

# Multi-Storeyed and Public Buildings Rules, 1973

TAMILNADU

India

## Multi-Storeyed and Public Buildings Rules, 1973

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Multi-Storeyed and Public Buildings Rules, 1973 Published vide Notification No. G.O. MS. No. 1769, Rural Development and Local Administration, dated 24th August, 1973 - S.R.O. A-914 of 1973 Published in Part V, page 1345 of the Tamil Nadu Government Gazette, dated the 7th November 1973. In exercise of the powers conferred by section 191 and sub-section (1) of section 303 of the Tamil Nadu District Municipalities Act, 1920 (Tamil Nadu Act V of 1920), the Governor of Tamil Nadu hereby makes the following special rules: -

#### 1. Short title.

(1) These rules may be called the Multi-storeyed and Public Buildings Rules, 1973. A. Multi-Storeyed Building

#### 2. Definition.

- In these rules unless there is anything repugnant in the subject or context "Multi-storeyed Building" means and include all buildings [with more than four floors (including ground floors)] [Substituted by SRO-A 177/84, Municipal Administration & Water Supply Department, dated 25th June 1984.] or whose height is 15 metres or more.

#### 3. Application of rules.

- Every person intending to construct, reconstruct, add to or alter any multi-storeyed building in addition to the general requirements laid down in the rules, shall also comply with the following special rules.

#### **4. Area for the construction.**

(a) Any construction, reconstruction, alteration or addition of or for a multi-storeyed building, shall be permitted only within the area approved for the construction of multi-storeyed buildings in a Town Planning Scheme made under the Tamil Nadu Town Planning Act, 1920, or in a development plan under the Tamil Nadu Town and Country Planning Act, 1971, or declared by a Special Resolution by the council with the approval of the Director of Town Planning for such purpose and shall not exceed the maximum number of storeys or maximum height prescribed for the individual area. (b) The minimum extent of site for construction of a multi-storeyed building shall be not less than 4 grounds in extent and should have the shortest side not less than 24-50 metres (80 feet) and shall abut on a street not less than 12-25 metres (40 feet) in width. (c) In so far as the determination of sufficiency of all aspects of structural design, building, services, plumbing, fire protection, construction practices and safety, the specifications, standards and codes of practice recommended in the National Building Code of India, 1970 shall be fully conformed to, besides those prescribed in these rules and any breach thereof shall be deemed to be a breach of the requirements under these rules.

#### **5. Engineer's approval.**

- The Engineers shall, while according his approval or permission, follow the code of practice and standard requirements recommended in the National Building Code of India, 1970.

#### **6. Site plan, streets and spaces.**

- The site plan to be submitted in triplicate under the rules, shall also show the following: -(a) The existing and proposed building in relation to the boundaries of the site and in relation also to/all adjacent streets, buildings (with number of storeys and height) and premises within a distance of 15 metres (50 feet) of the site; (b) The means of access from the street or streets to all buildings existing and proposed in the site, to the parking spaces and facilities provided in the site within or outside the buildings and for scavenging and fire protection; (c) The spaces to be left about the building for circulation, air, light access, parking and amenity; and (d) The general layout of the columns and load-bearing walls showing the estimated loads including moments and torques coming on the foundation units.

#### **7. Building plans.**

- The building plans to be submitted in triplicate under the rules shall also show, -(a) Floor plans of all floors and covered area, indicating clearly the size and spacing of all framing members and size and arrangements of rooms and the position of staircases, ramps and lift walls; (b) Longitudinal and cross-sections of the buildings to show size of footings, basement and superstructure, framing members and details of building and room heights and of staircases, etc.; (c) In the case of constructions using steel structures, complete design drawings, showing sizes, sections and relative location of the various steel members, floor levels, column centres and offsets; (d) In the case of

pre-fabricated building drawings, describing the elements of the structure or assembly including all required data or physical properties of component materials with details of joints to an enlarged scale, site or shop location of services such as installation of piping, wiring or other accessories and location of handling arrangements for lifting and handling the pre-fabricated elements; and(e)Plans and sectional details of water-supply and sewerage system for the building.

**7A. [ Water Conservation. [Inserted by G.O. Ms. No. 138, Municipal Administration and Water Supply Department (MAI), 11th October 2002.]**

