Part 3
GENERAL BUILDING REQUIREMENTS, CONTROL AND REGULATION

Chapter 1
General Building Requirements

Chapter 2
Classification of Buildings Based on Occupancy

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CHAPTER 1

General Building Requirements

1.1 SCOPE

This part of the Code puts forward classification of buildings based on occupancy or nature of use and deals with the general and specific requirements of each of the occupancy groups. Fire resistance requirements are expressed in terms of type of construction which shall conform with the specified fire-resistive properties.

1.2 TERMINOLOGY

This section provides an alphabetical list of the terms used in and applicable to this part of the Code. In case of any conflict or contradiction between a definition given in this section and that in Part 1, the meaning provided in this part shall govern for interpretation of the provisions of this part.

AREA PLANNING AUTHORITY : A government or semi-government agency or a local body which has been legally designated to formulate land use or plans of the area under their jurisdiction.

BALCONY : A portion of the seating space in an assembly room the lowest of which is at least 1.2 m above the level of the main floor and shall include the area providing access to the seating area or serving only as a foyer.

BALUSTER : A short vertical member to support guard rails.

BALUSTRADE : A row of balusters meant for supporting handrails.

BASEMENT : A floor level below the first storey in a building, except that a floor level in a building having only one floor level shall be classified as a basement unless such floor level qualifies as a first storey as defined in Part 1.

BUILDING LINE : The line up to which the plinth of a building may lawfully extend.

CITY DEVELOPMENT AUTHORITY : A government or semi-government agency or a local body which has been legally designated to carry out and/or control development works of the area under its jurisdiction.

FAR : Abbreviation for Floor Area Ratio. Measured as the ratio of total covered area of all floors of a building to the area of the plot on which the building is erected or intended to be erected.

FIRE SEPARATION DISTANCE : The minimum distance to be maintained from considerations of fire safety between a building and any other building on the site, or from other site, or from the opposite side of a street or other public space.

FRONTAGE : Length of the side of a plot facing the street. There may be more than one frontages depending on the location of a plot with respect to the street. (See Fig 3.1.1 for definition of front, side and rear of a plot).

GALLERY : An intermediate floor or platform projecting from a wall of an auditorium or a hall providing extra floor area or additional seating accommodation.

PLOT : A piece or parcel of land on which a building is intended to be or has already been constructed.

STRUCTURAL FRAME : Columns, girders, beams, trusses and spandrels which have direct connections with the columns and all other members which are essential to the stability of the building or structure as a whole.

TERRACE : A level paved area or floor on or adjacent to a building usually open to the sky.

VERANDAH : A covered area with at least one side open to the outside.

1.3 OCCUPANCY CLASSIFICATION OF BUILDINGS

Every building or portion thereof shall be classified according to its use or character of occupancy. A brief description of such occupancy groups is presented in Table 3.1.1. Details of each Occupancy and its sub-divisions are set forth in Sec 2.1. Occupancy A4 (Minimum Standard Housing) is described in Appendix A. Types of construction based on fire resistance are specified in Table 3.1.2. Details of such types of construction are set forth in Sec 3.1.

Table 3.1.1
Summary of Occupancy Classification
(Details in Sec 2.1. Details of Occupancy A4 in Appendix A)

Occupancy type	Sub-division	Nature of use or occupancy
A: Residential	A1	Detached single family dwelling
	A2	Flats or apartments
	A3	Mess, boarding houses, dormitories and hostels
	A4	Minimum standard housing
	A5	Hotels and lodging houses
B: Educational	B1	Educational facilities
	B2	Preschool facilities
C: Institutional	C1	Institutions for care of children
	C2	Custodial institutions for physically capable
	C3	Custodial institutions for physically incapable or handicapped
	C4	Penal and mental institutions
D: Health Care	D1	Normal medical facilities
	D2	Emergency medical facilities
E: Assembly	E1	Large assembly with fixed seats
	E2	Small assembly with fixed seats
	E3	Large assembly without fixed seats
	E4	Small assembly without fixed seats
	E5	Sports facilities
F: Business and Mercantile	F1	Offices
	F2	Small shops and markets
	F3	Large shops and markets
	F4	Garages and petrol stations
	F5	Essential services
G: Industrial	G1	Low hazard industries
	G2	Moderate hazard industries
H: Storage	H1	Low fire risk storage
	H2	Moderate fire risk storage
J: Hazardous	J1	Explosion hazard building
	J2	Chemical, biological or radiation hazard building
K: Miscellaneous	K1	Private garages and special structures
	K2	Fences, tanks and towers

Table 3.1.2
Classification of Buildings Based on Types of Construction
(Details in Sec 3.1)

Type	Description
1	Highest degree of fire resistance
2	Moderate degree of fire resistance
3	Lowest degree of fire resistance

1.4 LAND USE CLASSIFICATION AND PERMITTED USES

Every city, township, municipality or other development shall be divided into zones according to the intended land use pattern by the development and planning authorities and approved by the Government. This land use classification may divide an area into zones such as residential, commercial, industrial, storage, green park etc. or any combination of these. The land use zones shall be shown on the approved master plan of the area and the permitted occupancy classes for each zone clearly stated in the planning regulations. The Occupancy classes permitted in any zone shall be one or more of the Types of Occupancy defined in Sec 2.1.

1.5 REQUIREMENTS OF PLOTS

1.5.1 **General Requirements**

1.5.1.1 No building shall be constructed on any site which is water logged, or on any part of which is deposited refuse, excreta or other objectionable material, until such site has been effectively drained and cleared to the satisfaction of the Authority.

1.5.1.2 Provision shall be kept for any space within the plot left vacant after the erection of the building to be effectively drained by means of surface or underground drainage system.

1.5.1.3 Basic minimum sanitary waste and excreta disposal facility shall be created on the premises, unless the plot is served by a disposal system provided by any utility service authority or agency.

1.5.1.4 Written approval of the Authority or the appropriate drainage and sanitation authority shall be obtained for connecting any soil or surface water drain to the sewer line.

1.5.2 **Clearance from Overhead Electric Lines**

No building or any part thereof shall be erected within, nor any auxiliary part of the building be allowed to come closer than, the distances shown in Table 3.1.3 from any overhead electric line.

Table 3.1.3
Minimum Distances from Overhead Electric Lines

Line Voltage	Vertically (m)	Horizontally (m)
Low to medium voltage lines and service lines	2.5	1.25
High voltage lines up to 33 kV	3.5	1.75
High voltage lines beyond 33 kV	3.5 plus 0.3 for each additional 33 kV or part thereof.	1.75 plus 0.3 for each additional 33 kV or part thereof.

1.5.3 Plinth and Formation Levels

The formation level of the plot shall not be lower than the adjacent road level. In areas not susceptible to flood, the formation level shall not be higher than 450 mm from the surface level of the centre line of the adjacent front road. For flood prone and uneven or undulated areas the permitted height of the formation level shall be decided by the Authority considering the general characteristics of the terrain and future development plans. The plinth or ground floor level of the building shall be at least 450 mm above the surface level of the centre line of the adjacent front road.

1.5.4 **Boundary Wall**

Solid boundary walls surrounding a plot not higher than 1.5 m and open boundary walls made of grill, jali (screen), balustrade etc. with a maximum height of 2.75 m shall not require the permission of the Authority. For boundary walls made of a combination of solid wall and open grill or jali, the solid wall portion shall not be higher than 1.5 m. The Authority may, on specific application, permit the use of higher boundary walls.

1.5.5 **Plot Sizes**

1.5.5.1 Residential Plots

a) The minimum size of the plot shall be 65 m^2.

b) Corresponding to each type of residential development the sizes of the plots and the corresponding minimum widths of road frontage of the plots shall be as specified in Table 3.1.4, provided that :

i) plots accessible by link roads shall be considered to have a frontage equal to its width, and
ii) plots of irregular shape abutting the road shall be considered to have a frontage equal to their average width parallel to the road.

Table 3.1.4
Plot Sizes and Corresponding Minimum Frontages for Various Types of Residential Development

Type of Residential Development	Plot Size (m^2)	Minimum Frontage (m)
Approved row type houses	65 (Minimum size)	4.5
"	Over 65 to 135	7
Detached houses	65 (Minimum size)	5.5
"	Over 65 to 135	7
"	Over 135 to 200	8
"	Over 200 to 265	10
"	Over 265	Above 10
Semi-detached houses	135 (Minimum size)	7
"	Over 135 to 200	8
"	Over 200 to 265	10
"	Over 265	Above 10

c) The limitations of plot sizes and frontages imposed in (a) and (b) above may be waived for approved low income housing including site and service schemes. Guidelines governing the planning and design of such housing are given in Appendix A.

d) The minimum size of the plot for a group housing development scheme and other special requirements for group housing developments shall be as specified or approved by the respective city development authority.

e) Common private road or family road serving not more than four plots shall be at least 2.5 m wide. Open space requirements and height and area limitations of buildings on such plots shall be decided in view of the nearest public road.

f) Common private road or family road serving more than four plots shall be at least 3.5 m wide. Notwithstanding any other requirement for front open space, a residential building may be permitted to be constructed at a minimum distance of 1.5 m from the front property line of such plots.

1.5.5.2 Plots for Educational Buildings : The minimum size of plot for educational buildings shall be based on occupant capacity and shall be at the rate of 4 m^2 per pupil or occupant. In no case shall the size of the plot be less than 200 m^2.

1.5.5.3 Plots for Assembly Halls, Theatres, Cinema : The minimum size of plot for assembly halls, theatres, cinema halls and other similar buildings where people gather for entertainment or other public functions shall be based on the seating capacity of the building and shall be at the rate of 3 m^2 per seat.

1.5.5.4 Plots for Community Centres : The size of plot for rural or urban community centres shall be not less than 1300 m^2 and commensurate with the size of the community.

1.5.5.5 Business and Mercantile Plots : The minimum size of a business and mercantile plot shall be 200 m^2 and its road frontage width shall not be less than 10 m.

1.5.5.6 Industrial Plots : The minimum size of an industrial plot shall be 300 m^2 and its road frontage width shall not be less than 15 m.

1.5.5.7 Petrol Filling Stations : The minimum size of the plot for a petrol filling station without service bay or repair workshop shall be 500 m^2 and its road frontage width shall not be less than 30 m. The minimum size of the plot for a petrol filling station with service bay but without repair workshop shall be 1100 m^2 and its road frontage width shall not be less than 30 m.

1.5.5.8 Plots for Other Uses : The minimum sizes of plots for buildings for uses other than those mentioned in 1.5.5.1 to 1.5.5.7 shall be as determined by the Authority for specific areas.

1.6 MEANS OF ACCESS

1.6.1 All buildings and plots shall be approachable by a public or private road or street or an approved means of access.

1.6.2 **Residential Plots**
Public roads or means of access on which a residential plot abuts shall satisfy the minimum width requirements depending on the type of development and plot size specified in Table 3.1.5. Minimum widths of common private road or family road shall be as specified in 1.5.5.1 (e) and (f).

Table 3.1.5
Minimum Widths of Public Means of Access to Residential Plots

Type of Development	Plot Size (m^2)	Minimum Width of Access Road (m)	
		Existing[1] Development	New[2] Development
Approved row Type	65 (minimum size)	3.0	4.5
"	Over 65 to 135	3.5	4.5
Detached	65 (minimum size)	2.5	4.75
"	Over 65 to 135	2.5	6.0
"	Over 135 to 200	2.5	7.5
"	Over 200 to 265	2.5	9.0
"	Over 265	Over 3.0	Over 9.0
Semi-detached	135 (minimum size)	2.5	6.0
"	Over 135 to 200	2.5	7.5
"	Over 200 to 265	2.5	9.0
"	Over 265	Over 3.0	Over 9.0

Note :
1. Existing Development - Any approved residential development already in existence on the date of promulgation of this Code, with roads and streets for which the area planning authority does not have any scheme for future widening
2. New Development - Any new residential development implemented subsequent to the promulgation of this Code

1.6.3 **Assembly buildings**
For Assembly buildings such as cinema halls, theatres, halls for wedding receptions etc. where large crowds are likely to assemble, the width of the approach road shall not be less than 15 m.

1.6.4 **Other Buildings**
The width of the approach road for all plots other than residential and assembly shall be not less than 9 m.

1.6.5 **Internal Roads**
1.6.5.1 The width of internal roads and drive ways in a plot shall be decided by the number of buildings served. For internal roads on residential plots the provisions of Sec 1.5.5.1 (e) and (f) shall apply. For plots other than residential the width of internal roads and driveways shall be not less than 7 m. The permissible maximum length of internal roads for non-residential plots shall depend on their widths and shall be as specified in Table 3.1.6.

Table 3.1.6
Maximum Permissible Length of Internal Roads in Non-Residential Plots

Width (m)	Maximum Permissible Length (m)
7	80
8	150
9	300
10 or over	Unlimited

1.6.5.2 The internal roads in all types of plots shall be set back not less than 250 mm from the boundary wall/property line and the building.

