Pozzolana cement, Fly ash concrete, phosphogypsum based walling & roofing panels, particle wood – recycled use of industrial/ agricultural by-products. (Ref. Table 14)
- c) Fly ash/ AAC (Autoclaved aerated light weight concrete) panels/ CLC (Cellular light weight concrete) panels- ensures thermal comfort (significant reduction in air conditioning requirement)
- d) Use of bamboo & rapidly growing plantation timbers- environmental benefits.

Local materials are generally suitable for prevailing geo-climatic conditions & have advantage of low transportation cost & time. Sustainable use of building materials shall be encouraged which may combine certain mandatory provisions and incentives.

### 10.3 Various Guidelines for Green Rating systems

The respective State Governments may prepare their separate **Green Rating** systems for buildings by selectively combining/adopting/amending the provisions between the following guidelines:

1. IGBC guidelines by the Confederation of Indian Industries.
2. GRIHA guidelines by the Ministry of New and Renewable Energy. GoI.

In pursuance of the **National Sustainable Habitat Mission on Energy Efficiency** in Buildings, the Authority shall encourage the provisions of the following Energy efficiency guidelines by certain mandatory provisions and incentives-

3. ECBC guidelines prepared by Bureau of Energy Efficiency, Ministry of Power. GoI
4. Model Energy Efficiency guidelines. (NSMH Sub report by Bureau of Energy Efficiency)

# 11. FIRE PROTECTION AND FIRE SAFETY REQUIREMENTS

## 11.1 Scope

This part covers the requirements of the fire protection for the multi-storeyed buildings (high rise buildings) and the buildings, which are of 15 m. and above in height and low occupancies of categories such as Assembly, Institutional, Educational (more than two storeyed and built-up area exceeds 1000 sq m.), Business (where plot area exceeds 500 sq m.), Mercantile (where aggregate covered area exceeds 750 sq m.), Hotel, Hospital, Nursing Homes, Underground Complexes, Industrial Storage, Meeting/Banquet Halls, Hazardous Occupancies.

## 11.2 Procedure for clearance from fire service

- 11.2.1** The concerned Authority shall refer the building plans to the Chief Fire Officer for obtaining clearance in respect of building identified in clause 2.17.4 of these Bye-Laws.
- 11.2.2** The Authority shall furnish three sets of complete building plans along with prescribed fee to the Chief Fire Officer, after ensuring that the proposals are in line with Master Plan/Zonal Plan of the area.
- 11.2.3** The plans shall be clearly marked and indicate the complete fire protection arrangements and the means of access/escape for the proposed building with suitable legend along with standard signs and symbols on the drawings. The same shall be duly signed/certified by a licensed Fire Consultant/Architect. The information regarding fire safety measures shall be furnished as per Annexure 'D' along with details.
- 11.2.4** The Chief Fire Officer shall examine these plans to ensure that they are in accordance with the provisions of fire safety and means of escape as per these bye-laws and shall forward two sets of plans duly signed for implementation to the building sanctioning Authority.
- 11.2.5** After completion of fire fighting installations as approved and duly tested and certified by the licensed Fire Consultant/Architect, the Owner/ Builder of the building shall approach the Chief Fire Officer through the concerned Authority for obtaining clearance from fire safety and means of escape point of view. The concerned Authority shall ensure that clearance from Chief Fire Officer has been obtained for the building identified in clause 11.1 before granting the completion certificate.
- 11.2.6** On receipt of the above request, the Chief Fire Officer shall issue the No Objection Certificate from fire safety and means of escape point of view after satisfying himself that the entire fire protection measures are implemented and functional as per approved plans.
- 11.2.7** Any deficiencies observed during the course of inspection shall be communicated to the Authority for rectification and a copy of the same shall be forwarded to the concerned building owner /builder.

### 11.3 Renewal of fire clearance

On the basis of undertaking given by the Fire Consultant / Architect, the Chief Fire Officer shall renew the fire clearance in respect of the following buildings on annual basis:-

- 1) Public entertainment and assembly
- 2) Hospitals
- 3) Hotels
- 4) Underground shopping complex

### 11.4 Fee

For augmentation of fire service facilities for effecting rescue/fire fighting operation in high rise building, fee payable to Chief Fire Officer by the applicant(s) along with sets of plans for obtaining the No Objection Certificate shall be as prescribed by the Authority.

### 11.5 Fire Consultant

The engaged Competent Professional for building plan design (as per Appendix 'E') of the project shall be responsible for making provisions for fire protection and fire fighting measure as provided in this Chapter and for that she / he may consult an expert in this field, as in case of other professionals for structural, sanitary and others.

### 11.6 Terminology

For the purpose of this Chapter all the technical terms shall have the meaning as defined in National Building Code of India, Part-IV, Fire Protection as amended from time to time but for the terms which are defined otherwise in these bye-Laws.

### 11.7 General

The Chief Fire Officer may insist on suitable provisions in the building from fire safety and means of escape point of view depending on the occupancy, height or on account of new developments creating special fire hazard, in addition to the provision of these building bye laws and part IV (Fire Protection) of National Building Code of India

#### 11.7.1 Fire Resistance of Types of Constructions / Building Components

The fire resistance ratings for various types of construction for structural and non-structural members shall be as given in Table 1 of Part IV of the NBC, 2005.

Building elements/components such as walls, columns, beams and floors shall have the requisite fire resistance rating in accordance with the accepted standards at Tables 2 to 18 of Part IV of the NBC.

#### 11.7.2 The following Sections MEANS OF ACCESS

As provided in Building Bye-Laws, Clause 4.24

***Provisions of Exterior Open Spaces around the Building:***

As provided in building bye laws 4.25

### 11.7.3 EXIT REQUIREMENT

As provided in Section 4.2 of Part 4, NBC 2005.

*Type of Exits:* As provided in Section 4.2.1 of Part 4, NBC 2005.

*Number of Size of Exits:* As provided in Section 4.6 of Part 4, NBC 2005.

*Arrangements of Exits:* As provided in Section 4.5 of Part 4, NBC 2005.

*Occupant Load:* As provided in Section 4.3 of Part 4, NBC 2005.

*Capacity of Exit:* As provided in Section 4.4 of Part 4, NBC 2005.

*Staircase Requirements:* As provided in Section 4.9 of Part 4, NBC 2005.

*Minimum Width Provision for Stairways:* As provided in Section 4.9.6 of Part 4, NBC 2005

*Minimum Width Provision for Passageway/Corridors:* As provided in Section 4.8 of Part 4, NBC 2005

*Doorways:* As provided in Section 4.7 of Part 4, NBC 2005

*Stairways:* As provided in Section 4.9 of Part 4, NBC 2005

### 11.8 Fire Escapes or External Stairs:

- a) Fire escape shall not be taken into account while calculating the number of staircases for a building.
- b) All fire escapes shall be directly connected to the ground.
- c) Entrance to the fire escape shall be separate and remote from internal staircase.
- d) The route to fire escape shall be free of obstructions at all times except the doorway leading to the fire escape which shall have the required fire resistance.
- e) Fire escape shall be constructed of non-combustible materials.
- f) Fire escape stairs shall have straight flight not less than 125 cm wide with 25 cm treads and risers not more than 19 cm.
- g) Handrails shall be at a height not less than 100 cm.
- h) Fire escape staircase in the mercantile, business, assembly, hotel buildings above 24 m. height shall be a fire tower and in such a case width of the same shall not be less than the width of the main staircase. No combustible material shall be allowed in the fire tower.

#### 11.8.1 Spiral Stairs

- a) The use of spiral staircase shall be limited to low occupant load and to a building height 9 m.
- b) A spiral stair shall not be less than 150 cm in diameter and shall be designed to give the adequate headroom.

#### 11.8.2 Staircase Enclosures

- a) The external enclosing walls of the staircase shall be of the brick or the R.C.C. construction having fire resistance of not less than two hours. All enclosed staircases shall have access through self-closing door of one-hour fire resistance. These shall be single swing doors opening in the direction of the escape. The door shall be fitted with the check action door closers.

- b) The staircase enclosures on the external wall of the building shall be ventilated to the atmosphere at each landing.
- c) Permanent vent at the top equal to the 5% of the cross sectional area of the enclosure and openable sashes at each floor level with area equal to 1 to 15% of the cross sectional area of the enclosure on external shall be provided. The roof of the shaft shall be at least 1 m. above the surrounding roof. There shall be no glazing or the glass bricks in any internal closing wall of staircase. If the staircase is in the core of the building and cannot be ventilated at each landing, a positive of 5-mm. e.g. by electrically operated blower/blowers shall be maintained.
- d) The mechanism for pressurizing the staircase shaft shall be so installed that the same shall operate automatically on fire alarm system/sprinkler system and be provided with manual operation facilities.

### **11.8.3 Ramps**

- a) Ramps of slope of not more than 1 in 10 may be substituted for and shall comply with all the applicable requirements of all required stairways as to enclosure capacity and limiting dimensions. Larger slopes shall be provided for special uses but in no case greater than 1 in 8. For all slopes exceeding 1 in 10 and where the use is such as to involve danger of slipping, the ramp shall be surfaced with approved non-slipping material.
- b) The minimum width of the ramps in the Hospitals shall be 2.4 m. and in the basement using car parking shall be 6.0 m.
- c) Handrails shall be provided on both sides of the ramp.
- d) Ramp shall lead directly to outside open space at ground level or courtyards of safe place.
- e) For building above 24.0 m. in height, access to ramps from any floor of the building shall be through smoke fire check door.
- f) In case of nursing homes, hospitals etc. area exceeding 300 sq m. at each floor one of the exit facility shall be a ramp of not less than 2.4 m. in width.

### **11.9 Provision of lifts**

- a) Provision of the lifts shall be made for all multi-storeyed building having a height of 15.0 m. and above.
- b) All the floors shall be accessible for 24 hrs. by the lift. The lift provided in the buildings shall not be considered as a means of escape in case of emergency.
- c) Grounding switch at ground floor level to enable the fire service to ground the lift car in case of emergency shall also be provided.
- d) The lift machine room shall be separate and no other machinery be installed in it.

### 11.9.1 Lift Enclosure/lift

General requirements shall be as follows

- a) Walls of lift enclosures shall have a fire rating of two hours. Lift shafts shall have a vent at the top of area not less than 0.2 sq m.
- b) Lift motor room shall be located preferably on top of the shaft and separated from the shaft by the floor of the room.
- c) Landing door in lift enclosures shall have a fire resistance of not less than one hour.
- d) The number of lifts in one lift bank shall not exceed four. A wall of two hours fire rating shall separate individual shafts in a bank.
- e) Lift car door shall have a fire resistance rating of 1 hour.
- f) For buildings 15.0 m. and above in height, collapsible gates shall not be permitted for lifts and solid doors with fire resistance of at least one hour shall be provided.
- g) If the lift shaft and lobby is in the core of the building a positive pressure between 25 and 30 pa shall be maintained in the lobby and a possible pressure of 50 pa shall be maintained in the lift shaft. The mechanism for the pressurization shall act automatically with the fire alarm/sprinkler system and it shall be possible to operate this mechanically also.
- h) Exit from the lift lobby, if located in the core of the building, shall be through a self-closing fire smoke check door of one-hour fire resistance.
- i) Lift shall not normally communicate with the basement. If however, lifts are in communication, the lift lobby of the basement shall be pressurized as in (g) with self closing door as in (h).
- j) Grounding switch(es), at ground floor level shall be provided to enable the fire service to ground the lifts.
- k) Telephone/talk back communication facilities may be provided in lift cars for communication system and lifts shall be connected to the fire control room of the building.
- l) Suitable arrangements such as providing slope in the floor of the lift lobby shall be made to prevent water used during fire fighting, etc at any landing from entering the lift shafts.
- m) A sign shall be posted and maintained on every floor at or near the lift indicating that in case of fire, occupants shall use the stairs unless instructed otherwise. The sign shall also contain a plan for each floor showing the location of the stairways. Floor marking shall be done at each floor on the wall in front of the lift-landing door.
- n) Alternate power supply shall be provided in all the lifts.

### 11.9.2 Fire Lift

Following details shall apply for a fire lift in addition to above requirements:

- a) To enable fire service personnel to reach the upper floors with the minimum delay, one or more of the lifts shall be so designed so as to be available for the exclusive use of the fireman in an emergency and be directly accessible to every dwelling/lettable floor space on each floor.
- b) The lift shall have a floor area of not less than 1.4 sq.mt. It shall have a loading capacity of not less than 545 kg. (8 persons lift) with automatic closing doors.
- c) The electric supply shall be on a separate service from electric supply mains in a building and the cables run in a route safe from fire, that is within a lift shaft. Lights and fans in the elevator having wooden paneling or sheet steel construction shall be operated on 24-volt supply.
- d) In case of failure of normal electric supply, it shall automatically switch over to the alternate supply. For apartment houses, this changeover of supply could be done through manually operated changeover switch. Alternatively, the lift should be so wired that in case of power failure, it comes down at the ground level and comes to stand still with door open.
- e) The operation of a fire lift shall be by a single toggle of two-button switch situated in a glass-fronted box adjacent to the lift at the entrance level. When the switch is on landing; call points will become inoperative and the lift will be on car control only or on a priority control device. When the switch is off, the lift will return to normal working. This lift can be used by the occupants in normal times.
- f) The words '*FIRE LIFT*' shall be conspicuously displayed in fluorescent paint on the lift landing doors at each floor level.
- g) The speed of the fire lift shall be such that it can reach to the top floor from ground level within one minute.

### 11.10 Basement

As provided in *Chapter- 4* and Building Bye-Laws.

#### 11.10.1 Requirements

- i) The access to the basement shall be either from the main or alternate staircase providing access and exit from higher floors. Where the staircase is continued the same shall be enclosed type serving as a fire separation from the basement floor and higher floors. Open ramps shall be permitted if they are constructed within the building line subject to the provision of the (iv).
- ii) In case of basement for office, sufficient number of exit ways and access ways shall be provided with a travel distance not more than 15.0 m. The travel distance in case of dead-end shall be 7.5 m.
- iii) The basement shall be partitioned and in no case compartment shall be more than 500 sq m. and less than 50 sq m. area except parking. Each compartment shall have ventilation standards as laid down in Bye-Laws separately and



independently. The partition shall be made in consultation with Chief Fire Officer.

- iv) The first basement (immediately below ground level) can be used for services/parking/other permissible services. Lower basement, if provided, shall exclusively be used for car parking only.
- v) Each basement shall be separately ventilated. Vents with cross-sectional area (aggregate) not less than 2.5 percent of the floor area spread evenly round the perimeter of the basement shall be provided in the form of grills or breakable starboard lights or pavement lights or by way of shafts. Alternatively a system of air inlets shall be provided at basement floor level and smoke outlets at basement ceiling level. Inlets and extracts may be terminated at ground level with starboard or pavement lights as before. But ducts to convey fresh air to the basement floor level have to be laid. Starboard and pavement lights should be in positions easily accessible to the firemen and clearly marked "SMOKE OUTLET" or "AIR INLET" with an indication of area served at or near the opening.
- vi) The staircase of basement shall be of enclosed type having fire resistance of not less than two hours and shall be situated at the periphery of the basement to be entered at ground level only from the open air and in such positions that smoke from any fire in the basement shall not obstruct any exit serving the ground and upper stories of the building and shall communicate with basement through a lobby provided with fire resisting self closing door of one hour rating. In case of basement being used as car parking only, the travel distance shall be 45 m.
- vii) In multi-storeyed basements, intake duct may serve all basements levels, but each basement and basement compartment shall have separate smoke outlet duct or ducts. Mechanical extractors for smoke venting system from lower basement levels shall also be provided. The system shall be of such design as to operate on actuation of smoke, heat sensitive detectors/sprinklers, if installed, and shall have a considerably superior performance compared to the standard units. It shall also have an arrangement to start it manually.
- viii) Mechanical extractors shall have an internal locking arrangement so that extractors shall continue to operate and supply fans shall stop automatically with the actuation of fire detectors. Mechanical extractors shall be designed to permit 30 air changes per hour in case of fire or distress call. However, for normal operation, only 30 air changes or any other convenient factor can be maintained.
- ix) Mechanical extractors shall have an alternate source of power supply.
- x) Ventilating ducts shall be integrated with the structure and made out of brick masonry or RCC as far as possible and when this duct crosses the transformer area of electrical switchboard, fire dampers shall be provided.
- xi) Kitchens working on gas fuel shall not be permitted in basement/sub-basement.
- xii) If cutouts are provided from basement to the upper floors or to the atmosphere, all side cutout openings in the basements shall be protected by sprinkler heads at closed spacing so as to form a water curtain in the event of a fire.
- xiii) Dewatering pump shall be provided in all basements.

**11.11 Provision of helipad**

All high-rise buildings of height 200 m. and above shall have provision for a Helipad as per clause no 5.5.8 of the Bye-Laws. The same shall be approved by the Authority.

**11.12 Service ducts/refuge chute**

- a) Service duct shall be enclosed by walls and door, if any, of 2 hours fire rating. If ducts are larger than 10 sq m. the floor should seal them, but provide suitable opening for the pipes to pass through, with the gaps sealed.
- b) A vent opening at the top of the service shaft shall be provided between one-fourth and one-half of the area of the shaft. Refuge chutes shall have an outlet at least of wall of non-combustible material with fire resistance of not less than two hours. They shall not be located within the staircase enclosure or service shafts or air-conditioning shafts. Inspection panel and door shall be tight fitting with 1 hour fire resistance; the chutes should be as far away as possible from exits.
- c) Refuge chutes shall not be provided in staircase walls and A/C shafts etc.

**11.13 Electrical services**

Electrical Services shall conform to the following:

- a) The electric distribution cables/wiring shall be laid in a separate duct shall be sealed at every floor with non-combustible material having the same fire resistance as that of the duct. Low and medium voltage wiring running in shaft and in false ceiling shall run in separate conduits.
- b) Water mains, telephone wires, inter-com lines, gas pipes or any other service lines shall not be laid in ducts for electric cables.
- c) Separate conduits for water pumps, lifts, staircases and corridor lighting and blowers for pressuring system shall be directly from the main switch panel and these circuits shall be laid in separate conduit pipes, so that fire in one circuit will not affect the others. Master switches controlling essential service circuits shall be clearly labeled.
- d) The inspection panel doors and any other opening in the shaft shall be provided with airtight fire doors having fire resistance of not less than 1 hour.
- e) Medium and low voltage wiring running in shafts, and within false ceiling shall run in metal conduits. Any 230 voltage wiring for lighting or other services, above false ceiling should have 660V grade insulation. The false ceiling including all fixtures used for its suspension shall be of non-combustible material.
- f) An independent and well-ventilated service room shall be provided on the ground floor with direct access from outside or from the corridor for the purpose of termination of electrical supply from the licenses service and alternative supply cables. The doors provided for the service room shall have fire resistance of not less than 1 hour.
- g) Miniature circuit breakers(MCB) and Earth leakage circuit breaker (ELCB) shall be provided for electrical circuit.

### 11.14 Staircase and corridor lights

The staircase and corridor lighting shall be on separate circuits and shall be independently connected so that it could be operated by one switch installation on the ground floor easily accessible to fire fighting staff at any time irrespective of the position of the individual control of the light points, if any. It should be of miniature circuit breaker type of switch so as to avoid replacement of fuse in case of crisis.

- a) Staircase and corridor lighting shall also be connected to alternate source of power supply.
- b) Suitable arrangement shall be made by installing double throw switches to ensure that the lighting installed in the staircase and the corridor does not get connected to two sources of supply simultaneously. Double throw switch shall be installed in the service room for terminating the stand by supply.
- c) Emergency lights shall be provided in the staircase and corridor.

### 11.15 Air-conditioning

- a) Air- conditioning system should be installed and maintained so as to minimize the danger of spread of fire, smoke or fumes thereby from one floor of fire area to another or from outside into any occupied building or structure.–
- b) Air -Conditioning systems circulating air to more than one floor area should be provided with dampers designed to close automatically in case of fire and thereby prevent spread of fire or smoke. Such a system should also be provided with automatic controls to stop fans in case of fire, unless arranged to remove smoke from a fire, in which case these should be designed to remain in operation.
- c) Air- conditioning system serving large places of assembly (over one thousand persons), large departmental stores, or hostels with over 100 rooms in a single block should be provided with effective means for preventing circulation of smoke through the system in the case of fire in air filters or from other sources drawn into the system even though there is insufficient heat to actuate heat smoke sensitive devices controlling fans or dampers. Such means shall consist of approved effective smoke sensitive controls.

#### 11.15.1 Air- Conditioning should conform to the following:

- a) Escape routes like staircase, common corridors, lift lobbies; etc should not be used as return air passage.
- b) The ducting should be constructed of metal in accordance with BIS 655:1963
- c) Wherever the ducts pass through fire walls or floor, the opening around the ducts should be sealed with fire resisting material of same rating as of walls/floors.
- d) Metallic ducts should be used even for the return air instead of space above the false ceiling.
- e) The material used for insulating the duct system (inside or outside) should be of flame resistant (IS 4355: 1977) and non- conductor of heat.
- f) Area more than 750 sq m. on individual floor should be segregated by a firewall and automatic fire dampers for isolation should be provided.

- g) In case of more than one floor, arrangement by way of automatic fire dampers for isolating the ducting at every floor from the floor should be made. Where plenums used for return air passage, ceiling and its features and air filters of the air handling units, these should be flame resistant. Inspection panels should be provided in the main trenching. No combustible material should be fixed nearer than 15 cm. to any duct unless such ducting is properly enclosed and protected with flame resistant material
- h) In case of buildings more than 24 m. in height, in non-ventilated lobbies, corridors, smoke extraction shaft should be provided.

### 11.15.2 Fire Dampers

- a) These shall be located in air ducts and return air ducts/passages at the following points:
  - i) At the fire separation wall.
  - ii) Where ducts/passages enter the central vertical shaft.
  - iii) Where the ducts pass through floors.
  - iv) At the inlet of supply air duct and the return air duct of each compartment on every floor.
- b) The dampers shall operate automatically and shall simultaneously switch off the air- handling fans. Manual operation facilities shall also be provided.
 

*Note: For blowers, where extraction system and dust accumulators are used, dampers shall be provided.*
- c) Fire/smoke dampers (for smoke extraction shafts) for building more than 24 m. in height.
 

For apartment houses in non-ventilated lobbies/corridor operated by detection system and manual control sprinkler system.

For other buildings on operation of smoke/heat detection system and manual control/sprinkler system.
- d) Automatic fire dampers shall be so arranged so as to close by gravity in the direction of air movement and to remain tightly closed on operation of a fusible link.

### 11.16 Boiler Room

Provisions of boiler and boiler rooms shall conform to Indian Boiler Act, 2007. Further, the following additional aspects may be taken into account in the location of boiler/ boiler room -

- a) The boiler shall not be allowed in sub-basement, but may be allowed in the basement away from the escape routes.
- b) The boilers shall be installed in a fire resisting room of 4 hours fire resistance rating, and this room shall be situated on the periphery of the basement. Catch pits shall be provided at the low level.
- c) Entry to this room shall be provided with a composite door of 2 hours fire resistance.

- d) The boiler room shall be provided with fresh air inlets and smoke exhaust directly to the atmosphere.
- e) The furnace oil tank for the boiler if located in the adjoining room shall be separated by fire resisting wall of 4 hours rating. The entrance to this room shall be provided with double composite doors. A curb of suitable height shall be provided at the entrance in order to prevent the flow of oil into boiler room in case of tank rupture.
- f) Foam inlets shall be provided on the external walls of the building near the ground level to enable the fire services to use foam in case of fire.

### **11.17 Alternate source of electric supply**

A stand by electric generator shall be installed to supply power to staircase and corridor lighting circuits, lifts detection system, fire pumps, pressurization fans and bowlers, Public Addressal (PA) system, exit sign, smoke extraction system, in case of failure of normal electric supply. The generator shall be capable of taking starting current of all the machines and circuits stated above simultaneously.

If the standby pump is driven by diesel engine, the generator supply need not be connected to the standby pump. The generator shall be automatic in operation.

### **11.18 Safety measures in electric sub-station**

- 1) Clear independent approach to the sub-station from outside the building shall be made available round the clock
- 2) The approaches/corridors to the sub-station area shall be kept clear for movement of men and material at all times.
- 3) The sub-station space is required to be provided with proper internal lighting arrangements.
- 4) In addition to natural ventilation proper ventilation to the sub-station area is to be provided by grill shutters and exhaust fans at suitable places so as to discharge all smoke from the sub-station without delay in case of fire so that sub-station operations can be carried out expeditiously.
- 5) Cable trenches of 0.6 m. X 0.6 m. dummy floor of 0.6 mt. depth shall be provided to facilitate laying of cable inside the building for connecting to the equipment.
- 6) Steel shutters of 8'X 8' with suitable grills shall be provided for transformers and sub-station room.
- 7) The floor of the sub-station should be capable of carrying 10 tons of transformer weight on wheels.
- 8) Built up substation space is to be provided free of cost.
- 9) Sub-station space should be clear from any water, sewer, air conditioning, and gas pipe or telephone services. No other service should pass through the sub station space or the cable trenches.

- 10) Proper ramp with suitable slope may be provided for loading and unloading of the equipment and proper approach will be provided.
- 11) RCC pipes at suitable places as required will be provided for the cable entries to the sub station space and making suitable arrangement for non-ingress of water through these pipes.
- 12) The sub station space is to be provided in the approved/sanctioned covered area of the building.
- 13) Any other alteration /modification required while erection of the equipment will be made by the Owner / builder at site as per requirement.
- 14) Adequate arrangement for fixing chain pulley block above the fixing be available for load of 15 tons.
- 15) Provision shall be kept for the sumps so as to accommodate complete volume of transformer oil, which can spillover in the event of explosion of the transformer in the basement of the building. Sufficient arrangement should exist to avoid fire in the sub-station building from spread of the oil from the sumps.
- 16) Arrangement should be made for the provision of fire retardant cables so as to avoid chances of spread of fire in the sub-station building.
- 17) Sufficient pumping arrangement should exist for pumping the water out, in case of fire so as to ensure minimum loss to the switchgear and transformer.
- 18) No combustible material should be stacked inside the substation premises or in the vicinity to avoid chances of fire.
- 19) It should be made mandatory that the promoters of the multi-storeyed building should get substation premises inspected once a year to get their license revalidated for the provision of electric supply from Electricity Board so that suitable action can be taken against the Owner / Builder in case of non-implementation of Bye-Laws.
- 20) The sub-station must not be located below the 1<sup>st</sup> basement and above the ground floor.
- 21) The sub-station space should be totally segregated from the other areas of the basement by fire resisting wall. The ramp should have a slope of 1:10 with entry from ground level. The entire Sub-station space including the entrance at ground floor be handed over to the licensee of electricity free of cost and rent.
- 22) The sub-station area shall have a clear height of 15 feet (4.5 m.) below beams. Further the Sub-station area will have level above the rest of basement level by 2 feet.
- 23) It is to be ensured that the Sub-station area is free of seepage / leakage of water.
- 24) The licensee of electricity will have the power to disconnect the supply of the building in case of violation of any of the above points. However, provision of emergency lights has to be made in the sub-station for emergency operations.
- 25) Electric sub-station enclosure must be completely segregated with 4-hours fire rating wall from remaining part of basement.