- For effective conservation of rain-water, application for permission to construct or reconstruct or alter or add to a Multi-storeyed building, shall contain water conservation proposals as detailed below: -(A)Tiled and sloped terrace building. - (1) In the tiled or sloped building, semicircular gutters of width 15 to 25 centimetres of plastic or any other material shall be provided on the down side roof slopes of the building for harvesting rain-water. The gutter shall be connected at the downstream end with a down-pipe of 75 to 100 millimetres diameter, depending upon roof area and size of tank to convey the harvested rain-water from gutters to a plastic or any other material storage tank or sump (through a filter unit). An inlet screen (wire mesh) to prevent entry of dry leaves and other debris into the downpipe shall be fitted. The collected rain-water from the roof shall be allowed to pass through a filter unit. The filter unit is to be filled with suitable filter material such as well-burnt broken bricks (or pebbles) up to 15 centimetres from top. The top 15 centimetres shall be filled up with coarse sand. The filter unit shall be placed either over a storage tank or at bottom of the down-pipe.(2)The filtered rain-water shall be collected in a collection tank or storage tank placed over the ground or underground. The shape of the tank shall be cylindrical, rectangular or square of suitable size with a capacity ranging from 1,000 to 10,000 litres or even higher depending on the roof area. The materials of construction shall be brick work, stone work, cement bricks, ferro-cement, High Density Polyethylene (HDPE), plain cement concrete or reinforced cement concrete. The storage tanks or collection tanks shall be provided with pipe fixtures at appropriate places to draw the water, to clean the tank and to dispose of the excess water depending upon use or reuse either to open well or bore well to a percolation pit.(B)Ordinary building (Ground + First Floor). - (1) Percolation pits of 30 to 45 centimetres diameter and of depth adequate, not less than one metre, to recharge the ground, shall be made. This pit shall be filled with suitable filter material such as well-burnt broken bricks (or pebbles) up to 15 centimetres from top. The top 15 centimetres shall be filled up with coarse sand. The top of this pit shall be covered with perforated reinforced concrete cement (RCC) slab or of any other material, wherever considered necessary. The number of such percolation pits shall be provided on the basis of one pit per 30 square metres of available open terrace area or plinth area. The cross distance between the pits shall be minimum 3 metres.(2)Wherever an open well or bore well is available within the building premises the rain-water collected from the open terrace shall be collected through pipes of 150 millimetres diameter or other suitable sizes and led to filter pit of size 60 centimetres x 60 centimetres x 60 centimetres (with appropriate filter material) and then led into the open well or bore well through 150 millimetres diameter or other suitable pipes, after filling up a storage tank or sump.(3)Wherever existing water storage sumps are available, the rain-water so collected, after it passes through the filter, shall be allowed to flow to the sump through closed pipes. An overflow pipe shall be provided to the storage sump so that the surplus water is led into the nearby open well

or bore well or percolation pit.(4)In addition to the percolation pits of 30 centimetres diameter to be provided at 3 metre intervals, a pit of 1 to 1.5 metres width and appropriate depth, so as to recharge the ground, shall be provided all along the plinth boundary depending upon the soil classification below ground. This pit shall be filled with appropriate filter material namely, broken bricks, pebbles, broken stones, etc., at the bottom and the top 15 to 25 centimetres shall be filled with coarse sand. The ground or pavement surface around the building shall be sloped towards the percolation pit so that the surplus rain-water from terrace and sides, open spaces, etc., flow over this sloped surfaces and spread into the filter bed all around. Masonry dwarf walls 5 to 7.5 centimetres or of suitable height depending upon the site conditions shall be constructed, if necessary, at the entrance and exit gates to allow the surplus rain-water collected within the compound to recharge the ground within the premises itself, and from draining out to the road.(5)If the sub-soil is not a permeable one (namely, clay or black cotton) appropriate recharge structures, namely, recharge shaft or bore pit shall be provided below the filtration pits so as to recharge the ground.(C)Group development, industries and institutional building: - (1) For buildings for Ground + One Floor or Ground + 2 floors and above located within group development, industrial or institutional premises, the specification detailed in items A, B and C above shall apply.(2)The surplus surface run-off rain-water, in the open spaces within the Group development or industrial or institutional premises shall be allowed to run towards collection drains of suitable size and these drains shall be construed as rain-water friendly storm-water drains. All the approach and access roads to the buildings within the group development or industrial or institutional premises shall also be provided within the rain-water-friendly storm-water drains. These rain-water-friendly storm-water drains shall not have pave bottom. If adequate spaces, are available in low lying areas, percolation ponds of suitable size shall be formed and these rain-water-friendly storm-water drains shall be led into the percolation ponds for recharging the ground.(3)For other localised areas, recharge pits of .size of minimum 1 metre x 1 metre x 1 metre or 1 metre diameter shall be provided wherever needed, so as to prevent rain-water stagnation around the building. For other places catch water pit structures of size 30 centimetres diameter and 30 centimetres depth or higher depth as necessary shall be provided wherever necessary. For existing paved storm-water drains, catch water pits of 30 centimetres diameter and 30 centimetres depth or higher depth, as necessary, shall be provided at the bottom of these drains at 10 to 15 metre intervals. These catch water pits shall be filled with appropriate filter material as described in item 'B' above for ordinary building (Ground + First floor).Explanation. - For the purposes of these rules, in regard to rain-water harvesting structures are concerned any other modifications, additional structures or alternative designs, furnished by the applicant shall be considered for approval, if it conforms to rain-water harvesting concept to the satisfaction of the competent authority for building plan approval. Provision of water harvesting structures for re-use of used water like water emanating from kitchens and bathrooms for flushing toilets, gardening, shall be considered for approval on its merits.]