1.6.6 **Pedestrian Walkways**
1.6.6.1 The exterior pedestrian walkway that links buildings and the approach road shall not contribute to the building area.

1.6.6.2 The walkway shall not be used for any purpose other than pedestrian movement.

1.6.6.3 The minimum width of the walkway shall be 1.0 m provided the walkway is not enclosed by adjacent walls on both sides, otherwise the minimum width shall be 1.25 m.

1.6.6.4 Pedestrian walkways for access to different dwelling units in one or two-storeyed low income row or cluster housing schemes or site and service facilities shall be at least 3 m wide, subject to the condition that the height of the building shall not exceed two times the sum of the width of the walkway abutting and the front open space. The pedestrian walkway of 3 m width shall serve a maximum of 10 plots on each side of the walkway. The length of such walkway shall be limited to 60 m.

1.7 OPEN SPACES WITHIN A PLOT

1.7.1 For the purpose of applying the provisions of open space requirements, the side, rear and front of a plot shall be defined as shown in Fig 3.1.1 depending on the layout of roads around the plot.

1.7.2 At least one side of all habitable rooms shall be exposed to an exterior or an interior open space or to a balcony or verandah.

1.7.3 The total open area in a plot on which a building of educational, institutional, health care or assembly occupancy is constructed shall not be less than 50 per cent of the plot area.

1.7.4 The total open area in a plot on which a building of residential, industrial, storage, hazardous or miscellaneous occupancy is constructed shall not be less than 33 per cent of the plot area.

1.7.5 For the purpose of Sec 1.7.3 and 1.7.4, the total open area shall include all exterior open spaces and interior courtyards, but exclude the area of any lighting and ventilation shaft.

1.7.6 For approved low income row type or cluster housing or site and service schemes, the requirement of 1.7.3 may be relaxed by the Authority taking into consideration the density of occupancy, width of the approach road, fire safety and general lighting and ventilation (see Appendix A).

1.7.7 The total open area requirement for plots on which buildings of business and mercantile occupancy are constructed shall be as decided by the Authority for specific city, municipality, township or area taking into consideration fire safety, height of the building, parking facilities, occupancy load, abutting road widths and general lighting and ventilation.

1.7.8 **Separation of Buildings in the Same Plot**
For more than one building in the same plot, a minimum separation of 2 m between the buildings shall be maintained if the heights of both the adjacent buildings are not more than 8 m nor two storeys. If the height of either of the adjacent buildings in the same plot is more than 8 m or two storeys, mandatory open spaces between the buildings as specified in Fig 3.1.2 (a) to (c) and in the following shall be maintained :

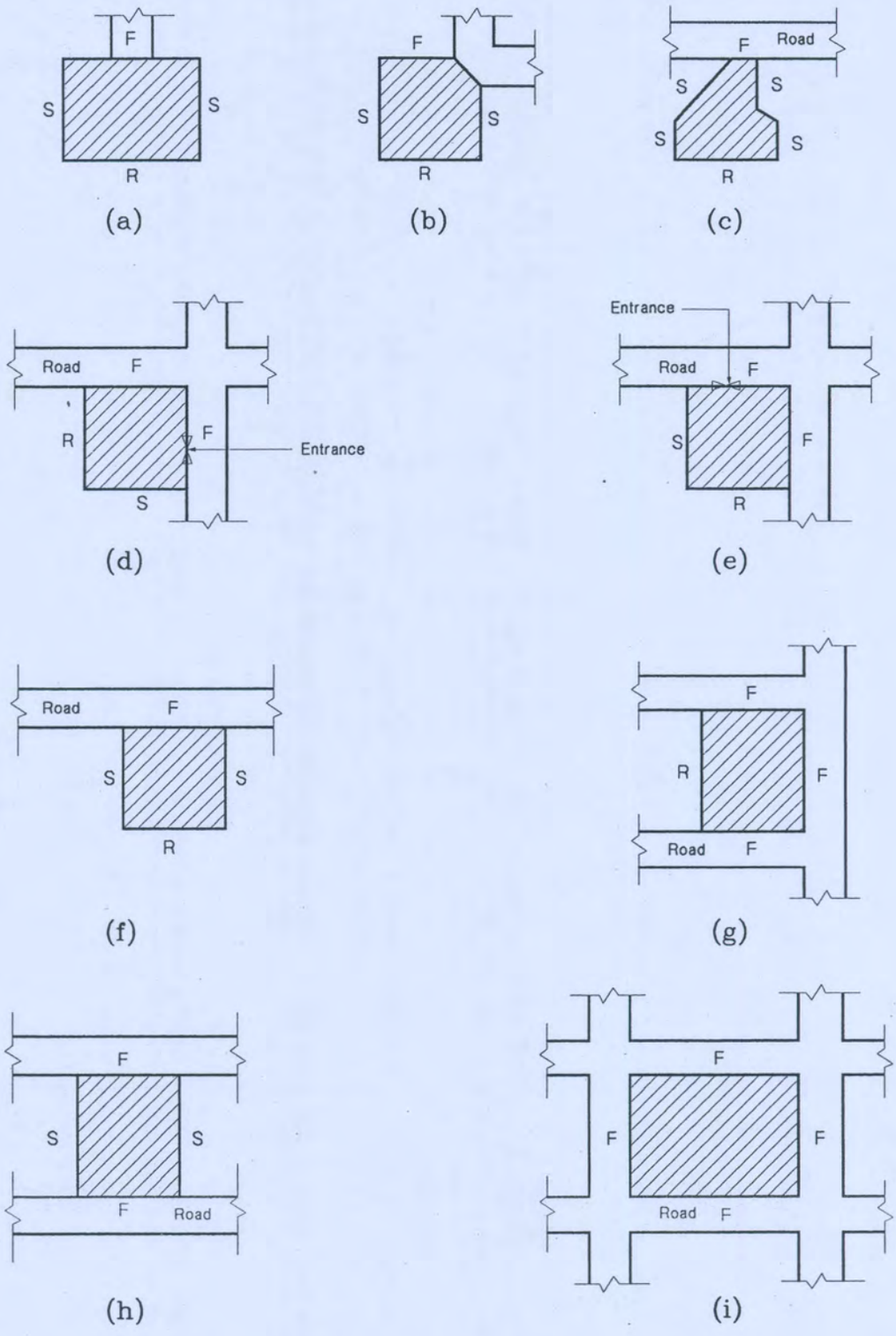
a) For grid iron layouts such as those shown in Fig 3.1.2 (a), the end to end open space between the buildings shall not be less than 2 m. The open space between the longer sides of the buildings shall not be less than 0.5 times the height of the shielding building on the south or the east.

b) For staggered layouts such as those shown in Fig 3.1.2 (b), the open space between the longer sides of the buildings shall not be less than 0.4 times the height of the shielding building on the south or the east, provided that at least 0.33 times the length of the shielded building is left unshielded by the shielding building.

c) For front to end layouts such as those shown in Fig 3.1.2 (c), the open space between the buildings shall not be less than 3 m, provided that the width of the shielding building on the south or the east is not more than 0.33 times the length of the shielded building. When the width of the shielding building is more than 0.33 times but less than 0.67 times the length of the shielded building, the open space between the buildings shall be at least 0.4 times the height of the shielding building; otherwise the open space between the buildings shall be at least 0.5 times the height of the shielding building. For the purpose of this requirement the width of the shielding building shall be taken as that portion of its width which actually shields the other building, or the aggregate of such widths of all shielding buildings, as the case may be.

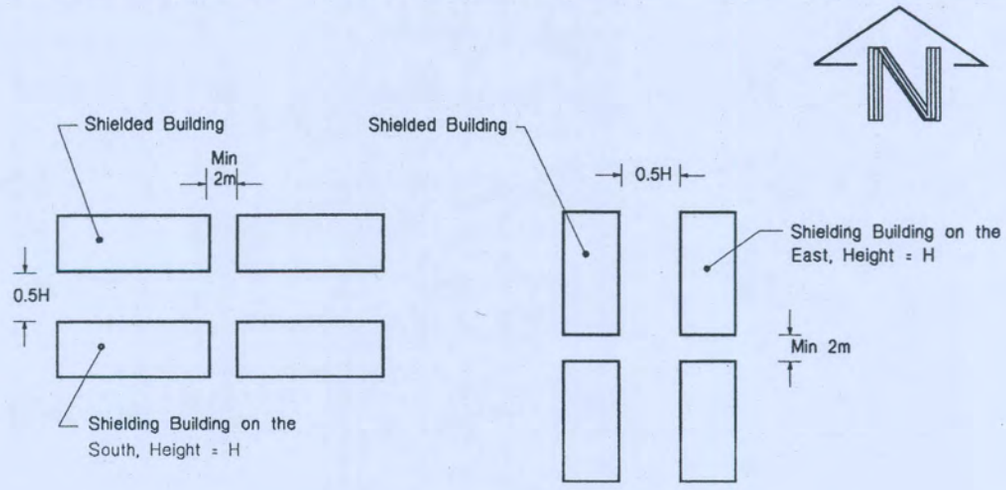
1.7.9 **Road Front Open Space for All Buildings**
1.7.9.1 All buildings facing a street and having a height not more than 17 m or five storeys shall be constructed at a distance of at least 4.5 m from the centre of the street or at least 1.5 m from the road front property line whichever is greater.

1.7.9.2 All buildings facing a street and having a height more than 17 m or 5 storeys shall be constructed at a distance of at least 4.5 m from the centre of the street or at least 2 m from the road front property line whichever is greater.

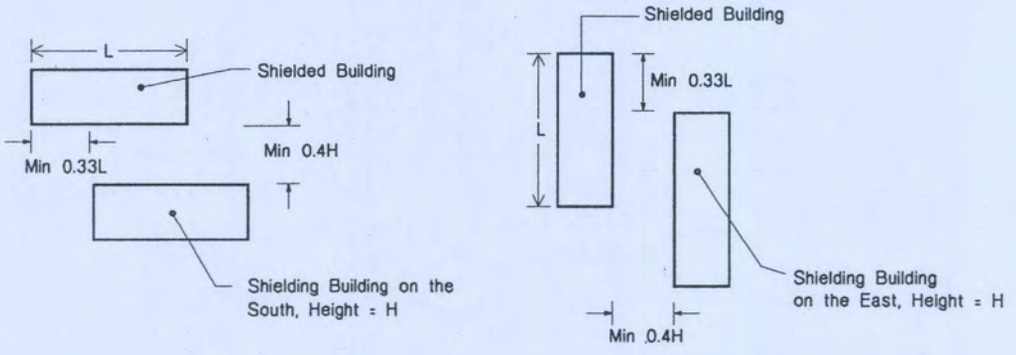


Legend : F = Front, S = Side, R = Rear

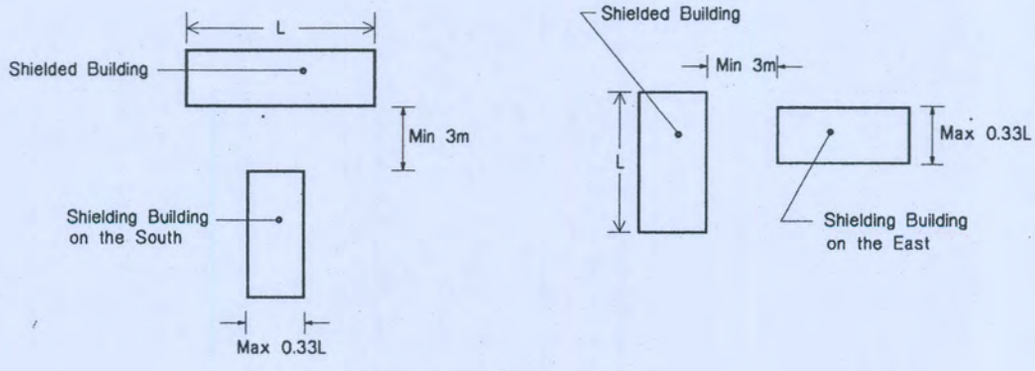
Fig. 3.1.1 Definition of Front, Side and Rear of a Plot



(a) Grid Iron Layouts



(b) Staggered Layouts



(c) Front to End Layouts

Fig. 3.1.2 Open Space Requirements Between Adjacent Buildings in the Same Plot in Defferent Layouts

1.7.9.3 In case a building abuts two or more roads, the road front open space requirement specified in Sec 1.7.9.1 and 1.7.9.2 shall be applicable to all the road fronts of the plot (see Fig 3.1.1).

1.7.10 **Side and Rear Open Spaces**

1.7.10.1 The minimum side and rear open space requirements of a plot for buildings of various occupancy classes shall be as specified in Table 3.1.7.

1.7.10.2 For approved row type residential, commercial or other buildings as may be permitted by the respective city or area development authority and for approved low income row type, cluster or site and service schemes, the requirement of side open space may be waived.