- 26) The sub-station should be located on periphery /sub basement and (not above ground floor).
- 27) Additional exit shall be provided if travel distance from farthest corner to ramp is more than 15 m.
- 28) Perfect independent vent system 30 air changes per hour linked with detection as well as automatic high velocity water spray system shall be provided.
- 29) All the transformers shall be protected with Nitrogen Injection System Carbon Dioxide total flooding system in case of oil filled transformer. In addition to this, manual control of auto high velocity spray system for individual transformers shall be located outside the building at ground floor.
- 30) Suitable arrangement for pump house, water storage tanks with main electrical pump and a diesel-operated pump shall be made if no such arrangement is provided in the building. In case the water pumping facilities are existing in the building for sprinkler system, the same should however be utilized for high velocity water spray system. Alternatively automatic CO2 total flooding system shall be provided with manual controls outside the electric sub-station.
- 31) System shall have facility to give an audio alarm in the basement as well as at the control room.
- 32) Fire control room shall be manned round the clock.
- 33) The electric sub station shall have electric supply from alternate source for operation of vent System lighting arrangements.
- 34) Cable trenches shall be filled with sand.
- 35) Partition walls shall be provided between two transformers as per the rules.
- 36) Electric control panels shall be segregated.
- 37) Exits from basement electric substation shall have self-closing fire smoke check doors of 2-hours fire rating near entry to ramp.
- 38) All openings to lower basement or to ground floor shall be sealed properly.
- 39) Yearly inspection shall be carried out by electrical load sanctioning Authority.
- 40) Ramp to be designed in a manner that in case of fire no smoke should enter the main building.
- 41) Electric sub-station transformer shall have clearance on all sides as per BBL/relevant electric rules.
- 42) Other facility will be as per Building Bye-Laws and relevant electric rules.
- 43) Rising electrical mains shall consist of metal bus bars suitably protected from safety point of view.
- 44) Oil less transformer shall be preferred. If the sub-station is located in basement / ground floor of the main building, the transformers shall be essentially of dry type. In case of dry type transformer room with wall enclosure is not essential.

*Note: The sub-station installations shall be carried out in conformity with the local fire regulations and rules there under wherever they are in force. At other places NBC guidelines shall be followed.*

**11.19 Fire protection requirements**

Buildings shall be planned, designed and constructed to ensure fire safety and this shall be done in accordance with part IV Fire Protection of NBC, 2005 of India, unless otherwise specified in these Bye-Laws. In the case of buildings (identified in Bye-Laws No. 2.17.4) the building schemes shall also be cleared by the Chief Fire Officer.

**11.19.1 First Aid /Fixed Fire Fighting /Fire Detection Systems and other Facilities**

Provision of fire safety arrangement for different occupancy from. Sl.No. 1 to 23 as indicated below shall be as per Annexure 'B-I' 'B-II' & 'B-III'.

1. Access
2. Wet Riser
3. Down Comer
4. Hose Reel
5. Automatic Sprinkler System
6. Yard Hydrant
7. U.G. Tank with Draw off Connection
8. Terrace Tanks
9. Fire Pump
10. Terrace Pump
11. First Aid Fire Fighting Appliances
12. Auto Detection System
13. Manual operated Electrical Fire Alarm System
14. P.A System with talk back facility
15. Emergency Light
16. Auto D.G. Set
17. Illuminated Exit Sign
18. Means of Escape
19. Compartmentation
20. MCB /ELCB
21. Fire Man Switch in Lift
22. Hose Boxes with Delivery Hoses and Branch
23. Pipes Refuge Area

**11.19.1.1 Note for Annexure 'B-I' 'B-II' & 'B-III'**

1. Where more than one riser is required because of large floor area, the quantity of water and pump capacity recommended in these Annexure should be finalized in consultation with Chief Fire Officer.
2. The above quantities of water shall be exclusively for fire fighting and shall not be utilized for domestic or other use.
3. A facility to boost up water pressure in the riser directly from the mobile pump shall be provided in the wet riser, down comer system with suitable fire service inlets (collecting head) with 2 to 4 numbers of 63 mm inlets for 100-200 mm dia main, with check valve and a gate valve.
4. Internal diameter of rubber hose for reel shall be minimum 20 mm. A shut off branch with nozzle of 5 mm. size shall be provided.



5. Fire pumps shall have positive suction. The pump house shall be adequately ventilated by using normal/mechanical means. A clear space of 1.0 m. shall be kept in between the pumps and enclosure for easy movement/maintenance. Proper testing facilities and control panel etc. shall be provided.
6. Unless otherwise specified in Bye-Laws, the fire fighting equipments/installation shall conform to relevant Indian Standard Specification.
7. In case of mixed occupancy, the fire fighting arrangement shall be made as per the highest class of occupancy.
8. Requirement of water based first aid fire extinguishers shall be reduced to half if hose reel is provided in the Building.

### 11.20 Static water storage tank

- a) A satisfactory supply of water exclusively for the purpose of fire fighting shall always be available in the form of underground static storage tank with capacity specified in Annexure-‘A’ with arrangements of replenishment b’ town's main or alternative source of supply @ 1000 liters per minute. The static storage water supply required for the above mentioned purpose should entirely be accessible to the fire tenders of the local fire service. Provision of suitable number of manholes shall be made available for inspection repairs and insertion of suction hose etc. The covering slab shall be able to withstand the vehicular load of 45 tonnes in case of high rise and 22 tonnes in case of low rise buildings. A draw off connection shall be provided. The slab need not be strengthened if the static tank is not located in mandatory set-back area.
- b) To prevent stagnation of water in the static water tank the suction tank of the domestic water supply shall be fed only through an over flow arrangement to maintain the level therein at the minimum specified capacity.
- c) The static water storage tank shall be provided with a fire brigade collecting branching with 4 Nos. 63mm dia instantaneous male inlets arranged in a valve box with a suitable fixed pipe not less than 15 cm dia to discharge water into the tank. This arrangement is not required where down comer is provided.

### 11.21 Automatic sprinklers

Automatic sprinkler system shall be installed in the following buildings:

- a) All buildings of 24 m. and above in height, except group housing and 45 m. and above in case of apartment /group housing society building.
- b) Hotels below 15 m. in height and above 1000 sq m. built up area at each floor and or if basement is existing.
- c) All hotels, mercantile, and institutional buildings of 15 m. and above.
- d) Mercantile buildings having basement more than one floor but below 15 m. (floor area not exceeding 750 sq m.)
- e) Underground Shopping Complex.
- f) Underground car / scooter parking /enclosed car parking.
- g) Basement area 200 sq m. and above.

- h) Any special hazards where the Chief Fire Officer considers it necessary.
  - i) For buildings up to 24 m. in height where automatic sprinkler system is not mandatory as per these Bye-Laws, if provided with sprinkler installation following relaxation may be considered.
  - ii) Automatic heat/smoke detection system and M.C.P. need not be insisted upon.
  - iii) The number of Fire Extinguisher required shall be reduced by half.

### **11.22 Fixed Carbon di-oxide /Foam/DCO water spray extinguishing system**

Fixed extinguishing installations shall be provided as per the relevant specifications in the premises where use of above extinguishing media is considered necessary by the Chief Fire Officer.

### **11.23 Fire alarm system**

All buildings of 15 m. and above in height shall be equipped with fire alarm system, and also residential buildings (Dwelling House, Boarding House and Hostels) above 24 m. height.

- a) All residential buildings like dwelling houses (including flats) boarding houses and hostels shall be equipped with manually operated electrical fire alarm system with one or more call boxes located at each floor. The location of the call boxes shall be decided after taking into consideration their floor without having to travel more than 22.5 m.
- b) The call boxes shall be of the break glass type without any moving parts, where the call is transmitted automatically to the control room without any other action on the part of the person operating the call boxes.
- c) All call boxes shall be wired in a closed circuit to a control panel in a control room, located as per Bye-Laws so that the floor number from where the call box is actuated is clearly indicated on the control panel. The circuit shall also include one or more batteries with a capacity of 48 hours normal working at full load. The battery shall be arranged to be a continuously trickle charged from the electric mains.
- d) The call boxes shall be arranged to sound one or more sounders so as to ensure that all occupants of the floor shall be warned whenever any call box is actuated.
- e) The call boxes shall be so installed that they do not obstruct the exit ways and yet their location can easily be noticed from either direction. The base of the call box shall be at a height of 1.5 m. from the floor level.
- f) All buildings other than as indicated above shall, in addition to the manually operated electrical fire alarm system, be equipped with an automatic fire alarm system.
- g) Automatic detection system shall be installed in accordance with the relevant standard specifications. In buildings where automatic sprinkler system is provided, the automatic detection system may not be insisted upon unless decided otherwise by the Chief Fire Officer.

*Note: The installation of Fire Alarm Systems shall be carried out in conformity with the local fire regulations and rules, there under whenever they are in force and the provisions in local bye-laws, if any. Several type of fire detectors are available in the market but the application of each type is limited and has to be carefully considered in relation to the type of risk and the structural features of the building where they are to be installed.*

### 11.24 Control Room

There shall be a control room on the entrance floor of the building with communication system (suitable public address system) to all floors and facilities for receiving the message from different floors. Details of all floor plans along with the details of fire fighting equipment and installation shall be maintained in the Control Room. The Control Room shall also have facility to detect the fire on any floor through indicator boards connecting fire detection and alarm system on all floors. The staff in charge of the Control Room shall be responsible for the maintenance of the various services and fire fighting equipment and installation. The Control Room shall be manned round the clock by trained fire fighting staff.

### 11.25 Fire drills and fire orders

The guidelines for fire drill and evacuation etc. for high-rise building may be seen in Appendix (B) of NBC 2005 part IV. All such buildings shall prepare the fire orders duly approved by the Chief Fire Officer.

A qualified fire officer and trained staff shall be appointed for the following buildings:

- a) All high rise buildings above 30 m. in height where covered area of one floor exceeds 1000 sq m. except apartments / group housing.
- b) All hotels, identified under classification 3 star and above category by Tourism Department and all hotels above 15 m. in height with 150 beds capacity or more without star category.
- c) All hospital building of 15 m. and above or having number of beds exceeding 100.
- d) Underground shopping complex where covered area exceeds 1000 sq m.
- e) All high hazard industries.
- f) Any other risk which Chief Fire Officer considers necessary.

The **lightening protection** warning light (red) for high-rise buildings shall be provided in accordance with the relevant standard. The same shall be checked by electrical department.

### 11.26 Material used for construction of building

- a) The combustible/flammable material shall not be used for partitioning, wall paneling, false ceiling etc. Any material giving out toxic gases/smoke if involved in the fire shall not be used for partitioning of a floor or wall paneling or a false ceiling etc. The surface frames spread of the lining material shall conform to class-I of the standard specification. The framework of the entire false ceiling would be

provided with metallic sections and no wooden framework shall be allowed for paneling/false ceiling.

- b) Construction features/elements of structures shall conform to National Building Code and BIS code

### **11.27 Liquefied Petroleum Gas (LPG)**

The use of LPG shall not be permitted in the high-rise building except residential/hotel/hostel/kitchen/pantry (if any) and shall be located at the periphery of the building on the ground level.

### **11.28 House keeping**

A high standard of house keeping must be insisted upon by all concerned. There must be no laxity in this respect. It must be borne in mind that fire safety is dependent to a large extent upon good housekeeping.

#### **11.28.1 Good House-Keeping includes the following:-**

- a) Maintaining the entire premises in neat and clean condition.
- b) Ensuring that rubbish and combustible material are not thrown about or allowed to accumulate, even in small quantity, in any portion of the building. Particular attention must be paid to corners and places hidden from view.
- c) Providing metal receptacles/waste paper basket (of non-combustible material) at suitable locations for disposal of waste. Separate receptacles must be provided for disposal of cotton rags/waste, wherever it is generated, these must under no circumstances be left lying around in any portion of the building.
- d) Ensuring that receptacles for waste are emptied at regular intervals and the waste removed immediately for safe disposal outside the building.
- e) Ensuring that all doors/fixtures are maintained in good repairs, particular attention must be paid to self-closing fire smoke check doors and automatic fire/doors/rolling shutters.
- f) Ensuring that self-closing fire/smoke check doors close properly and that the doors are not wedged open.
- g) Ensuring that the entire structure of the building is maintained in good repairs.
- h) Ensuring that all electrical and mechanical service equipments are maintained in good working condition at all times.
- i) Ensuring that Cars /Scooters etc. are parked systematically in neat rows. It is advisable to mark parking lines on the ground in the parking areas near the building and in the parking area on ground floor and in basement(s); as applicable, inside the building. A parking attendant must ensure that vehicles are parked in an orderly manner and that the vehicles do not encroach upon the open space surrounding the building.

#### **11.28.2 Smoking Restrictions**

- a) Smoking shall be prohibited throughout the basement(s) and in all areas where there is a profusion of combustible materials. Easily readable "NO SMOKING"

signs must be conspicuously posted at locations where they can catch the eye. Each sign must also include a pictograph. The sign may also be illuminated.

- b) In all places where smoking is permitted ashtrays, half filled with water, must be placed on each table/at each other suitable locations for safe disposal of spent smoking material. The design of the ashtrays must be such that they cannot easily topple over. If, for any reason, this is not practicable a minimum of one metal bucket or other non-combustible container half filled with water must be provided in each compartment for disposal of spent smoking materials.

### 11.28.3 Limiting the Occupant Load in Parking and Other Areas of Basement(s)

Where parking facility is provided in the basement(s) no person other than the floor-parking attendant may be allowed to enter and remain in the parking areas except for parking and removal of Cars/Scooters. Regular offices must not be maintained in the storage/parking area in the basement(s). The stores/godowns must be opened for the limited purpose of keeping or removing stores.

No person other than those on duty may be permitted in the air-conditioning plant room(s), HT/LT switch room, transformer compartment, control room pump-house, generator room, stores and records etc.

## 11.29 Fire prevention

In addition to the measures recommended above, the following fire prevention measures must be implemented when the building is in occupation.

- a) Storage of flammable substances, such as diesel oil, gasoline, motor oils, etc must not be allowed anywhere within the building. The only exception to this rule may be:
  - i) Storage of diesel oil in a properly installed tank in a fire-resisting compartment in the generator room;
  - ii) Diesel oil, gasoline, motor oil etc, filled in the vehicle tanks.
- b) Preparation of tea and warming of food must be prohibited throughout the building.
- c) Where heaters are used during winters, the following precautions must be taken.
  - i) All heaters, except convector heaters, must be fitted with guards.
  - ii) Heaters must not be placed in direct contact with or too close to any combustible material.
  - iii) Heaters must be kept away from curtains to ensure that the latter do not blow over the heater accidentally.
  - iv) Heaters must not be left unattended while they are switched on.
  - v) Defective heaters must be immediately removed from service until they have been repaired and tested for satisfactory performance.
  - vi) Use of heaters must be prohibited in the entire basement, fire control room and in all weather maker rooms throughout the building. Also in all places where there is profusion of combustible flammable materials.
- d) Use of candles or other naked light flame must be forbidden throughout the building, except in the offices (for sealing letters only) and kitchen. When

candles/ spirit lamps are used for sealing letters/packets, extreme care must be taken to ensure that paper do not come in direct contact with the naked flame and the candle/spirit lamp does not topple over accidentally while still lighted. All candles/spirit lamps kitchen fires must be extinguished when no longer required.

- e) Fluorescent lights must not be directly above the open file racks in offices/record rooms. Where this is unavoidable, such lights must be switched on only for as long as they are needed.
- f) Filling up of old furniture and other combustible materials such as scrap paper, rags, etc. must not be permitted anywhere in the building. These must be promptly removed from the building.
- g) More than one portable electrical appliance must not be connected to any single electrical outlet.
- h) Used stencils, ink smeared combustible materials and empty ink tubes must not be allowed to accumulate in rooms/compartments where cyclostyling is done. These must be removed and disposed off regularly.
- i) All shutters/doors of main switch panels and compartments/shafts for electrical cables must be kept locked.
- j) Aisles in record rooms and stores must have a clear uniform width of not less than 1.0 m. Racks must not be placed directly against the wall/partition.
- k) In record rooms, offices and stores, a clear space of not less than 30 cm. must be maintained between the top-most stack of stores/records and the or lighting fittings whichever is lower.
- l) A similar clearance, and at (k) above must be maintained from fire detectors.
- m) Fire detectors must not be painted under any circumstances and must also be kept free from lime/distemper.
- n) Records must not be piled/dumped on the floor.
- o) Welding or use of blow torch shall not be permitted inside the building, except when it is done under strict supervision and in full conformity with the requirements laid down in IS: 3016-1966 code of practice for fire precautions in welding and cutting operation.
- p) Printing ink/oil must not be allowed to remain on the floor, the floor must be maintained in a clean condition at all times.

**11.30 Occupancy restrictions**

- a) The premises leased to any party shall be used strictly for the purpose for which they are leased.
- b) No dangerous trade/practices (including experimenting with dangerous chemicals) shall be carried on in the leased premises.
- c) No dangerous goods shall be stored within the leased premises.
- d) The common/public corridor shall be maintained free of obstructions, and the lessee shall not put up any fixtures that may obstruct the passage in the corridor and/or shall not keep any wares, furniture or other articles in the corridor.
- e) The penalty for contravention of the condition laid down below must be immediate termination of lease and removal of all offending materials.
- f) Regular inspection and checks must be carried out at frequent intervals to ensure compliance with conditions above.

*Note: For any further details / clarification NBC, Part 4 shall be referred. Norms and standards in Part 4 of NBC 2005 shall be overriding in any instance of variance of standards.*





## 12. CONSERVATION OF HERITAGE SITES INCLUDING HERITAGE BUILDINGS, HERITAGE PRECINCTS AND NATURAL FEATURE AREAS

Conservation of heritage sites shall include buildings, artifacts, structures, areas and precincts of historic, aesthetic, architectural, cultural or environmentally significant nature (heritage buildings and heritage precincts), natural feature areas of environmental significance or sites of scenic beauty.

### 12.1 Applicability

These regulations shall apply to heritage sites which shall include those buildings, artifacts, structures, streets, areas and precincts of historic, architectural, aesthetic, cultural or environmental value (hereinafter referred to as Listed Heritage Buildings/Listed Heritage Precincts) and those natural feature areas of environmental significance or of scenic beauty including, but not restricted to, sacred groves, hills, hillocks, water bodies (and the areas adjoining the same), open areas, wooded areas, points, walks, rides, bridle paths (hereinafter referred to as ‘listed natural feature areas’) which shall be listed in notification(s) to be issued by the State Government / identified in Master Plan.

The provisions in this chapter are beyond the regulations applicable on the *Prohibited and Regulated areas* as defined by Ancient Monuments and Archaeological Sites and Remains (AMASR) Act 2010, where *site specific Heritage Bye-Laws* prepared and notified by the Competent Authority (National Monuments Authority) under the AMASR Act shall be applicable. NOC shall have to be obtained by submission of required documents as may be necessary, including “*Heritage Impact Assessment*” report, if so necessitated by the NMA.

#### 12.1.1 Definitions

- a) “*Heritage building*” means and includes any building of one or more premises or any part thereof and/or structure and/or artifact which requires conservation and/or preservation for historical and/or architectural and/or artisanry and/or aesthetic and/or cultural and/or environmental and/or ecological purpose and includes such portion of land adjoining such building or part thereof as may be required for fencing or covering or in any manner preserving the historical and/or architectural and/or aesthetic and/or cultural value of such building.
- b) “*Heritage Precincts*” means and includes any space that requires conservation and/or preservation for historical and/or architectural and/or aesthetic and/or cultural and/or environmental and/or ecological purpose. Walls or other boundaries of a particular area or place or building or may enclose such space by an imaginary line drawn around it.

- c) **“Conservation”** means all the processes of looking after a place so as to retain its historical and/or architectural and/or aesthetic and/or cultural significance and includes maintenance, preservation, restoration, reconstruction and adoption or a combination of more than one of these.
- d) **“Preservation”** means and includes maintaining the fabric of a place in its existing state and retarding deterioration
- e) **“Restoration”** means and includes returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without introducing new materials.
- f) **“Reconstruction”** means and includes returning a place as nearly as possible to a known earlier state and distinguished by the introduction of materials (new or old) into the fabric. This shall not include either recreation or conjectural reconstruction.

## **12.2 Responsibility of the owners of heritage buildings**

It shall be the duty of the owners of heritage buildings and buildings in heritage precincts or in heritage streets to carry out regular repairs and maintenance of the buildings. The State Government, the Municipal Corporation or the Local Bodies and Authorities concerned shall not be responsible for such repair and maintenance except for the buildings owned by the Government, the Municipal Corporation or the other local bodies.

## **12.3 Restrictions on development / re-development / repairs etc.**

No development or redevelopment or engineering operation or additions / alterations, repairs, renovations including painting of the building, replacement of special features or plastering or demolition of any part thereof of the said listed buildings or listed precincts or listed natural feature areas shall be allowed except with the prior permission of Commissioner, Municipal Corporation /Vice Chairman, Development Authority. Before granting such permission, the agency concerned shall consult the Heritage Conservation Committee to be appointed by the State Government and shall act in according with the advice of the Heritage Conservation Committee.

- i) Provided that, before granting any permission for demolition or major alterations / additions to listed buildings (or buildings within listed streets or precincts), or construction at any listed natural features, or alteration of boundaries of any listed natural feature areas, objections and suggestions from the public shall be invited and shall be considered by the Heritage Conservation Committee.
- ii) Provided that, only in exceptional cases, for reasons to be recorded in writing, the Commissioner, Municipal Corporation/ Vice Chairman, Development Authority may refer the matter back to the Heritage Conservation Committee for reconsideration.

However, the decision of the Heritage Conservation Committee after such reconsideration shall be final and binding.

#### 12.4 Penalties

Violation of the regulations shall be punishable under the provisions regarding unauthorized development. In case of proved deliberate neglect of and/or damage to Heritage Buildings and Heritage Precincts, or if the building is allowed to be damaged or destroyed due to neglect or any other reason, in addition to penal action provided under the concerned Act, no permission to construct any new building shall be granted on the site if a Heritage Building or Building in a Heritage Precinct is damaged or pulled down without appropriate permission from Commissioner, Municipal Corporation/ Vice Chairman, Development Authority.

It shall be open to the Heritage Conservation Committee to consider a request for re-building/reconstruction of a Heritage Building that was unauthorizedly demolished or damaged, provided that the total built-up area in all floors put together in such new construction is not in excess of the total built-up area in all floors put together in the original Heritage Building in the same form and style in addition to other controls that may be specified.

#### 12.5 Preparation of list of heritage sites including heritage buildings, heritage precincts and listed natural feature areas

The list of heritage sites including Heritage Buildings, Heritage Precincts and listed Natural Features Areas is to be prepared and supplemented by the Commissioner, Municipal Corporation / Vice- Chairman, Development Authority on the advice of the Heritage Conservation Committee. Before being finalized, objections and suggestions of the public are to be invited and considered. The said list to which the regulation applies shall not form part of this regulation for the purpose of Building Bye-laws. The list may be supplemented from time to time by Government on receipt of proposal from the agency concerned or by Government *suo-moto* provided that before the list is supplemented, objections and suggestions from the public be invited and duly considered by the Commissioner, Municipal Corporation/Vice- Chairman Development Authority/and/or State Government and / or the Heritage Conservation Committee.

When a building or group of buildings or natural feature areas are listed it would automatically mean (unless otherwise indicated) that the entire property including its entire compound / plot boundary along with all the subsidiary structures and artifacts, etc. within the compound/plot boundary, etc. shall form part of list.

#### 12.6 Alteration / modification / relaxation in development norms

On the advice of the said Heritage Conservation Committee to be appointed by the Government and for reasons to be recorded in writing, the Commissioner, Municipal Corporation / Vice Chairman, Development Authority shall follow the procedure as per Development Authority Act, to alter, modify or relax the Development Control Norms prescribed in the Master Plan, if required, for the conservation or preservation or retention of historic or aesthetic or cultural or architectural or environmental quality of any heritage site.

### **12.7 Heritage precincts / Natural feature areas**

In cases of streets, precincts, areas and (where deemed necessary by the Heritage Conservation Committee) natural feature areas notified, development permissions shall be granted in accordance with the special separate regulation prescribed for respective streets, precincts / natural feature areas which shall be framed by the Commissioner Municipal Corporation/ Vice- Chairman, Development Authority on the advice of the Heritage Conservation Committee.

Before finalizing the special separate regulations for precincts, streets, natural features, areas, the draft of the same shall be published in the official gazette and in leading newspapers for the purpose of inviting objections and suggestions from the public. All objections and suggestions received within a period of 30 days from the date of publication in the official gazette shall be considered by the Commissioner, Municipal Corporation / Vice- Chairman, Development Authority / Heritage Conservation Committee.

After consideration of the above suggestions and objections, the agency concerned, acting on the advice of the Heritage Conservation Committee shall modify (if necessary) the aforesaid draft separate regulations for streets, precincts, areas and natural features and forward the same to Government for notification.

### **12.8 Road widening**

Widening of the existing roads under the Master Plan of the City or Town / Zonal Development Plan or in the Layout Plan shall be carried out considering the existing heritage buildings (even if they are not included in a Heritage Precinct) or which may affect listed natural features areas.

### **12.9 Incentive uses for heritage buildings**

In cases of buildings located in non-commercial use zones included in the Heritage Conservation List, if the owner / owners agree to maintain the listed heritage building as it is in the existing state and to preserve its heritage state with due repairs and the owner / owners / lessees give a written undertaking to that effect, the owner / owners / lessees may be allowed with the approval of the Heritage Conservation Committee within permissible use zone to convert part or whole thereof of the non-commercial area within such a heritage building to commercial/office use/hotel. Provided that if the heritage building is not maintained suitably or if the heritage value of the building is spoiled in any manner, the commercial / office / hotel use shall be disallowed.