## 8. Specifications.

- The following detailed specification shall be furnished with the application for permission under these rules: -(a)General and detailed specifications, giving the type and grade of materials to be used;(b)Detailed computations, stress diagrams to show the sufficiency and correctness of the design; and(c)Type and condition of soil or rock to which the foundation transfers the loads.

## 9. Floor area ratio and maximum plot coverage.

- The maximum Floor Area Ratio and maximum permissible plot coverage for different occupancies shall be as in the following Table: -Floor Area Ratios, and Maximum Plot Coverage For Different Building Types.

SI. No.	Building type	Floor area ratio	Plot coverage
	(1)	(2)	(3)
1.	Residential	150	35
2.	Commercial -		
	(a) George Town and other special areas declared by council with the approval of Director of Town Planning	250	50
	(b) Other areas of the city	160	40
3.	Public and Industrial -		
	(a) George Town and other special areas declared by council	150	50
	(b) Other areas of the city	100	50

Explanation (1). -The floor area ratio specified in the Table may be increased by 20 per cent for the following services: -(a) A basement or cellar and space under a building constructed on stilts and used as parking space, store-room and air-conditioning plant room used as necessary to the principal one; (b) Electric cabin or sub-station, watchman's booth, pump house and garage stilts; and (c) Staircase room and lift rooms above the common storey, architectural features, chimneys. Explanation (2). -The maximum plot coverage specified in the Table includes 5 per cent for covered parking and another 5 per cent may be allowed for covered garages for car and cycle parking. This area for parking in ground floor will not be taken into consideration for calculating floor area ratio, but the space above it in first and upper floors will be counted.

## 10. Structural sufficiency. - (1) Foundations.

-(a) Every wall, column post and beam of building shall be supported adequately by foundations of concrete or reinforced concrete, piles, piers, caisson or other foundations of such thickness and projection as will be necessary to safely sustain and consult all the dead and superimposed load without exceeding the limitations of permissible stresses provided in these rules. (b) All foundations, apart from those resting on bedrock, shall be carried down below the level of possible damage by frost or seasonal changes on soils possessing shrinking and swelling, characteristics, such as clayey soils. (c) The structural design of the foundations shall be determined as per the recommendations in the National Building Code of India, 1970 to ensure sufficiency and safety of the structures and to keep the stresses of the foundation materials and supporting soils within permissible limits prescribed in these rules. (d) Piles, either friction piles or end bearing piles, may be used for the foundations of a building when soil condition are suitable and their design, use and spacing shall conform to the recommendations in Part VI - section 2 of the National Building Code. (e) All piles used to support any structure or part thereof shall be driven, jetted or otherwise embedded to such

depth as is necessary to secure adequate soil or rock bearing capacity and in such a manner as not to impair their strength and shall be of sufficient strength to Withstand also all stresses resulting from the handling and driving.(2)Walls and Columns. - (a) The thickness of every load-bearing non-reinforced masonry wall shall be sufficient at all points to ensure that the stresses due to the worst conditions of loading for which the structure is designed are within the limits prescribed.(b)Maximum slenderness ratio:Walls. - For a wall, the slenderness ratio shall be the effective height divided by the effective thickness or the effective length divided by the effective thickness whichever is less.Column. - For a column, the slenderness ratio shall be the effective height divided by the corresponding lateral dimension (thickness or width),(i)In the case of load-bearing walls set in cement mortar (1: 6) or cement lime mortar (1:2:9), the slenderness ratio shall not exceed 18 and for those set in lime mortar it shall not exceed 12.(ii)In the case of non-load-bearing walls, the slenderness ratio shall not exceed 30 for panel walls and curtain walls and shall not exceed 24 for force standing walls and parapet walls.(iii)The slenderness ratio for load-bearing column shall not exceed 12.(c)Where a solid wall or masonry is load-bearing, its thickness shall not be less than that determined by the calculated masonry method through the monograms of the National Building Code of India, 1970 unless otherwise determined through the structural analysis of the building on accepted principles of mechanics to sustain the most adverse combination of loads to which the building shall be subject to during or after erection.(d)The design loads and other forces to be taken for the design of masonry structures shall conform to those laid down in Part VI -Section I of the National Building Code of India, 1970 briefly extracted in Appendix-L to these rules.(e)Where a wall is sub-divided into panels by adequate horizontal or vertical supports or both, the individual panels shall be designed for structural sufficiency.(f)Where reinforced concrete walls are intended to carry vertical loads, they should be designed generally in accordance with the design criteria for columns. The cross-sectional area of vertical reinforcement and the lateral reinforcement parallel to the wall face may be reduced to not less than 0.2 per cent.(g)The thickness of a reinforced concrete wall should not be less than 10 cm.(3)Concrete and steel structures. - The design and structural use of plain, reinforced and pre-stressed concrete for buildings and the component parts shall conform to the recommendations of the National Building Code of India in its Part VI - Section 5 and the use of structural steel in general building construction shall conform to the stipulations in Section 6 of Part VI of the said National Building Code.(4)Pre-fabricated building. - The modular planning, component sizes, joints, manufacture, storage, transport and erection of pre-fabricated elements for use in the building shall conform to the recommendations in Section 7, Part VI of the National Building Code of India, 1970.(5)Excavations. - (a) All excavations shall be protected and properly guarded in such a manner as to prevent danger to life or property; where necessary, excavations shall be sheet-piled to prevent the earth, soil or surface of any street or adjoining property from caving in or being damaged thereby.(b)No excavation for any purpose shall extend within 30 cm. of the angle of repose or natural slope of the soil under any footing or foundation unless such footing or foundation is properly under-pinned or protected against settlement.(c)Where an excavation is back filled, measures shall be taken to place the back fills as to -(i)maintain the lateral support of the soil exposed by the excavation;(ii)have a bearing capacity adequate to support the anticipated surcharge; and(iii)prevent detrimental settlement.