1.7.10.3 For semidetached buildings approved by the city or area development authority, which are permitted to be constructed with one side on the property line, the minimum requirements of open space, specified in Sec 1.7.9, 1.7.10.1 and 1.7.10.2, for the side opposite to that property line shall be increased by 0.5 m. The requirement of open space for the remaining sides shall remain unchanged.

Table 3.1.7
Minimum Rear and Side Open Space Requirements of a Plot

Occupancy	Plot Size (m^2)	Minimum Rear Open Space (m)	Minimum Side Open Space (m)
Residential (Not higher than 10 storeys or 33 m)	Not over 135	1.25	Nil
	Over 135 to 200	1.5	1.25
	Over 200 to 265	1.75	1.25
	Over 265 to 330	2.5	1.25
See Note below	Over 330 to 660	3.0	1.25
	Over 660	4.0	1.25
Residential (Higher than 10 storeys or 33 m)	Any	4.0	3.0
Business and Mercantile (Not higher than 10 storeys or 33 m)	Any	1.5	1.5
Business and Mercantile (Higher than 10 storeys or 33 m)	Any	2.0	2.0
Educational, Institutional, Health Care, Assembly, Industrial, Storage and Hazardous	Any	3.0	3.0

Note : For residential buildings not higher than 10 storeys or 33 m, if the rear property line of the plot is curved or not a continuous straight line or not parallel with the building, the minimum rear open space requirement shall apply to the average distance of the rear property line from the building, but at no point shall the distance be less than 1.25 m.

1.7.11 **Interior Courtyard**

1.7.11.1 If any room depends entirely on an interior open space for its natural light and ventilation, such interior open space shall be in the form of an interior courtyard open to the sky over its entire cross-section. The interior courtyard shall have the minimum dimensions depending on the height of the building as specified in Table 3.1.8. The shorter side dimension of such interior courtyard shall not be less than one-third of the longer side dimension.

For buildings over 20 storeys high, the size of the interior courtyard shall not be less than the square of one-third the height of the tallest wall abutting the courtyard.

1.7.11.2 The courtyard shall not be interrupted by any form of construction at the courtyard level, except landscaping, sculpture etc.

1.7.11.3 If the courtyard is to serve as a component of the means of escape, it shall be accessible from all exit points at ground level.

1.7.12 **Permitted Construction in the Mandatory Open Space**

1.7.12.1 No construction except landscaping, sculpture etc. shall be permitted in the interior courtyard.

1.7.12.2 A maximum of one-third of the mandatory exterior open space in a plot required by the provisions of Sec 1.7.9 and 1.7.10 may be used for construction of garage, servants' quarter and other services auxiliary to and required for the main occupancy of the building, provided that the building is not higher than 10 storeys or 32 m, and provided further that conditions (a) to (g) below are satisfied:

a) No such construction permitted in the mandatory open space shall be higher than 2.75 m from the formation level of the plot, except for the tops of inverted beams or intermittent parapets, which may rise up to 3.25 m.

b) No window, door or ventilator shall be placed on any wall adjacent to the abutting property or street.

c) Entrance to the garage shall not be directly from the road. A minimum distance of 1.5 m shall be kept between the entrance to the garage and the property line adjoining the road.

d) Drainage from the roof or any other part of such construction shall not be allowed to discharge into the adjacent property. Drainage from any part shall not discharge directly into the street through spouts.

e) No structure or room shall be constructed over the garage or any other permitted service structure within the limits of the mandatory open space.

f) The roof of any construction permitted in the mandatory open space shall not be used as a balcony or a terrace or in any such manner that would interfere with the privacy of the occupants of the adjacent property.

g) No toilet shall be constructed adjoining the abutting property or street.

Table 3.1.8
Minimum Area of Interior Courtyard

No. of Storeys	Maximum Height (m)	Minimum Net Area of the Interior Courtyard, m^2
Up to 3	11	9
4	14	16
5	17	25
6	20	36
7	23	49
8	26	64
9	29	81
10	32	100
11	36	121
12-13	42	144
14-15	48	196
16-17	54	256
18-20	63	361

1.7.12.3 Roof or cornice of the building may be extended into the mandatory open space for a maximum distance of 0.5 m. The construction of the roof shall be such that rain or other water from the roof is not drained into the neighbouring property or street.

1.7.12.4 Sunshades over exterior doors or windows of the building may extend into the mandatory open space for a maximum distance of 0.75 m, provided that such sunshades are at least 2.5 m above the formation level of the ground.

1.7.12.5 Cantilever canopy at a clear height of at least 2.5 m above the formation level may project into the mandatory open space provided that a clearance of at least 1.5 m is maintained between the edge of the canopy and the property line. The top of such canopy shall not be used as a balcony and shall not be accessible from the building.

1.7.12.6 Balconies at levels higher than 6 m may project into the mandatory open space by not more than 0.9 m provided that a clearance of at least 1.5 m is maintained between the edge of the balcony and the property line.

1.7.12,7 Underground constructions such as water reservoirs, septic tanks, inspection pits, sewer lines etc. shall be permitted in the mandatory open space provided that no part of such construction projects more than 150 mm above the formation level.

1.8 GENERAL HEIGHT AND AREA LIMITATIONS

1.8.1 Not withstanding the requirements of open spaces and the height limitations specified in Sec 1.7, the maximum permissible height and area of a building shall not be more than the provisions of Sec 1.8.2 and 1.8.3.

1.8.2 **Height Limitations Based on Road Width**
1.8.2.1 The maximum height of any building of Type 1 construction shall not exceed the nominal value of two times the sum of the width of the front road and the front open space (distance between the front

property line and the building). For the purpose of fulfilling this requirement, the height limitations specified in Table 3.1.9 shall apply.

1.8.2.2 For plots having front road width not less than 23 m in an approved residential or business and mercantile area, there shall be no restriction on height for residential and business & mercantile buildings of Type 1 construction, provided the minimum open space requirements specified in Table 3.1.10 are satisfied.

1.8.2.3 For Type 2 construction, the maximum permissible height of the building shall be 4 storeys or 14 m for values of two times the sum of the width of the front road and the front open space not less than 13.6 m.

1.8.2.4 For Type 3 construction, the maximum permissible height of the building shall be 3 storeys or 11 m for values of two times the sum of the width of the front road and the front open space not less than 13.6 m.

1.8.2.5 For applying the provisions of Sec 1.8.2.1 through 1.8.2.4, the width of the front road for the layouts shown in Fig 3.1.1 (b), (c), (d), (e) and (f) where the plot abuts more than one road, shall be taken as the average of the widths of the abutting roads.

Table 3.1.9
Height Limitations Based on Road Width and Front Open Space

2 times (Front Road Width Plus Front Open Space)	Maximum Permissible Height					
	Type 1		Type 2		Type 3 (3)	
	No. of storeys	Height (m)	No. of storeys	Height (m)	No. of storeys	Height (m)
Below 10.6 m	3	11	2	8	2	8
10.6 m to below 13.6 m	4	14	3	11	2	8
13.6 m to below 16.6 m	5	17	4	14	3	11
16.6 m to below 19.6 m	6	20	4	14	3	11
19.6 m to below 22.6 m	7	23	4	14	3	11
22.6 m to below 25.6 m	8	26	4	14	3	11
25.6 m to below 28.6 m	9	29	4	14	3	11
28.6 m to below 31.6 m	10	32	4	14	3	11
31.6 m to below 34.6 m	11	36	4	14	3	11
34.6 m to below 37.6 m	12	39	4	14	3	11
37.6 m to below 40.6 m	13	42	4	14	3	11
40.6 m to below 43.6 m	14	45	4	14	3	11
43.6 m to below 46.6 m and so on in increments of 3 m	15	48	4	14	3	11

Note :
1. For plots with front road width (Sec 1.8.2.5) not less than 23 m, residential and business & mercantile buildings of Type 1 construction shall have no height restriction subject to additional open space requirements (Sec 1.8.2.2).
2. The maximum permissible height for Type 2 construction is 4 storeys or 14 m (Sec 1.8.2.3)
3. The maximum permissible height for Type 3 construction is 3 storeys or 11 m (Sec 1.8.2.4)

1.8.2.6 For buildings more than six storeys or 20 m high, the following arrangements shall be provided :

a) Lifts of adequate size, capacity and number (See Chap 5, Part 8);
b) Adequate fire protection and fire fighting arrangements (See Part 4);
c) Separate emergency fire escape stair.

Table 3.1.10
Minimum Open Space Requirements for Buildings of Unlimited Height and Area
(Sec 1.8.2.2 and 1.8.3.5)

Occupancy	Minimum Open Space		
	Front (m)	Rear (m)	Side (m)
Residential	4.0	6.0	4.0
Business and Mercantile or other	6.0	6.0	6.0

1.8.2.7 For buildings in the vicinity of airports or aerodromes, the height shall be limited by the requirements of the civil aviation authority, city or area development authority or other concerned agencies of the Government.

1.8.3 **Area Limitations Based on FAR**

1.8.3.1 The limiting total building area for different classes of Occupancy and Types of construction shall be based on the maximum permissible floor area ratio (FAR). For the purpose of this section, FAR shall be calculated as the total floor area of the building in all the storeys divided by the area of the plot.

1.8.3.2 The maximum permissible values of FAR for different classes of Occupancy and Types of construction shall be as specified in Table 3.1.11.

1.8.3.3 The FAR values specified in Table 3.1.11 are based on the following considerations :

a) that the approach roads to the plots do not suffer from traffic congestion problems of a serious nature;

b) that the use of the plot as well as that of the others in the area conform with the land use classification indicated in the master plan;

c) that adequate off street car parking facilities are created in conformity with the provisions of this Code;

d) that adequate utility services such as gas, electricity, water supply, drainage etc. are provided in accordance with the requirements of this Code;

e) that fire fighting facilities are available locally so that the fire brigade is able to arrive within half an hour of a distress call; and

Table 3.1.11
Maximum Permissible Floor Area Ratios (FAR)

Occupancy		Type of Construction		
		Type 1	Type 2	Type 3
Occupancy A : Residential	A 1	3.0	2.0	1.5
	A 2	UL	2.0	1.5
	A 3	UL	2.0	1.5
	A 4	4.5	3.0	1.5
	A 5	UL	2.0	1.5
Occupancy B : Educational	B 1	2.5	1.5	0.5
	B 2	2.0	1.5	0.5
Occupancy C : Institutional	C 1	3.0	1.5	0.5
	C 2	3.0	1.5	0.5
	C 3	3.0	1.5	0.5
	C 4	UL	NP	NP
Occupancy D : Health Care	D 1	6.0	1.5	1.0
	D 2	4.0	NP	NP
Occupancy E : Assembly	E 1	3.5	1.0	0.5
	E 2	3.5	1.0	0.5
	E 3	3.5	1.0	0.5
	E 4	3.5	1.0	0.5
	E 5	3.5	0.5	0.25
Occupancy F : Business and mercantile				
	F 1	UL	2.0	1.5
	F 2	4.0	1.5	1.0
	F 3	UL	2.0	1.5
	F 4	6.0	1.5	1.0
	F 5	3.0	NP	NP
Occupancy G : Industrial	G 1	7.5	1.5	1.0
	G 2	5.0	1.5	1.0
Occupancy H : Storage	H 1	6.0	1.5	1.0
	H 2	4.0	1.0	0.5
Occupancy J : Hazardous	J 1	3.0	NP	NP
	J 2	2.0	NP	NP

Note : UL : Unlimited, NP : Not permitted
For occupancy classification of buildings, see Sec 2.1
For classification based on type of construction, see Sec 3.1

f) that adequate fire protection measures are provided in the building in accordance with the requirements of this Code for the Occupancy class and Type of construction of the building.

1.8.3.4 The values of FAR specified in Table 3.1.11 shall be applicable in general, unless the city or area development authority specifies different values of FAR for a particular zone or area with the approval of the Authority. In specifying any deviation in FAR from Table 3.1.11, the city or area development authority shall take into consideration the following :

a) Occupancy group,
b) Type of construction,
c) Width of approach roads,
d) Traffic density in the approach roads,
e) Population density of the area,
f) Parking facilities,
g) Utility services,
h) Local fire fighting facilities.

1.8.3.5 For Occupancy for which unlimited area is permitted by Table 3.1.11, the minimum open space requirements specified in Table 3.1.10 shall be applicable.

1.8.3.6 For the purpose of calculating FAR, the area of any floor including basement, of which at least two-third is used exclusively for car parking and the remaining one-third is used for purposes such as mechanical plant room, electrical substation, security cabin, reception booth, water tank, pump house, stairs and lifts, which are accessory to the main occupancy, shall be excluded from the total floor area of the building.