### **12.10 Maintaining skyline and architectural harmony**

After the guidelines are framed, buildings within heritage precincts or in the vicinity of heritage sites shall maintain the skyline in the precinct and follow the architectural style (without any high-rise or multi-storeyed development) as may be existing in the surrounding area, so as not to diminish or destroy the value and beauty of or the view from the said heritage sites. The development within the precinct or in the vicinity of

heritage sites shall be in accordance with the guidelines framed by the Commissioner, Municipal Corporation / Vice- Chairman, Development Authority on the advice of the Heritage Conservation Committee or separate regulations / guidelines, if any, prescribed for respective zones by Municipal Corporation / Development Authority.

**12.11 Restrictive covenants**

Restrictions existing as imposed under covenants, terms and conditions on the leasehold plots either by the State Government or by Municipal Corporation of the city/town or by Development Authority shall continue to be imposed in addition to Development Control Regulations. However, in case of any conflict with the heritage preservation interest/environmental conservation, this Heritage Regulation shall prevail.

**12.12 Grading of the listed buildings / listed precincts**

Listed Heritage Buildings / Listed Heritage Precincts may be graded into three categories. The definition of these and basic guidelines for development permissions are as follows:

Listing does not prevent change of ownership or usage. However, change of use of such Listed Heritage Building / Listed Precincts is not permitted without the prior approval of the Heritage Conservation Committee. Use should be in harmony with the said listed heritage site.

**Table 12.1 Grading of Listed heritage**

Grade-I	Grade-II	Grade-III
<p>(A) Definition Heritage Grade-I comprises buildings and precincts of national or historic importance, embodying excellence in architectural style, design, technology and material usage and/or aesthetics; they may be associated with a great historic event, personality, movement or institution. They have been and are the prime landmarks of the region.  All natural sites shall fall within Grade-I.</p>	<p>Heritage Grade-II (A&amp;B) comprises of buildings and precincts of regional or local importance possessing special architectural or aesthetic merit, or cultural or historical significance though of a lower scale than Heritage Grade-I. They are local landmarks, which contribute to the image and identity of the region. They may be the work of master craftsmen or may be models of proportion and ornamentation or designed to suit a particular climate.</p>	<p>Heritage Grade-III comprises building and precincts of importance for townscape; that evoke architectural, aesthetic, or sociological interest through not as much as in Heritage Grade-II. These contribute to determine the character of the locality and can be representative of lifestyle of a particular community or region and may also be distinguished by setting, or special character of the façade and uniformity of height, width and scale</p>
<p>(B) Objective: Heritage Grade-I richly deserves careful preservation.</p>	<p>Heritage Grade-II deserves intelligent conservation.</p>	<p>Heritage Grade-III deserves intelligent conservation (though on a lesser scale than Grade-II and special protection to unique features and attributes)</p>

<b>Grade-I</b>	<b>Grade-II</b>	<b>Grade-III</b>
<p>(C) Scope for Changes: No interventions be permitted either on exterior or interior of the heritage building or natural features unless it is necessary in the interest of strengthening and prolonging the life of the buildings/or precincts or any part or features thereof. For this purpose, absolutely essential and minimum changes would be allowed and they must be in conformity with the original.</p>	<p>Grade-II(A): Internal changes and adaptive re-use may by and large be allowed but subject to strict scrutiny. Care would be taken to ensure the conservation of all special aspects for which it is included in Heritage Grade-II. Grade-II(B): In addition to the above, extension or additional building in the same plot or compound could in certain circumstances, be allowed provided that the extension / additional building is in harmony with (and does not detract from) the existing heritage building(s) or precincts especially in terms of height and façade.</p>	<p>Internal changes and adaptive re-use may by and large be allowed. Changes can include extensions and additional buildings in the same plot or compound. However, any changes should be such that they are in harmony with and should be such that they do not detract from the existing heritage building/precinct.</p>
<p>(D) Procedure: Development permission for the changes would be given on the advice of the Heritage Conservation Committee.</p>	<p>Development permission for the changes would be given on the advice of the Heritage Conservation Committee.</p>	<p>Development permission for changes would be given on the advice of the Heritage Conservation Committee.</p>
<p>(E) Vistas / Surrounding Development: All development in areas surrounding Heritage Grade-I shall be regulated and controlled, ensuring that it does not mar the grandeur of, or view from Heritage Grade-I.</p>	<p>All development in areas surrounding Heritage Grade-II shall be regulated and controlled, ensuring that it does not mar the grandeur of, or view from Heritage Grade-II.</p>	<p>All development in areas surrounding Heritage Grade-III shall be regulated and controlled, ensuring that it does not mar the grandeur of, or view from Heritage Grade-III.</p>

### **12.13 Opinion of the Heritage Conservation Committee**

Nothing mentioned above should be deemed to confer a right on the owner / occupier of the plot to demolish or reconstruct or make alterations to his heritage building / buildings in a heritage precinct or on a natural heritage site if in the opinion of the Heritage Conservation Committee, such demolition / reconstruction /alteration is undesirable.

### **12.14 Approval to preserve the beauty of the area**

The Heritage Conservation Committee shall have the power to direct, especially in areas designated by them, that the exterior design and height of buildings should have their approval to preserve the beauty of the area.

### **12.15 Signs and outdoor display structures / including street furniture on heritage sites**

Commissioner, Municipal Corporation/ Vice- Chairman, Development Authority on the advice of the Heritage Conservation Committee shall frame regulations or

guidelines to regulate signs, outdoor display structures and street furniture on heritage sites.

### 12.16 Composition of heritage conservation committee

The Heritage Conservation Committee shall be appointed by the State Government comprising of:

- |        |  |                         |
|--------|--|-------------------------|
| (i)    | Secretary (UD)   | <b>Chairman</b>         |
|        | (i) In charge Architecture, State PWD  | Member                  |
|        | (iii) Structural Engineer having experience of 10 years in the field and membership of the Institution of Engineers, India | Member                  |
|        | A) Architect having 10 years experience  | Member                  |
|        | B) Urban Designer  | Member                  |
|        | C) Conservation Architect  | Member                  |
| (ii)   | Environmentalist having in-depth knowledge and experience of 10 years of the subject .                                     | Member                  |
| (iii)  | Historian having knowledge of the region having 10 years experience in the field   | Member                  |
| (vi)   | Natural historian having 10 years experience in the field  | Member                  |
| (vii)  | Chief Town Planner, Municipal Corporation  | Member                  |
| (viii) | Chief Town Planner, Development Authority  | Member                  |
| (ix)   | Chief Architect, Development Authority   | Member                  |
| (x)    | Representative of State Archeological Department   | Member                  |
| (xi)   | Chief Town Planner, State Town & Country Planning Department   | <b>Member-Secretary</b> |
| (a)    | The Committee shall have the powers to co-opt upto three additional members who may have related experience.               |                         |
| (b)    | The tenure of the Chairman and Members of other than Government Department / Local Bodies shall be three years.            |                         |

#### The terms of reference of the Committee shall inter alia be:

- (i) To advice the Commissioner, Municipal Corporation/ Vice- Chairman, Development Authority whether development permission is to be granted under Building Bye-Laws No. 12.3 and the conditions of permission.
- (ii) to prepare a supplementary list of heritage sites, which include buildings artifacts, structures, streets, areas, precincts of historic, aesthetic, architectural, cultural, or environmental significance and a supplementary list of natural feature areas of environmental significance, scenic beauty including but not restricted to sacred groves, hills, hillocks, water bodies (and the areas adjoining the same), open areas, wooded areas, points, walks, rides, bridle paths etc. to which this Building Bye-Law would apply.
- (iii) To advise whether any relaxation, modification, alteration, or variance of any of the Building Bye-laws;

- (iv) To frame special regulations / guidelines for precincts and if necessary for natural feature areas to advise the Commissioner, Municipal Corporation/ Vice- Chairman, Development Authority regarding the same;
- (v) To advise whether to allow commercial / office/ hotel use in the (name the areas) and when to terminate the same.
- (vi) To advise the Commissioner, Municipal Corporation/ Vice- Chairman, Development Authority in the operation of this Building Bye-law to regulate or eliminate/erection of outside advertisements/bill boards/street furniture;
- (vii) To recommend to the Commissioner, Municipal Corporation/ Vice- Chairman Development Authority guidelines to be adopted by those private parties or public / government agencies who sponsor beautification schemes at heritage sites;
- (viii) To prepare special designs and guidelines / publications for listed buildings, control of height and essential façade characteristics such as maintenance of special types of balconies and other heritage items of the buildings and to suggest suitable designs adopting appropriate materials for replacement keeping the old form intact to the extent possible.
- (ix) To prepare guidelines relating to design elements and conservation principles to be adhered to and to prepare other guidelines for the purposes of this Regulation;
- (x) To advise the Commissioner, Municipal Corporation / Vice- Chairman, Development Authority/ on any other issues as may be required from time to time during course of scrutiny of development permissions and in overall interest of heritage / conservation;
- (xi) To appear before the Government either independently or through or on behalf of the Commissioner, Municipal Corporation / Vice-Chairman, Development Authority in cases of Appeals under Development Authority/Municipal Corporation Act in cases of listed buildings / heritage buildings and listed precincts / heritage precincts and listed natural feature areas.

### **12.17 Implications of listing as heritage buildings**

The Regulations do not amount to any blanket prevention of demolition or of changes to Heritage Buildings. The only requirement is to obtain clearance from Commissioner, Municipal Corporation/ Vice- Chairman Development, Authority and Heritage Conservation Committee from heritage point of view.

### **12.18 Ownership not affected**

Sale and purchase of Heritage Buildings does not require any permission from Municipal Corporation of the city/town/ Development Authority/or Heritage Conservation Committee. The Regulations do not affect the ownership or usage. However, such usage should be in harmony with the said listed precincts / buildings. Care will be taken to ensure that the development permission relating to these buildings is given within 60 days.



## 13. STREAMLINING OF BUILDING PLAN APPROVALS

### 13.1 Streamlining the building approval/sanction procedure (*Ease of Doing Business*)

Typically for any urban infrastructure development project, a number of clearances are required. As per World Bank's Report Doing Business, 2014 India is ranked 183, out of 189 countries in terms of dealing with construction permits and on an average there are 37 procedures involved and 162 days are spent before obtaining permission for undertaking construction. It clearly signifies that the procedure for obtaining clearances is time consuming and projects often get stalled due to delay in obtaining clearances from various agencies.

In order to attract investments into the country, efforts are being made to improve '*Ease of Doing Business*'. In this direction, the limit of Built-up Area (BUA) for Foreign Direct Investment (FDI) has been reduced from 50,000 sqm to 20,000 sqm. The local bodies have been directed to get the entire building approval process made online so that the building plan applications are submitted online alongwith building fees and other charges, and after due scrutiny, the approvals are also to be conveyed online.

Further, external bodies like Urban Art Commission (UAC), National Monuments Authority (NMA), Airports Authority of India (AAI), Metro Rail Corporation (MRC), Heritage Conservation Committee (HCC), etc. grant No Objection Certificate (NOC)/ approvals on the proposed building plans to the local bodies. All such external bodies are mandated to prepare online NOC systems compatible to and integrated with that of the local bodies and the desired information is to be sent to the concerned external bodies and their comments/ NOC/ approval are to be received online so that there is no need for building proponents to pursue matter with local bodies or external agencies. The specific requirements of the external bodies are to be added in the *Common Application Form (CAF)* of the local body so that building proponent has to file all information at a single customized online application. The objective is to make the whole process simplified and streamlined to ensure ease in getting the approvals for building permit within stipulated time.

Further, a procedure has been laid down in clause 2.14.1 d of the MBBL for sanction of building plans of small residential plots measuring up to 105 sqm based on standard or other designs. The process is to facilitate building proponents of such small sized plots to either adopt standard plans or get their building plans prepared by a competent professional, and submit to the concerned local bodies along with fees, other charges, drawings and documents before commencement of the construction where the ***submission itself shall be deemed sanction***. Hence, such persons may not have to wait for processes of approval from the local bodies to commence construction.

### 13.2 Clearances at Master Plan level

Individual construction proposals should not generally require separate clearances from various authorities each time. Such clearances should be integrated into the DCR of the Master/Development Plan of the concerned city. The areas unaffected by any of the restrictions should be clearly marked out and mapped, preferably on a GIS platform. Area zones of differential control regulations (within the city) by any of these agencies may also be mapped accordingly. This will result in a composite map of the city with various control regulations as per the various agencies clearly marked on the map. Thus, the sites which are located outside these restricted/regulated areas would not require availing clearance from the respective authorities, thereby reducing the clearance process significantly.

Following are the clearances which should be integrated into the city Master Plan-

**Table 13.1 Clearances from various agencies proposed to be integrated in Master Plans**

Sl No.	Name of Agency	Type of Clearance	Area of Influence
1	National Monuments Authority through Competent Authority	Ancient Monument approval	As prescribed in the AMASAR (Amendment and Validation) Act, 2010 for protection of monuments
2	Ministry of Environment	Environment Clearance (EC)	As prescribed in the statutory provisions for EIA and clearance based on the size of the project in accordance with Environment protection Act, 1986
3	Central Ground Water Authority	Borewell Registration Certificate	As per Guidelines/criteria for evaluation of proposals/ requests for ground water abstraction, 2012
5	Ministry of Civil Aviation	AAI Height NoC	Critical and non-critical area as identified by AAI
6	Ministry of Defense	Defense Clearance	Areas in and around Defense Establishments as identified by MoD.
7	Coastal Zone Management Authority	NOC (if near sea/coastal areas)	Areas under the CRZ regulations.
8	NHAI/PWD	Road access	Buffer zones as prescribed by NHAI along National Highways.
9	Ministry of Railways	Area clearance	Buffer zones as prescribed by Railways along the Rail tracks/depots/yards etc.

Efforts are on at the Government of India level to coordinate with all the central ministries and their organizations so that they streamline their own internal processes to issue no objection etc. where ever required by law. The efforts are mainly focused on delegating the powers at appropriate levels, establishing an online application process for time bound delivery, creating public awareness about their requirements, reviewing the restrictions and reducing them, sharing the data and norms with local authorities to be incorporated in DCR etc.

Recognizing the concern for streamlining the procedures for clearances to be obtained from various departments in least possible number of procedures and number of days, the following model is given which suggests that the entire process of Pre and Post-Construction approvals should be completed within one month:

Table 13.2 Timelines of clearances from various agencies

S.I No.	Type of approval	Approving Authority	Stage of project	Normal Duration (Days)	Reduced Duration (Days)	Activity Sequence
A	Intimation of Disapproval (IoD)	Development Authority/ Municipality	Pre construction	30	5	Start Activity
B	Site & Building Layout approval	Development Authority/ Municipality	Pre construction	30-60	5	Following A
C	NOC (if near sea/coastal areas)	Coastal Zone Management Authority	Pre construction	30-60	10	Following B
D	Road access	NHAI/PWD	Pre construction	30	10	Following B
E	Ancient Monument approval	Archaeological Survey of India (ASI)	Pre construction	30	10	Following B
F	Environment Clearance	Ministry of Environment	Pre construction	180	Only for large project	Following B
G	Borewell Registration Certificate	Central Ground Water Authority	Pre construction	15	5	Following B
H	Fire Fighting Scheme Approval	Fire Department	Pre construction	30	15	Following B
I	AAI Height NoC	Civil Aviation Department	Pre construction	30-60	10	Following B
J	Defence Clearance	Ministry of Defence	Pre construction	180	10	Following B
K	Building Permit Issue (All NOCs)	Development Authority/ Municipality	Pre construction		1	Max of After C-J
	<b>Sub total</b>				<b>26 (Max)</b>	
L	Electric Substation NoC (substation /transformers in the building)	Electricity Distribution Authority	During construction	15	5	After K
M	Damp Proof Certificate (On Site)	Development Authority	During construction	7	3	After K
N	Pollution Clearance	State Pollution control Board	During construction	30-60	5	After L
Ø	<b>Construction Complete</b>	<b>Construction Time depends on the project Scale and Size</b>				
O	Building completion Certificate	Development Authority/ Municipality	Post construction	30-60	5	After Ø
P	Service Plan Clearance and Service Connections	Service Departments/ Parastatals	Post construction	30	10	After O
Q	Occupancy Certificate	Development Authority/ Municipality	Post construction	15	2	After P
	<b>Sub total</b>				<b>17 (Max)</b>	

**Explanatory Notes:**

1. The above Table and Chart indicates that the processes after the applicant applies for building approval with clear land title and possession of land. Hence, clearances related to CLU and Land Title has not been considered.
2. The table illustrates the duration of clearances obtained in Normal course and suggests the reduced duration of 26 days (Pre-Construction) if the Approving Authority **adopts online sanctions**.
3. Clearances indicated at S Nos. C-J are concurrent with applications at the pre-construction stages, wherein their process of approval can be taken up simultaneously.
4. Clearances indicated at S Nos. L-N are concurrent with applications during-construction stage, wherein their process of approval can be taken up simultaneously.
5. S No. P has to be linked with S No. O, once applicant receives the **Completion Certificate**, service plan clearances and connections would be deemed to be sanctioned.

### 13.3 Clearances at the Local Authorities

The Urban Local Bodies and Urban Development Authorities shall ensure clearances in minimum possible time. Clearances indicated at Sl. No. A,B,H,K,L,M,N,O,P, and Q have to be obtained at the local level and all efforts have to be made to sanction the building plan using online application procedures.

### 13.4 Options for reducing the timelines for approvals:

The above suggested model is only indicative, however, there is scope for streamlining the procedures for clearances to be obtained from various departments in the least possible number of procedures and number of days. The model should serve as a guide to Urban Local Bodies and Development Authorities for adoption. Since the number of procedures and duration varies from state to state, as per the local conditions, the model would require modifications to suit a specific city. Some of the options which can reduce the time taken for various procedures are:

- (a) **Online sanctions:** Some of the ULBs/Development Authorities like Pune Municipal Corporation and West Bengal Housing and Industrial Development Corporation have introduced online sanction for issuing building plan and completion certificate. This process reduces the time taken to a large extent. The example of Pune and West Bengal may be considered in other States.

The process involves use of software tools for scrutiny of building plans. All the documents are required to be submitted electronically using a portal. In case the building plans do not conform to the DCR the deviations are listed out in form of a report and intimated to the applicant/engaged Competent Professional for building plan design, vide an online ID in his account.

- (b) **Empowering Professionals:** Empowering Competent Professionals (as per Appendix 'E') for building plan design will facilitate to streamline the procedure for obtaining approvals. The Authority shall empanel such professionals based on their track record. The empowered professionals can, also on behalf of Developers/builders submit the documents required at the time of various clearances.

Signing authority of Architects and Town planners for different size and type of layout shall be followed as per section 2.10.

Further to the *Standard Building Layouts* as specified in section 2.14.1 (d), any building proposed with a ceiling limit of 105 sq mt of built-up area on plots of any size, conforming to the standard approved layout by the Authority shall be treated as deemed approved for construction. No formal sanction would be required for the owner/proponent who can submit a simple one page form alongwith other documents to the local body and can immediately take up construction work.

Commencement of construction work on site shall be undertaken as per clause 2.15.1 of the bye-laws. The process of obtaining "**Completion Certificate**" can also be initiated by the owner by submitting "as-built drawings".

- (c) **Outsourcing procedures:** Countries like USA, Australia and New Zealand have outsourced work pertaining to clearances and have appointed firms /companies to undertake the work on behalf of Authorities. This has been working very successfully and the procedure for obtaining clearances is free of any hassles and the same has become transparent and streamlined. The example of Passport office is a good case to study to build confidence in favor of outsourcing non discretionary activities in order to support limitations of capacity and manpower at the Authority.
- (d) **Creating a Cell in ULB/Development Authorities:** There is a need for creating a specialized cell in Authority which is manned by qualified personnel conversant with the procedures and the interpretation of development regulations. The Cell should be headed by a qualified Town Planner who should lead a team of Architects, Engineers, Environment Specialist and Legal Experts among others. The cell should have the dedicated provision for online submissions and conveying the on line approvals as well. This will require robust software and hardware system capable of handling large digital files.
- (e) **Single Window System:** This is a requirement that is growing popularity among the Authorities. All agencies involved in the process need to be integrated in a single electronic facility with proper coordination and monitoring of timelines. The Authority needs to constitute teams comprising of experts from various agencies to be formed under the overall supervision of a Town Planner designated to assist developers/builders with complex projects and to constantly improve the sanction process by cutting down delays.
- (f) **Integration of agencies outside the ULBs for online clearances:** Various agencies like AAI, NMA, SUAC, Fire Services, Department of Industries, Ministry of Defense, Metro Rail etc grant NOC clearance to the building plans in certain specific cases. This may be streamlines in the spirit of *Ease of Doing Business* by following 2 directions as given below -
- i. Building permission for specific areas /sizes are to be examined by the external agencies. These areas should be plotted on GIS based colour-coded map which may be made available in the public domain on the agency's website, with clearly identified co-ordinates so that building falling only in these areas need to approach the concerned agencies for obtaining clearances. These maps may also be made available on the website of the concerned Local Bodies.
  - ii. The external agencies also need to develop online clearance/NOC application systems which should suitably be integrated with the online building approval systems of the Local bodies.

The two systems should be so compatible that the building plans submitted to the local bodies may after scrutinizing with colour-coded zoning maps shall be e-transmitted to the external agencies. The agency concerned should give clearance within a period of maximum of 10 days with no requirement of applicant to physically visit the offices of the agencies. The NOC may again be e-transmitted to the concerned local body on the building permission system so that the ULB shall use those for final approval.

### 13.5 Risk Based Classification of building proposals

There is a need to make provisions for fast-tracking building permission procedures for all non-automatic approvals. Therefore, in the spirit of 'Ease of Doing Business', the buildings have been classified further on the basis of risk parameters/ risk based classification to clear the building permits on fast track system. This kind of classification shall be used for fast tracking the sanction of building plans, which shall facilitate regulated and faster construction permits, and also aid in improving the rating of the country in World Bank's assessment in 'Ease of Doing Business'.

Further, the ULB in consultation with all parastatal bodies involved, shall identify risk based classification of industrial, commercial and institutional buildings and prepare risk based matrix, in-line with those proposed in MBBL for residential and storage buildings/ warehouses/ godowns and accordingly prescribe the fast tracking approval system. This exercise shall be done within a period of 3 months from the date of publication of the Local Building Bye-laws.

On the basis of above-mentioned risk matrix prepared by each of the agencies involved in approving building plans, State Government shall design and notify necessary legal instructions to implement risk based mechanism with a view to **fast track building permissions based on their risk classification**. These instruments may include, but are not limited to, delegation of powers, out-sourcing, empowering architects, self-certifications, etc. These notifications shall be done within 3 months from the date of notification of risk matrix by each competent authority / agency as mentioned above.

#### 13.5.1 Residential Buildings

For approval of the residential plotted and group housing buildings, risk based classification shall be as per Table 13.3 -

**Table 13.3 Risk Matrix for different Residential buildings**

Risks		Very Low	Low	Moderate	High
<b>Criteria</b>	<b>Parameters</b>				
Size of the Plot	Square Meters	Below 105 m <sup>2</sup>	105 - 500 m <sup>2</sup>	Above 500 m <sup>2</sup>	All sizes <sup>ii</sup>
Height of building	Meters	Below 15 m	Below 15 m	Below 15 m	15 m and above
Use of the premise	Various Categories	Residential Plotted	Residential Plotted	Residential Plotted	Group Housing

Note:

- Considering no other issue like Monuments, Metro, DUAC, Airports etc. are involved. In case the property lies within the regulated zone of metro rail, airport etc. the online clearance from the local body concerned shall be taken
- Group Housing area is minimum 2000 sq mt (may vary between States)
- The Urban Local Body/ Urban Development Authority shall empanel professionals as per "Appendix E-1".
- The Urban Local Body/ Urban Development Authority shall work out and prescribe fees for submitting the building plans
- The fees shall be derived by an automated built-in calculator in the online system of submission.

#### Suggested Fast Tracking Tools:

##### **For Very Low Risk Buildings:**

The process prescribed in clause 2.14.1 d) shall be followed.

##### **For Low Risk Buildings:**

A Competent professional (qualification & competence as per Annexure-E) shall be empowered to issue the building permit, but only after submitting the plan along with requisite documents and fees to the concerned local body. If the owner/ professional desires to get the building plan sanctioned by the local body, building plans prepared by a qualified architect/ engineer will have to be submitted to the concerned local body along with the fees and other requisite documents and the local body shall grant the building permit within 10 days

**For Moderate risk Buildings:**

Building plans will have to be prepared by a competent professional and the building plans will have to be submitted to the concerned local body along with the fees and other requisite documents. The local body shall grant the building permit within 20 days.

**For High risk Buildings:**

Clearance from Fire department and other necessary clearances from AAI, NMA and other agencies have to be obtained. Building plans will have to be prepared by a competent professional and the building plans will have to be submitted to the concerned local body along with the fees and other requisite documents. The local body shall grant the building permit within 20 days.

**13.5.2 Storage/Warehouse Buildings**

For approval of the buildings meant for use as storage buildings/ warehouses/ godowns, risk based classification shall be as per Table 13.4 -

**Table 13.4 Risk Matrix for Storage/Warehouses**

Risks	Very Low	Low	Moderate	High
Covered Area on all floors/ Built-up area	Up to 250 m <sup>2</sup>	Above 250 m <sup>2</sup> and up to 2000 m <sup>2</sup>	Up to 2000 m <sup>2</sup>	Above 2000 m <sup>2</sup>
Height of building	Below 15 m	Below 15 m	Below 15 m	Below 15 m
Abutting Road width	Min. 12 m	Min. 12 m	Min. 12 m	Min. 12 m
Type of Material storage	Category A	Category A	Category B (Stacking height - Medium)	Category B (Stacking height -High)

Note:

- The level of Risk is classified according to the material stored in the warehouse/storehouse. Material shall be classified according to the Categories defined in Appendix "I".
- Building application of buildings listed under sections 3.6.8, Section 4.9 and Item 2 of Table 3.14 of the MBBL shall be dealt in accordance with this table for building plan approvals.
- The Urban Local Body/ Urban Development Authority shall empanel professionals as per "Appendix E-1".
- The building application processing fees shall be derived by an automated built-in calculator in the online system.