## 11. Open Spaces.

(1) Open spaces around and about the building: (a) There shall be a permanent open air space, forming an integral part of the site and of a minimum extent specified in this rule, between each of the boundaries of the site and every building proposed within the site. (b) The extent of the open spaces (specified in the above sub-rule) which shall be co-extensive with the site boundaries shall be as follows: -

Building Type	Minimum open yard from the site boundaries
(1)	(2)
(i) Building up to a height of 10 metres.	Three metres.
(ii) Building of height above 10 metres up to 30 metres	Three metres plus 1 metre for every additional 3 metres or fraction thereof over 10 metres.
(iii) Building of height over 30 metres.	Ten metres plus 1 metre for every additional 5 metres or fraction thereof, subject to a maximum of 16 metres.

(c) The space specified above shall be kept open to the sky and free from any erection of any building other than a fence or compound wall, provided, however, that parking garages not exceeding 3 metres in height and subject to compliance with the stipulations of F.A.R. and access ways may in the case of sites abutting more than one screen on the wider of the streets and provided also that open yards may be used for the provision of open access ways to the building and parking facilities. (2) Open spaces for amenity. - Where the building proposed is a residential building for accommodating multi-family dwelling, there shall be also provided in the site a common amenity open space. The extent of this additional open space shall be 10 per cent of the site area.

## 12. Means of access and circulation.

(1) (a) There shall be provided from the street to the entrance door or doors of every building in the site a clear way of not less than 5 metres in width as a means of access to such building which shall be maintained free from any obstruction or any overhang or projection from the building. (b) The space so set apart as means of access shall be separately distinguished from any house, gully or open space for amenity requirement prescribed under the rules. (c) Every such means of access shall be made drained and lighted to the satisfaction of the Engineer and manhole covers or other drainage, water or any other fittings laid in such means of access shall be flush with the finished surface level so as not to obstruct safe travel over the same. (d) Any person who undertakes construction work on building shall not reduce the access to any building previously existing below the minimum width prescribed under these rules. (2) Exits and means of egress. - (a) Every building meant for human occupation shall be provided with exits sufficient to permit safe escape of occupants in case of fire or other emergency. (b) An exit may be a doorway, corridor, passageway to an internal staircase or external staircase or to a verandah or roofs or terrace having access to the street. (c) Exits shall be so arranged as to provide continuous means to egress to the exterior of a building or an exterior open space leading to a street, without passing through any occupied unit. (d) Exits shall be so located that the travel distance on the floor shall not exceed 22.5 metres in the case of residential and public

buildings and 30 metres in the case of commercial, industrial and other buildings. There shall be at least two exits serving every floor and at least one of them shall be stairway. Notes. - Travel distance means the distance from any point in the floor area to any exit measured along the path of egress travel except that when floor areas are sub-divided into rooms used singly or suites or room and served by corridors or passages, the travel distance may be measured from the corridor entrance of such rooms or suites to the nearest exit. (e) Width of any exit shall not be less than 100 cm. and shall be determined for the total number of occupants as specified in the following Table. The unit of exit width for measuring the capacity of exits shall be 50 cm. A clear width of 25 cm. shall be at an additional half unit and clear width less than 25 cm. shall not be covered for exit width.

SI. No.	Occupancy	Number of occupants	
		Stairways	Door
(1)	(2)	(3)	(4)
1.	Resident	25	75
2.	Business	50	75
3.	Educational	25	75
4.	Other public buildings	60	90
5.	Industrial	50	75

### 13. Parking and parking facilities.

(1)(a) For the use of the occupants and the persons visiting the premises for the purpose of profession, trade, business, recreation or any other work, parking space and parking facilities shall be provided within the site, to the satisfaction of the Commissioner and conforming to the standards specified in Appendix-E to these rules; and (b) Necessary provision shall be also made for the circulation of vehicles gaining access to and from (i) the parking spaces and facilities and (ii) the premises into the street. (2) The parking spaces and facilities provided under this rule shall be maintained as such to the satisfaction of the Engineer and conforming to any bye-law that may be made by the Corporation in this regard.