1.8.4 The height limitations imposed in Sec 1.8.2 (Table 3.1.9) can be exceeded for stepped tower structures if the area limitations imposed by the FAR requirements of Sec 1.8.3 are not exceeded, provided the following conditions are satisfied :

a) the building is of Type 1 construction;

b) the front road width is at least 9 m;

c) local conditions or regulations do not restrict the height (Sec 1.8.2.7);

d) the minimum ground level open spaces of Table 3.1.10 are maintained as for buildings of unlimited height;

e) every part of the building is contained within the envelope shown in Fig 3.1.3, which is a volume bounded by vertical sides at required distances from the property line up to the height limited by the requirements of Sec 1.8.2, topped by a pyramid with sides inclined at 2 vertical to 1 horizontal.

1.9 OFF STREET PARKING SPACES

1.9.1 Every building shall be provided with adequate arrangements for entrance, exit, loading, unloading and parking of vehicles. The parking spaces can be either covered or open.

1.9.2 Ramps, if provided, shall have a grade not steeper than 1 vertical to 8 horizontal.

1.9.3 The parking space shall be provided either within the building or adjacent to it within the plot.

1.9.4 A 23 m^2 space shall be allotted for parking of each car. The number of parking spaces required shall be based on the total floor area of the building and shall depend on its occupancy. Parking spaces shall be provided for various occupancies at the following minimum rates :

Occupancy	Parking Requirement
A. Residential (A1 & A2)	1 car for every 300 m^2
" (A5)	1 car for every 200 m^2
B. Educational	1 car for every 200 m^2
C. Institutional	1 car for every 300 m^2
D. Health Care	1 car for every 300 m^2
E. Assembly	1 car for every 20 occupants or 100 m^2
F. Business and Mercantile (F1)	1 car for every 200 m^2
" (F5)	1 car for every 100 m^2
G. Industrial	1 car for every 300 m^2
H. Storage	1 car for every 25 occupants
J. Hazardous	1 car for every 25 occupants

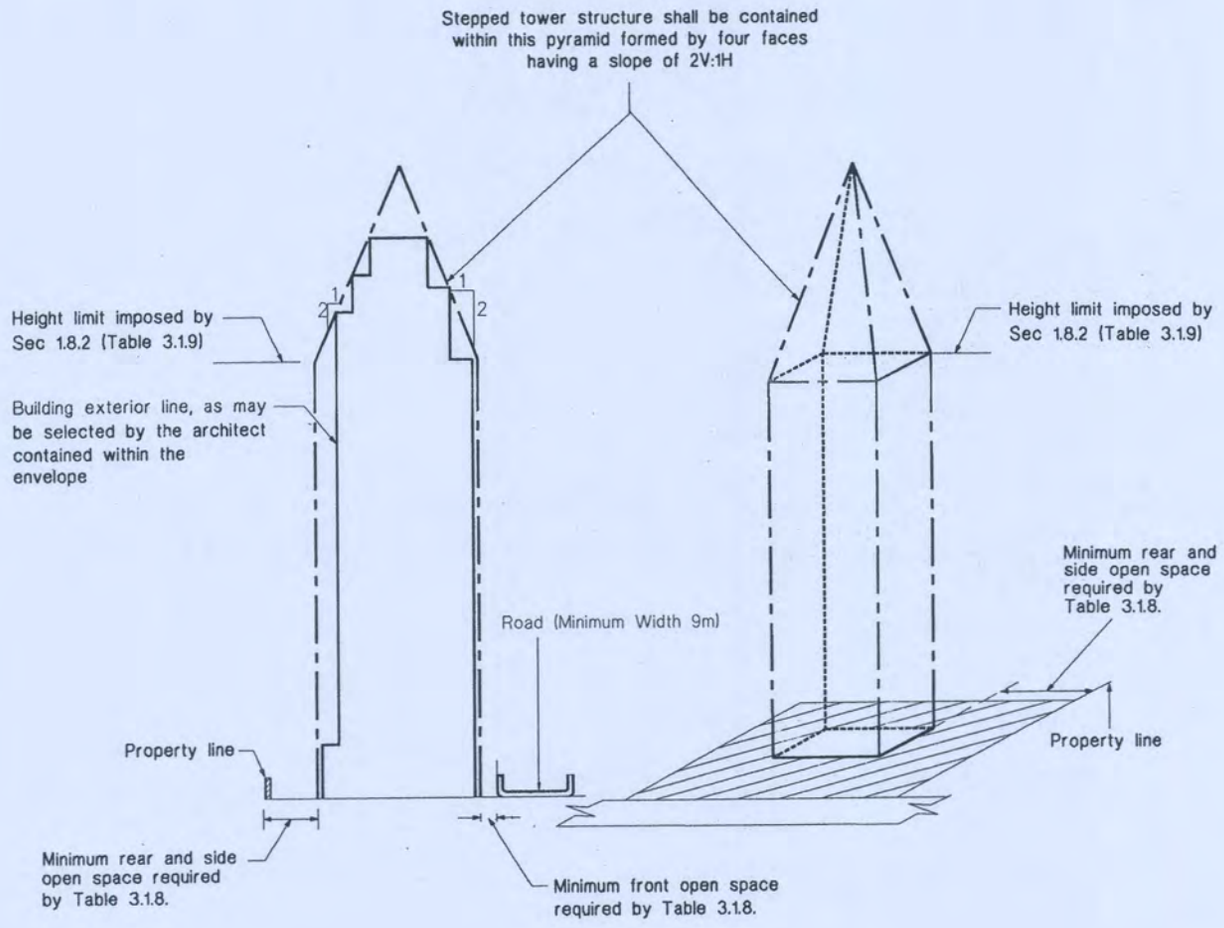


Fig. 3.1.3 Limiting Envelope for Stepped Tower Structures

1.9.5 For storage and industrial buildings, required space for loading and unloading of at least one truck/lorry shall be provided.

1.9.6 When administrative or sales offices are located in the industrial premises, parking space for one car for every 300 m^2 of the office area shall be provided in the premises.

1.9.7 For residential buildings with front road width not less than 9 m, the parking space requirements may be reduced or waived provided the road is not too busy to preclude on street parking. The city or area development authority shall earmark all such streets where on street parking for adjacent residential property is not permitted.

1.9.8 In planned commercial developments, where separate car parking facilities are available, the parking space requirements of neighbouring buildings may be reduced or waived. The city or area development authority shall have all such commercial areas and commercial plots identified in the master plan.

1.9.9 In areas other than metropolitan cities, the city or area development authority may waive or alter the minimum parking requirements with the approval of the Authority.

1.10 STREET ENCROACHMENT

No part of any building shall project beyond the property line or building line established by the provisions of this Code into the street, except the following :

a) Below Grade : The footing of the boundary wall adjacent to the street may encroach the street land not more than 0.3 m at least 1.5 m below grade.

b) Above Grade : Marquee, canopy or other temporary projection of cantilever type from buildings of business and mercantile occupancy may project on the footpath of a road, provided that no part of such projection is below a height of 3 m from the footpath level and that the outer edge of the canopy is at a minimum clear horizontal distance of 0.25 m from the road side edge of the footpath. The canopy shall be so constructed as to be readily removable without endangering the building structure. No canopy shall project into a street without a footpath.

1.11 COMMUNITY OPEN SPACE AND AMENITIES

1.11.1 Community Space for a Single Tall Building

For all residential or residential-cum-business buildings having ten or more storeys, community space at the rate of 5% of the total floor area shall be provided either within the building or outside within the premises solely for use of the occupants of the building. Roofs of such buildings shall not be considered as community open spaces. For residential or residential-cum-business plots measuring more than 0.1 hectare, 10% of the area of land shall be left vacant to be used as children's playground. This playground shall be contiguous and shall have a length not exceeding 2.5 times its width. The playground may extend into the mandatory open space of the plot.

1.11.2 Community Space for a Group of Buildings in One Plot

1.11.2.1 For all plots on which more than one residential or residential-cum-business buildings are constructed, community space at the rate of 5% of the total floor area of all the buildings shall be provided either within the buildings or outside within the premises. Roofs of such buildings shall not be considered as community open spaces.

1.11.2.2 A single storeyed structure such as a pavilion not exceeding 25 m^2 in area shall be permitted to be constructed in such community spaces, which area shall be excluded from the FAR calculations. No toilet block shall be permitted in such a structure.

1.11.2.3 Each community area or the structure built thereon shall be accessible either directly from each building on the plot or by an independent means of access.

1.11.2.4 No building shall extend beyond 3 m of the boundary of the community space.

1.11.2.5 Such community open spaces shall cater only to the needs of the immediate community contiguous to the open space and shall not be made available for use of outsiders.

1.11.3 Community Open Space for Industrial Buildings

A minimum of 10% of the total area but not exceeding 0.25 hectare of every industrial plot having an area of 1.0 hectare or more, shall be reserved as community open space. Such area shall be contiguous and shall have a means of access from every unit of the industry for recreational activities of the persons working in the industry.

1.11.4 Community Open Space Zones in Area Layouts

1.11.4.1 Residential or Business Areas : In dividing any land measuring a total of 0.4 hectares or more into residential or business plots, community open spaces shall be reserved for recreational purposes of the population for which the layout is planned. The minimum requirement of open spaces in a layout shall be as follows :

a) 15% of the area of the planned layout, or

b) 2000 m^2 for every 1000 persons. For approved low income housing schemes this limit may be reduced to 1000 m^2 for every 1000 persons.

The community open space in residential or business layouts shall as far as practicable be provided in one place or planned out to serve the community in clusters or groups. No such community open space plot shall be less than 400 m^2 in area. The shape of the plot shall be such that the length is not more than 2.5 times its width.

1.11.4.2 Industrial Areas : In dividing any land measuring a total of 1 hectare or more into industrial plots, 5% of the total land area shall be reserved as amenity open space which shall be used as lawn, park or garden. The minimum size of such open space shall be 600 m^2. When the area of the open space exceeds 1000 m^2, the area of land in excess of 1000 m^2 can be used for the construction of buildings for banks, clinics, welfare centres and other common facilities for use of the persons working in the industries.

1.12 REQUIREMENTS OF PARTS OF BUILDINGS

1.12.1 Plinth and Formation Levels

The plinth and formation levels of the building and the plot shall conform to the requirements of Sec 1.5.3.

1.12.2 Room Dimensions

1.12.2.1 Ceiling Heights

a) All habitable rooms in non-air-conditioned residential and business & mercantile buildings, apart from kitchen, store room, utility room, box room and garage, shall have a ceiling height not less than 2.75 m measured from the finished surface of the floor to the under side of the finished ceiling, or false ceiling. A maximum of one-third of the floor area of such habitable rooms may, however, have a minimum ceiling height of 2.44 m. For air-conditioned rooms in such buildings, the minimum ceiling height shall be 2.44 m.

In the case of pitched roof without a horizontal ceiling the lowest point of the finished ceiling shall be at least 2 m above the finished surface of the floor and the average height of the ceiling shall not be less than 2.44 m.

b) The minimum clear head room under the ceiling, folded plate, shell etc. and under the false ceiling or duct in an air-conditioned room shall not be less than 2.44 m. The minimum clear distance between the floor below and the soffit of a beam shall not be less than 2.15 m.

c) The requirements of ceiling height for buildings of occupancy other than residential and business & mercantile shall be as follows :

Occupancy	Minimum Ceiling Height
Educational, Institutional, Health Care, Assembly.	3 m for non-air-conditioned and 2.6 m for air-conditioned buildings.
Industrial, Storage, Hazardous.	3.5 m for non-air-conditioned and 3.0 m for air-conditioned buildings.

1.12.2.2 Room Sizes : Every dwelling unit in a residential building shall have at least one room which shall have not less than 9.5 m^2 of floor area with a minimum width of 2.5 m. Other habitable rooms in the dwelling unit shall have a minimum area of 5 m^2 each with a minimum width of 2 m.

1.12.3 Kitchen

1.12.3.1 The minimum clear height of kitchen measured from the finished surface of the floor to the finished ceiling shall be 2.75 m, except for any floor trap of the upper floor which shall have a minimum clearance of 2.15 m above the finished floor. The minimum clear height of kitchen shall be 2.15 m where mechanical exhaust is installed.

1.12.3.2 The minimum floor area of kitchen without provision for dining shall be 4 m^2 with a minimum width of 1.5 m. The minimum floor area of a kitchen which is intended to provide dining or occasional sleeping space shall be 7.5 m^2 with a minimum width of 2.2 m.

1.12.3.3 Every kitchen shall be provided with a kitchen sink or other means for washing utensils. The waste water shall be discharged into the waste water pipe or drain.

1.12.3.4 The floor of the kitchen shall be water tight .

1.12.3.5 Every kitchen shall be provided with window having a minimum area of 1 m^2 which shall open to the exterior or to an interior open space of adequate dimensions (see Sec 1.7.11).

1.12.4 Bathroom and Toilets

1.12.4.1 The height of any bathroom, toilet or water closet shall not be less than 2.15 m measured from the finished floor surface to the finished ceiling or false ceiling or to the lowest point of any trap of the upper floor's plumbing system.