**Suggested modes of Fast Tracking:****For Very Low Risk Buildings:**

A competent professional (qualification & competence as per Annexure-E) shall be empowered to issue the building permit, but only after submitting the plan along with requisite documents and fees to the concerned local body. If the owner/ architect/ engineer desires to get the building plan sanctioned by the local body, he shall apply online to the local body and the local body shall grant the building permit within 10 days.

**For Low Risk Buildings:**

Building plans will have to be prepared by a competent professional and the building plans will have to be submitted to the concerned local body along with the fees and other requisite documents. The local body shall grant the building permit within 20 days.

**For Moderate Risk Buildings:**

Building plans will have to be prepared by a competent professional and the building plans will have to be submitted to the concerned local body along with the fees and other requisite documents. The local body shall grant the building permit within 20 days.

**For High Risk Buildings:**

Building plans will have to be prepared by a qualified architect and the building plans will have to be submitted to the concerned local body along with the fees and other requisite documents. The local body shall grant the building permit within 30 days.

### 13.5.3 Industrial Buildings

For approval of the buildings meant for use as storage buildings/ warehouses/ godowns, risk based classification shall be as per Table 13.5

**Table 13.5 Risk Matrix for Industries**

Risks		Low	Moderate	High
<b>Criteria</b>	<b>Parameters</b>			
Size of the Plot	Square Meters	upto 350 m <sup>2</sup>	Above 350 m <sup>2</sup>	All sizes
Height of building	Meters	Less than 15 m	Less than 15 m	15 m and above
Abutting Road width	Meters	Min. 12 m	Min. 12 m	Min. 12 m

Note:

- The level of Risk is classified according to the size and height of the industrial building proposed.
- The Urban Local Body/ Urban Development Authority shall empanel professionals as per "Appendix E-1"..
- The building application processing fees shall be derived by an automated built-in calculator in the online system.

#### **Suggested modes of Fast Tracking:**

##### **For Low Risk Buildings:**

- Deemed Approval with Self-Certification
- Plans to be submitted along with Structural drawings which does not require sanction

##### **For Moderate Risk Buildings:**

- Plans to be submitted to the *empanelled professional*.
- Fire/Structural safety certification by Fire Services/ Structural Engineers
- Approval to be granted within 10 working days by the empanelled professional.
- Approved plan to be submitted to ULB/DA.

##### **For High Risk Buildings:**

- Online application
- Immediate acknowledgement by software
- Fire/Structural safety certification by Fire Services/ Structural Engineers
- Approval by ULB/DA within 20 working days.

### 13.6 Other Suggestions to enhance ease of doing business:

Some other suggestions, regarding Fast-Track construction permits are:

#### 13.6.1 Citizens' Charter

A *Citizens' charter* lists out the timelines and upper limits of time for the delivery of citizen services of the organization. The objective of issuing the charter is to improve the quality of public service in terms of timely delivery. Such charters should be brought out by all municipalities to maintain high standards of accountability and transparency. The standards of service to be provided, the maximum number of days required for building approvals and the standards procedures should be listed out in the citizens' charter. Some states have gone a step further and introduced a **citizen service delivery guarantee act** whereby the time lines prescribed by a citizen charter are made statutory and binding on officials.

#### 13.6.2 Capacity building

Capacity building measures are to be adopted for such functionaries to identify Training Needs (TNA) and other technical requirement of duties that they are required to discharge. Fresh recruitments commensurate to the technical qualification/ experience are to be made by the State Government, if there is complete absence of the technical expertise needed for the said services.



### **13.6.3 Empowered Committees**

The Authorities may also consider constituting ‘Empowered Committees’ or ‘Peer Expert Groups’ for undertaking scrutiny and approval. This committee can be manned as per the requirement and area of more than one municipality can be put under its jurisdiction.

### **13.6.4 Simplification of bye-laws**

The building Bye-Laws need to be simplified for easy comprehension of lay person as well as professionals involved in developmental activities. The simplification process should also include the process of application, the filling up of forms and streamlining the process of application.



## 14. CLIMATE RESILIENT CONSTRUCTION – INTEGRATION OF ENVIRONMENTAL CLEARANCE WITH SANCTION

Land, Air, Noise, Water, Energy, biological/ socio-economic/ solid / other waste management are the main facets considered in relation to *Pre, During and Post* Building Construction for Sustainable Environment Management. Therefore, it is necessary for the building process to ensure compliance to various conditions laid down by the Ministry of Environment, Forest and Climate Change.

The building construction sector is a major contributor towards carbon footprints which affects climate change. India is committed towards mitigating the effects of climate change and moving towards internationally accepted norms for environmental friendly building construction. Currently this objective of environmental safeguard is achieved through obtaining a specific environmental clearance (EC) for any construction project having a size of more than 20,000 sq mts. This is administered under notification of Ministry of Environment, Forest and Climate Change.

With rapid urbanisation and growth of Indian economy, it is anticipated that the construction activity will experience a proportionate growth. Government is also committed towards streamlining of clearances for buildings and real estate sector and empowering the urban local bodies with an objective of Ease of Doing Business.

### 14.1 Environmental conditions for compliance during Building approvals

The Ministry of Environment, Forest and Climate Change has now decided to integrate the environmental concerns into building plan approval process and empowering the concerned local body/development authority to approve and certify compliance of stipulated requirements. The new building construction proposals are classified in the following 3 categories:-

- 1) Conditions for **Category ‘A’** Buildings: Built-up Area 5000 sqmt – 20000 sqmt
- 2) Conditions for **Category ‘B’** Buildings: Built-up Area 20000 sqmt – 50000 sqmt
- 3) Conditions for **Category ‘C’** Buildings: Built-up Area 50000sqmt – 150000 sqmt

A local Authority, i.e. ULB/DA/any other body authorized to sanction building plans shall approve the building plans by ensuring the stipulated conditions in Table 14.1, 14.2 and 14.3 for the respective categories of buildings.

These environmental conditions may be suitably integrated in the building permission conditions so that their effective implementation could be ensured by the local authority while sanctioning building plans in their respective urban areas.

However, in order to empower the Local Authority, the State/UT Governments will be required to amend their building by-laws to incorporate a specific set of conditions as

given in the Tables 14.1, 14.2 and 14.3. Once these conditions are incorporated through due process adopted by States/UTs into the Building Bye-Laws and made applicable and enforceable by their local authority, States / UTs will be required to approach M/o Environment, Forest and Climate Change alongwith the Draft notification for seeking clearance that the requirements have been met and after getting the clearance from M/o EFCC, State/UT shall issue notification of Building Bye-laws alongwith stipulated conditions. Copy of the notification shall be forwarded to Ministry of Environment, Forest and Climate Change so that they may notify the particular State or part thereof for which conditions have been suitably integrated to delegate the powers to the Local Authority. Thereafter, for such notified area no separate prior Environmental clearance will be required. However, for those States/UTs or part of the States/UTs where these conditions have not been incorporated in the Building Bye-Laws, the existing arrangement of mandatory prior Environment clearance by State Environment Impact Assessment Authority shall continue to hold.

States are, therefore, advised to amend their building by-laws by incorporating the set of conditions for each category A, B and C as mentioned above either for the entire State/UT or clearly identified part thereof, where they would like to integrate the environmental clearance conditions with building permissions and empower the local authority to examine, stipulate and ensure compliance of conditions required to address environmental concerns. The State/UT should submit such proposal/notification at draft stage as well as a copy of the final notification to the M/o Environment, Forest and Climate Change.

- i. For building plans with a total built-up area between 5,000 sqm and 1,50,000 sqm, environment clearance will be required to be synchronized with the bye-laws.
- ii. The concerned Urban local body, authorized to sanction building plans, shall ensure at the time of sanctioning a building plan that the environmental requirements stipulated in Table 14.1 (for above 5,000 sqm and up to 20,000 sqm), Table 14.2 (for above 20,000 sqm and up to 50,000 sqm) and Table 14.3 (for above 50,000 sqm and up to 1,50,000 sqm), as the case may be, are complied with.

**Table 14.1: Environmental Conditions for Building and Construction****(Category “A”: 5000 sqmt - 20000 sqmt)**

Sl. No.	Medium	Environmental conditions	MBBL Ref. Clause
1	Natural Drainage	The inlet and outlet point of natural drain system should be maintained with adequate size of channel for ensuring unrestricted flow of water.	-
2	Water conservations – Rain Water Harvesting and Ground Water Recharge	A rain water harvesting plan needs to be designed where the recharge bores (minimum one per 5000 sqm of built-up area) shall be provided. The rain water harvested should be stored in a tank for reuse in household through a provision of separate water tank and pipeline to avoid mixing with potable municipal water supply. The excess rain water harvested be linked to the tube well bore in the premise through a pipeline after filtration in the installed filters.	Table 9.1
2(a)		The unpaved area shall be more than or equal to 20% of the recreational open spaces.	10.2.1 (iv)
3	Solid Waste Management	Separate wet and dry bins must be provided at the ground level for facilitating segregation of waste.	10.2.5 (b)
4	Energy	In common areas, LED/ solar lights must be provided.	10.2 3c)
5	Air Quality and Noise	Dust, smoke and debris prevention measures such as screens, barricading shall be installed at the site during construction. Plastic/ tarpaulin sheet covers must be used for trucks bringing in sand and material at the site.	-
5 (a)		The exhaust pipe of the DG set, if installed, must be minimum 10m away from the building. In case it is less than 10m away, the exhaust pipe shall be taken up to 3m above the building.	-
6	Green cover	A minimum of 1 tree for every 80 sqm of land shall be planted and maintained. The existing trees will be counted for this purpose. Preference should be given to planting native species.	10.2.1 (i)
6(a)		Where the trees need to be cut, compensatory plantation in the ratio of 1:3 (i.e. planting of 3 trees for every 1 tree that is cut) shall be done with the obligation to provide continued maintenance for such plantations.	10.2.1 (ii)

**Table 14.2: Environmental Conditions for Building and Construction**  
**(Category “B”: 20000 sqmt - 50000 sqmt)**

Sl. No.	Medium	Environmental conditions	MBBL Ref. Clause
1	Natural Drainage	The inlet and outlet point of natural drain system should be maintained with adequate size of channel for ensuring unrestricted flow of water.	-
2	Water conservations – Rain Water Harvesting and Ground Water Recharge	A rain water harvesting plan needs to be designed where the recharge bores (minimum one per 5000 sqm of built-up area) shall be provided. The rain water harvested should be stored in a tank for reuse in household through a provision of separate water tank and pipeline to avoid mixing with potable municipal water supply. The excess rain water harvested be linked to the tube well bore in the premise through a pipeline after filtration in the installed filters.	Table 9.1
2(a)		The unpaved area shall be more than or equal to 20% of the recreational open spaces.	10.2.1 (iv)
3	Solid Waste Management	Separate wet and dry bins must be provided at the ground level for facilitating segregation of waste.	10.2.5 (b)
4	Energy	In common areas, LED/ solar lights must be provided.	10.2 3c)
4(a)		At least 1% of connected applied load generated from renewable energy source such as photovoltaic cells or wind mills or hybrid should be provided.	10.2
4(b)		As per the provisions of the Ministry of New and Renewable energy solar water heater of minimum capacity 10 litres/4 persons (2.5 litres per capita) shall be installed.	1–2.4 - IV
4(c)		Use of flyash bricks: Fly ash should be used as building material in the construction as per the provisions of Fly Ash Notification of September, 1999 and as amended from time to time.	10.2.6 (b)
5	Air Quality and Noise	Dust, smoke and debris prevention measures such as screens, barricading shall be installed at the site during construction. Plastic/ tarpaulin sheet covers must be used for trucks bringing in sand and material at the site.	-
5(a)		The exhaust pipe of the DG set, if installed, must be minimum 10m away from the building. In case it is less than 10m away, the exhaust pipe shall be taken up to 3m above the building.	-
6	Green cover	A minimum of 1 tree for every 80 sqm of land shall be planted and maintained. The existing trees will be counted for this purpose. Preference should be given to planting native species.	10.2.1 (i)
6(a)		Where the trees need to be cut, compensatory plantation in the ratio of 1:3 (i.e. planting of 3 trees for every 1 tree that is cut) shall be done with the obligation to provide continued maintenance for such plantations.	10.2.1 (ii)

**Table 14.3: Environmental Conditions for Building and Construction****(Category “C”: 50000 sqmt - 150000 sqmt)**

Sl. No.	Medium	Environmental conditions	MBBL Ref. Clause
1	Natural Drainage	The inlet and outlet point of natural drain system should be maintained with adequate size of channel for ensuring unrestricted flow of water.	-
2	Water conservations – Rain Water Harvesting and Ground Water Recharge	A rain water harvesting plan needs to be designed where the recharge bores (minimum one per 5000 sqm of built-up area) shall be provided. The rain water harvested should be stored in a tank for reuse in household through a provision of separate water tank and pipeline to avoid mixing with potable municipal water supply. The excess rain water harvested is to be linked to the tube well bore in the premise through a pipeline after filtration in the installed filters.	Table 9.1
2(a)		The unpaved area shall be more than or equal to 20% of the recreational open spaces.	10.2.1 (iv)
2(b)		The ground water shall not be withdrawn without approval from the competent authority	
2(c)		Use of potable water in construction should be minimized.	
2(d)		Low flow fixtures and sensors must be used to promote water conservation.	
2(e)		Separation of grey and black water should be done by the use of dual plumbing system.	
3	Solid Waste Management	Separate wet and dry bins must be provided at the ground level for facilitating segregation of waste.	10.2.5 (b)
3(a)		All non-biodegradable waste shall be handed over to authorized recyclers for which a written tie-up must be done with the authorized recyclers.	
3(b)		Organic waste composter/ vermiculture pit with a minimum capacity of 0.3 Kg/tenement/day must be installed wherein the STP sludge may be used to be converted to manure which could be used at the site or handed over to authorized recyclers for which a written tie-up must be done with the authorized recyclers.	
4	Energy	In common areas, LED/ solar lights must be provided.	10.2 3c)
4(a)		At least 1% of connected applied load generated from renewable energy source such as photovoltaic cells or wind mills or hybrid should be provided.	10.2
4(b)		As per the provisions of the Ministry of New and Renewable energy solar water heater of minimum capacity 10 litres/4 persons (2.5 litres per capita) shall be installed.	10.2.4 - IV
4(c)		Use of flyash bricks: Fly ash should be used as building material in the construction as per the provisions of Fly Ash Notification of September, 1999 and as amended from time to time.	10.2.6 (b)
4(d)		Use of concept of passive solar design of buildings using architectural design approaches that minimize energy consumption in buildings by integrating conventional energy-efficient devices, such as mechanical and electric pumps, fans, lighting fixtures and other equipment, with the passive design elements, such as building orientation, landscaping, efficient building envelope, appropriate fenestration, increased day lighting design and thermal mass.	10.2 (3)
4(e)		Optimize use of energy systems in buildings that should maintain a specific indoor environment conducive to the functional requirements of the building by following mandatory compliance measures (for all applicable buildings) as recommended in the Energy Conservation Building Code (ECBC) 2007 of the Bureau of Energy Efficiency, Government of India.	10.2 (3)
5	Air Quality and Noise	Dust, smoke and debris prevention measures such as screens, barricading shall be installed at the site during construction. Plastic/ tarpaulin sheet covers must be used for trucks bringing in sand and material at the site.	-

Sl. No.	Medium	Environmental conditions	MBBL Ref. Clause
5 (a)		The exhaust pipe of the DG set, if installed, must be minimum 10m away from the building. In case it is less than 10m away, the exhaust pipe shall be taken up to 3m above the building.	-
6	Green cover	A minimum of 1 tree for every 80 sqm of land shall be planted and maintained. The existing trees will be counted for this purpose. Preference should be given to planting native species.	10.2.1 (i)
6 (a)		Where the trees need to be cut, compensatory plantation in the ratio of 1:3 (i.e. planting of 3 trees for every 1 tree that is cut) shall be done with the obligation to provide continued maintenance for such plantations.	10.2.1 (ii)
7	Sewage Treatment Plant	Sewage treatment plant with capacity of treating 100% waste water shall be installed. Treated water must be recycled for gardening and flushing.	4.32.4
8	Environment Management Plan	The environment infrastructure like Sewage Treatment Plant, Landscaping, Rain Water Harvesting, Power backup for environment, Infrastructure, Environment Monitoring, Solid Waste Management and Solar and Energy conservation, should be kept operational through Environment Monitoring Committee with defined functions and responsibility.	-

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**REFERENCES:**

The following listed documents and guidelines have been extensively referred in preparation, compilation and finalization of the **Model Building Bye-Laws 2016**

1. *National Building Code, 2005*, Bureau of Indian Standards.
2. *Draft Unified Building Bye Laws for Delhi 2015*, Delhi Urban Arts Commission.
3. *Proposed Amendment in Town and Country Planning Legislations, Regulations for Land Use Zoning, Additional Provisions in Development Control Regulations for Safety Additional Provisions in Building Regulations / Byelaws for Structural Safety- in Natural Hazard Zones of India* by Committee of Experts, Ministry of Home Affairs, GoI.
4. *DC Regulations Greater Mumbai- 1991*, Government of Maharashtra.
5. *Kerala Municipal Building Rules – 1999*, Government of Kerala.
6. *Draft Harmonized Guidelines on the Norms and Standards for Barrier Free Environment for persons with disability and elderly persons, 2014*
7. *Energy Conservation Building Code, 2007*, by Bureau of Energy Efficiency, Ministry of Power.
8. *Indian Green Building Council, 2001*, by Confederation of Indian Industries.
9. *Green Rating for Integrated Habitat Assessment (GRIHA) Guidelines*, MNRE
10. *CE 335 Design project preliminary design of structural members* by R. Clarke
11. *Building Bye-Laws notified by various State Governments of India*

## Annexure “A”

## Occupancy Categorization of Buildings for Water and Other Requirement for Fire Fighting

Zone-I	Zone-II	Zone-III
GROUP “A”: RESIDENTIAL	GROUP “A”: RESIDENTIAL	GROUP “A”: RESIDENTIAL
A1 Lodging and Rooming Houses A2 One or two family private dwelling A3 Dormitories A4 Apartment Houses	A5 Hotels	F2 Shops and stores, etc. above 500 sq.mt. floor area F3 Underground shopping centers
GROUP “B” EDUCATIONAL	GROUP “C” INSTITUTIONAL	GROUP “G” INDUSTRIAL
B1 Schools up to higher secondary level	C1 Hospitals and Sanitoria (More than 100 beds)	G3 High hazard Industries
GROUP “C” INSTITUTIONAL	GROUP “D” ASSEMBLY BUILDINGS	GROUP “H” STORAGE BUILDINGS
C1 Hospital & Sanitoria (upto 100 beds) C2 Custodial Institutions C3 Penal & mental Institutions	D1 For more than 1000 persons with permanent stage and fixed seats D2 For less than 1000 persons with permanent stage and fixed seats	
GROUP “D” ASSEMBLY BUILDINGS	GROUP “E” BUSINESS BUILDINGS	GROUP “J” HAZARDOUS BUILDINGS
D3 Upto 300 persons without permanent stage and fixed seats D4 Above 300 persons without permanent stage & fixed seats	E1 Offices, Banks, etc. E2 Laboratories, Libraries, etc. E3 Telephone Exchanges	
GROUP “E” BUSINESS	GROUP “F” MERCANTILE	
E3 Computer Installations E5 Broadcasting stations	F1 Shops, Stores, etc. upto 500 m <sup>2</sup> floor area	
GROUP “G” INDUSTRIAL	GROUP “G” INDUSTRIAL	
G1 Low hazard Industries		

## Annexure “B-I”

## Fire Protection Requirements for Buildings in Zone-I Category

Sl. No.	Measures	Group-A: Residential A1, A2, A3, A4				Group-B: Educational			Group-C: Institutional		
		O	I	II	III	I	II	III	I	II	III
1	Access	P	P	P	P	P	P	P	P	P	P
2	Means of Escape	P	P	P	P	P	P	P	P	P	P
3	Compartmentation	P	P	P	P	P	P	P	P	P	P
4	Refuge Area	X	X	X	X	X	X	X	X	X	X
5	Emergency Lights	X	X	P	P	P	P	P	P	P	P
6	Exit Signs	P	P	P	P	P	P	P	P	P	P
7	PA System with Talk Back Facility	X	X	X	X	X	P	P	P	P	P
8	Moefa	X	X	X	P	X	P	P	P2	P	P
9	Extinguishers	P	P	P	P	P	P	P	P	P	P
10	Hose Reel	P3	P	P	P	P3	P	P	P	P	P
11	Yard Hydrant	X	X	X	P	X	P	P	X	P	P
12	Down Comer	X	X	X	P	X	P	X	P4	X	X
13	Wet Riser	X	X	P	X	X	X	P	X	P	P
14	Fire Detection System	X	X	X	X	X	P6	X	P2	P	P
15	Automatic Sprinkler System	S	S	S	S	S	S	FS	S	S	FS
16	Under Ground Tank	X	X	X	X	X	X	P	P2	P	P
17	Over Head Tank	P13	P	P	P	P	P	P	P	P	P
18	Fire Pumps	X	X	X	X	X	X	P	X	P	P
19	Booster Pumps	P3	P	P	P	P	P3	P	P	X	P
20	Auto D.G. Set	P3	X	P	P	P3	P	P	P	P	P
21	MCB/ELCB	P	P	P	P	P	P	P	P	P	P
22	Hose Boxes	X	X	X	P	X	P	P	P4	P	P
23	Fireman’s Grounding Switch	P	P	P	P	P	P	P	P	P	P

## Annexure “B-I” (Contd.)

## Fire Protection Requirements for Buildings in Zone-I Category

Sl. No.	Measures	Group-D: Assembly D3, D4			Group-E: Business E3, E5			Group-G: Industrial G1				
		I	II	III	I	II	III	IV	V	VI	VII	VIII
1	Access	P	P	P	P	P	P	P	P	P	P	P
2	Means of Escape	P	P	P	P	P	P	P	P	P	P	P
3	Compartmentation	P	P	P	P	P	P	P	P	P	P	P
4	Refuge Area	X	X	X	X	X	X	X	X	X	X	X
5	Emergency Lights	P	P	P	P	P	P	P	P	P	P	P
6	Exit Signs	P	P	P	P	P	P	X	X	P	P	P
7	PA System with Talk Back Facility	P1	P	P	X	P	P	X	X	X	X	P
8	Moefa	P1	P	P	X	P	P	X	X	P	P	P
9	Extinguishers	P	P	P	P	P	P	P	P	P	P	P
10	Hose Reel	P2	P	P	P	P	P	X	P	P	P	P
11	Yard Hydrant	X	P	P	X	P	P	X	X	X	P	P
12	Down Comer	X	X	P	P2	X	X	X	X	X	X	X
13	Wet Riser	X	P	P	X	P	P	X	X	X	P5	P
14	Fire Detection System	P7	P	P	P2	P8	P9	X	X	X	P	P
15	Automatic Sprinkler System	S7	FS	FS	S	S	FS	S	S	S	S	FS
16	Under Ground Tank	P7	P	P	X	P	P	X	X	P10	P11	P
17	Over Head Tank	P2	P	P	P	P	P	P5	P	P	P	P
18	Fire Pumps	P11	P	P	X	P	P	X	X	X	P5	P
19	Booster Pumps	X	X	X	P	X	X	P12	P	P	P	P
20	Auto D.G. Set	P7	P	P	P	P	P	X	X	P	P	P
21	MCB/ELCB	P	P	P	P	P	P	P	P	P	P	P
22	Hose Boxes	P	P	P	P2	P	P	X	X	X	P5	P
23	Fireman’s Grounding Switch	P	P	P	P	P	P	P	P	P	P	P

## Legend

- O Guest Houses/Lodging having up to 20 rooms or 40 beds and below
- I Height less than 15 mt.
- II Height 15 mt. and above up to 24 mt.
- III Height above 24 mt
- IV Height less than 15 mt. and plot area less than 250 sq.mt.
- V Height less than 15 mt. and plot area 251 sq.mt. and above up to 500 sq.mt.
- VI Height less than 15 mt. and plot area 501 sq.mt. and above up to 1000 sq.mt.
- VII Height less than 15 mt. and plot area more than 1001 sq.mt.
- VIII Height above 15 mt. and up to 18 mt.

- P To be Provided.
- X Not to be provided.
- S Sprinklers to be provided if basement area is 200 sq.mt. or more.
- FS Fully Sprinklered.
1. To be provided if seating capacity exceed 750.
  2. To be provided if building is more than ground floor, first floor and total covered area exceed 1500 sq. mt.
  3. To be provided in building where total covered area exceeds 1000 sq. mt.
- or
- Building is more than ground floor except group housing.
4. To be provided if building is ground floor, first floor and total covered area exceeds 300 mt.
  5. To be provided if building is more ground floor.
  6. To be provided in building except educational buildings.
  7. In case seating capacity is 1000 persons minimum or covered area above 1500 sq.mt. or basement area 200 sq.mt. and more (other than places or worships).
  8. To be provided fore E-4 and E-5 buildings but not required if building is fully sprinklered.
  9. To be provided for E-4 and E-5 buildings.
  10. 25,000 lt. capacity under ground water storage tank to be provided.
  11. 50,000 lt. capacity under ground water storage tank to be provided.
  12. To be provided where ever sprinklers are not installed.
  13. Terrace tank of 5,000 lt. capacity to be provided, if sprinklers and installed. The capacity shall be accordingly increased.