### 14. Fire safety.

(1) All buildings in their design and construction shall be such as to contribute to and ensure individually and collectively the safety of life from fire, smoke, fumes and panic arising from these or similar other causes. (2) Fire detecting and extinguishing system. - In buildings of such size, arrangement or occupancy that a fire may not itself provide adequate warning to occupants, automatic fire detecting and alarm facilities shall be provided where necessary to warn occupants of the existence of fire so that they may escape or to facilitate the orderly conduct of fire exit drills. (3) Fire protecting and extinguishing system shall conform to accepted standards and shall be installed in accordance with good practice as recommended in the National Building Code of India, 1970, and to the satisfaction of the [Directorate of Fire Service.] [Now, re-designated as Directorate of Fire and Rescue Services.]



## **15. Architectural Control.**

(1)The design and plans of the buildings shall be made and countersigned by a qualified architect who is an Associate of the Indian Institute of Architects.(2)The design and plan shall be scrutinised and approved by a panel comprising of the following members: -(i)Engineer;(ii)a Town Planner of Government; and(iii)a prominent private Architect, provided that the Architect member of the panel shall not have made the plans and designs for the buildings under consideration.(3)Any suggestions or alterations suggested by the panel shall be incorporated in the plans shall be conformed to.B. Public Buildings.

## **16. Sufficient exits.**

(1)Every person intending to construct, reconstruct, add to or alter any public building shall, in addition to the general requirements laid down in the rules, also comply with rules 9,11 (a), (b), (c), 12 and 13 prescribed for multi-storeyed buildings and also with the following rules.(2)(a)Every place of assembly, every tier or balcony and every individual room used as a place of assembly in a public building shall have exits sufficient to provide for the total capacity thereof leading directly outside the building or to stairways and ramps or both.(b)There shall be at least two separate exits as remote from each other as practicable for each room, hall or place of assembly, with a capacity of 600 persons, at least three separate exits when the capacity is between 601 to 1,000, at least four separate exits when the capacity is over 1000:Provided that when the capacity is less than 100 persons, and no part of the room or hall or place of assembly is 15 metres from the doorway in the line of travel, a single doorway of 100 cm. may be permitted.

### **16A. [ Water Conservation. [Inserted by G.O. Ms. No. 138, Municipal Administration and Water Supply Department (MAI), dated 11th October, 2002.]**

- For effective conservation of rain-water, application for permission to construct or reconstruct or alter or add to a public building shall contain water conservation proposals as detailed in rule 7-A.]

### **16B. [ Provision of Rain-Water Harvesting Structure. [Inserted G.O. Ms. No. 56, Municipal Administration and Water Supply Deptt. (MAI), dated 21st July, 2003.]**

- Notwithstanding anything contained in these rules, -(1)in every building owned or occupied by the Government or a statutory body or a company or an institution owned or controlled by the Government-rain-water harvesting structure shall be provided in the manner specified in rule 7-A on or before the 10th October 2003.(2)(a)subject to sub-rule (1) every owner or occupier of a building shall provide rain-water harvesting structure in such building in the manner specified in rule 7-A on or before the 31st August 2003. If the owner or occupier of the building fails to provide the said rain-water harvesting structure by the said date, the executive authority or any person authorised by him in this behalf may after giving notice to the owner or occupier of the building,

cause rain-water harvesting structure to be provided in such building and recover the cost of such provision along with the incidental expense thereof in the same manner as property tax. This however, does not absolve the liability of the owner or occupier of the building from providing the rain-water harvesting structure before the 10th October 2003.(b)if the owner or occupier of the building fails to provide rain-water harvesting structure on or before the 10th October 2003, the water supply connection provided to such building shall be disconnected till rain-water harvesting structure is provided.]

**16C. [ Separation of bath and wash-basin water and reuses. [Inserted by G.O. Ms. No. 138, Municipal Administration and Water Supply Department (MAI), dated 11th October, 2002.]**

-Notwithstanding anything contained in these rules, every Multi-storeyed and Public building shall be provided with separate pipelines, one for collecting waste water from bath and wash-basins and the other for connecting the toilets. The waste water from the toilets alone shall be connected to the street sewer. Each building shall have a separate downward pipeline to collect waste water from bath and washbasins and the collected waste water shall be treated adequately by organic or mechanical recycling and taken to a sump for onward pumping in the exclusive overhead tank or to a separate compartment of overhead tank for exclusive use of toilet flushing through huge cisterns. The excess waste water not reused for toilet flushing, shall be suitably connected to the rain-water recharge structures for ground-water recharge.Explanation. - For the purposes of these rules in regard to recycling systems are concerned, any other modifications, additional structures, alternative designs furnished by the applicant shall be considered for approval, if it conforms to recycling concept to the satisfaction of the competent authority for building plan approval.]