1.12.4.2 The minimum floor area of a bathroom where water closet and bathing facilities are combined shall be 2.8 m^2 with a minimum width of 1 m. For bathrooms without water closet, the minimum area shall be 1.5 m^2 with a minimum width of 1 m. The minimum area of a toilet with water closet only shall be 1.2 m^2 with a minimum width of 1 m. Three fixture bathrooms containing bathing, hand washing and water closet facilities shall have a minimum area of 3 m^2 with a minimum width of 1.25 m.

1.12.4.3 No bathroom or toilet containing water closet shall open directly into any kitchen or cooking space by a door, window, ventilator, fanlight or any other opening. Every such bathroom or toilet shall have a door completely shutting it off from the exterior.

1.12.4.4 Every bathroom, toilet and water closet shall be located against an exterior wall or wall on the interior open space (see Sec 1.7.11), except where they are ventilated through an interior lighting and ventilation shaft. Such interior lighting and ventilation shafts shall have the minimum dimensions specified in Table 3.1.12 for different heights of buildings. In addition, shafts for buildings exceeding 6 storeys or a height of 20 m shall be mechanically ventilated. All shafts must be accessible at the ground floor level for cleaning and servicing purposes.

Table 3.1.12
Minimum Dimensions of Lighting and Ventilation Shaft

Building Height		Minimum Net Cross-sectional Area of Shaft (m^2)	Minimum Width of Shaft (m)
No. of Storeys	Height (m)		
Up to 3	Up to 11	1.5	1.0
4	14	3.0	1.2
5	17	4.0	1.5
6	20	5.0	2.0
Over 6*	Over 20	6.5	2.5
* Mechanical ventilation of the shaft shall be provided for buildings over 6 storeys high. Shaft dimensions shall conform to mechanical design considerations.			

1.12.4.5 Floors of bathrooms, toilets or water closets shall be treated with water repellent material and shall be water tight. All bathroom walls or partitions shall be treated with non-absorbent water repellent smooth impervious finish material to a height of not less than 1 m above the finished floor level. The floor shall be sloped gently towards gratings or openings of the floor traps.

1.12.5 **Stair case**

1.12.5.1 Limiting Dimensions : The minimum width of the staircase for various occupancies shall be as specified in Table 3.1.13.

Table 3.1.13
Limiting Dimensions of the Staircase

Occupancy			Minimum Width of Stair (m)
A.	Residential Buildings		
	A1	Detached Single Family Dwelling	1.0
	A2	Flats or Apartments	1.15
	A3	Mess, Boarding House and Hostel	1.25
	A4	Minimum Standard Housing	See Appendix A
	A5	Hotels and Lodging Houses	1.25
B.	Educational Buildings		1.5
C.	Institutional Buildings		1.5
D.	Health Care Buildings		2.0
E.	Assembly Buildings		2.0
F.	Business and Mercantile Buildings		
	F1	Offices	1.5
	F2	Small Shops and Markets	1.5
	F3	Large Shops and Markets	2.0
	F5	Essential Services	1.5
		All Other Buildings	1.25

1.12.5.2 Combination of the riser and the tread dimensions shall be such that the sum of the riser height and the tread depth shall be between 400 mm and 425 mm with a minimum tread depth of 215 mm and a maximum riser height of 215 mm. The tread depth may include any nosing and any increase due to slant riser faces. The variation between depths of adjacent treads and heights of adjacent risers shall not exceed 5 mm. The difference between the largest and the smallest riser or between the largest and the smallest tread shall not exceed 2 per cent of the respective average dimensions in any flight of stairs .

1.12.5.3 The number of steps in a single flight shall be limited to 15.

1.12.5.4 The minimum clear head room between flights of a staircase shall be 2.15 m. The clear head room may be reduced to 2.03 m for not more than three flights in any staircase.

1.12.5.5 The minimum clear height of any passage below a landing providing access to non-habitable and service spaces shall be 2.03 m. The minimum clear height of all other passages and spaces below a landing shall be 2.15 m.

1.12.5.6 Handrails shall have a minimum height of 0.9 m measured from the nose of stair to the top of the handrail. When children are likely to use the stairs, the balustrade design shall incorporate adequate child safety measure.

1.12.6 **Mezzanine Floor**

1.12.6.1 The total area of mezzanine floors in a building shall not exceed one-third the plinth area of the building. The area of the mezzanine floors shall be included in calculating the FAR.

1.12.6.2 The clear headroom both over and under the mezzanine floor shall be at least 2.2 m.

1.12.6.3 The lighting and ventilation of the space both over and under the mezzanine floor shall not be obstructed in any way.

1.12.7 **Lofts**

1.12.7.1 The minimum height of a loft shall be 1.5 m and it shall not be used as a habitable space.

1.12.7.2 The minimum height requirements for various rooms specified under Sec 1.12.2, 1.12.3 and 1.12.4 shall be maintained under the loft.

1.12.7.3 A maximum of 25% of the floor area of any room may be covered by a loft, except bathrooms, toilets, water closets, store rooms and corridors where the whole area may have an overhead loft.

1.12.7.4 The loft shall not interfere with the lighting and ventilation of any room.

1.12.8 **Cabins or Chambers**

1.12.8.1 Cabins or Chambers created by removable partitions on an open floor shall have a minimum area of 3 m^2.

1.12.8.2 Clear passages at least 0.75 m wide shall be maintained between the cabins leading to a means of exit which shall in no case be further than 16 m from any cabin.

1.12.8.3 A clear gap of at least 300 mm shall be maintained between the top of the partition walls enclosing the cabin and the ceiling, unless the cabin is exposed to the exterior deriving natural light and ventilation or is artificially lighted and ventilated.

1.12.9 **Store Room**

A store room provided in a dwelling unit of a residential building shall have a minimum area of 1.5 m^2 with a minimum width of 1 m. The clear height of the store room shall not be less than 2.2 m.

1.12.10 **Private Garage**

A private garage in a residential building shall have a minimum clear height of 2.03 m. The length of the garage shall not be less than 4.5 m. The width of the garage for a single car shall be at least 2.6 m and for two cars shall be at least 5 m.

1.12.11 **Basement**

1.12.11.1 Any underground floor of a building wholly or partially below formation level shall be called a basement and shall satisfy the requirements of the following sections.

1.12.11.2 Subject to the provision of Sec 1.8.3.6, the area of the basement shall be included in the calculation of FAR.

1.12.11.3 The walls and floors of the basement shall be damp-proof and waterproof (see Chap 3, Part 6). The basement shall be protected against surface water and drainage waste intrusion.

1.12.11.4 The basement shall have natural lighting and ventilation or shall be artificially lighted and ventilated.

1.12.11.5 The portion of the staircase below the ground floor level shall be secluded by a fire wall or fire separation assembly having a minimum fire resistance time of 2 hours. Independent open staircase and open ramps for access to the basement from the ground floor or the street level shall be permitted.

1.12.11.6 The slope of any ramp provided shall not be steeper than 1 vertical in 8 horizontal.

1.12.11.7 The clear height of the basement below soffit of beams shall not be less than 2.03 m.

1.12.11.8 The floor and the walls of the basement shall be made damp-proof in accordance with the provisions of Sec 3.13 of Part 6.

1.12.12 **Entrance to the Building**

All buildings shall have a covered entrance or other covered area for callers waiting at the door. The main entrance door to the building shall not open into an uncovered exterior.

1.12.13 **Roof Drainage**

1.12.13.1 The roof of a building shall be constructed in such a manner that rain water is drained freely away from the building without causing dampness of the roof or the walls of the building or of an adjacent building.

1.12.13.2 Water from the roof shall not be discharged into the adjacent property or street.

1.12.13.3 For one or two storeyed buildings with flat or pitched roof, rain water may be discharged directly to the ground, in which case the roof shall have extended eaves or cornices to direct the water away from the walls.

1.12.13.4 For other buildings, gutters or parapets shall be provided to direct the water to the piping of an adequate rain water drainage system.

1.12.13.5 The roof shall be impermeable or shall be treated with an impervious material to make it effectively water tight. Flat concrete roofs shall be topped with an impervious layer of lime concrete or other effective means of waterproofing. All flat roofs shall be sloped gently towards gutters, gratings or mouths of the rain water drainage pipes.

1.12.14 **Parapet**

All accessible flat roofs shall be enclosed by parapets or hand rails having a height of at least 1 m. All such parapets and hand rails shall be designed to withstand the lateral forces due to wind and occupancy in conformity with the provisions of Part 6 of this Code.

1.12.15 **Septic Tank**

A septic tank shall be provided within the premises for disposal of sewage, where no public sewer is available. The location, design and construction of the septic tank shall conform with the requirements of Chapter 7, Part 8 of this Code.

1.13 LANDSCAPING

1.13.1 Plantation of trees and shrubs within the open spaces of a plot aimed at enhancing the environmental quality of the building shall comply with the requirements of this section.

1.13.2 Trees and shrubs shall be planted judiciously to meet the requirements of shade and sunshine, to control noise and dust, to provide privacy and to improve visual quality, without jeopardizing natural ventilation and lighting of a building.

1.13.3 Species of trees shall be so chosen and planted that their roots do not endanger the building foundation and their branches do not interfere with the building superstructure. This shall be achieved by maintaining sufficient distance between the trees and the building depending on the species of the tree.

1.14 DAMP-PROOFING AND WATERPROOFING OF FLOORS AND WALLS

1.14.1 All floors at the ground floor level and all foundation and plinth walls shall be made damp-proof and waterproof.

1.14.2 Protective measure shall be taken to eliminate rising damp in ground floor walls by including a RC grade beam at the plinth level. The grade beam may be dispensed with if an approved membrane is applied at the plinth level. If no beam or membrane is provided a damp-proof course (DPC) shall be placed along all the walls at the plinth level. Such damp-proof course shall be made of a rich cement concrete having a thickness of 75 mm and shall be finished with two coats of bitumen.

1.14.3 Foundation, floor and walls below grade shall be damp-proofed and waterproofed in accordance with the provisions of Sec 3.13 of Part 6.

1.15 EXISTING BUILDINGS

1.15.1 Existing buildings and structures in their present occupancy condition shall not be required to be in full compliance with all the requirements of this Code. Additions or alterations to such existing buildings or change of use thereof shall not be permitted if such addition, alteration or change of use is likely to render the building more hazardous with respect to fire safety, life safety and sanitation than it was before.

1.15.2 Any horizontal or vertical extension of an existing building or any change of use thereof shall subject the altered building or occupancy to the provisions of this Code for a new building. The building together with the additions and changes shall not exceed the height, area and open space requirements for new buildings specified in this Code.

1.15.3 All buildings and structures, both new and existing shall be maintained in a safe and sanitary condition as provided for in this Code. To determine compliance with this requirement, the Authority may cause the building or structure to be periodically inspected.

1.15.4 Any proposed change in an existing building or structure shall have to satisfy the requirements set forth in Part 9 of this Code.

1.16 BUILDINGS AND PLACES OF HISTORICAL OR ARCHITECTURAL VALUE

1.16.1 All historic buildings and places identified, listed and classified so by the appropriate agency of the Government under the Act of Antiquity shall be deemed to be protected. Any change of use, repair, alteration or extension of such buildings shall be in compliance with the requirements of this section and those of the Department of Archaeology of the Government.

Similarly, buildings and works under the jurisdiction of and identified by the Authority as having architectural value shall be exempted from satisfying some of the provisions of this Code as specified in Sec 1.16.2 below. The owner of any such building may also apply to the Building Official for enlistment as a building with architectural value. To be so identified, a building shall have been in existence for at least 20 years from the date of its completion. To determine whether the building or work is architecturally valuable, the Authority shall appoint a standing committee comprising noted experts from the fields of Architecture, Planning, Engineering, History, Art, Literature or any other discipline which may be deemed relevant. The committee shall identify a building as architecturally valuable if, in their judgement, the building possesses distinctive architectural features, has cultural or symbolic value, has become part of the heritage, or bears testimony of some historical event. In addition to satisfying the requirements of Sec 1.16.2 below, any proposed repair, alteration or addition to such buildings must also have the approval of the standing committee who shall have to be satisfied that the proposed changes will not impair the aesthetic quality and architectural character of the building.

1.16.2 Repairs, alterations and additions necessary for the preservation, restoration, rehabilitation, continued use or adaptive reuse of such historic buildings and structures, and of buildings and works of architectural value may be exempted by the Authority from having to be in full compliance with all the requirements of this Code, provided that the restored building or structure will be no more hazardous, if any, than the existing conditions in terms of life safety, fire protection and sanitation.

See also Sec 1.5 of Part 1 and Sec 3.8 of Part 2.

1.17 VENTILATION, LIGHTING AND SANITATION

1.17.1 All rooms and interior spaces designated for human occupancy shall be provided with means of natural or artificial lighting and natural or mechanical ventilation.

1.17.2 All buildings shall have water and sanitation facilities as provided for in this chapter and in Chapters 6 and 7 of Part 8.