## Annexure “B-II”

## Fire Protection Requirements for Buildings in Zone-II Category

Sl. No.	Measures	Group-A: Residential A5 : Hotels				Group-C: C2: Hospital		Group-D: Assembly D1, D2, D5	
		I	II	III	IV	V	VI	V	VI
1	Access	P	P	P	P	P	P	P	P
2	Means Of Escape	P	P	P	P	P	P	P	P
3	Compartmentation	P	P	P	P	P	P	P	P
4	Refuge Area	X	X	X	X	X	X	X	X
5	Emergency Lights	P	P	P	P	P	P	P	P
6	Exit Signs	P	P	P	P	P	P	P	P
7	PA System With Talk Back Facility	X	P	P	P	P	P	P	P
8	Moefa	X	P	P	P	P	P	P	P
9	Extinguishers	P	P	P	P	P	P	P	P
10	Hose Reel	P	P	P	P	P	P	P	P
11	Yard Hydrant	X	X	P	P	X	P	X	P
12	Down Comer	X	P2	X	X	X	X	X	X
13	Wet Riser	X	X	P2	X	P4	P	P5	P
14	Fire Detection System	X	P	P	P	P3	P	P	P
15	Automatic Sprinkler System	S	S	FS	F S7	S	FS	S8	FS
16	Under Ground Tank	X	X	P	P	P3	P	P8	P
17	Over Head Tank	P	P	P	P	P	P	P	P
18	Fire Pumps	X	X	P	P	P4	P	P8	P
19	Booster Pumps	P	P	P	X	P	X	P	X
20	Auto D.G. Set	P	P	P	P	P	P	P	P
21	MCB/ELCB	P	P	P	P	P	P	P	P
22	Hose Boxes	X	P	P	P	P4	P	P	P
23	Fireman’s Grounding Switch	P	P	P	P	P	P	P	P

## Annexure “B-II” (Contd.)

## Fire Protection Requirements for Buildings in Zone-II Category

Sl. No.	Measures	Group-E: Business E1, E2, E4			Group-F: Mercantile	Group-G. Industrial G2				
		VII	VIII	IX	X	XI	XII	XIII	XIV	XV
1	Access	P	P	P	P	P	P	P	P	P
2	Means of Escape	P	P	P	P	P	P	P	P	P
3	Compartmentation	P	P	P	P	P	P	P	P	P
4	Refuge Area	X	X	X	X	X	X	X	X	X
5	Emergency Lights	P	P	P	P	X	X	P	P	P
6	Exit Signs	P	P	P	P	X	X	P	P	P
7	PA System with Talk Back Facility	X	P	P	X	X	X	X	X	P
8	Moefa	X	P	P	X	X	X	P	P	P
9	Extinguishers	P	P	P	P	P	P	P	P	P
10	Hose Reel	P	P	P	P1	P	P	P	P	P
11	Yard Hydrant	X	P	P	X	X	X	X	P	P
12	Down Comer	P3	X	X	X	X	X	P4	X	X
13	Wet Riser	X	P	P	X	X	X	X	P6	P
14	Fire Detection System	P3	P	P	X	X	X	X	X	P
15	Automatic Sprinkler System	S	S	FS	S	S	S	S	FS	FS
16	Under Ground Tank	X	P	P	X	X	P9X	P10	P	P
17	Over Head Tank	P	P	P	P1	P	P	P	P	P
18	Fire Pumps	X	P	P	X	X	X	X	P	P
19	Booster Pumps	P	P	P	P1	P	P	P	P	P
20	Auto D.G. Set	P	P	P	X	X	P	P	P	P
21	MCB/ELCB	P	P	P	P	P	P	P	P	P
22	Hose Boxes	P3	P	P	X	X	X	P	P	P
23	Fireman’s Grounding Switch	P	P	P	P	P	P	P	P	P

## Legend for Appendix “B-II”

- I Height less than 15 mt. and area up to 300 sq. mt. on each floor.
- II Height less than 15 mt. and area above 300 sq. mt. up to 1000 sq. mt. on each floor.
- III Height less than 15 mt. and area above 1000 sq. mt. on each floor.
- IV Height 15 mt. and above.
- V Height less than 15 mt.
- VI Height 15 mt. and above up to 30 mt.
- VII Height less 15 mt.
- VIII Height 15 mt. and above up to 24 mt.

- IX Height more than 24 mt.
- X Height less than 15 mt. and plot area up to 750 sq. mt.
- XI Height less than 15 mt. and plot area less than 250 sq.mt.
- XII Height less than 15 mt. and plot area 251 m2 and above up to 500 sq. mt.
- XIII Height less than 15 mt. and plot area 501 m2 and above up to 1000 sq.mt.
- XIV Height less than 15 mt. and plot area more than 1001 sq. mt..
- XV Height above 15 mt. and up to 18 mt.
- P to be Provided
- X not to be provided
- S Sprinklers to be provided if basement area is 200 m2 or more
- FS Fully Sprinklered.
1. To be provided if building is more than one floor.
  2. To be provided in buildings above two floors.
  3. To be provided if the building is more than ground floor, first floor and covered area exceeds 1500 sq. mt.
  4. To be provided if building is more than first floor and the covered area exceeds 300 sq. mt.
  5. To be provided for more than storeyed buildings and above.
  6. To be provided if building is ground floor, first floor and above.
  7. Buildings to be fully sprinklered if height exceeds 15 mt.
  8. To be provided if seating capacity exceeds 1000 persons.
  9. 25,000 lt. capacity under ground tank to be provided.
  10. 50,000 lt. capacity a ground tank to be provided if riser is not provided.



## Annexure “B-III”

## Fire Protection Requirements for buildings in Zone-III Category

Sl. No.	Measures	Group F mercantile (F2,F3)			Group G Industrial (G3)				Group H Storage		Group J Hazardous	
		H<15m A>750M <sup>2</sup>	H>15 m	UGS	I	II	III	IV	H<15m Single Storey	H<15m More than one Storey	H<15 m Single Storey	H<15m More than one Storey
1	Access	P	P	P	P	P	P	P	P	P	P	P
2	Means of Escape	P	P	P	P	P	P	P	P	P	P	P
3	Compartmentation	P	P	P	P	P	P	P	P	P	P	P
4	Refuge Area	X	X	X	X	X	X	X	X	X	X	X
5	Emergency Lights	P	P	P	X	P	P	P	X	P	P	P
6	Exit Signs	P	P	P	X	P	P	P	X	P	P	P
7	PA System with talk back facility	P1	P	P	X	X	X	X	X	X	P	P
8	Moefa	P1	P	P	X	X	X	P	X	X	P	P
9	Extinguishers	P	P	P	P	P	P	P	P	P	P	P
10	Hose Reel	P	P	P	P	P	P	P	P	P	P	P
11	Yard Hydrant	P	P	P	X	X	P	P	P2	P2	P	P
12	Down Comer	X	X	X	X	X	X	X	X	X	X	X
13	Wet Riser	P1	P	P	X	X	P3	P1	X	P3	X	X
14	Fire Detection System	X	P	P	X	X	P	P	X	X	P	P
15	Automatic Sprinkler System	FS	FS	FS	FS	FS	FS	FS	FS4	FS	FS	FS
16	Under Ground Tank	P	P	P	P5	P6	P7	P	P6	P	P	P
17	Over Head Tank	P	P	X	P	P	P	P	P	P	X	P
18	Fire Pumps	P	P	P	P	P	P	P	P4	P	P	P
19	Booster Pumps	X	X	X	X	X	X	X	X	X	X	X
20	Auto D.G. Set	P	P	P	P	P	P	P	P	P	P	P
21	MCB/ELCB	P	P	P	P	P	P	P	P	P	P	P
22	Hose Boxes	P1	P	P	X	P	P	P	X	P3	P	P
23	Fireman's Grounding Switch in Lifts	P	P	P	P	P	P	P	X	P	X	P

**Legend for Annexure “B-III”**

- U.G.S. Under Ground Shopping complex
- i) Height less 15 mt. shopping complex
  - ii) Height less 15 mt. and plot area 251 sq. mt. and above up to 500 sq. mt.
  - iii) Height less 15 mt. and plot area 501 sq.mt. and above up to 1000 sq.mt.
  - iv) Height less 15 mt. and plot area more than 1001 sq.mt.
- P To be provided.
- X Not to be provided.
- S Sprinklers to be provided if basement area is 200 sq. mt. or more.
- FS Fully Sprinklered.
- 1. To be provided in building of more than one floor.
  - 2. To be provided if covered area exceeds 1000 sq.mt.
  - 3. To be provided in building above two floors.
  - 4. To be provided in buildings if covered area is more than 200 sq.mt.
  - 5. 50,000 lt. capacity underground state water storage tank to be provided.
  - 6. 1, 00,000 lt. capacity underground state water storage tank to be provided.
  - 7. 2, 00,000 lt. capacity underground state water storage tank to be provided.

## Annexure “C”

1. **Water Requirement Criterion:** Unless otherwise specified in Annexure B, water requirement for fighting in different categories of occupancies shall be based on following.

Occupancy Category	Sprinkler Design Discharge Density (lt./min/sq.mt.)	Sprinkler Design Area (sq.mt.)	Max. area coverage/ Sprinkler (sq.mt.)	No. of House Streams* Fully other Sprinkled	Duration of Discharge (Min.)	
					Fully Sprinkled	Wet Riser Sprinkled
LEVEL-I	02.5	084	21	2 4	45	45
LEVEL-II	05.0	360	12	3 6	60	90
LEVEL-III	10.0	225	09	3 6	90	90

*Note: The discharge through a standard hose stream shall be taken as 567 lt./min.*

2. **Estimation of Total Water Requirements Fully Sprinklered Buildings**

Occupancy Category	Sprinkler (lt.)	Riser (lt.)	Total (lt.)	Wet Riser cum Down Comer (lt.)
LEVEL-I	9,450	51,030	60,480 (60,000)	1,02,060 (1,00,000)
LEVEL-II	1,08,000	1,02,060	2,10,060 (2,00,000)	2,04,120 (2,00,000)
LEVEL-III	2,02,500	1,02,060	3,04,560 (3,00,000)	3,06,180 (3,00,000)

3. **Water Storage Tanks**

- The design of the water storage tanks shall be as laid down in National Building Code of India.
- The capacity of underground water storage tank shall not be more than 85% of the total water requirement.
- The capacity of overhead tank shall not be less than 15% of the total water requirement.
- The entire water requirement can be provided in over head tanks and pumping requirements shall be finalized in consultation with Chief Fire Officer.
- Under ground water storage tank shall not be provided in the set back areas.

## Storage Requirements

Occupancy Category	Under Ground Static Tank		Over Head Tank	
	Fully Spkd. (lt.)	Riser (lt.)	Fully Spkd. (lt.)	Riser (lt.)
LEVEL-I	50,000	85,000	10,000	15,000
LEVEL-II	1,70,000	1,70,000	30,000	30,000
LEVEL-III	2,50,000	2,50,000	50,000	50,000

### 4. Riser/Downcomer

1. The size of the riser/ downcomer shall be such that velocity of flow does not exceed 5 m/second subject to a minimum of 100 mm. diameter.
2. The number of riser/downcomer shall be calculated on the basis that if 30 mt. of delivery hose is laid, it reaches the farthest corner of the remotest compartment on the floor.
3. The riser/downcomer shall be provided in the staircase/staircase lobby in such a manner that it does not obstruct the means of escape.
4. Only single headed hydrants shall be used on the riser/downcomer.
5. The size of hose to be provided with the internal hydrants shall be 50 mm diameter and with 63 mm diameter instantaneous male/female couplings.
6. Diffuser branch shall only be provided in the hose boxes.
7. In case of partially sprinklered building tapping from the wet riser is permitted for sprinkler feed.
8. In case of fully sprinklered building separate rising mains and pumps shall be used for sprinkler system and wet riser.

### 5. Selection of Pumps

1. Pumping requirement shall be met by a single pump or combination of pumps.
2. If more than one pumps are installed to meet the pumping requirement they shall be so arranged that they come into operation one after another depending upon fall in pressure in the mains and the combined pumping capacity shall be 20% more than the actual pumping capacity needed.
3. Jockey pump shall be selected to give minimum 3% and maximum 5% of aggregate pumping requirement at the same pressure to that of the main pump subject to maximum discharge of 450 LPM.
4. Standard pumps shall only be used having discharge capacity as 1800 LPM, 2280 LPM 2850 LPM & 4550 LPM.
5. The pump shall be capable of giving the pressure as shown in the table below:

Occupancy Category	Pressure* At Terrace Level	
	Fully Spkd. (Kgf./Cm2)	Riser(Kgf./Cm2)
LEVEL-I	3.5	3.5
LEVEL-II	3.5	5.5
LEVEL-III	5.5	7.0

\* Orifice plates shall be installed at the hydrants on rising mains / yard hydrants to ensure that the pressure does not exceed 7 Kgf./Cm2.

## Annexure "D"

**Questionnaire for High Rise Buildings/Other Buildings****Fire Service Headquarters**

1. Name of the building .....
2. Address of the building .....
3. Name and address of builder/promoter.....
4. Name and address of owners /occupiers of individual flats .....
5. Plot area .....
- (a) Title .....
- (b) Land use (in case of residential building indicate no. of dwelling units.....
6. Covered Area (at grade level) .....
7. Height of tile building .....
8. a) Overall height (from grade level up to terrace level ) .....
- b) Whether set back areas are conforming to unified building bye-laws .....
- ..
9. a) Number of Basement(please indicate level below grade in each case)
- b) If basement extends beyond the building line, please indicate the load bearing strength of the roof of basement) .....
- c) Area of the basement .....
- d) Whether any piazza is proposed? if so, details of the level of piazza and ramp etc. be indicated .....
10. Number of floors (including ground floor) .....
11. Occupancy use (please mention separately, use for basement and floors) .....
12. Covered area of typical floor .....
13. Parking areas (please give details) .....
14. Details of surrounding properties / features

Compass direction In relation to the building	Type of Property/ feature	Height in case of building	Distance wall to wall from building	Any other information
North				
South				
East				
West				

15. Approach to proposed building width of the road and connecting roads, if any .....
16. Please give details of water supply available exclusively for the fire fighting .....
17. Has wet riser(s) been provided? If so, please indicate the number of risers and internal dia of each .....
18. Has any down comer been provided? If so, please give details including pump capacity.....
19. Please indicate the present arrangement for replenishment of water for fire fighting.....
20. Is a public or other water storage facility available nearby? if so, please give the capacity and distance from your building, also please indicate if it is easily accessible.....
21. Please give any other information regarding availability of water supply for fire fighting .....
22. Have internal hydrants on each floor including basement (s) and terrace.
  - a) No. of hydrants on each floor including basement (s) and terrace.....
  - b) Bore and length of each floor including basement(s) .....
  - c) Size (bore) and type of nozzle fitted to each hose reel.....
  - d) Is the hose reel connected directly to the riser or to the hydrant outlet? .....
23. Has fire hose been provided near each hydrant? if so, Please indicate .....
  - a) The type hoses.....
  - b) The size (bore) of hose .....
  - c) The length of each hose .....
24. Have branch pipes been provided? if so, please indicate

- a) The type of branch pipe.....
- b) Size of nozzle fitted to each branch.....
25. a) If the basement is used for Car / Scooter parking or storage.  
Has it been sprinkled?.....
- b) Whether any cubicles proposed in the basement? If so, the area of each cubical be indicated? .....
- c) Whether segregation/compartimentation of the basement has been provided? If so, please give details.....
26. Is the building equipped with automatic fire detection and alarm system? If so, please indicate
- a) The type of detectors used .....
- b) The standard to which the detectors conform .....
- c) The code to which the installation conform .....
27. Have manual call boxes been installed in the building for raising an alarm in the event of outbreak of fire? If so, please give details.....
28. Has public address system been installed in the building with loudspeaker on each floor with talk back facility.....
29. Has an intercom system been provided between the various floors and the fire control room in entrance lobby? .....
30. Has a fire control room been provided in the entrance lobby of the building?  
.....
31. How many staircases have been provided in the building? Please indicate in each case:-
- a) Width of the stairway.....
- b) Width of treads.....
- c) Height of risers .....
- d) If the treads are of the non-slip type.....
32. What is the average occupant load per floor?.....
33. Whether fire tower has been proposed? .....
34. How many lifts have been installed in the building? Please indicate in each case:
- a) The floors between which the lifts runs.....
- b) The type of doors fitted to the lift Car and at each landing.....
- c) Fire resistance rating of lift Car and landing doors, if known .....
- d) Floor area of the lift car.....
- e) Loading capacity of the lift car .....



- f) Has communication system been installed in the lift car? .....
- g) Has a fireman's switch been installed in the lift for grounding it in the event of fire .....
- 35. Have any stationary fire pump (s) been installed or pressuring the wet riser? If so, please indicate.
  - a) The number of pumps.....
  - b) The size of suction and delivery connection of each pump .....
  - c) The output of each pump .....
- 36. Has the building been protected with sprinkler system, If so, detail of sprinkler pump.....
- 37. Has a standby source of power supply been provided? If it is through a generator, please indicate.
  - a) The capacity (output) .....
  - b) The functions that can be maintained simultaneously by the use of the Generator, such as operating lift(s); fire pumps, emergency lighting etc. system; exit signs; PA system etc.....
  - c) Is the generator automatic in action or has to be started manually?.....
- 38. Has any Yard hydrant been provided from the building's fire pump? .....
- 39. Where more than one lifts are installed in a common enclosure have individual lifts been separated by fire resisting walls or 2 hours fire rating? .....
- 40. Has the lift shaft(s) lift lobby or stairwell been pressurized? If so, give details.....
- 41. Has the lift lobbies and staircase been effectively enclosed to prevent fire/smoke entering them from outside at any floor? .....
- 42. Have all exits and direction of travel to each exit been sign-posted with illuminated signs? .....
- 43. Has a false ceiling been provided in any portion of the building? If so, please indicate location and also mention if the material used for the false ceiling is combustible or non-combustible.....
- 44. Is the building centrally air-conditioned? if so, please indicate:
  - a) The material used for construction of ducts and its fittings.....
  - b) The type of lining used for ducts, if any.....
  - c) The type of lagging used for ducts, if any for insulating any portion of the duct; please also indicate how the lagging is secured.....
  - d) If plenum is used for return air passage has it been protected with fire detectors? Please give details.....
  - e) Has a separate A.H.U. been provided for each floor?

- f) Whether automatic shutdown of A. H. U. is coupled with detection system/sprinkler system.....
- g) Is the ducting for each floor effectively isolated or is it continuous on more than one floor? .....
- h) Are the fire dampers being provided?.....
- 45 Where are the switchgear and transformer located? If inside the building please indicate: .....
- a) If the switchgear and transformer (s) have been housed in separate compartments, effectively separated from each other and other portions of the building by a four-hour's fire resistive wall? .....
- b) What precautions have been taken to prevent a possible fire in the transformer (s) from spreading? .....
- c) Are transformer protected by high velocity water spray system.....
- 46 I) Where electrical cables, telephone cables wet risers / down comers pass through a floor or wall has the spaces (apertures) round the cables /pipes been effectively sealed/plugged with noncombustible, fire resistance material?.....
- II) Ventilation
- a) Whether natural ventilation is relied upon? If so, give details of the vents for the stairwell life shafts.....
- b) Whether mechanical ventilation has been proposed? If so, give details of the proposed system indicating the number of air changes for the basement and other floors.....
- c) Whether mechanical ventilation is coupled with automatic detection system/sprinkler system? Please give details of the system.....
47. Please indicate the number and type of fire extinguishers provided at various locations and the arrangement for the maintenance of the extinguishers .....
48. Please indicate if all fire extinguishers bear the BIS mark.....
49. Whether the refugee area has been provided? If so, the floor on which provided and the total area provided floor-wise.....
50. Are the occupants of the building systematically trained in fire prevention, use of fire extinguishers and emergency procedures? If so, please give details.....
51. Does an emergency organization exist in the building? If so, please give details and append a copy of the emergency (fire) orders.....
52. Has a qualified officer been appointed for the building either individually or jointly with other building(s).....

53. Has the building been protected against lightning? If so, does the lighting protection conform to any code? Please indicate details provision of MCB and ELCB in the building.....

54. The work has not been started on site and construction will be started only after final approval of the Authority / the position of construction at site is given below:

.....

Name and address of the consultant with Registration No.....

Owner's Signatures

Signature of the Applicant / Architect

Name.....  
(In block letters)

Name.....  
(In block letters)

Designation.....

Organization.....

Signature of Fire Consultant

Dated:

Name.....  
(In block letters)

Remark of the concerned Authority. The proposal has been broadly examined. The above information is correct and the proposal is permissible as far as development Authority is concerned (Additional comments, if any, may be given below or attached):

The proposal can be considered by Fire Services at conceptual stage/is forwarded to Fire Service along with 3 sets of drawings which are according to bye-laws, Master Plan, Zonal Plan, and fire fighting regulations and policy instructions of Government. The proposal involves relaxation in respect of height/set backs/ .....The architect has been advised to furnish the requisite material and documents given in the attached list, within one week time directly to the Fire Service.

Signature of Authority

Name:

Designation and office Seal:

**Appendix “A”**

(Bye laws 2.9.1 & 6.3.5)

(To be submitted in duplicate)

**Form for Application to Erect, Re-Erect or to make Material Alteration in any Place in a Building**

To

Commissioner/Vice Chairman/Secretary

Development Authority

Sir,

I hereby give notice on behalf of Shri.....(owner) that the owner intends to erect/demolish or make alteration in the building number or to on/in Plot No .....Block No..... House No .....situated at .....Scheme.....and in accordance with the building Bye-law No.....

and I forward herewith, the following plans and specification duly signed by me and by the owner.

1. Site plan
  2. Building Plan
  3. Service Plan
  4. Parking and circulation plan.
  5. Landscape Plan
  6. General Specifications (in attached form)
  7. Ownership Title (Lease/Conveyance/Sale Deed, etc)
  8. Other document, as required
- ii) The building plan has been prepared strictly as per the approved building Byelaws and relevant IS Codes / provisions of NBC. The construction shall be carried out in accordance with the building plan and I shall be completely accountable for any lapse on my part up to within 6 months after obtaining completion certificate of the building.
- iii) The Building permit fee as required under bye-laws 2.13 has been deposited vide receipt No .....dated. ....(Photocopy enclosed).

iv) I am aware that in the event of building being constructed in violation of the sanctioned building plan approval, the Authority shall have the right to take action against me as it may deem fit including referring the matter to concerned professional and statutory councils for taking disciplinary action against me.

.....	.....
Signature of the Owners	(Signature of Registered Architect/Engineer/Supervisor)
Name of owner(s).....	Registration No. of the Architect/Engineer/Supervisor
Address of the owner(s).....	Address of the Architect/Engineer/Supervisor
Encl: As stated above	Dated: .....

**Appendix “A-1”**  
(Bye laws 2.9.1)

**Statement of the Proposal and Certificate**

By the Owner and Registered Architect

Classification of the Proposal.....  
(To erect/re-erect/demolition)

Scheme /Colony ..... Plot No. ....  
Plot Area ..... sq.mt. Size (in meter)

**Area Statement**

Description	Permissible	Proposed sq.mt.	Remarks sq.mt.
Max. Ground coverage			
Basement			
Ground Floor			
First Floor			
Second Floor			
Third Floor			
Total Floor area			
Floor Area Ratio			
No. of Dwelling Units			

**Maximum height (in meters)**

Setbacks	As per approved Layout plan (mt.)	Proposed (mt.)
Front		
Rear		
Left		
Right		

**Parking (for above 250 sq.mt)**

Equivalent Car space @ 1.33 ECS per 100 sq.mt of permissible built floor area	Open Parking @ 23 sq.mt per ECS	Ground Floor covered parking @ 28 sq.mt per ECS	Basement Total parking (sq.mt) @32 sq.mt per ECS
---	---------------------------------	---	--

Area in sq.mt	Area in sq.mt@ 23 sq.mt per ECS Open Parking	Area in sq.mt @ 28 sq.mt. per ECS Covered Gr. Floor	Area in sq.mt @ 32 sq.mt. per Basement	Total (sq.mt)
1	2	3	4	5

ii) Fee & Charges

- a) Building permit fee Rs.....
- b) Use of City Infrastructure Charges Rs.....
- c) Additional floor space charges (provisional) Rs.....
- d) Peripheral charges (Provisional) only for Group IV CHBS  
Rs.....
- e) Any other charges (please specify) Rs.....

Total amount (as per the details above) Rs.....

Receipt No..... Dated.....

We hereby certify that

1. The plot in question forms part of the approved layout plan and its location size and area conform to the approved layout plan and lease/sale deed/NOC of the lease Administration Branch of concerned Development Authority.
2. Plot is lying vacant and no construction shall be started before sanction.
3. The plot is free from all encumbrances (owner responsibility).

- 4. The period of construction valid up to ..... As per the lease condition / further extension of time for construction granted by the lessor is valid up to ..... Time construction obtained from the lease Administration Branch, Concerned Development Authority.
- 5. Size of each dwelling unit is not more than 300 sq.mt.

Signature of Owner(s)

Signature of Registered Architect

Name.....

Name.....

(In block letters)

(in block letters)

.....

Registration No.....

Address.....

Address.....

.....

.....

Dated: .....

Dated: .....

**Authority Letter**

I hereby authorize Mr./Mrs..... to collect the sanction whose signature is verified below.

Specimen signature of

signature of the owner(s)/Registered Architect/

Mr./Mrs.....

Dated received..... Date .....

(Signature of authorized person / owner / Registered Architect)

Dated:.....

Remark, if any.....



**Appendix “A-2”**  
(Bye laws: 2.10.9)

**Form for Specifications of Proposed Building**

The purpose (Residence, Office, Restaurant, Hotel, Dharmshala, School, Hostel Cinema, Shop, Factory Others) for which it is intended to be used.....  
.....

Details of coverage on respective floor are given below:

	Existing (sq.mt)	Proposed (sq.mt)	Total (sq.mt)
1. Basement Floor.....			
2. Ground Floor.....			
2. Mezzanine Floor.....			
3. First Floor.....			
4. Second Floor.....			
5. Third floor.....			
6. ....			
7. ....			
8. ....			
9. ....			
10. ....			

- a) Approximate number of inhabitants proposed to be accommodated.....  
.....
- b) The number of latrines, Urinals, Kitchens, Baths to be provided.....  
.....
- c) The source of water to be used in the construction.....  
.....
- d) Distance from public sewer.....
- e) The materials to be used in construction Walls/Columns/Foundations/Roof/  
Floors.....

Signature of Registered Architect/Engineer/Supervisor

Name.....  
Registration No.....  
Address.....  
.....

**Appendix “A-3”**  
(Bye laws: 2.10.10)

**Form for Supervision**

To  
The Commissioner/Vice-Chairman/Secretary  
Development Authority

Sir,

I hereby certify that erection/re-erection demolition or material alteration in / of Building No.....on / in .....Plot No.....in Block No..... situated at ..... scheme..... shall be carried out under my supervision and I certify that all the materials (type & Grade) and workmanship of the work shall be generally in accordance with the general specification submitted along with and the work shall be carried out according to the sanctioned plans which also included the services like drainage, sanitary, water supply, and electrical.

Signature of Registered Architect Engineer/Supervisor

.....

Name of Registered Architect/Engineer/Supervisor

(In block letters).....

Registration No. of Architect/Engineer/Supervisor

.....