**17. Aisles and spacing rows of seats.**

(a)Clear aisles not less than 1.2 metres in width shall be provided at right angles to the line of seating in such number and manner that no seat shall be more than 3.8 metres away from an aisle measured in the line of seating.(b)Where all the aisles do not directly meet the exit doors, cross aisles of minimum 1 metre width and at the rate of one cross aisle for every 19 rows of seats shall be provided parallel to the line of seating so as to provide direct access to the exit.(c)Rows of seats between aisles shall not have more than 14 seats and in the case of such rows opening to an aisle at one end, shall not have more than 7 seats.(d)There shall be a minimum space of 85 cm. between the backs of any two rows of seats and a minimum of 35 cm. between the back of any seat and the front of the seat immediately behind as measured between plumb lines.[17-A. Separation of bath and wash-basin water and reuse. [Inserted by G.O. Ms. No. 138, Municipal Administration and Water Supply Department (MAI), dated 11th October, 2002.]- Notwithstanding anything contained in these rules, every building shall be provided with separate pipelines, one for collecting water from bath and wash-basins and the other for connecting the toilets. The waste water from the toilets alone shall be connected to the street water. The waste water from the bath and wash-basins shall be disposed of as hereunder: -(i)Ordinary buildings (Ground + I Floor, residential buildings, not exceeding four dwelling units or Commercial/Industrial/Institutional building not exceeding 300

square metres). - The waste water from the bath and wash-basin shall be used for ground-water recharge by organic filtration (by providing suitable filter media) depending upon the soil suitability or for recycling for toilet flushing as indicated for other buildings specified in item (ii) below, - (ii) Building other than buildings specified in time (1) above. - Each building shall have a separate downward pipeline to collect waste water from bath and wash basins and the collected waste water shall be treated adequately by organic or mechanical recycling and taken to a sump for onward pumping to the exclusive overhead tank or to a separate compartment of overhead tank, for exclusive use of toilet flushing cisterns. The excess waste water not reused for toilet flushing, shall be suitably connected to the rain-water recharge structures for ground-water recharge. Explanation. - For purposes of these rules in regard to recycling systems are concerned, any other modifications, additional structures alternative designs furnished by the applicant shall be considered for approval, if it conforms to recycling concept to the satisfaction of the competent authority for building plan approval.]

## 18. Fire detecting and extinguishing systems.

- Every public building having a capacity of 1,000 persons or more, shall be provided with either a manually operated fire-alarm system coded to alert employees or attendants or with an automatic fire detection system to conform to the standards and recommendations laid down in the National Building Code of India, 1970 and to the satisfaction of the [Directorate of Fire Services.] [Now, re-designated as Directorate of Fire and Rescue Services.] Appendix E Table 2

SI. No.	Land and buildings use	Area of parking spaces unit in sq. metres	Number of units of spaces to be provided
(1)	(2)	(3)	(4)
1.	Residential:		
	(a) Single Family House.	17.5	One for every site with an area of 350 square metres and over.
	(b) Apartment Flats	17.5	One for every two families. One for the first 200 square metres of floor area and one additional unit for every 100 square metres or part thereof of every 200 square metres,
2.	Commercial:		
	(a) Shops.	17.5	
	(b) Shopping Centres.	20	One for every 250 square metres of site area or part thereof.
	(c) Office and Firms.	20	(i) For building with floor area less than 100 square metres Nil. (ii) For building with floor area over 200 square metres, one for every 200

			square metres or part thereof upto 1,000 square metres and one additional unit for every 100 square metres of floor area over 1,000 square metres.
	(d) Restaurants.	17.5	(i) Restaurants with less than 50 seats – Nil. (ii) With 50 seats and over one unit for every 20 seats or parts of 20 seats.
	(e) Hotels and Lodges.	17.5	One for every 6 beds.
	(f) Cinemas and Public Halls including Community Hall.		
	(g) Kalyanamandapam, etc.	17.5	One for every 20 square metres of site area.
3.	Warehousing and Wholesale stores.		One for every 500 square metres of floor area or part thereof.
4.	Public and Semi-public Offices.	20	(i) For building with floor area less than 100 square metres – Nil. (ii) Floor area of 100 square metres and above – one for every 200 square metres or part thereof.
5.	Hospitals and Nursing Homes.	17.5	One for every 15 beds,
6.	Industries.	30	(i) Up to 100 square metres of floor area – Nil. (ii) With floor area over 100 square metres – one for every 200 square metres.
7.	For other uses, Institutions and Transport and Communication Centres.		Requirements to be assessed by Commissioner in consultation with Commissioner of Police and [Director of Town Planning.] [Now, re-designated as Director of Town and Country Planning.]