1.17.3 Every kitchen shall have facility for washing of utensils.

1.17.4 Every building or independent unit thereof shall be provided with at least one water closet.

1.17.5 All naturally ventilated and illuminated interior spaces, staircases and other areas of human occupancy in a building shall have windows or ventilators opening directly to the exterior or an interior open space or to a verandah. Ventilation of bathrooms may also be achieved through ventilation shafts as provided for in Sec 1.12.4.4.

1.17.6 All habitable and non-habitable spaces within a building shall have the following minimum aggregate area of openings in the exterior wall, excluding doors, expressed as percentage of the net floor area :

Habitable rooms such as those used for sleeping, living, study, dining etc.	15%
Kitchens	18%
Non-habitable spaces such as bathrooms, store, staircase and other utility	10%

1.17.6.1 Notwithstanding the provision of 1.17.6 an enclosed staircase shall have exterior windows not less than 1 m^2 in area on every floor through which the stairway passes.

1.17.6.2 Toilet and bathroom windows shall open to the exterior or an approved ventilation shaft and the openable area shall not be less than 1 m^2 .

1.17.7 The required minimum average intensity of illumination in a habitable space at a height of 750 mm above the floor level shall be 65 lux. Any point in a room more than 7 m away from an exterior window shall be considered to be not illuminated by daylight unless measurement of illumination gives an intensity of 65 lux or more.

1.17.7.1 The required intensity of illumination for various tasks in a building shall be as specified in Chapter 1 of Part 8.

1.17.7.2 Whenever the illumination achieved by daylight is not sufficient or occupancy at night is necessary, artificial lighting shall be installed to supplement daylight, or to provide the required night lighting, in accordance with the provisions of Chapter 1 of Part 8.

1.17.8 The requirements of opening areas specified in Sec 1.17.6 shall suffice for ventilation provided that the windows or ventilators forming the opening are openable. When part of the window area is made of fixed glazing, the openable portion only shall be counted in aggregating the opening area.

1.17.8.1 The net clear opening area required for supplying oxygen for breathing shall be taken as 5% of the floor area.

1.17.8.2 Mechanical ventilation, when provided, shall conform to the requirements of Chapter 3 of Part 8.

1.18 AIR-CONDITIONING AND HEATING

All air-conditioning and heating equipments shall be selected and installed in accordance with the requirements of Chapter 3 of Part 8.

1.19 PROVISION OF LIFTS AND ESCALATORS

Wherever required by this Code or desired by the owner for comfort, lifts and escalator facilities shall be planned, designed and installed in accordance with the provisions of Chapter 5 Part 8.

1.20 SOUND INSULATION

Acoustical design of a building to attain the desired noise levels shall be performed in accordance with the provisions of Chapter 4 of Part 8.

1.21 THERMAL INSULATION

Thermal comfort in a building shall be achieved through adequate ventilation and thermal insulation of walls and roof.

1.22 LIGHTNING PROTECTION OF BUILDINGS

Lightning protection measures shall be installed on all buildings whose exposure conditions indicate the likelihood of lightning strike and consequential hazard to life and property. Buildings housing explosives or detonators, buildings where a large number of people live or congregate and those that are of strategic or defence importance shall always be protected against lightning strikes. The requirement of lightning protection systems shall be assessed and they shall be designed and installed in accordance with the provisions of Chapter 2 of Part 8.

1.23 RAT PROOFING AND TERMITE PROOFING OF BUILDINGS

Rat proofing and termite proofing measures shall be undertaken on the basis of the degree of protection desired from rats and termites. Any chemical used for the control of rats and termite shall be free from environmental hazards.

1.23.1 **Rat Proofing**

1.23.1.1 Buildings supported directly on the ground, for which rat proofing is required, shall have continuous foundation walls extending from at least 600 mm below the ground level to at least 150 mm above the ground level. The floor of such buildings shall be of continuous masonry or reinforced concrete or any other effective rat proof construction.

1.23.1.2 Openings in such buildings shall be made rat proof. Doors and windows shall be tight-fitting. Drains, construction joints or other junctions shall be tight-fitting and shall have a protection with grillage or screening or shall be properly closed with metal sheet or masonry or concrete cover.

1.23.1.3 Commercially available chemicals which are repellent or lethal to rats and which do not constitute environmental hazard may be used in buildings according to the manufacturer's instructions.

1.23.2 **Termite Proofing**

The provisions of this section shall apply to buildings where termite infestation may be a problem and measure for protection against termite is considered necessary.

1.23.2.1 Constructional Measures

a) The site of any building shall be cleared of any scrap timber, wooden debris, roots, leaves, stumps or other organic matter. Such debris shall not be buried or accumulated near the building or under the floor or under the foundation.

b) The area underneath the building and its surroundings shall be properly drained and water shall not be allowed to accumulate in such areas. Access of water into these areas from the surroundings shall be effectively prevented.

c) No void or opening or cracks shall be allowed in the foundation or floor or its sub-base. All earth filling in the sub-base and the surroundings shall be free from roots, leaves or other organic matters and properly rammed to prevent any subsidence or formation of voids or cracks. Joints in the foundation or floor or its sub-base shall be properly sealed. Joints in the upper layer shall be staggered from the sub-base.

d) If timber is used in a building, it shall be capable of resisting the attacks of termite or fungi.

e) All masonry works of lime mortar to be exposed to soil shall have a mix ratio of no leaner than 1:3.

f) Vertical joints between the floor and the plinth masonry shall be filled with heavy grade coal tar pitch.

g) In buildings where high degree of termite proofing is necessary, anti-termite construction or termite shields, termite caps or termite grove may be used. (See Appendix B)

1.23.2.2 Pre-constructional Chemical Treatment

a) Termite mounds within the plinth area of a building shall be destroyed with insecticides in the form of water suspension or emulsion. The mound shall be opened at several places onto which suspension or emulsion of the insecticide shall be poured. The mix ratio of the emulsion and the volume of such emulsion to be used may be determined from manufacturer's instructions, or 4 litre for about 1 m^3 of the mound may be used with the following emulsions (expressed in concentration by weight):

- 5 per cent DDT
- 0.5 per cent BHC
- 0.25 per cent dieldrin
- 0.25 per cent aldrin
- 0.5 per cent heptachlor
- 0.5 per cent chlordane

b) Complete and continuous chemical barriers may be formed under the whole of the structure to be protected. All foundations shall be fully surrounded by a barrier of treated soil. The barrier shall be formed with commercially available termite repellent chemicals according to the manufacturer's instructions or any of the following chemicals in water emulsion is effective when applied uniformly over the area to be treated:

- 0.5 per cent dieldrin
- 0.5 per cent aldrin
- 0.5 per cent heptachlor
- 1 per cent chlordane

Treatment of the soil shall be undertaken when excavation is complete and ready for pouring of foundation concrete or laying of form work. (See Appendix B)

Note : The use of chemicals specified in Sec 1.23.2.2 shall be permissible in applications for termite proofing of buildings as long as any of these are not prohibited by the Government for environmental or other reasons for such application. In such cases the relevant chemical shall be deemed to be deleted from the lists given in Sec 1.23.2.2.

1.23.2.3 Treatment for Existing Buildings

a) Termites detected in a building shall be exterminated by applying oil or kerosene based solution of either dieldrin 0.5 per cent concentration or chlordane 1.0 per cent concentration by weight. Other commercially available chemicals may be used as per instructions of the manufacturer.

b) Existing buildings may be protected against termites by treating the soil adjacent to or under the building with a chemical toxicant that kills or repels termites. One of the emulsions specified in Sec 1.23.2.2(b) or any other environment friendly commercially available chemicals may be used for such termite protection work.

i) The soil in contact with the outer vertical surface of the foundations shall be treated with 15 litre/m^2 of the vertical surface. Such treatment shall extend up to a depth of 500 mm from the ground level but shall not extend below the top of the footing. Emulsions may be sprayed on the foundation surface by opening trenches or by pouring into holes.

ii) The soil below any opening in the floor through which termites are likely to seek entry into a building shall be treated with emulsions. Holes of diameter 12 mm at an interval of 300 mm shall be drilled in the floor along cracks, construction joints or any other opening and emulsions shall be pumped in until refusal or up to a maximum of 1 litre per hole.

iii) For protection of masonry walls against termites, holes shall be made on such walls on both sides at critical points like wall corners and where door and window frames are embedded in the floor or wall at 300 mm interval. The holes shall have a downward slant of 45° through which emulsions shall be applied with a manually operated pump till refusal or to a maximum of 1 litre per hole. The holes shall be sealed after the treatment.

1.23.3 **Inspection**
Periodic inspections shall be undertaken for effective protection against rats and termites.

1.24 REQUIREMENTS FOR BUILDINGS IN FLOOD PRONE AND COASTAL REGIONS OF BANGLADESH

The specifications of this section shall be applicable to all buildings located in the flood or surge prone areas in addition to other requirements of this Code.

a) The planning and development control authority of the city, township, municipality or region where this Code is intended to be applied shall delineate any area having a potential for being flooded under at least 1 m deep water due to flooding as Flood Prone Area (FPA). The provisions of Sec 1.24.1 shall be applicable to areas designated as FPA. There shall be a design flood level in the FPA's which shall be recommended by the Authority to be used in interpreting the provisions of this section.

b) Similar delineation shall be made in the coastal regions on the basis of expected occurrence of a surge or wave run-up of 1 m or higher. Such areas shall be designated as Surge Prone Area (SPA). The provisions of Sec 1.24.2 shall be applicable to buildings located in the SPA's. There shall be a design surge height in the SPA's which shall be recommended by the Authority to be used in interpreting the provisions of this section.

1.24.1 **Flood Prone Areas**

1.24.1.1 Elevation : The lowest floor including the basement of any building located in the FPA shall not be located below the design flood level. For buildings of height two storey or less the roof shall be accessible with an exterior stair. For buildings three storeys or higher, the floor immediately above the design flood level shall be accessible with an exterior stair.

Exceptions:
1. Except for Occupancy A (Residential), any occupancy may have floors below the design flood level in accordance with the provisions of Sec 1.24.1.3.
2. A floor of Occupancy A (Residential) may be constructed below the design flood level provided the building has at least another floor of Occupancy A above the design flood level. Such floors shall comply with the requirements of Sec 1.24.1.2 and 1.24.1.3.
3. Floors which are used only for building access, exits, foyers, storage or parking garages may be located below the design flood level in accordance with the provisions of Sec 1.24.1.2.

1.24.1.2 Enclosures below Design Flood Level : There shall be no enclosed space below the design flood level except for building access, exits, foyers, storage and parking garages. There shall be vents, valves or other openings in the walls of the enclosed spaces which shall equalize the lateral pressure of the water. The bottom of such openings shall not be higher than 300 mm above the finished grade. There shall be at least one opening for each enclosure in a building but the total number of such openings shall be at least two. The total net area of openings for an enclosure shall be at least 0.4 m^2, or 7 per cent of the floor area of the enclosure, whichever is greater.

1.24.1.3 Flood-resistant Construction : Floors constructed below the design flood level under the provisions of Exceptions in Sec 1.24.1.1 shall comply with the following requirements:

a) Floors and exterior walls of such floors shall have a construction impermeable to the passage of water.

b) Structural components of such floors shall be capable of resisting the hydraulic and buoyant forces resulting from the occurrence of floods at the design flood level. Design requirements in such cases are specified in Chapter 1, Part 6.

c) Vents, openings and valves provided below the design level shall have water-tight closures capable of resisting any structural forces resulting from the occurrence of the design flood.

d) Penetrations made for electrical, mechanical or plumbing installations shall be made water-tight to prevent any penetration of flood water. Sewerage systems having opening below the design flood level shall have a closure device to prevent backwater flow during the occurrence of floods.

1.24.2 **Surge Prone Areas**

1.24.2.1 Elevation : The lowest floor including the basement of any building in a surge prone area shall not be located below the design surge height. For buildings of height two storey or less the roof shall be accessible with an exterior stair. For buildings three storeys or higher, the floor immediately above the design surge level shall be accessible with an exterior stair.

Exception:
Footing, mat or raft foundations, piles, pile caps, columns, grade beams and bracings may be constructed below the design surge height.

1.24.2.2 Enclosures below Design Surge Height : Spaces of a building in the SPA's below the design surge height shall not obstruct any flow of water during the occurrence of surge.

Exception:
Structural or non-structural members serving as entries or exits may be constructed below design surge height.

1.24.2.3 Foundations : Foundations of the buildings erected in the SPA's shall be located well below the ground level so that they are protected from erosion or scour during the occurrence of surge. If piled foundations are used, they shall be designed to withstand with adequate factor of safety the loss of support due to scour. Design of the foundations shall conform to the requirements of Chapter 3, Part 6.