Address of Registered Architect/Engineer/Supervisor

.....

Dated: .....

**Appendix “A-4”**  
(Bye laws: 2.13)

**Undertaking for Payment of Other and Peripheral Charges**

*Note: It should be on non-judicial stamp paper of specified amount attested by Notary Public / First class Magistrate.*

**Undertaking**

I .....Son of Shri ..... aged.....  
Years residents of .....Owner of Plot No .....  
in.....Co-operative Housing Building Society Ltd.....  
hereby undertake to pay the balance of peripheral and other charges as and when required  
by the concerned Authority and in this regard Authority’s decision will be finally binding  
on me.

Executed by me as.....on day of.....2004.

.....

Executant

Witness:

1.....

2.....

**Appendix “A-5”**  
(Bye laws: 2.9.4 viii)

**Affidavit-cum-Undertaking**

(Affidavit of Competent Professional on Rs. 2/- Non-Judicial Stamp paper of specified amount to be attested by Notary Public/Metropolitan Magistrate)

I ..... son of .....Architect  
by profession having office at.....Do hereby solemnly affirm  
and declare as under:

1. That I am a Licensed Architect/Engineer/Supervisor/Plumber duly registered with the Authority vide registration No. ....
2. That I have been engaged as a Competent professional as per Appendix ‘E’ of the Bye-Laws for preparing the building plans and to supervise construction in respect of Plot No.....Block No..... situated at.....
3. That I have prepared the building plans in respect of the aforesaid plot.
4. That I have studied the layout plan of the colony and gone through the instructions, policy decisions and other relevant documents in respect of the plot and colony.
5. That I have personally inspected the site. The plot under proposal forms part of the approved layout plan with respect to its location, size shape and area of the plot and proposed land use is also in conformity with the approved layout plan. The plot has been demarcated at site and the size, shape and area of plot available at site tallies with the approved layout plan.
6. That the ownership documents are in the shape of registered sale-deed/lease-deed in favour of the applicants and have been thoroughly examined and the ownership in favour of the applicant is in order.
7. That there is no construction in existence at the plot and no construction shall be started before sanction of the building plans.
8. That there is no encroachment on the Municipal land/road/other property and road widths as shown in the layout plan are available at site.
9. That the proposal are in conformity with the terms and condition of lease deed which is still valid and period of construction as per lease-deed and the extension granted by the lessor is valid up to.....
10. That the proposal have been prepared strictly in accordance with the Building Bye-laws rules regulation and practice of the department and no misinterpretation on inference of provision of Building Bye-Law has been done while preparing the plans. The construction shall be carried out strictly in accordance with the sanctioned building plans and in case any deviation is carried out, I shall inform the concerned Authority within 48 hours.

11. That in case the owner dispenses with my services at any stage whatsoever, I shall inform the concerned Authority within 48 hours.
12. That the size of each dwelling unit is not more than 300 sq. mt.
13. That mandatory setbacks have been proposed and shall be maintained in accordance with the setbacks marked in the layout plan/Master Plan.
14. That before submission of the proposal, necessary information/clarification have been obtained from the concerned department of the concerned Authority. The plot is safe and is not affected in any scheme or the road widening. Building activities for residential use are allowed with number of storeys as per approved layout plan.
15. That no development/additional development/deficiency charges are payable, against this plot (in case development/additional development/deficiency charges are payable then its details be given in the separate para)
16. That no non-compoundable deviations shall be carried out during the course of construction.
17. That nothing has been concealed and no misrepresentation has been made while preparing and submitting the building plans.
18. That in case anything contrary to the above is found or established at any stage, the concerned Authority shall be at liberty to take any action as it may deem fit including revocation of sanction of building plans and debarring me for submission of building plans with the Authority under the scheme and also lodge a complaint with the Council of Architecture for appropriate action.

Deponent

Verification:

I the above named deponent do hereby verify at .....  
on this..... of ..... 20..... that contents of the above affidavit are true and correct to my knowledge. No part of it is false and nothing has been concealed there from.

Deponent

**Appendix “A-6”**  
(Bye laws: 2.14.2)

**Building Permit/Sanction**

File No.....

Dated.....

To

Subject: Sanction u/s.....

Dear Sir or Madam,

With reference to your application dated..... for the grant of sanction to erect/re-erect/add to/alteration in the building to carry out the development specified in the said application relating to Plot No..... Block No..... situated in/at..... I have to state that the Authority subject to the following conditions and corrections done in the plans has sanctioned the same on.....

1. The plans are valid up to .....day.....Months ..... year .....
2. The construction will be undertaken as per sanctioned plan only and no deviation from the bye-laws will be permitted without prior sanction. Any deviation done against the bye-laws is liable to be demolished and the supervising Architect engaged on the job will run the risk of being black listed.
3. Violation of building bye-laws will not be compounded.
4. It will be the duty of the owner of the plot and the Architect preparing the plans to ensure that the sanctioned plans are as per prevalent Master Plan/Zonal Plan/Building Bye-laws. If any infringement of bye-laws remain unnoticed, the concerned Authority reserves the right to amend the plans as and when infringement come to the notice and concerned Authority will stand indemnified against any claim on this account.
5. A notice in writing shall be sent to Authority before commencement of the constructions of the building as per bye-laws. Similar notice will be sent to Authority when the building has reached up to plinth level.
6. The owner shall not occupy or permit to occupy the building or use or permit to use the building or any part thereof affected by any such work until occupancy certificate is issued by the concerned Authority.
7. Concerned Authority will stand indemnified and kept harmless from all proceedings in court and before other authorities of all expenses /claims

which the concerned Authority may incur or become liable to pay as a result or in consequences of the sanction accorded by it to these building plans.

8. The doors and window leaves shall be fixed in such a way that they shall not, when open project on any street.
9. The owner will not convert the house into more dwelling units on each floor then the sanctioned.
10. The building shall not be constructed within minimum distance as specified in Indian Electricity Rules from voltage lines running on side of the site.
11. The land left open as a consequence of the enforcement of the setback rule shall form part of the public street.
12. The owner shall ensure that the public areas like road, parks and other public opens spaces are not used for stacking the building materials or machineries to avoid public inconvenience and nuisance.
13. The sanction will be void if auxiliary conditions mentioned above and other conditions whatsoever imposed are not complied.
14. The owner will use the premises for the use, which has been sanctioned.
15. The owner will not proceed with the construction without having the supervision of an Architect/Engineer as the case may be. If he\she changes his Architect\Engineer, he\she shall inform the Authority about the appointment of new Architect\Engineer within 48 hours, with a proper certificate from him.

Yours Faithfully

For .....

Encl: A set of sanctioned plan.

**Appendix “A-7”**  
(Bye laws: 2.14.2)

**Form for Refusal of Building Permit**

To

File No.....  
.....

Dated

Sir.

With reference to your application No.....dated.....  
for the grant of sanction for the erection of building/execution of work in House  
No..... Plot No.....Block No.....  
Scheme..... Situated at ..... I have you  
inform you that building permit under relevant provisions of the Act  
of..... has been refused on.....  
on the following grounds.

- 1
- 2
- 3
- 4
- 5

Yours faithfully

For.....

Authority.



**Appendix “A- 8”**  
(Bye laws: 2.14.3)

**Form of Revalidation**

File No.....  
Dated.....

Shri /Madam .....  
.....  
.....

**Subject: Revalidation of Building Plans relating to plot No.....**  
**Block No.....Scheme.....**

Dear Sir / Madam,

Block No.

1. With reference to your application dated.....on the subject cited above, I am directed to inform you that your building plan which were sanctioned on..... vide file No.....have been revalidated up to .....
2. Original sanctioned plan submitted by you is also returned herewith.
3. Please acknowledge receipt.

Yours Faithfully,

For.....

Authority

Encl: As above.

**Appendix “A-9”**

(Deleted vide amendment in Bye laws: revised clause 2.15.1 b)

**Form for Notice for Commencement of Work**

(contents deleted vide amendments)

**Appendix “A-10”**  
(Bye laws: 2.15.3)

**Information for Intimation of Completion of Work up to Plinth Level**

To

The .....  
.....Authority,

Sir,

The construction up to plinth/column up to plinth level has been completed in Building No..... on/in Plot No..... Scheme No..... Road/Street .....Ward.....in accordance with your permission No.....dated.....under my supervision and in accordance with the sanctioned plan.

Yours faithfully,

Signature of Licensed Architect/Engineer/Supervisor

Name.....  
(In Block letters)

Address:.....  
.....

Date:.....

**Appendix "A -11"**  
(Bye laws: 2.15.3)

**Inspection Report**

I.....working as a ..... with .....  
have carried out the inspection of Building No.....on/in Plot No.....  
Scheme No.....Road/Street.....ward..... in accordance  
with permission No.....dated..... .The following deviation from  
the sanctioned plans have been noticed which are against the provision of Master Plan /  
Bye-laws are of non-compoundable nature.

Description of deviations noticed: .....  
.....  
.....  
.....

You may not proceed with further work till such time the deviations made are rectified  
and construction brought in conformity to sanction plans.

Yours Faithfully

For.....  
.....  
.....

Competent Authority

Office No.....  
Office Stamp.....  
Date.....

**Appendix “A-12”**

(Bye laws: 2.16)

**Form of Notice of Completion**

(To be submitted along with prescribed fee for notice of completion and other relevant documents)

To

The .....  
.....Authority,

Dear Sir,

I/We hereby give notice that I/We have completed the erection of building/execution of the works in Plot No ..... Block No.....Scheme..... situated at..... in pursuance of the sanction granted by the Authority vide File No..... dated.....I/We are enclosing all reports of the Authority inspection carried out during construction period.

- 2. Permission to occupy or use the building may be granted.

Yours Faithfully,

Signature of owner.....

Name of owner .....

(In Block letters)

Address of the owner .....

.....

Dated: .....

Encl : As above

**Appendix “A-13”**

(Bye laws: 2.16 x)

**Form for Certificate of Architect/Engineer/Supervisor**

(To be submitted along with notice of completion)

To

The .....

.....Authority,

Dear Sir,

We hereby certify that the erection, re-erection or material alteration in/at building No.....on in Plot No..... Block No.....Scheme.....situated at.....has been supervised by me and has been completed on ..... according to the plans sanctioned, vide office communication No..... dated .....The work has been completed to our best satisfaction, the workmanship and all the materials (type & grade) have been used strictly in accordance with general and detailed specifications. All the drainage/Sanitary/Water Supply work has been executed under our supervision and as per Building Bye-laws. No provisions of the Building Bye-laws and condition prescribed or order issued there under have been transgressed in the course of the work. The building is fit for use for which it has been erected /re-erected or altered/constructed and enlarged.

## 2. Certificate:

- i) Certified that the building(s) has been constructed according to the sanctioned plan and structural design (one set of structural drawings as executed is enclosed) which incorporate the provisions of structural safety as specified in relevant prevailing NBC Part 6 and IS codes standards/Guidelines.
- ii) Further certified that water harvesting as well as waste water re-cycling systems have been provided as per the sanctioned building plan.
- iii) It is also certified that construction has been one under our supervision and guidelines and adheres to the drawings submitted and the records of supervision have been maintained by us.

3. Permission to occupy of use the building may be granted.

4. Any subsequent change from completion drawings will be the responsibility of the owner(s)

- |   |  |
|---|--|
| a) Signature of the owner<br>with date<br>Name in Block letters | b) Signature of the Architect/Engineer<br>with date<br>Name in Block letter, Licence No. |
|---|--|

Address

Address

c) Signature of the Structural Engineer  
with date (for certificate 1)  
(as defined in NBC of India)  
Name in Block Letters  
Address

c) Signature of Supervisor/Engineer/  
Group/Engineer with date  
Name in Block letters, Licence No.  
Address

Dated : .....

**Appendix “A-14”**  
(Bye laws: 2.17.1)

File No.....

Plan No.....

Dated:.....

Shri/Miss/Smt.....

.....

**Completion-cum-Occupancy Certificate**

With reference to your notice of completion dated.....I hereby certify that building as per description below certified plan at Plot No.....Block No..... Scheme .....situated at .....

whose plans were sanctioned vide No.....has been inspected with reference to building bye-laws in respect to the structural safety, fire safety, hygienic and sanitary conditions and proposed rainwater harvesting systems inside and in the surroundings and is declared fit for occupation and release of regular water and electricity connections. The description of the construction work completed is given as under:

**Description of Construction Work Block Wise/Building Wise.**

1. Block Building No.
2. Details of Completed Work floor wise.

Vice Chairman  
or  
Commissioner of Authority



**Appendix "A-15"**  
(Bye laws: 2.17.1)

**Form of Rejection or Compliance in Respect of Occupancy Certificate**

File No.....

Dated:.....

Sh/Smt.....

.....

Subject:       Occupancy Certificate in respect of Plot No.....

Dear Sir / Madam,

- 1)     With reference to your letter dated
- 2)     With reference to your notice of completion dated
- 3)     In continuation of this office letter of even No.....dated on the subject noted above, I am directed to inform you that your case has been examined and occupancy certificate is rejected for the reasons as given below:-

Yours Faithfully

For.....

.....Authority

1.     .....

2.     .....

3.     .....

4.     .....

**Appendix “B”**  
(Bye laws: 2.9.4 & 6.3.8)

**Affidavit/Undertaking**  
**(For Handing Over Land Required For Road Widening)**

That I/We have submitted building plans for construction of building on plot No..... Block No.....located at.....to the ..... under Sanction..... of the ..... Act for favour of sanction.

I/We undertake to hand over the land required for road widening as shown on site plan to concerned Authority free of cost as and when asked by.....to do so.

I/We have already understood that the.....is granting sanction on the basis of my undertaking.

If I/We fail to do so, the sanction so accorded shall be revoked and construction done as consequence thereof shall be deemed to have done unauthorisedly and shall be actionable u/s .....of the .....Act.

**DEPONENT**

**Verification**

I/We verify that the contents of the above undertaking are correct to the best of my knowledge and belief and nothing material has been concealed there from.

**DEPONENT**

**Appendix “B-1”**  
(Bye laws: 2.9.4. iv)

**INDEMNITY BOND FOR BASEMENT**

This Indemnity Bond is executed by Shri/Smt.....  
S/o, D/O, W/O Shri/Smt.....  
R/O.....in favour of Development Authority.

Whereas the executant has submitted to the concerned Authority the plans for, sanction of basement over Plot No..... under the provisions of the Act and lie bye- laws made there under:-

And whereas the concerned Authority has agreed to sanction the aforesaid construction subject to the conditions that the owner shall indemnify the concerned Authority in the event of any loss or damage being cause to the adjoining building on account of the construction of the said basement either at the time of digging of its foundations or in the course of its construction or even thereafter and also against any claim of any concern thereto.

And whereas the executant has agreed to execute an indemnity bond to the above affect and also to abide by the terms imposed by the concerned Authority to the grant of sanction for construction of the basement.

Now this deed witnesses:

1. That in consideration of the sanction of the plans by..... for construction of the basement the executant undertakes that he/she shall at all times keep.....harmless and free from any liability, loss or damages/ flowing from any injury or damage caused to the adjoining built-up properties or to any person as a consequence of the construction of at the time of digging of its foundations or during the course of its construction or at any time thereafter.
2. The owner agreed and undertakes that in the event of any claim being made by any person or persons against the concerned Authority either in respect of the sanction granted by the concerned Authority to the owner for the construction of basement or in respect of the construction or manner of construction of the basement by the owner or the consequences flowing from the said sanction the executant shall be responsible and liable and not the concerned Authority.
3. The executant agrees and undertake to indemnify the concerned Authority fully in respect of any amount which the concerned Authority may be required to pay to any person either by way of compensation or damages or on any other account as a result of any claim or suit or any other proceedings concerning the sanctioning

of the construction of the basement of the making thereof and also in respect of the costs and expenses which the concerned Authority may incur on defending any action.

- 4 Without prejudice to the above undertaking the executant hereby binds itself to pay to the concerned Authority to the full extent any amount which the concerned Authority may be required to pay to any person in connection with, relating to or concerning the sanctioning of the basement or the making thereof.
- 5 The owner further agrees and undertakes that this bond shall remain in full force and effect till the executant faithfully observes/performs the undertaking herein before contained.

In witness whereof the executant above named has signed this bond on this ..... day of .....at.....

**Indemnifier**

Witness:

(Signatures).....

- 1. Name.....  
Full Address.....  
(Signatures).....
- 2. Name.....  
Full Address.....

**Appendix “C”**  
(Bye laws: 2.12.1)

**PERFORMA TO BE SUBMITTED BY OWNER**

1. Name, Status, and Address of the applicant
2. Name of the Architect and address with Registration number with Council of Architecture.
3. Details of the property/plot
  - a) Location
  - b) Boundaries
  - c) Area in sq.mt. with dimensions (net plot area)
  - d) Width of the roads
4. Land use
  - a) Master Plan
  - b) Zonal Development Plan
  - c) Approved Layout Plan
5. Title
  - a) Free Hold
  - b) Leasehold under notification for acquisition if lease hold permission of lessor for construction under the leasehold condition obtained.
  - c) Whether under acquisition, if so give details.
6. Whether the plot/land is affected under the Urban Land (Ceiling & Regulation) Act, 1976. If so, copy of the NCO from the concerned Authority be furnished.
7. Proposals
  - a) Land Use
  - b) Coverage on each floor with proposed use of the floor space including basement.
  - c) FAR
  - d) Height
  - e) No. of floors.
  - f) Envelope controls/set backs
  - g) Parking norms

Encl:

1. Ownership title
2. Permission to construct under the lease
3. Permission under the Land Ceiling Act, 1976.
4. Site/Location Plan
5. Tentative proposals to explain the scheme

Signature of Architect

Signature of the owner

Name.....

Name.....

Reg. No.....

Address.....

Address.....

**Appendix “D”**  
(Bye laws: 4.32.2)

**Number and Type of Lifts Required for Different Occupancies and Space for Electrical Installations**

1. The number and type of lifts required depending on the capacity of lift, desired speed nature of operation are as given in table below:

**Table: Number and types of lifts for non-residential Multistoried Building**

Sl. No.	No. of floors	Capacity of lifts in person	Speed m/s	No. of persons that can be carried by a lift							
				In 6 min		In 30 min.		In 50 min.		In 60 min.	
				Manually Operated	Automatic	Manually Operated	Automatic	Manually Operated	Automatic	Manually Operated	Automatic
1	2	3	4	5	6	7	8	9	10	11	12
1	7	6	0.6-0.75	17	-	102	-	170	-	204	-
2	7	8	0.6-0.75	22	-	132	-	220	-	-	-
3	7	10	0.6-0.75	26	-	156	-	260	-	312	-
4	7	10	1.0	30	-	180	-	300	-	360	-
5	7	13	1.0	37	-	122	-	370	-	444	-
6	11	6	0.6-0.75	11	-	70	-	115	-	140	-
7	11	8	0.6-0.75	15	-	90	-	150	-	180	-
8	11	10	0.6-0.75	18	-	108	-	180	-	216	-
9	11	13	0.6-0.75	22	-	132	-	220	-	264	-
10	11	10	1.0	21	-	126	-	210	-	252	-
11	11	10	1.5	24	-	144	-	240	-	288	-
12	11	13	1.5	28	-	156	-	260	-	312	-
13	11	13	1.5	32	-	180	-	300	-	-	-
14	16	10	1.0	17	-	100	126	170	210	-	252
15	16	13	1.5	20	24	120	145	200	240	248	290
16	16	13	1.5	23	30	138	180	230	300	-	360
17	16	16	1.5	25	33	150	198	250	330	300	356
18	21	10	1.5	18	32	108	132	180	220	214	264
19	21	13	1.5	21	26	126	156	210	250	250	312
20	21	14	1.5	23	28	138	168	230	280	-	-

**Note-1:**

- a) For all non-residential buildings, the traffic cleared in 50 minutes is considered adequate and is approved by Authority. As such for calculation the number of lifts required, the rate of the clearance of traffic in column 9 and 10 and the population may be taken into consideration.
- b) In addition to total number of lifts required as above, provision of one lift of the same capacity may be considered to serve as stand-by.

**Note-2:** The population may be worked out on the basis of useful carpet area which the person occupy (excluding area of Verandah, Lobbies, Halls, Passages, Lavatory blocks, etc.)

**Note-3:** The population on ground and first floor may not be taken into consideration since these floors are not generally served by lifts.

**Note-4:** 0.75 meter per sec. Equivalent to 150 ft. per Min.

1.00 meter per sec. Equivalent to 200 ft. per Min.

1.5 meter per sec. Equivalent to 300 ft. per Min.

**Note-5:** The height of buildings for lift installation i.e. the travel on the lift presumed in the above statements is as below:

7 floors 21.0 mt.

11 floors 33.0 mt.

16 floors 48.0 mt.

21 floors 64.0 mt.

**Table: Number and types of lifts for Residential Building**

Sl. No.	No. of floors	No	Passenger unit capacity Persons	Speed in m/s	Landing Gate Type	Central System	Service Lift No.	Capacity Persons	Type of Gate	Central System
1	5 to 8	2	6	0.0 to 0.5	*	Automatic push button operation both from car and landing	-	-	-	-
2	9 to 11	2	8	0.6 to 1	*	--Do--	1	8	-	Push button car handle switch control
3	11 to 13	2	8	0.6 to 0.74	*	--Do--and without collection system	1	8	-	--do--
		1	6			Power operated doors				
4	13 to 19	2	8	1	-	--do--	1	8	-	--do--
		2	8	1		power operated doors				

\* For buildings more than 15 mt. in height collapsible gates shall not be permitted. (see bye-law No. 7.9.1(f) )



**Appendix “D-1”**  
(Bye laws: 4.32.2)

The dimensions and relevant information for lift installations like lift well, pit depth, machine room, clearance from top floor landing to machine room flooring is given in table below:

**Table: Dimensions and required information for Lift Installation in Building**

Carrying Capacity of lift (persons) Number	Load (kg)	Lift speed	Dimension of Lift well front depth (In cm.)		(Cm)	Leading Pit Entrance (Cm)	Dimension of Machine Room			Clearance from top floor landing to machine room flooring cm	Imposed load in tones on top of lift well due to installation. It may be noted that figures do not include weight of the machine from floors and well, etc.
			4	5			8	9	10		
1	2	3	4	5	6	7	8	9	10	11	12
4	272	Up to & including 1 m/s	175	115	70	140	230	275	245	450	6.5
6	408	--do--	195	135	80	140	230	335	275	450	7.0
8	544	Up to & including 1 m/s	200	170	80	150	245	395	275	450	8.5
10	680	Up to & including 1.5 m/s	225	170	90	150	245	395	305	470	10.5
13	884	--do--	235	188	90	150	245	425	335	470	13.0
16	1088	--do--	255	205	105	150	245	520	335	480	15.0
20	1360	--do--	255	220	105	150	245	520	335	480	15.0

**Note:**

- i) All lift well dimensions are minimum clear finished plumb requirements.
- ii) Where more than one lift is located in the lift well, extra width of 10 cm. Separator beam should be provided.
- iii) 1 m/s = 200 ft./min.
- iv) The height of landing entrance should be 210 cm. (about 7 ft.) for all lifts.

**Appendix “D-2”**  
(Bye laws: 4.32.3)

**D.2 Spaces for Electrical Installations**

The spaces required for different electrical installations are given at 3.1 to 3.3

**D.2.1 Electric Sub-station** – The norms given in 3.1.1 and 3.1.2 shall be adopted for provision of space for sub-station.

**D.2.1.1 Area Requirements for Sub-Station for buildings**

Sl.No.	Total covered Area (sq.mt)	Transformer Capacity (KVA)	S/Stn. Size Required (sq.mt)
1	2500	1 X 400	70
2	4500	1 X 630	70
3	8000	2 X 630	100
4	10,000	2 X 630	130
5	15,000	4 X 630	160
6	20,000	5 X 630	175
7	25,000	6 X 630	200
8	30,000	7 X 630	220

**Note:**

1. For additional 1000 sq.mt. covered area, a load of 90 KVA will come up with 150 KVA TR. Capacity at 60 % loading.
2. For additional of one transformer as per covered area, a space of additional 16 sq.mt. is to be provided.
3. In case of any deviation in space size due to unavoidable circumstance, the same may be considered with the approval of Electricity Board.
4. The floor of the sub-station shall have cable trenches of 0.6 mt. depth, the layout for which will be given at the time of actual construction. For this purpose, a dummy floor of 0.6 mt. depth shall be provided to facilitate cutting/digging of floor for installation of equipment's and making subsequent changes in trenches. This floor shall be capable to withstand minimum load of 10 tones of each transformer mounted on flour wheels.

The break-up spaces required for different installations in a sub-station are given as below:

1. Supply company's Switchgear room and or space of meters.
2. *Transformer Rooms:* The number and size of transformer rooms shall be ascertained from the total power requirements of the company. To determine the size of transformer and clearance around a transformer, reference may be made to good practice (I.S.1887-1967 code of practice for installation and maintenance of Transformer). A 500 KVA transformer may be provided with a minimum space of 4 mt. X 4 mt.

If transformer is to be installed outdoor space shall be provided on similar considerations and adequate provision for safety enclosure is to be made. For transformer having large oil content (more than 2000 lt.) soak pits are to be provided in accordance with rule 64 of Indian Electricity Rules, 1956.

3. *High Voltage Switch Rooms:* In case of sub-station having one transformer, the owner is required to provide only one high voltage switch. In the case of single point supply for two transformers, the number of switches required is 3 and for 'n' transformers the number of switches is n+1. The floor area required in case of a single switch will be roughly 4 mt. X 1mt. and for every additional switch the length should be increased by 1mt.
4. *Low Voltage Switch Rooms:* The floor area requirement in respect of low voltage switchgear room cannot be determined by any formula.
5. *Room for Stand-by-Generator:* A room space not less than 6 mt. X 9 mt. may be provided for housing a standby Generator set of 50 KW.

**D.2.1.1.A: Location of electric sub-station in basement of multistoreyed buildings:**

1. The electric sub-station should be provided in the approved/sanctioned covered area of the buildings not below the first basement level and should be on the periphery of the building with clear independent round the clock approach having proper ramp with slope.

The ramp should be designed in such a manner that in case of fire no smoke should enter the main buildings. The exit from basement electric sub-station shall have self-closing fire/smoke check doors of 2 hours. F.R. near entry to ramp. Additional exit shall be provided if traveled distance from the farthest corner of the ramp is more than 15mt.