Appendix-L (See Special Rule 10(2) (d) of Multi-storeyed Buildings) Design Loads and other Forces For Design of Masonry Structures

**1. Deadloads. - The deadload in a building shall comprise the weight of all walls, partitions, floors and roofs and shall include the weights of all other permanent constructions in the building. The dead load is determined adopting the dead weight of the construction material and as given in the following Table: -**

## (a) Description of construction materials -

Weight in kg/M<sup>2</sup>

(1)	Brick in mud, lime or cement mortar.	1,920
(2)	Coarsed rubble in lime or cement mortar.	2,240
(3)	Laterite in lime mortar.	2,000
(4)	Concrete in lime or cement mortar.	(a) 19.20 (brick jelly)(b) 2,240 (hard broken stone)
(5)	Random rubble in lime or cement mortar.	2,240
(6)	Limestone.	2,400 to 2,640
(7)	Sandstone.	2,240 to 2,400
(8)	Cuddapah slabs.	2,720
(9)	Ashlar.	2,720
(10)	Granite stone.	2,640 to 2,800
(11)	Reinforced concrete.	2,400
(12)	Cast-iron.	7,030 to 7,130
(13)	Wrought-iron.	7,700
(14)	Steel.	7,850
(15)	Teak.	625
(16)	Pine.	610
(17)	Oak.	865
(18)	Fir.	430 to 460

## (b) Description of roof materials and roofs.

Weight in kg /M<sup>2</sup>

(1)	Corrugated iron sheet (1.25 mm).	10.56
(2)	Corrugated iron sheet (1.00 mm).	8.60
(3)	Brick in mud, lime or cement mortar.	1,920
(4)	Coarsed rubble in lime or cement mortar.	2,240
(5)	Laterite in lime mortar.	2,000
(6)	Concrete in lime or cement mortar.	(a) 19.20 (brick jelly),(b) 2,240 (hard broken Stone)
(7)	Random rubble In lime or cement mortar.	2,240

(8)	Lime-stone.	2,400
(9)	Sand-stone.	2,240 to 2,400

**2. Live loads. - (a) Live loads on floors. - (i) Live loads on floors shall comprise all loads other than dead load. The minimum live loads on different floors for different uses are specified in the following table in terms of uniformly distributed static loads.**

(ii) In designing the walls, columns, piers, their supports and foundations, the following reductions in assumed total live loads on floors may be made: -

Number of floors carried by member under consideration	Per cent reduction of total live load on all floor above the member under consideration
1	0
2	10
3	20
4	30
5 or more	40

(iii) No reduction shall be made in the case of warehouses, garages and other buildings used for storage purposes and for factories and workshops designed for 500 kg/M<sup>2</sup>.

Type of Floors	Minimum Live Loads per kg/m <sup>2</sup> of floor area	Alternative Minimum Live Load
(1)	(2)	(3)
Floors in dwelling houses, tenements, hospital wards, bed-rooms and private sitting-rooms in hostels and dormitories.	200	
Office floors other than entrance halls, floors of light workrooms.	250-400	
Floors of banking halls, office entrance halls and reading-rooms.	300	
Shop floors used for display and sale of merchandise; floors of workrooms, generally floors of classrooms in schools, floors or places of assembly with fixed seating, restaurants, circulation space in machinery halls, power-stations, etc., not occupied by plant or equivalent.	400	Subject to a minimum total load of 2.5 times the values in column 4 for any given slab panel and 6 times the values in column 4 for any given beam.
Floors of warehouses, workshops, factories and other building or parts of buildings of similar category for light-weight loads; office floors for storage and filing purposes; floors of places of assembly without	500	This total load shall be assumed uniformly distributed on the entire area of the slab panel or the entire length of

fixed seating, public rooms in hotels, dance-halls, the beam.  
waiting-halls, etc.

The lower value of 250 kg/m<sup>2</sup> should be taken where separate storage facilities are provided and the higher value of 400 kg/m<sup>2</sup> should be taken where such provisions are lacking.

Type of Floors	Minimum Live Loads per kg/m <sup>2</sup> of floor area	Alternative Minimum Live Load
(1)	(2)	(3)
Floors of warehouses, workshops, factories and other buildings or parts of buildings of similar category for medium-weight loads.	750	
Floors of warehouses, workshops, factories and other buildings or parts of buildings of similar category for heavy-weight loads, floors of bookstores and libraries, roofs and pavement lights over basements projecting under the public roof path under the public foot-path.	1000	
Floors used for garages for vehicles not exceeding 2.5 tonnes gross weight slabs.	400	The worst combination of actual wheel loads, whichever is greater.
Beams	250	The worst combination of actual wheel loads, whichever is greater.
Floors used for garages for vehicles not exceeding 4 tonnes gross weight.	750	Subject to a minimum of one and a half times maximum wheel load but not less than 900 kg. considered to be distributed over 5 cm. square.
Stairs, landings and corridors for class 200 loading but not liable to overcrowding	300	Subject to minimum of 130 kg. concentrated load at the unsupported end of each step for stairs constructed out of structurally independent cantilever steps
Stairs, landings and corridors for class 200 loading but liable to overcrowding, and for all other classes.	500	
Balconies not liable to over-crowding:		
For class 200 loading	300	
For all other classes	500	
Balconies liable to overcrowding:		
	500	