Related Appendices

Appendix A	Guidelines for the Development of Minimum Standard Housing (Occupancy A4)
Appendix B	Suggestive Typical Termite Proof Constructions and Pre-constructional Measures

CHAPTER 2

Classification of Buildings Based on Occupancy

2.1 OCCUPANCY CLASSIFICATION

Every building shall be classified according to its use or the character of its occupancy as a building of Occupancy A, B, C, D, E, F, G, H, J or K as defined below :

Occupancy	A	:	Residential
Occupancy	B	:	Educational
Occupancy	C	:	Institutional
Occupancy	D	:	Health Care
Occupancy	E	:	Assembly
Occupancy	F	:	Business and Mercantile
Occupancy	G	:	Industrial
Occupancy	H	:	Storage
Occupancy	J	:	Hazardous
Occupancy	K	:	Miscellaneous

Minor occupancy incidental to operations in another type of occupancy shall be considered as part of the main occupancy, and shall be classified under the occupancy group relevant for the main occupancy.

Any occupancy not mentioned specifically shall be classified by the Authority under the occupancy group to which its use most closely resembles, considering the potential life and fire hazard.

Each occupancy group shall be subdivided as detailed in the following sections. The example provided for each occupancy group are nonexhaustive and indicative only. If there is any use or character of occupancy in a building which is not mentioned here, it shall be classified by the Authority.

2.1.1 **Occupancy A : Residential Buildings**
Buildings classified under this Occupancy shall include all buildings that provide sleeping and living accommodations to related or unrelated groups of people, with or without cooking or dining facilities, except any building classified under Occupancy C or D. This Occupancy shall be subdivided as follows:

A1 DETACHED SINGLE FAMILY DWELLING : These shall include any building, detached from neighbouring buildings by distances required by this Code, and having independent access, which is used for private dwelling by members of a single family.

A2 FLATS OR APARTMENTS : These shall include any building or portion thereof or group of buildings in which living quarters are provided for more than one family, living independently of each other, with independent cooking facility for each family. Flats or apartments may be located in walk up buildings, high rise buildings or in housing complexes.

A3 MESS, BOARDING HOUSES, DORMITORIES AND HOSTELS : These shall include any building in which sleeping and living accommodations are provided for groups of unrelated persons, with or without common dining facilities, and with common cooking under management control or with individual or group cooking facilities, for example, mess houses, dormitories, boarding houses, hostels and students' halls of residence.

A4 MINIMUM STANDARD HOUSING : These shall include any building in which one or more families are housed, specifically built for minimum standard accommodation of lower income families, in which the minimum requirements for hygiene and safety are maintained, for example, multi-storeyed complexes, cluster houses and rehabilitation housing or housing undertaken by private low income groups approved by the Authority.

A5 HOTELS AND LODGING HOUSES : These shall include any building or group of buildings under single management, in which sleeping and living accommodation, with or without dining facilities but without cooking facilities for individuals, is provided for hire on transient or permanent basis, for example, hotels, motels, rest houses, lodging and rooming houses, inns, and clubs.

2.1.2 **Occupancy B : Educational Buildings**
Buildings classified under this Occupancy shall include all buildings in which education and care are provided to children or adults. This Occupancy shall be subdivided as follows :

B1 EDUCATIONAL FACILITIES : These shall include any building or portion thereof used for purposes involving assembly for instruction, education and recreation of more than six persons, and which is not covered by occupancy E, for example school, college, university class rooms, lobbies and related facilities, coaching centres, tutorial homes etc.

B2 PRESCHOOL FACILITIES : These shall include any building or portion of a building used for purposes involving care and education of children more than six in number, for example, day-care centres, nurseries, kindergartens and other preschool facilities.

2.1.3 **Occupancy C : Institutional Buildings**
Buildings classified under this Occupancy shall include those used for purposes of institutional care of the occupants, such as medical or nursing care of persons suffering from physical or mental illness or infirmity, care of infants, orphans, convalescents or old persons, and care and detention for correctional or penal purposes where the personal liberty of the inmates is restricted. These buildings shall ordinarily provide sleeping accommodation for the occupants. This occupancy shall be subdivided as follows :

C1 INSTITUTIONS FOR CARE OF CHILDREN : These shall include any building or portion thereof or group of buildings under single management used as an institution for the full time care of children, including orphanages, each accommodating more than six children, for example, child care institutions and orphanages, Lillah boarding, child care homes and school hostels.

C2 CUSTODIAL INSTITUTIONS FOR THE PHYSICALLY CAPABLE : These shall include any building or portion thereof or group of buildings under single management used for purposes of full time care and custody of old or mentally disabled persons physically capable of responding to emergency, for example, home for the aged, home for the care of mentally disabled persons in which the personal liberty of the inmates is not restricted, and convalescent home for locomotory patients.

C3 CUSTODIAL INSTITUTIONS FOR THE INCAPABLE : These shall include any building or portion thereof or group of buildings under single management used for purposes of full time care and custody of persons physically or mentally incapable of responding to emergency, for example, home for the old and infirm persons not capable of self preservation in an emergency, convalescent home for non locomotory patients, and mental institution without detention facilities.

C4 PENAL AND MENTAL INSTITUTIONS : These shall include any building or portion thereof or group of buildings under single management used for housing persons under restraint, or who are detained for penal and corrective purposes, in which personal liberty of the inmates is restricted, for

example, jails, prisons, mental hospitals and psychiatric sanatoria with detention facilities, Borstals and reformatories.

2.1.4 **Occupancy D : Health Care Buildings**
Buildings under this Occupancy group shall include those used for purposes of providing medical care and treatment to persons, in which sleeping accommodation may or may not be provided. This Occupancy shall be subdivided as follows :

D1 NORMAL MEDICAL FACILITIES : These shall include any building or portion thereof or group of buildings under single management in which general and specialized medical, surgical and other treatment is provided to persons suffering from physical limitations because of health, for example, hospitals, nursing homes, clinics, dispensaries, infirmaries and sanatoria.

D2 EMERGENCY MEDICAL FACILITIES : These shall include any building or portion thereof used for purposes of providing essential medical facilities having surgery, emergency and casualty treatment areas, which is equipped and designated to handle post disaster emergency, and is required to remain operational after disasters, for example, emergency and casualty units of designated hospitals, and clinics and dispensaries built as part of a disaster preparedness programme.

2.1.5 **Occupancy E : Assembly Buildings**
Buildings under this Occupancy group shall include any building or portion thereof in which groups of people congregate or assemble for recreation, amusement, social, religious, political, cultural, travel and similar purposes, for example, cinemas, theatres, assembly halls, auditoriums, mosques and other places of worship, prayer halls, exhibition halls, museums, art galleries, gymnasiums, stadiums, restaurants, club rooms, dance halls, recreation piers, passenger stations and terminals of rail, bus, air and marine transportation systems, community centres and lecture halls. This Occupancy shall be subdivided as follows :

E1 LARGE ASSEMBLY WITH FIXED SEATS : This occupancy shall include assembly buildings provided with a stage and with fixed seats for 1000 or more persons. Assembly buildings under this subdivision shall be primarily meant for theatrical, operatic or cinematic performances having a raised stage, proscenium curtains, scenery loft or projection screen, lights, projection booth and necessary theatrical and mechanical equipment. Examples of this Occupancy are, large theatres, cinema halls, auditoriums and similar large assembly halls meant for presentation of the performing arts.

E2 SMALL ASSEMBLY WITH FIXED SEATS : This occupancy shall include any building primarily meant for use as described for buildings under Occupancy E1, but with fixed seats for less than 1000 persons. These assembly buildings may or may not be provided with a legitimate theatrical stage or related accessories or equipment. Examples of this Occupancy are, small and medium sized theatres, cinema halls, auditoriums, churches with fixed pew, seminar halls and other assembly halls.

E3 LARGE ASSEMBLY WITHOUT FIXED SEATS : This occupancy shall include any assembly building, its lobbies, foyer, corridors and other related spaces, in which there are no fixed seats, which may or may not be provided with a legitimate stage or theatrical accessories, and which has accommodation for 300 or more persons, for example, mosques, prayer halls and other places of worship, lecture halls, waiting lounges, museums, art galleries, dance halls, restaurants, night clubs, library reading rooms and lending counters, passenger terminals, exhibition halls and halls for incidental picture shows or dramatic or theatrical presentations.

E4 SMALL ASSEMBLY WITHOUT FIXED SEATS : This shall include any building primarily intended for use as described in Occupancy E3, but with accommodation for less than 300 persons.

E5 SPORTS FACILITIES : This shall include any building meant for assembly of people for recreational, amusement and sporting purposes, for example, stadiums, reviewing stands, indoor stadiums, sports centres, indoor facilities of amusement parks, and indoor swimming pools and gymnasiums with spectator gallery.

2.1.6 Occupancy F : Business and Mercantile Buildings
Buildings under this Occupancy group shall include any building or portion thereof which is used for transaction of business, display and sale of merchandise, and keeping of accounts and records. This Occupancy shall be subdivided as follows :

F1 OFFICES : These shall include any building or part thereof which is used as offices, banks and professional establishments such as architect and engineer's offices, lawyer's and doctor's chambers, hair dressing saloons and beauty parlours, research establishments and test laboratories involving low hazard materials, computer installations.

F2 SMALL SHOPS AND MARKETS : These shall include any building or portion thereof used for purposes of display and sale of merchandise, either wholesale or retail, with or without incidental storage and service facilities, with an area not exceeding 300 m^2, for example, shops, stores and markets.

F3 LARGE SHOPS AND MARKETS : These shall include any building or portion thereof used for purposes of display and sale of merchandise, either wholesale or retail, with or without incidental storage and service facilities, with an area more than 300 m^2, for example, large shops, markets, departmental stores, supermarkets and hyper markets.

F4 GARAGES AND PETROL STATIONS : These shall include any building or portion thereof used for providing services moderately hazardous in nature, for example, petrol pump stations, automobile garages, and aircraft hangars without repair services.

F5 ESSENTIAL SERVICES : These shall include any building or portion thereof used for purposes of providing emergency services and utilities which are required to remain operational after a disaster or in other emergency situations, for example, police stations, fire stations, TV, radio, telecommunication and air terminal buildings, power stations and other utilities designated to provide post disaster emergency services, and buildings having critical national defence capabilities.

2.1.7 Occupancy G : **Industrial Buildings**
Buildings under this Occupancy group shall include any building or portion thereof in which materials are fabricated, assembled, or processed by physical, chemical, pharmaceutical, nuclear, mechanical and other processes, in order to alter their characteristics or to produce or manufacture new materials. Such buildings may also house incidental storage and handling of the raw and the finished materials or goods. Examples of such buildings are various mills, factories and plants, automatic laundries, power plants, pumping stations, smoke houses, saw mills, foundries and machine shops, pharmaceutical, nuclear and irradiation plants.

Buildings under this Occupancy shall be subdivided on the basis of hazard potential of the contents and the processes of the industry. The potential hazard of the occupancy, for the purpose of the Code, shall be determined by the Authority on the basis of the character of the contents and the processes or operations conducted in the industry. The hazard shall generally mean the relative danger of the start of fire and the rapidity of its spread, the danger of smoke and gases generated, the danger of biological contamination, radiation leakage and infection, and the danger of explosion and other occurrences that pose a potential threat to the safety of the occupants of the building. Where the combustibility of the building structure, the flame spread rate of interior finishes and fittings, or other potential hazards integral to the type of construction of the building, constitute a greater degree of hazard than that associated with the contents or processes of the industry, the greater degree of hazard shall dictate the classification. Unless areas with different degrees of hazard are effectively segregated and separated in accordance with the provisions of the Code, the most hazardous area in a building shall govern its classification. The Industrial Occupancy group shall be subdivided as follows :

G1 LOW HAZARD INDUSTRIES : These shall include any industrial building in which the contents are of such low combustibility and the processes conducted therein are of such low hazardous nature that danger of self-ignition and self-propagation of fire is nonexistent, the only danger being an onset of fire from external sources with the resulting danger to life and property arising only from panic, fumes or smoke.

G2 MODERATE HAZARD INDUSTRIES : These shall include any industrial building in which the contents are moderately combustible and the industrial processes conducted therein are liable to give rise to a fire which will spread with moderate rapidity, giving off considerable smoke, but in which the danger of toxic fumes, biological contamination, radiation or explosions is non-existent.

2.1.8 **Occupancy H : Storage Buildings**
Buildings under this Occupancy group shall include any building or portion thereof used primarily for storage or sheltering, including incidental servicing, processing or repairs, of goods, wares, merchandise, vehicles or animals. Goods, wares and merchandise stored in buildings of this Occupancy group shall be nonexplosive and shall not involve highly combustible or self-igniting substances. Storage buildings are characterized by a relatively small number of human occupants in proportion to the area. Incidental storage auxiliary to other uses shall not render a building to be classified as storage building.

Examples of buildings in this Occupancy are, warehouses, godowns, cold storage, freight depots, transit sheds, truck and marine terminals, silos, barns and stables. This Occupancy shall be subdivided as follows :

H1 LOW FIRE RISK STORAGE : These shall include any building or portion thereof which is used for storage of materials or other contents which do not constitute the danger of self-ignition, and which in the event of fire will burn with low to moderate rapidity, for example, cold storage, freight depots, warehouses or godowns containing low fire risk materials, grain silos, terminals, stables and barns etc.