2. The electric sub-station should be totally segregated from rest of the basement having 4 hours. F.R. wall and should have adequate internal lighting and ventilation. A perfect independent ventilation system of 30 air charges per hour linked with detection as well as automatic medium velocity water spray system for individual transformer shall be located outside the building at ground floor, fire control room shall be manned round the clock and shall also have an audio system in the basement as well as in the control room. No service such as water, sewer, air-conditioning, gas pipes or telegraphs services should pass through electric substation or the cable trench.
3. The rising mains should be of metal bus bars. The floor of electric sub-station should be 2 ft above the rest of basement floor and designed suitably to carry 10 tons of transformer weight on wheels also having provision of proper cable trenches 0.6 X 0.6 mt. depth. Dummy floor of

0.6 mt. depth be provided to facilitate laying of cables inside the building connecting to equipment. Fire retarding cables should be provided and cable trenches be filled with said cables. R.C.C. pipes at suitable places as required will be provided for cable entries to the sub-station spaces with suitable water proofing arrangement. A provision of 12 ft. clear height below beams should be made in the electric sub-station area along with adequate arrangement for fixing chain pulley block for a load of 15 tons. Provision of sumps shall be kept in the floor so that complete volume of transformer oil in the event of spillover could be accommodated. Sufficient arrangement to prevent spread of fire to oil pumps be made.

4. Transformers room and sub-station room shall be provided with steel shutters of 8' X 8' with suitable grills. Sufficient arrangement for pumping the water out, in case of flooding should be made to minimize loss to switchgear and transformer.
5. In view of experience of installation of exhaust chimneys in the multi-storeyed buildings at undesirable locations, proper provision in the form of vertical exhaust leading to above terrace level should be made for the sub-station.
6. Electric sub-station space should be made available free of cost by promoters and should be free of seepage/leakage of water. There should be no combustible material kept in side or in the vicinity. Periodic inspection of electric sub-station shall be mandatory and violation of any bye-law will be dealt, sternly with penalty and immediate disconnection.

#### **D.2.1.2. Other Requirements for Sub-station**

1. The sub-station will preferably be located on the ground level failing which it can be in the basement floor in no case at higher level.
2. The entire space will be provided at one floor in continuation.
3. The minimum width of the sub-station space shall not be less than 6 mt.
4. The areas given above in respect of the different categories of rooms hold good if they are provided with windows and independent access doors.
5. All the rooms should be provided with partition up to the Ceilings and shall have proper ventilation. Special care should be taken to ventilate the transformer rooms and where necessary, louvers at lower levels and exhaust fans at higher level shall be provided at suitable locations.
6. In order to prevent storm water entering the transformer and switch rooms through the soak pits, the floor level of the sub-station shall be at least 15 cm above the highest flood water level that may be anticipated in the locality.

## **D.2.2 Cable Trenches Shafts Etc.**

**D.2.2.1** Suitable number of vertical shafts, rising mains, distribution boxes, etc. shall also be provided as per the requirements at suitable location. Cable trenches with suitable handy covers for entry of the cables up to the substation onwards up to the street adjoining other building shall also be provided as per the requirements. These vertical shafts, rising mains, distribution boxes, cable trenches, etc. shall be so constructed as to be accessible only to authorized personnel. The rising mains and other installations in the vertical shafts, tap off boxes distribution boxes etc. required at each floor shall be provided, installed and maintained by the owner at their own cost.

Adequate enclosed space shall also be provided at each floor for installation of equipment's for distribution on respective floors such as distribution boxes, cut-out, and meter boxes and main switches.

**D.2.2.2** *Location of Switch Room:* In large installations other than where a substation is provided, a separate switch room shall be provided. This shall be located as closely possible to the electrical load center and suitable ducts shall be laid with minimum number of bends from the point of entry of the supply to the position of the main switchgear. The switch room shall also be placed in such a position that rising ducts may readily be provided there from to the upper floors of the building in one straight vertical run. In larger building, more than one rising duct and horizontal ducts may also be required for running cables from the switch room to the foot of each rising main. Such cable ducts shall be reserved for the electrical services only, which may, however, include medium and low voltage installations, such as call bell systems. Telephone installation should be suitably segregated.

**D.2.2.3** *Location and Requirement of Distribution Panels:* The electrical gear distribution panels and other apparatus, which are required on such floor may conveniently be mounted adjacent to the rising mains, and adequate space should be provided at each floor for this purpose.

**D.2.2.4** *Location and Requirement of PBX/PABX Room:* Information regarding provision and location of PBX/PABX room, telephone outlets and riser shall be ascertained from the relevant Authority.

*Adequate* space should be provided for installation of Sub-Distribution Board.

## **D.2.3. GENERAL**

**D.2.3.1** The maintenance of the built up space for electric sub-station, distribution equipment, vertical shafts and enclosure at each floor shall be done by the owner.

The standby arrangement for electricity supply up to and including the sub-station equipment and distribution pillars at the sub-station shall be provided compulsorily.

**Appendix “E”**  
(Bye laws: 2.12.5 & 6.3.6)

**Qualification and Competence of Technical Personnel for Preparations of Schemes  
for Building Permit and Supervision**

**1.0 General**

Building/Development work for which permission is sought, shall be planned, designed and supervised by registered professionals. The registered professionals for carrying out the various activities shall be:

Architect, Engineer, Structural engineer, Town planner, Landscape architect, Urban designer, Supervisor. Requirements of registration/license for these professionals by the Authority or by the body governing such profession and constituted under a statute, as applicable to practice within the local body’s jurisdiction, are given in items 1 to 7 of the following table:

(items 8-10 *Plumber, Electrician and Fire Consultant* may not need registration)

SI No	Professional	Qualifications	Competence / Functions
1	<b>Architect</b>	Registered with valid membership of the Council of Architecture, India as prescribed under Architect’s Act 1972.	The registered architect shall be competent to carry out the work related to the building/development permit as given below: <ul style="list-style-type: none"> <li>a. Prepare and sign all plans, sub-division/layout plans and information connected with building permit except engineering services of multi-storeyed/ special buildings.</li> <li>b. Preparation of building plans, drawings and related information connected with development permit of area up to 1 hectare for metro-cities and 2 hectare for other places.</li> <li>c. Issuing certificate of supervision for development permit of area up to 1 hectare for metro-cities and 2 hectare for other places. (related to building layout and other architectural aspects)</li> <li>d. Issuing certificate of supervision and completion of all buildings pertaining to architectural aspects.</li> </ul>
2	<b>Engineer</b>	Graduate in Civil Engineering from recognized Indian or foreign university.  Registered with valid membership (Civil) of the Institution of Engineers, India.	The registered engineer shall be competent to carry out the work related to the building/development permit as given below: <ul style="list-style-type: none"> <li>a. Prepare and sign all building plans, structural drawings and service plans and information connected with building permit;</li> <li>b. Preparation of structural drawings, details and calculations of buildings on plot up to 500 m<sup>2</sup> and up to 5 storeys or 16 m in height, all service plans and related information connected with development permit of area up to 1 hectare for metro-cities and 2 hectare for other places.</li> <li>c. Issuing certificate of supervision for development permit of area up to 1 hectare and 2 hectare for other places (pertaining to building layout, Building structure, civil works and service installations);</li> <li>d. Issuing certificate of supervision and completion of all buildings pertaining including structure and building services.</li> </ul>

SI No	Professional	Qualifications	Competence / Functions
3	<b>Structural Engineer</b>	<p>Graduate in Civil engineering from recognized Indian or foreign university, or Corporate Member (Civil) of Institution of Engineers (India), minimum 3 years experience in structural engineering practice with designing and field work.</p> <p>NOTE — The 3 years experience shall be relaxed to 2 years in the case of post-graduate degree of recognized Indian or foreign university in the branch of structural engineering. In case of doctorate in structural engineering, the experience required would be one year.</p>	<p>The registered structural engineer shall be competent to prepare the structural design, calculations and details for all buildings and undertake their supervision.</p> <p>In case of buildings having <i>special structural features</i>, as decided by the Authority, they shall be designed only by Structural engineers.</p>
4	<b>Town Planner</b>	<p>Graduate or Post-graduate degree in Town and country planning with valid Associate Membership of the Institute of Town Planners, India.</p>	<p>The registered town planner shall be competent to carry out the work related to the development permit as given below:</p> <ol style="list-style-type: none"> <li>Preparation of plans for land sub-division/ layout and related information connected with development permit for all areas more than 1 Hectare..</li> <li>Issuing of certificate of supervision for development of land of all areas.</li> </ol> <p>NOTE — However, for land layouts for development permit above 5 hectare in area, landscape architect shall also be associated, and for land development infrastructural services for roads, water supplies, sewerage/drainage, electrification, etc, the registered engineers for utility services shall be associated.</p>
5	<b>Landscape Architect</b>	<p>Bachelor or Master's degree in landscape architecture or equivalent from recognized Indian or foreign university.</p>	<p>The registered landscape architect shall be competent to carry out the work related to landscape design for building/development permit for land areas 5 hectares and above. In case of metro-cities, this limit of land area shall be 2 hectares and above.</p> <p>NOTE — For smaller areas below the limits indicated above, association of landscape architect may also be considered from the point of view of desired landscape development.</p>
6	<b>Urban Designer</b>	<p>Master's degree in Urban Design or equivalent from recognized Indian or foreign university.</p>	<p>The registered urban designer shall be competent to carry out the work related to urban design for city areas more than 5 hectares and campus area more than 2 hectares. He/She shall also be competent to carry out the work of urban renewal for all blighted/congested areas.</p> <p>NOTE — For smaller areas below the limits indicated above, association of urban designer may be considered from the point of view of desired urban design.</p>
7	<b>Supervisor</b>	<p>Diploma in Civil engineering / Architectural Assistantship from recognized institute with 2yrs working experience or Civil Draftsmanship from I.T.I with 5yrs experience under a qualified Architect / Civil Engineer for building construction and supervision.</p>	<p>The registered supervisor shall be competent to carry out the work related to the building permit as given below:</p> <ol style="list-style-type: none"> <li>All plans and related information connected with building permit for residential buildings on plot up to 100 m<sup>2</sup> and up to two storeys or 7.5 m in height; and</li> <li>Issuing certificate of supervision for buildings as per (a).</li> </ol>



SI No	Professional	Qualifications	Competence / Functions
8	Plumber	licensed by the concerned Authority through examination of candidates- Certificate of training from ITI, with min. 2yrs experience of execution of sanitary and plumbing works under any govt. Dept./ Local body or a qualified Architect / Engineer. Knowledge of working drawings and dimensioned sketches.	A plumber shall be competent to do the following jobs: a. Execution / supervision of sanitary works up to 500 sq mt plot size and 4 storeyed buildings.
9	Electrician	As prescribed by the concerned electricity company	
10	Fire Consultant	As prescribed by Chief Fire Officer, Town/City Fire Service.	

**Appendix “E-1”**

(Bye laws: 1.1 - 37)

**Empanelment of Competent professional**

1. **Definition:** In these rules, unless the context otherwise requires:
  - a) **“Act”** – the Act of the concerned Authority
  - b) **“Empanelled Architect”** – A person empanelled by the Authority as per rules under these bye-laws as authorized person to sanction building plans of *residential buildings up to 15 mt. in height and for plot size up to 500sqm*, forming part of an approved lay-out plan *and for other buildings as authorized in section 13.5 of the Bye-laws.*
  - c) **“Person Authorized”** – means a qualified and duly registered Architect having a degree in Architecture or equivalent qualification and registered with the Council of Architects, India with minimum 5 years of experience.
  - d) **“Sanctioned Building Plan”** means a building plan of a building/premises to be constructed on a plot and approved by the Competent Authority/ Architect in accordance with the provisions of Master Plan/Zonal development plan and Building Bye-laws.
  - e) **“Fee”** means a fee to be charged by the Authority/Architect for sanction of building plans. (*Design and consultations fees agreed between the architect and his/her client is independent of this ‘Fee’*)

**For the empanelment,** the qualified Architect/Engineer shall submit list of projects handled with proof and credentials along with recommendations from Council of Architecture, India.
2. **Authority should obtain** security deposit/professional indemnity bond and professional liability insurance from empanelled Architects as decided in value from time-to-time.
3. **The empanelment of an Architect** shall be for a period of *two years* and can be extended from time to time subject to review by the Authority at the end of every two years.
4. **The Architect shall be empowered** to sanction building plans of *residential buildings up to 15 mt. height and for plot size up to 500sqmt*, forming part of approved layout plan. And *for other buildings* the criteria of empanelment shall be as per section 13.5 of the Bye-laws.
5. **In respect of sanction of building plans of Government buildings,** the plans shall be sanctioned by the Chief Architect/ Senior Architect of the concerned Department of the Government, provided it conform to Master Plan/Zonal Development Plan, approved layout plan and Building Bye-laws.

6. **The Architect shall charge** building application fee, other charges as prescribed under Building Bye-laws and other charges as prescribed form time to time. He will be permitted to retain 50% of the building application fee towards his service charges and balance amount along with other charges shall be deposited with the Authority along with two sets of building plans and other required documents. If the Authority wants to raise any objection, the same shall be communicated to the architect within 10 days of filing the application with the Authority. The architect while sanctioning the building plans shall take due cognizance of the objections raised by the Authority.
7. **Before sanction of building plans**, the Architect shall ensure and satisfied himself that various permissions as required by the law from different Authorities have been obtained.
8. **The Empanelled Architect shall also ensure at the time of sanction of building plans as well as during the inspections at construction stage and also at the time of giving completion certificate** that there is no violation of Master Plan/Zonal Development Plan, Approved Layout Plan and Building Bye-laws and other related rules and regulations in force.
9. **In case it is found that there had been a violation** of Master Plan/Zonal Development Plan, approved layout plan and Building Bye-laws and other related rules and regulations in force at the time of sanction of building plans/ construction stage / issue of completion certificate, action for penalising the Architect shall be taken including removal from the panel and referring the matter to the Council of Architecture, India for appropriate action.
10. **The Empanelled Architect shall be required to file a quarterly return** of building plans received for sanction, fee received, etc. to the Concerned Authorities. His work shall be monitored to check the backlog and performance.
11. **Before issue of a completion certificate** a joint inspection is to be carried out by the officer authorized by the Authority in this behalf and the empanelled Architect. Within 10 days of the joint inspection, the Architect shall be informed about the non-compoundable deviations to be removed and composition fee to be charged for minor deviations under the rules.
12. **The Architect shall issue the completion certificate** after having satisfied himself that non-compoundable deviations have been removed form the building and necessary compounding/regularization fee has been deposited with the concerned Authority.

**Appendix: “F”**  
(Bye laws: 7.12.1)

**Penal Action for violation of provisions of Development Code of Master Plan, Zonal Regulation and Building Bye-laws.**

**(A) Non-Compoundable Items**

Any deviations except those set in para “AA” hereunder, from the maximum, minimum prescribed limits regarding:

1. Coverage,
2. F.A.R.
3. Setbacks,
4. Open spaces,
5. Total height of the building
6. No. of floors,
7. No. of DUs & density
8. Parking norms,
9. Light and Ventilation provisions,
10. Use
11. All other provisions of these bye-laws except item given in para ‘B’ below shall not be compounded/regularized and shall have to be rectified by altering/ demolition at the risk and cost of owner. Besides this any other action as per terms and conditions of lease and provisions of Act shall proceed.

**(A.A) Compounding Excess Coverage/FAR**

- i) Deviations in the coverage/FAR to the extent of 5% of the permissible coverage/FAR or 13.5 sq.mt. whichever is less in building(s) use premises, other than building(s) use premises where 100% ground coverage and fixed height is allowed as per Architectural control forming part of comprehensive schemes like District Centre, Community Centres, Cluster Court Housing etc. may be compounded after levying penalty at the following Rates:

Rates of excess coverage/floor area:

Up to 5% of excess coverage/FAR a one time compounding fee equivalent to the land rated in the concerned locality applicable at the time of the application for compounding.

- ii) For excess coverage / FAR for above 5%

Any excess coverage above 5% or 13.5 sq.mt whichever is applicable would be liable to demolish to that extent.

iii) Compounding at set back Infringements

The infringements of the set backs maximum to the extent of 30 cm (1 ft.) may be compounded by way of levying compounding fee at the following rates:

Infringements	Residential Buildings	Non-Residential Buildings
Upto 15 cm (6 inch)	Rs. 1000 per sq.mt. of area infringing the set back	Rs. 2500 per sq.mt. of area infringing the set back
Above 15 cm (6 inch)	Rs. 2000 per sq.mt of area infringing the set back	Rs. 5000 of area of the infringing the set back

**(B.B) Compoundable Items**

If a building or part thereof has been constructed unauthorized, i.e. without obtaining the requisite building permit from the concerned Authority as required under the building bye-laws, the same shall be compounded at the following rates provided the building or part thereof so constructed other wise conforms to the provisions contained in the Building Bye-laws and Master/Zonal Plan regulations. For this party shall have to submit the request for building permit in the prescribed procedure.

**Rates:**

- a) Rs. 50 per sq.mt. of the covered area constructed unauthorized in residential building up to 500 sq.mt. Plot size.
- b) Rs. 100 per sq.mt of the covered area constructed unauthorized in the building categorized below:
  - All Govt. Public and Semi-Public and Utility Buildings.
  - Religious, Institutional and Educational Buildings.
- c) Rs. 250 per sq.mt. of the covered area constructed unauthorisedly
  - Residential building above 500 sqmt. plot size, Group Housing & Guest Houses.
  - Industrial Buildings:
  - Storage buildings (underground or above ground)
- d) Rs. 1000 per sq.mt. of covered area constructed unauthorisedly.
  - Cinema and Theatre Building.
  - Petrol Pumps (Filing / Service Station)
  - Hazardous Buildings.
  - Commercial / Business Buildings

1. The buildings not covered specifically under the above categories shall be compounded as decided by the Authority, considering merits of each individual case.
2. Items which are exempted from the calculations of the coverage and FAR e.g. cupboards, canopy, basement, and mezzanine, loft, watchman cabins, etc. but constructed unauthorisedly without obtaining prior permission from the Authority, but within the permissible limits shall also be compounded/regularized at the rate prescribed above.
3. Deviations of the building bye-laws other than specified in (A) (Non-compoundable)

Deviation up to the maximum extent of 10% from the maximum/minimum prescribed limit (as prescribed by the building bye-laws) shall be compounded at the following rates:

- a) In case of deviations of areas of various components of the building, the rate of penalty will be @ Rs. 50/- per 1% deviation.
- b) For deviations in terms of height the penalty shall be @ Rs. 50/- per 1% of deviation for every 10 sq.mt. or part thereof of the affected area.
- c) Deviations from the prescribed limit of width, length, penalty shall be @ Rs. 50/- per 1% of the deviation for every 10 sq.mt. or part thereof of the affected area.

**Notes:**

- 1) *Notwithstanding the provisions above, no penalty shall be levied for the first 3% of deviation but in case the deviation limit exceed 3% penalty shall be levied at above rates for the total deviation up to 10%.*
- 2) *The penalties of the above rates as given in (ii) (a), (b), and (c) shall be charged for each deviation and for every component of the building separately.*
  - a) *In case of increase in size of canopy in front open space from the prescribed limits of bye-laws the same shall be charged @ Rs. 100/- per sq.mt.*
  - b) *End walls up to 0.9 mt. in width in a terrace type construction constructed purely as an architectural feature Rs. 50/- each.*
  - c) *Enclosing of front balcony with jail wall which is being used as a part of stair case Rs. 500/- sq.mt.*
  - d) (i) *An open Urinal Wall up to 1.7 mt. height ----- No Penalty.*  
(ii) *Water storage Tank over open urinal with walls up to 1.70 mt. in height ----- No Penalty, if sanctioned. If not sanctioned, Rs. 500/- each.*
  - e) *All roof projections beyond permissible limit of bye-laws as specified shall be counted towards FAR calculations if other wise the same do not infringe up to any other bye-laws.*
  - f) *Plinth steps in setback portion ----- Rs. 100 each.*
  - g) *Extra slab in mummy constructed without sanction shall be compounded at the rate given in (B) (compoundable item) provided it does not infringe upon the provision of any other bye-laws.*
  - h) *Partition wall provided without sanction at any floor if the same are not infringing upon the provision of any other bye-laws ----- Rs. 50 per sq.mt. of the surface area of the wall (i.e. length X height)*
  - i) *Projections/sunshade/(not more than 0.45 mt. in width on public streets/roads over window opening above first floor shall be objected. However, at Ground Floor these shall be not permitted.*

**Note:**

*The Authority if satisfied that there are other deviations of general nature, which are not described above, may fix rates for compounding such deviations. However, there shall be no further relaxation in FAR and coverage over that permitted above.*

*Revision of all fees and charges under consideration for compounding and regularization shall be revisited by the Authority from time-to-time based on the Schedule of rates.*

**Appendix “G”**

(Bye laws: 7.9 &amp; 8.12)

**To Provide Facilitates in the Public Building excluding Domestic Buildings for Differently-abled Persons****1. Definitions**

**Ambulant Disabled People:** Disabled who are able to walk but who may depend on prostheses (Artificial Limbs) orthoses (Calipers), Sticks, crutches or walking aids.

**Non-Ambulant Disabled People:** Disabled people with impairments that confine them to wheelchair.

**Wheel Chair:** Chair used by disabled people for mobility.

i) Size of small wheel chair: 750 x 1050 mm

ii) Size of large wheel chair: 800 x 1500 mm

**2. Scope**

These bye-laws are applicable to public buildings and exclude domestic buildings.

Building which shall provide access to ambulant disabled and Non-Ambulant disabled are listed below. Distinction is made for buildings to be designed for the use of large wheel chairs and small wheel chair.

**3. Building to be designed for Ambulant Disabled People**

Higher Secondary School, Conference Hall, Dance Halls, Youth Centres, Youth Clubs, Sport Centres, Sport Pavilions, Boat Club Houses, Ice Rinks, Bowling Centres, Swimming Pools, Police Stations, Law Courts, Courts Houses, Sport Stadiums, Theaters, Concert Halls, Cinemas, Auditorias, Small Offices (the maximum plinth area 1400 sq.mt) Snack Bars, Cafes and banqueting rooms (for capacity above 50 dinners).

**Note:**

i) *In sport stadiums provisions shall be made for non-ambulant spectators (small wheel chair)*

ii) *@ 1:1000 up to 10,000 spectators and @ 1:2000 for spectators above 10,000.*

iii) *In Theaters, Concert Halls, Cinemas and Auditoria provisions shall be made for non-ambulant spectators (Small Wheel Chairs) @ 1/250 up to 1000 spectators and 1/500 for spectators above 1000.*

**4. Building to be designed for Non-Ambulant Disabled People:**

Schools for physically handicapped, cremation, buildings as mentioned in 3, Botanical Gardens, Religious Buildings, Old People Clubs, Village Halls, Day Centers, Junior Training Centres, Post Offices, Banks, Dispensaries, Railway Stations, Shops, Super Markets, and Departmental Stores.

**Notes:** *Large wheel chair criteria shall be applicable on ground floors of the following building, post offices, banks, dispensaries, railway station, shops, supermarkets, and departmental stores.*



5. **Building to be designed for Non-Ambulant People (using small wheel chairs)**  
Public lavatories in Tourist Sports, Clubs Motels, Professional and Scientific Institution, Museum, Art Galleries, Public Libraries, Laborites, Universities, Collage for further Education, Teachers Training Colleges, Technical College, Exhibition Halls Dentist Surgeries, Administrative Department of the Hospitals, Service Stations, Car Parking, Buildings Airports Terminals, Bus Terminals, Factories Employing Handicapped for Sedentary Works, Large Offices, (with plinth area abode 1400 sq.mt.), Tax Offices, Passport Offices, Pension Offices, and Labour Offices, Cafes, Banqueting Rooms and Snack Bars (For capacity above 100 dinners).
6. **Buildings Requirements:**  
All Building requirements for building projects proposed under this category shall be conforming to *Annex D, Part 3 of NBC 2005*.

**Appendix “H”**  
(Bye laws: 7.10)**Regulations for Resettlement and Slum In-situ Upgradation****i) Density**

The net density shall be up to 250 tenements per hectare.

**ii) Minimum Plot Size**

The Minimum Plot Size shall be 25 sq.mt. However, it can be 18 sq.mt. with 100% coverage provided 7 sq.mt. per tenement is clubbed for cluster space.

**iii) External walls**

115 mm thick external brick wall with or without plaster shall be permitted.

**iv) Staircase**

Single flight staircase without landing between the two floors shall be permitted.

**v) Pathways**

The width of path ways shall be as follows:

2 mt. width for pathways up to 30 m in length.

3 mt. width for pathways up to 50 m in length.

**vi) Flushing System:**

In water closets flushing system shall not be essential and toilets without this provision may be permitted.

**vii) Water closets pan size:**

The water closets seat shall be of minimum 46 m (18 inches) in length.

**viii) Septic tank and leaching pit (soak pit)**

A septic tank shall be provided with capacity 141.6 m liters (five cubic feet) per capita, where the municipal services are likely to be available within four or five years or so, pour flush water seal latrines (NEERI type) shall be permitted, where the municipal sewage system is not available and the water table in the area is not high.