Explanation 1. - A reference to a "floor" includes a reference to any part of that floor, and a reference to "slabs" includes boarding and beams or ribs spaced not further apart than one metre between centres, and a reference to "beams" means all other beams and ribs. Explanation 2. - Under loading class No. 250, the reference to light workrooms envisages rooms in which some light machines (for example, sewing machine used by millers or tailors) are operated without a central driven unit, that is, the machines are independently operated either by hand or by small motors. Under loading class No. 400, the reference to work rooms generally envisages the installation of machines operated with a central power-driven unit, with the individual machines being belt driven. Explanation 3. - "Fixed seating" implies that the removal of the seating and the use of the space for other purposes improbable. The maximum likely load in this case is, therefore, closely controlled. Explanation 4. - The loading in workshops, warehouses and factories varies considerably and so three loadings under the terms "light", "medium" and "heavy" are introduced in order to allow for more economical designs but the terms have no special meaning in themselves other than the live load for which the relevant floor is designed. It is, however, important particularly in the case of heavy weight loads, to assess the actual loads to ensure that they are not in excess of 1,000 kg./m<sup>2</sup>; in cases where they are in excess, the design shall be based on the actual loading. Explanation 5. - The load classification for stairs, corridors, balconies and landings provide for the fact that these often serve several occupancies and are used for transporting the furniture and goods. (b) Live loads on roofs. - Allowance for live load on flat roofs, sloping roofs and curved roofs shall be as given in the following Table: - Table Live Loads on Floors

Type of roofs	Live Loads measured on plain	Minimum live load measured on plan
(1)	(2)	(3)
Flat, sloping or curved roof with slopes up to and including 10 degrees. (a) Access provided	150 kg./m <sup>2</sup>	375 kg. uniformly distributed over any span of one metre width of the roof slab and 900 kg. uniformly distributed over the span in the case of all beams.
(b) Access not provided except for maintenance.	75 kg./m <sup>2</sup>	190 kg. uniformly distributed over any span of one metre width of the roof slab and 450 Kg. uniformly distributed over the span in the case of beam.
Sloping roof with slope greater than 10 degrees	(a) For roof membrane sheets of purline 75 kg./m <sup>2</sup> ; less 2 kg./ m <sup>2</sup> for every degree increase in slope over 10 degrees. (b) For members supporting the roof membrane and roof purlines, such as trusses, beams girders, etc. - 2/3 of load in (a). (c) Loads in, (a) and (b) do not include loads due to snow, rain, dust collection,	Subject to a minimum of 40 kg/m <sup>2</sup>



etc., and the effects of such loads shall be appropriately considered.

Curved roofs with slope at springing greater than 10 degrees. (75-345  $r^2 \text{ kg./m}^2$  Where  $r = h/1$   $h$  = the height of the highest point of the structure measured from its springing and 1 = chord width of the roof in singly curved and shorter of the two sides, if doubly curved. Subject to a minimum of 40  $\text{kg./m}^2$

Note. - For special types of roofs with highly permeable and absorbent material, the contingency of roof material increasing in weight due to absorption of moisture shall be provided for. (c) Impact and vibrations. - For structure carrying live loads which reduce impact or of vibrations, the live load shall be increased as follows: (i) For flame supporting lifts and hoists - 100 per cent. (ii) For foundations, footings and piers supporting lifts and hoisting apparatus - 40 per cent. (iii) For light machinery, shaft or motor units - 20 per cent minimum. (iv) For reciprocating machinery or power units - 50 per cent minimum.

### 3. Wind load. - The wind load on a building shall be calculated on basis of the basic wind pressure, given in the following Table, which is the equivalent static pressure in the direction of blow of wind: -

(1) Basic wind pressures for the City. -

Height in Metres	Pressure in $\text{kg./m}^2$
(1)	(2)
up to 30	200
35	208
40	210
45	217
50	222
60	230
70	236
80	244
100	254
120	264
150	276

For intermediate height, interpolated values may be adopted. (2) Wind pressures on roofs. - For flat and perched roofs, the wind pressures and suctions normal to the surface due to wind blowing at right angles to the ridge shall be determined by multiplying the basic wind pressure ( $p$ ) with the factors given in the Table below: Wind Pressures on Roofs (Wind normal and ridges)

Slope of roof on	External	Wind pressure
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(1)	(2)	(3)
Windward side	Wind ward slope	Leeward slope
0°	-1.00 P	- 0.50 P
10°	-0.70 P	- 0.50 P
20°	-0.40 P	- 0.50 P
30°	- 0.10 P	- 0.50 P
40°	+ 0.10P	- 0.50 P
50°	+ 0.30 P	- 0.50 P
60°	+ 0.30 P	- 0.50 P
70°	+ 0.50 P	- 0.50 P
80°	+ 0.50 P	- 0.50 P
90°	+ 0.50 P	- 0.50 P

**4. Seismic loads. - The seismic coefficients, stress increase, design live loads as stipulated in the National Building Code of India, 1,970, shall be taken into account while designing the structures.**