**Appendix “I”**  
(Bye laws: 13.5, Table 13.4)

**Categories of Materials of storage for Warehouses as per combustion risk**

**A. Non combustible materials:**

Articles (which are Non- Combustible, Non -Flammable, Non -Corrosive, Non -toxic, Non-poisonous, Non-Explosive) such as Cement, brick, mortar, hardware items, metals in solid bar/metal goods (excluding those having melting point below 1000° C)

**B. Combustible Materials in following 4 sub categories**

Category	Material Specifications	Stacking height	
		Medium (in m)	High (in m)
<b>Category I</b>	Articles such as Carpets, Non synthetic/synthetic yarn and fabrics. Mechanical and electrical goods (dominantly metal parts), Glassware and crockery, fiberboards, groceries, metal goods, Papers other than those listed under categories Moderate and High, Powdered and canned foods, Plastic/glass bottles containing non-flammable liquids, etc.	<b>4</b>	<b>6.5</b>
<b>Category II</b>	Articles such as Batteries, Baled cotton/synthetic fibers, Books, Baled cork, Baled waste paper, Cartons containing alcohols ( in cans/bottles), Cartons of canned lacquers which dry by solvent evaporation, Chipboard, Cardboard rolls (horizontally Stored), Cereals/Grains/Foodstuff/ Flour/Sugar in sacks, Cellulose/Cellulose pulp, Electrical goods other than those stated in Category low, Flammable liquids in non-combustible containers, Leather goods, Palletized liquor stocks, Plastics (non-foamed, other than cellulose nitrate), Rolled pulp and paper and asphalted paper (Horizontal storage), Veneer sheets, Wooden patterns, Metal/wooden furniture with plastic seats, etc	<b>3</b>	<b>5.5</b>
<b>Category III</b>	Articles such as Bitumen/Wax coated paper, Candles, Carbon black, Card board rolls (vertically stored), Charcoal, Coal> cellulose nitrate, Foamed plastic and foam rubber products, Flammable liquids in combustible containers, Linoleum products, Matches, Plastics other than those stated in Category Moderate, Rolled pulp and paper and asphalted paper (vertical storage), Rubber goods including tyres and tubes, Sawn timber, Ventilated wood stacks, Waxed and asphalt coated papers and containers in cartons, Wood wool, wooden pallets and flats (idle), Ail materials having wrappings or pre-formed containers of foamed plastics, etc.	<b>2</b>	<b>4.5</b>
<b>Category IV</b>	Offcuts and random pieces of foamed plastic or rubber rolls of sheets of foamed plastic or foamed rubber, Foam mattress, Expanded polystyrene packaging, Foam upholstery, etc	<b>1.25</b>	<b>3.5</b>

**Explanations:**

<p># The deflector of the sprinkler fitted in the ceiling shall be at more than 1.5 m from the goods stored below. However, in case of jute storage, no jute stock shall reach within 2 m of the deflectors of the sprinkler heads.</p> <p># In case of storage in racks or shelves, if the height of storage is more than what is specified, intermediate sprinklers shall be provided for each shelf/rack in addition to the ceiling sprinklers and overall design density and AMAO shall be maintained as per Table 5 of IS: 15105.</p> <p># The aisle width between the storage stacks shall not be less than 2.5 m and the maximum area of each storage stack shall not be more than 15.0.m<sup>2</sup>. If these parameters are exceeded, the design density applicable shall be loaded by 2.5 L/min/m<sup>2</sup>.</p> <p># In case of mixed storage (both moderate and high hazard storage) in buildings, the parameters will be governed by the most hazardous occupancy</p>	<p>Goods stored not higher than what is stated above for the appropriate category or not higher than the eaves height of the roofs or within 1 m of a flat ceiling whichever is the lowest shall be regarded as moderate hazard storage. If the above conditions are not met, the risk shall be regarded as high hazard storage</p>
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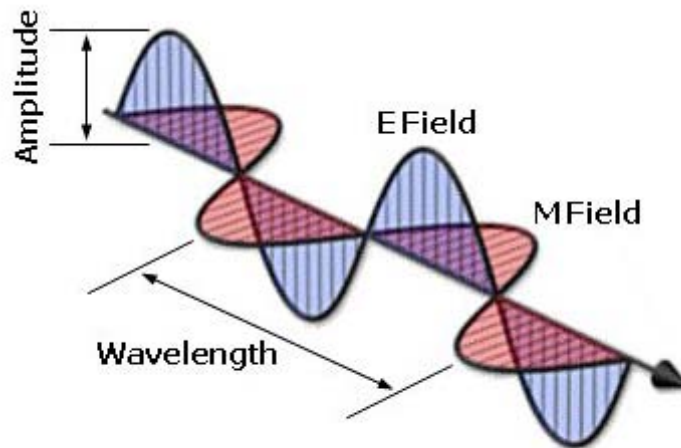
**Notes:**

1. Any new use which increase the number of occupants to a figure comparable with other classes of occupancy shall change the classification of the building to that of the new use (for example, Warehouse used \ for office purposes).
2. Ware house buildings shall not include any article which is highly combustible or explosive materials or products which are liable to bum with extreme rapidity and or which may produce poisonous fumes or explosions for storage, handling and which involve highly corrosive, toxic or noxious alkalis, acids or other liquids or chemicals producing flame, fumes and explosive, poisonous, irritant or corrosive gases; and for the storage, handling of any material producing explosive mixtures of dust which result in the division of matter in to fine particles subject to spontaneous ignition as such buildings fall in Hazardous Building Category

**Guidelines for mitigation of effects of  
Electro Magnetic Radiation  
in  
Built spaces**

## INTRODUCTION

Electromagnetic radiations are energy waves having time varying electric and magnetic fields at right angles to each other and are predominantly used for wireless communication.



**Waves of Electromagnetic Radiation**

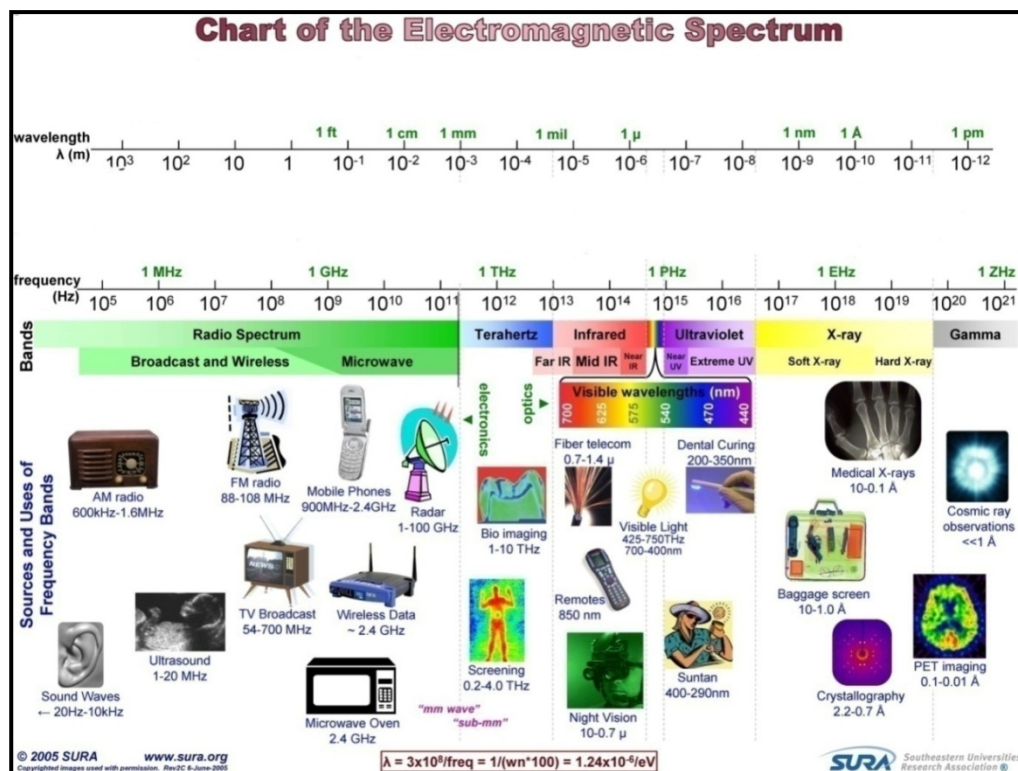
Although, **Electromagnetic Fields** (EMF) occur in nature and thus have always been present on earth (Sun is the biggest source of natural EMR), nevertheless their occurrence has become more pronounced due to rapid advances of wireless technology in the communication sector.

The twentieth century witnessed, steady rise of environmental exposure to man-made sources of EMF due to increasing electricity demand, ever-advancing wireless technologies and changes in work practices and social behavior. The unprecedented growth in communication industry in recent years has also caused an exponential rise in electromagnetic radiations in the envelopes surrounding all living habitats.

Human beings are thus exposed to a complex mix of electric and magnetic fields at many different frequencies, at home and at work. EMF (Electro Magnetic fields) can be broadly divided into-

1. **Low-frequency electromagnetic fields**- the common sources of which include power lines, household electrical appliances, and
2. **High frequency electromagnetic fields**: the main sources of which are radar, radio and television broadcasting, mobile telephones and their base stations, induction heaters and anti-theft devices etc.

Given below is the chart of Electromagnetic spectrum which highlights various ranges of frequencies and the equipments which work in these ranges of frequencies:-



Therefore, there is an urgent need to adopt precautions for living beings from any effects of electromagnetic radiations at our work places as well as at our living spaces.

## **ELECTROMAGNETIC RADIATIONS: EFFECTS OF EXPOSURE**

The effects of electromagnetic radiation upon living cells, including those on humans, depend upon the frequency as well as the penetrating power of the radiation.

Initially, it was believed that low frequency fields were too weak to cause heating to a significant level and thus do not have any biological effect. There have been a number of epidemiological studies for a relationship between cell phone use and consequent health threats that have been largely inconclusive. Thus, it can be concluded that their effect is not very prominent although significant. However, there are sufficient evidences to suggest the existence of complex biological effects of weaker *non-thermal* electromagnetic fields, and modulated RF and microwave fields. World Health Organization has classified radiofrequency electromagnetic radiation as a possible group 2b carcinogen (possible weaker threats).

In case of low-frequency radiations (radio waves to visible light) therefore, depending upon the power of the radiation heating effects are caused due to absorption of radiation by the living cells. These thermal effects increase with the frequency of radiation as penetration of radiation into the organism increases (for example microwaves penetrate more than infrared rays).

At higher frequencies (visible and beyond) however, the individual photons of the radiation carry enough energy individually and thus directly or indirectly can damage biological molecules. All frequencies of UV radiation have therefore been classified as Group 1 carcinogens by the World Health Organization. In this context it is a significant fact that *Ultraviolet radiation from sun exposure* is the primary cause of skin cancer. Thus, at such frequencies electromagnetic radiations cause much more damage to biological systems than simple heating. This is most obvious for the "extreme" Ultraviolet, X-ray and Gamma radiations, which are referred to as ionizing radiations due to the ability of photons of this radiation to produce ions and free radicals in materials which include living tissues as well. Since such radiation can produce severe damage to life at powers that produce very little heating, it is considered much more dangerous than the rest of the electromagnetic spectrum.

Health risks from Electromagnetic radiations can be numerous depending upon the power and frequency of radiations.

From the perspective of prevention of any health effects of Electro Magnetic Radiations there is a need of suitable precautions, since it is not possible to keep away from them owing to the advent of wireless communication technology which is based upon electromagnetic waves of higher frequencies besides many other applications like microwave, remote controlled toys, cordless phones, TV remotes etc.



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## **Guidelines for Buildings and Built forms mitigating effects of EMR**

While planning a building or a residential complex/ township, it is most desirable to list all probable equipments/ appliance emitting *Electromagnetic Radiations* in order of ascending/descending intensities. These should also be categorized as per *indoor and outdoor* emissions. Their placement in the built space and surroundings can then be decided based on certain premises.

The most fundamental principal in this regard is that the effect of Electromagnetic Radiation decreases with increase in distance from radiation emitting source. It is thus advisable-

- To keep a safe distance from working electric and electronic equipments.
- Minimize the use of all equipments working on wireless technology like cordless phones, Wi-Fi, Bluetooth and the cell phones.
- Disconnect electric and electronic equipments from the power supply when not in use, especially in areas of prolonged occupancy.

Further, the list of equipments/appliances generally used in and around working/living space is placed below for appreciation of EMR radiations :-

1. RF Sources i.e. the transmitting towers such as AM/FM radio towers, TV towers, cell phone towers transmitting EMR continuously.
2. Cell phone which is ON but not in use also radiates and Wi Fi (Wireless Internet)
3. Cordless phone
4. Wi-max
5. Other wireless devices
6. CFL (Compact Florescent Light) bulbs
7. Neighboring EMR sources that are located next to shared walls.
8. Computers and laptops
9. Air conditioning systems
10. Refrigerators
11. Electrical heating systems/ Microwave Ovens
12. Power generators and voltage converters
13. Stereo and home entertainment systems
14. Fans

This list is only indicative and not exhaustive and there can be additions to it.

From the view point of effective communication, providing of mobile towers in a township/ office complex is an essential requirement and thus should be carefully planned.

The mobile tower generates and transmits high frequency radiations; so more care is needed for their placement. It should be ensured that the building identified to mount the tower should be the tallest in the vicinity and should not have adjoining buildings on which proposed or existing habitable floors are within close range.

OR

Mobile Tower should be mounted on the highest sanctioned building in an area.

In regular practice that many cellular operators mount their antenna on a single tower along with other operators which increase the effects of EMR manifolds and should thus be avoided as far as possible. Else height of the tower should be increased.

Besides, Substation Equipments like Transformer, DG set etc. are also to be provided for fulfilling the bulk power requirement of the building and should be suitably placed for electrical safety as well as for mitigating effects of EMR. However, as these are low frequency devices, their placement is too decided more from electrical safety point of view than EMR.

In addition, various light sources inside the living/working spaces, UPS, servers, various other equipments running on Wi-Fi may also emit EMR. Hence their placement inside the building also needs careful consideration.

Thus, in a built environment of considerable human occupancy, following broad guidelines should be adopted for placement of utility equipments/ appliances serving the building as a whole:

## **Equipments external to the building: Mobile Towers**



Location of communication towers is governed by radio frequency system adopted and as far as possible cellular operator should try to avoid residential areas. However where it is not possible to avoid these, they should request for permission from the appropriate authority for installation on roof top of the tallest existing buildings.

- (i) First preference should however, be given to the location of tower in the commercial areas or other public areas.
- (ii) Where it is not possible to avoid the location of this tower in residential, area possibility should be explored to locate them in green belts within residential sectors or open spaces/community buildings in the sectors.

Where it is not possible to find such suitable space mentioned at Sr. No. (ii) above, tower should be permitted on the roof top of residential buildings subject to the condition that a structural safety certificate from a certified Structural Engineer has been obtained.

Such towers should not be permitted on occupied buildings, however if inevitable, a Steel/Metal frame of 6 M height over the roof level of the last habitable floor of the building should be provided to accommodate the tower and its associated units.

Structural stability of the said building should be calculated with the overall loading of such metal/steel frames mounted atop and 'Structural stability certificate' should be submitted by a registered structural engineer with the application for permission of building (pre-design) or installation (post-design)

**Transformers:** In addition to the fenced *ionized area* around a transformer, neighborhood level congregation activity areas should not be planned/permitted within 3M of the fence.

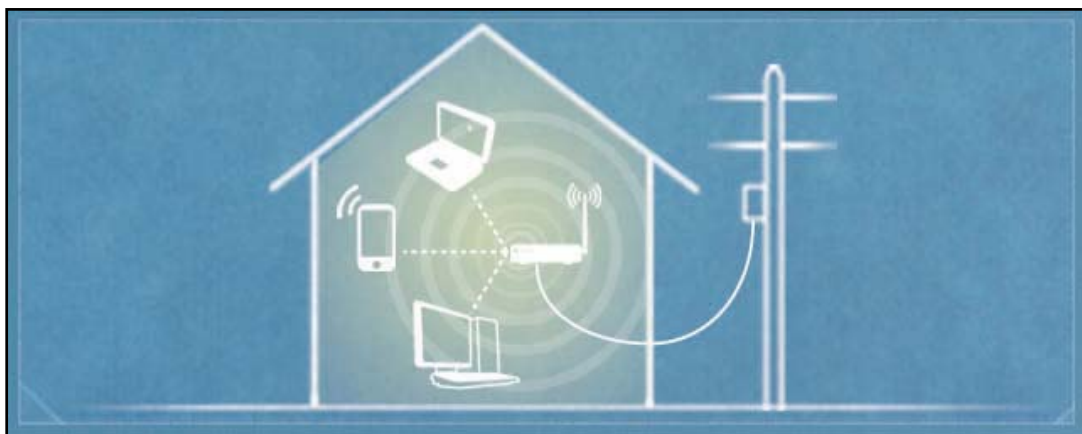
**Diesel Generators:** The location of the Generator within the Plot premises should not be adjacent to any habitable / community / recreational activity within a radius of 3M.

**Indoor Equipments/Appliances:**

**Electrical Switchboards:** Unless otherwise amended by *Barrier-free access regulations* to such fixtures, they should be mounted as per existing stipulations laid down in CPWD General Specifications for Electrical Works- Part I Internal 2013.

**Wireless Routers :** Within the housing unit, the vertical mounting height of the router should be not less than 4 feet and should be kept in the Drawing / Dining zone and not within the zones of longer period of occupancy e.g. Bedrooms.

In non – residential units i.e. office spaces these routers should be kept as much away as possible and should be switched off when not in use.



**Server Room:** Occupied Work-stations should be at least 5 meters away from the server room or associated equipments. If people are sitting in the same room, they must wear protective gear and should not have prolonged exposure.

**Computer:** Should be placed in the most isolated place in a dwelling unit, while in an office space, it should not be less than 2.5 feet away from the person using it.

**UPS:** Should also be placed in the most isolated place in a dwelling unit, while in an office space it should not be less than 2.5 feet away from the person using it.

**Mobile Phone:** It usually remains with the user all the time. The only time it is kept away is when it is being charged. Thus mobile should be charged from a remotely located power point. It is thus preferable to provide a charging station in almost every working/living space at a location, as far as permissible from living space considerations.

**Light sources:** Usually, sun as a source of natural light is the biggest source of electromagnetic radiations. However, the atmosphere surrounding us provides a natural shield from electromagnetic radiations. In this context, the light sources used inside a living/working space should be given careful consideration from the point of view of Electromagnetic Radiations. Many luminaries available presently, like Fluorescent tubes, compact fluorescent lamps, LED lights etc. are used in working / living spaces. So their use should not only be determined from the point of view of energy conservation but also from the point of view of Electromagnetic Radiations. For this purpose recommendations of the manufacturers should serve as proper guidelines.

**Table below summarizes appropriate placement of equipments /appliances in the built environment:**

Sr. No	Equipment	Minimum safe distance
1	Mobile Towers	6 m height over the roof level of the last habitable floor of the building.
2	Transformers	3 m
3	Electrical Switchboards	No Change
4	Wireless Routers	4 feet (1.2 m)
5	Server Room	5 m
6	UPS	2.5 feet (0.75 m)
7	Diesel Generators	Radius of 3 m
8	Mobile Phone	2 feet (0.6 m)
9	Computer	2.5 feet (0.75 m)
10	Laptop	2.5 feet (0.75 m)
11	UPS	2.5 feet (0.75 m)
12	Wireless Router modem	4 feet (1.2 m)
13	Server room	5 m away from workstations

*Note: Intensity of Electromagnetic Radiations decreases with increase in distance from the radiation source. So as to minimize exposure maximum possible distance should be kept.*

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**Technical Aspects and Options of  
Rain water Harvesting  
in  
Built forms and open spaces**

## **INTRODUCTION**

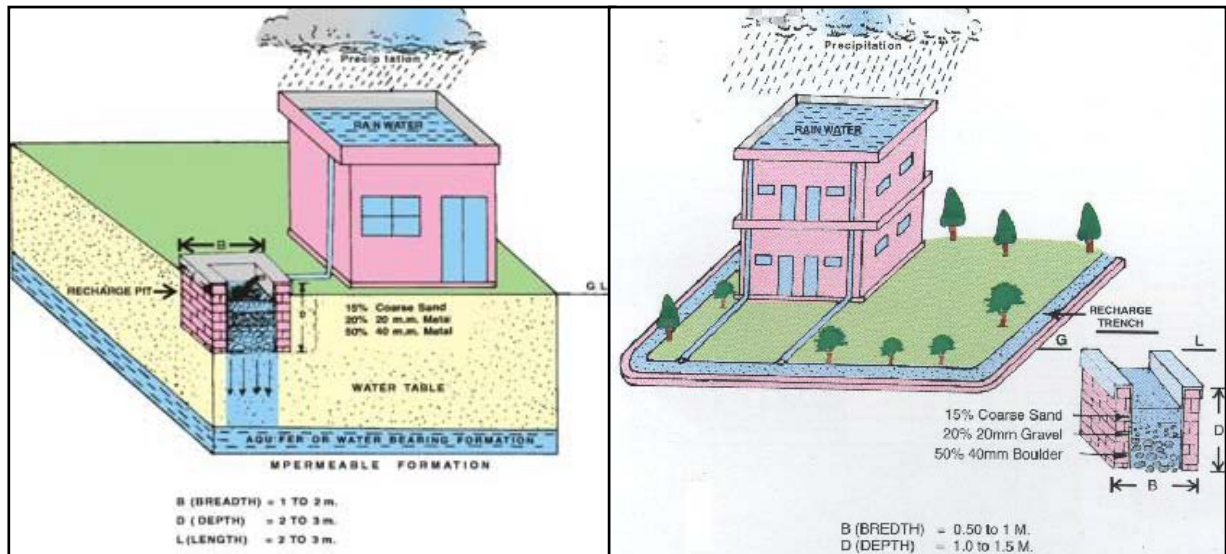
The storage of rain water on surface is a traditional technique and the structures used were underground tanks, ponds, check dams, weirs etc. Recharge to ground water is a new concept of rain water harvesting and the structures generally used are:-

- a. **Pits:** Recharge pits are constructed for recharging the shallow aquifer. These are constructed 1 to 2m, wide and to 3m. deep which are back filled with boulders, gravels, coarse sand.
- b. **Trenches:** These are constructed when the permeable stream is available at shallow depth. Trench may be 0.5 to 1m. wide, 1 to 1.5m deep and 10 to 20m long depending up availability of water. These are back filled with filler materials.
- c. **Dug wells:** Existing dug wells may be utilized as recharge structure and water should pass through filter media before putting into dug well.
- d. **Hand pumps:** The existing hand pumps may be used for recharging the shallow/deep aquifers, if the availability of water is limited. Water should pass through filter media before diverting it into hand pumps.
- e. **Recharge wells:** Recharge wells of 100 to 300 mm. diameter are generally constructed for recharging the deeper aquifers and water is passed through filter media to avoid choking of recharge wells.
- f. **Recharge Shafts:** For recharging the shallow aquifer which are located below clayey surface, recharge shafts of 0.5 to 3 m. diameter and 10 to 15 m. deep are constructed and back filled with boulders, gravels & coarse sand.
- g. **Lateral shafts with bore wells:** For recharging the upper as well as deeper aquifers lateral shafts of 1.5 to 2 m. wide & 10 to 30 m. long depending upon availability of water with one or two bore wells are constructed. The lateral shafts are back filled with boulders, gravels & coarse sand.
- h. **Spreading techniques:** When permeable strata start from top then this technique is used. Spread the water in streams/Nalas by making check dams, nala bunds, cement plugs, gabion structures or a percolation pond may be constructed.

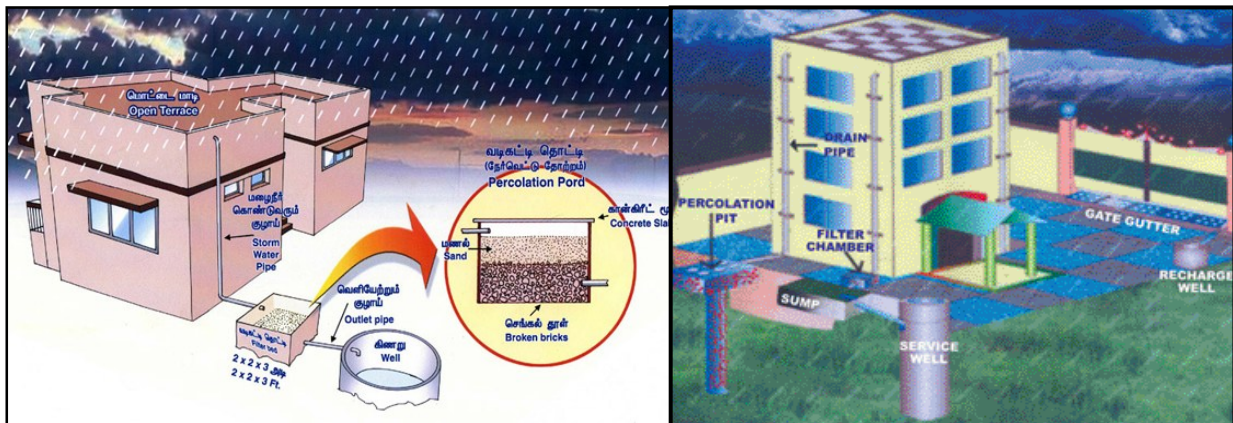


**ILLUSTRATIONS OF COMMON HARVESTING TECHNIQUES**

**Figure.1 Rainwater harvesting and groundwater recharge for individual plotted house (by percolation pits and well-cum-channel)**



**Figure. 2: Rainwater harvesting and groundwater recharge for individual plotted house and multistoreyed residential building (by storage sump and percolation pits)**



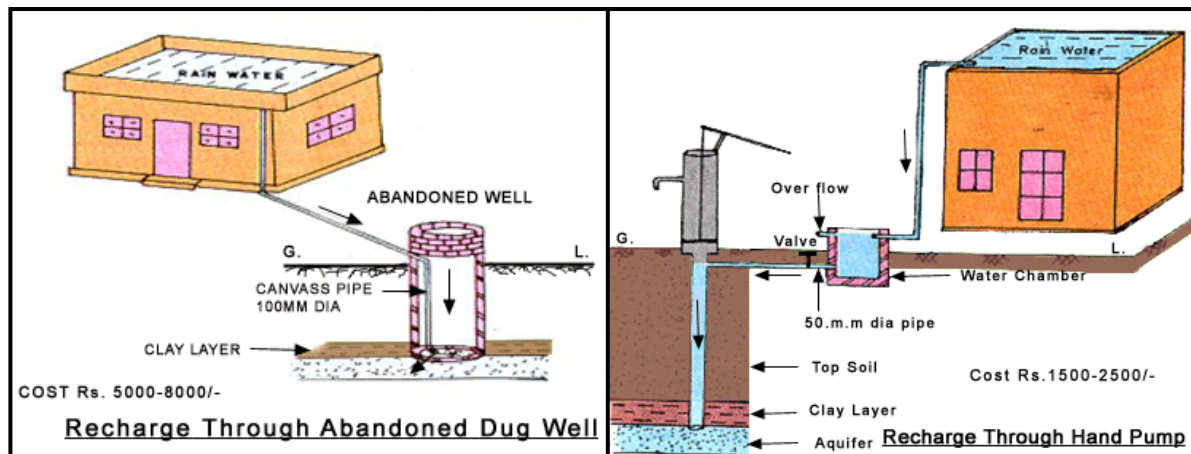
**Figure. 3 Rainwater harvesting for parks/open spaces**



Figure. 4 Rainwater collection (through downpipes and sieves)



Figure. 5 Rainwater collection and Groundwater recharge (through abandoned wells and Hand pumps)



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