H2 MODERATE FIRE RISK STORAGE : These shall include any building or portion thereof which is used for storage of materials which do not constitute the danger of self-ignition but which in the event of fire will burn with moderate rapidity, for example, warehouses, godowns or depots containing high fire risk materials, such as paper, textiles, cotton, jute etc., library stack rooms.

Items which shall be deemed to render a building hazardous are specified in Sec 2.13.13 along with the exempted amount for each item.

2.1.9 **Occupancy J : Hazardous Buildings**
Buildings under this Occupancy group shall include any building or portion thereof which is used for the storage, handling, processing or manufacture of hazardous materials or products. The hazards may arise out of handling, processing, manufacture or storage of materials which are highly combustible or explosive that burn with extreme rapidity emitting poisonous fumes or smokes, which may produce explosive dust capable of self-ignition, or which are highly corrosive, toxic or noxious producing flame, fumes, and explosive, poisonous, irritant or corrosive gases, and materials which pose biological contamination or radiation danger. This Occupancy shall be subdivided as follows :

J1 EXPLOSION HAZARD BUILDINGS : These shall include any building or portion thereof which is used for storage, handling, processing or manufacture of materials and products that present high explosion hazard or that are highly flammable or combustible, capable of self-ignition and/or self-propagation of fire. Such materials include explosives, blasting agents, fireworks, black powder, natural gases, other explosive and combustible gases, rocket propellants, petroleum, kerosene, other fuel oils and highly flammable liquids.

J2 CHEMICAL HAZARD BUILDINGS : These shall include any building or portion thereof which is used for storage, handling, processing or manufacture of materials and products that are highly corrosive, toxic, poisonous and biologically harmful including corrosive and toxic alkalis, acid or other liquids or chemicals, producing flame, fumes, radiation, and explosive, poisonous, irritant and corrosive gases.

Definition of hazard and the amount of such materials which shall be deemed to render a building hazardous are set forth in Sec 2.13.13.

2.1.10 **Occupancy K : Miscellaneous Buildings**
Buildings under this Occupancy group shall include special buildings and ancillary structures not covered in other Occupancy groups. The Occupancy shall be subdivided as follows :

K1 PRIVATE GARAGES AND SPECIAL STRUCTURES : These shall include private garages, carports, garden sheds and tools sheds, zoo, park and botanical garden structures, bus stops etc.

K2 FENCES, TANKS AND TOWERS : These shall include fences and boundary walls over 1.5 m high, water tanks and towers.

2.2 CHANGE OF USE

No change shall be made in the character of occupancy or use of any building that would place it in a different group or in a different subdivision of the same group. Such changes may be made only when the building is made to comply with the provisions of this Code for such group of Occupancy.

Exceptions:
a) Change in character of occupancy or use of any building may be made and approved by the Authority without complying to all the requirements of the new group provided the building is less hazardous, based on life and fire risk, than the existing occupancy.
b) Changes and extensions in existing buildings may be allowed provided such changes and extensions comply with Sec 1.15 (Existing Buildings).

2.3 MIXED OCCUPANCY

When a building is utilized for more than one occupancy or purpose, each part having a distinct occupancy as defined in Sec 2.1 shall be separated from any other occupancy as specified in Table 3.2.1. Each portion of the building shall comply with the requirements of this Code for the occupancy it accommodates. If separations are not provided as specified in Table 3.2.1, the building shall conform to the requirements of the most hazardous of the occupancies.

2.3.1 **Nonseparated Uses**
The following occupancies are not required to be separated from uses to which they are accessory :

a) Assembly rooms having a floor area not more than 75 m^2.

b) The administrative and clerical offices and similar offices not exceeding 25 per cent of the floor area of the major occupancy and not related to Occupancy J (Hazardous Buildings).

c) Administrative offices, gift shops and other similar uses in Occupancy A (Residential Buildings) provided the uses do not exceed 10 per cent of the floor area of the major occupancy.

d) Kitchens associated with a dining area.

Table 3.2.1
Fire Resistance Rating Requirements for Separating Walls and Floor/Ceiling Assemblies between Mixed Occupancies (hours)
(See Section 3.1.8 for exceptions)

	A1	A2	A3	A4	A5	B1	B2	C1	C2	C3	C4	D1	D2	E1	E2	E3	E4	E5	F1	F2	F3	F4	F5	G1	G2	H1	H2	J1	J2	K1	K2
A1	NA §																														
A2	NA	1.5																													
A3	NA	2	1.5																												
A4	NA	2	2	1																											
A5	NA	2	2	2	2																										
B1	NA	2	2	2	2	2																									
B2	NA	2	2	2	2	2	2																								
C1	NA	3	3	2	3	3	3	2																							
C2	NA	2	2	2	2	2	2	2	2																						
C3	NA	3	3	2	3	3	3	2	2	2																					
C4	NA	NP ‡	NP	NP	NP	NP	NP	NP	NP	NP	2																				
D1	NA	3	3	2	3	3	3	3	3	3	3	2																			
D2	NA	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	2	2																		
E1	NA	2	2	2	2	2	2	3	2	3	3	3	NP	3																	
E2	NA	2	2	2	2	2	2	3	2	3	3	3	NP	2	2																
E3	NA	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3															
E4	NA	2	2	2	2	2	2	3	2	3	3	3	3	2	2	3	2														
E5	NA	2	2	2	2	2	2	3	2	3	3	3	NP	2	2	3	2	2													
F1	NA	2	2	2	2	2	2	3	2	3	3	3	3	2	2	3	2	2	2												
F2	NA	2	2	2	2	2	2	3	2	3	NA	3	3	2	2	3	2	2	2	2											
F3	NA	2	2	2	2	2	2	3	2	3	NA	3	3	2	2	3	2	2	2	2	2										
F4	NA	2	2	2	2	2	2	3	3	3	NA	3	NP	NP	NP	NP	3	NP	2	3	3	3									
F5	NA	2	2	2	2	2	2	3	2	3	NA	3	3	NP	NP	NP	2	NP	4	2	2	2	3								
G1	NA	2	2	2	2	2	2	3	2	3	3	3	NP	NP	NP	NP	2	NP	2	2	2	2	2	2							
G2	NA	3	3	2	3	3	3	3	3	3	3	3	NP	NP	NP	NP	3	NP	3	3	3	3	3	2	2						
H1	NA	2	2	2	2	2	2	3	2	3	3	3	3	2	2	3	2	2	2	2	2	2	2	2	2	2					
H2	NA	3	3	3	3	3	3	4	3	4	3	4	3	3	3	3	3	3	2	3	3	3	2	2	2	2	2				
J1	NA	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	4	4	4	4	NP			
J2	NA	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	4	4	4	4	NP	NP		
K1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	4	4	1	
K2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	4	4	1	1

§ NA = Not Applicable
‡ NP = Not Permitted

e) Carports having at least two sides entirely open associated with Occupancy A.

f) Parking or storage of motor vehicles associated with Occupancy F4 (Garages and Petrol Stations).

g) Fuel dispensing pumps covered with a canopy with opening on at least three sides associated with Occupancy F2 (Small Shops and Markets) provided the following conditions exist:

i) The Occupancy F2 is provided with two exits separated by a distance of at least one-half the maximum diagonal dimension of the building or area to be served and not located in the same exterior wall.

ii) The pump islands are located more than 6 meter away from the Occupancy F2.

2.3.2 **Forms of Occupancy Separations**
Portions of a building having different occupancies shall be separated with horizontal or vertical or of any other form of separation as may be required to achieve a complete separation.

2.3.3 **Types of Occupancy Separation**
The occupancy separations shall be classified as follows:

a) Four Hour Fire Resistive : The four hour fire resistive separation shall have no openings therein and shall provide a fire resistance of at least four hours.

b) Three Hour Fire Resistive : The three hour fire resistive separation shall provide a fire resistance of not less than three hours. The total width of all openings in any one storey shall not exceed 25 per cent of the length of the wall in that storey and no single opening shall have an area greater than 12 m^2. The openings shall be protected with a fire resistance assembly providing a fire resistance of at least three hours.

In case of a floor having a three hour fire resistance rating, the openings shall be protected by vertical enclosures extending above and below such openings. The walls of such vertical enclosures shall be of a construction offering at least two hours of fire resistance. All openings in the walls of these vertical enclosures shall be protected with fire assembly having a fire resistance rating of at least one and one-half hour.

c) Two Hour Fire Resistive : The two hour fire resistive separation shall be of a construction having a fire resistance rating of not less than two hours. All openings in such separations shall be protected with a fire assembly of a fire protection rating of at least one and one-half hour.

d) One Hour Fire Resistive : The one hour fire resistive separation shall be of at least one hour fire protection construction. All openings in such separations shall be protected with a fire protection assembly of at least one-half hour fire resistance.

2.4 GENERAL REQUIREMENTS OF ALL OCCUPANCIES

2.4.1 **Location on Property**
2.4.1.1 All buildings shall have access to a public road or yard on at least one side of the property.

2.4.1.2 Fire separation distance of the exterior wall of a building shall be measured from the building face to the adjacent property line. For the purpose of this section, the centre line of an adjoining public way shall be considered an adjacent property line. For two buildings on the same plot an imaginary line equidistant from both buildings shall be considered as the relevant property line.

2.4.1.3 The exterior walls shall have a fire resistance and opening protection as specified in Tables 3.2.2 and 3.2.3 and in accordance with such additional provisions as are set forth in Part 4.

2.4.1.4 Projection beyond exterior building line shall be limited to the sunshade line as specified in Sec 1.7.12.4.

2.4.1.5 When openings in exterior walls are required to be protected due to distance from the property line, the aggregate area of such openings shall not exceed 50 per cent of the total area of the wall in each storey.

2.4.2 **Allowable Floor Areas**
2.4.2.1 The total area of the building shall comply with Sec 1.8.3.

2.4.2.2 The area of the mezzanines shall be included in the area of the floor where the mezzanines are located, unless they are considered as separate floors.

2.4.2.3 A basement floor area need not be included in the total available area of the building provided it is used for car parking, electrical or mechanical plant or service room. For other uses or occupancies in the basement, the floor area shall be included in the total area of the building.

Table 3.2.2
Fire Resistance Ratings of Exterior Walls (in hours) for Various Occupancy Groups
(See Sec 3.18 for exceptions)

Fire Separation Distance	Occupancy				
	A1, K1, K2	A2, A4	A3, A5, B, C, D, E, F1, F2, G1	F3, F4, F5, G2, H1	H2, J
Up to 1.5 m	1	1	2	3	4
Greater than 1.5 m and up to 3 m	N	1	1	2	3
Greater than 3 m and up to 4.5 m	N	N	N	1	2
Greater than 4.5 m and up to 9 m	N	N	N	N	1
Greater than 9 m	N	N	N	N	N
N = No requirements					

Table 3.2.3
Requirements for Opening Protection Assembly Based on Fire Resistance Rating of Exterior Walls

Fire Resistance Rating of Wall (in hours)	Fire Resistance Required for Opening Assembly (in hours)
4	Not permitted
3	3
2	1.5
1	0.5
N	No requirements

2.4.3 **Permitted Types of Construction**
The types of construction for any occupancy shall conform to the specifications set forth in Table 3.2.4.

Table 3.2.4
Permitted Types of Construction and Fire Zones for Various Occupancy Groups

Occupancy	Permitted Types of Construction	Fire Zone
A B C D E F1, F2, F3 H1 K	1, 2 or 3	1
F4, F5 G H2	1 or 2	2
J	1	3

2.5 REQUIREMENTS OF OCCUPANCY A - RESIDENTIAL BUILDINGS

Buildings shall be classified as Occupancy A in accordance with Sec 2.1.1.

2.5.1 **Construction, Height and Allowable Area**
2.5.1.1 Buildings or parts thereof classified as Occupancy A shall be limited to the type of construction set forth in Table 3.2.4 and shall not exceed in area or height as specified in Sec 1.8 and 2.4.2.

2.5.1.2 Walls and floors separating dwelling units in the same building shall not be of less than one-hour fire resistive construction.

2.5.1.3 Storage or laundry rooms in Occupancy A2, A3 or A5 that are used in common by the occupants shall be separated from the rest of the building by at least one hour fire resistive occupancy separation.

2.5.1.4 When the basement or ground floor of a building of Occupancy A2 or A5 is used for parking or storage of private cars of the occupants, the parking floor shall be of Type 1 construction and shall be separated from the floor above with a three hour occupancy separation.

2.5.2 **Location on Property**
Buildings of Occupancy A shall comply with the requirements for location on property and fire resistive exterior walls and openings as specified in Sec 2.4.1.

2.5.3 **Access and Exit Facilities and Emergency Escapes**
2.5.3.1 Facilities for access and exit shall comply with the provisions set forth in Sec 1.6, and Chapter 3, Part 4.

2.5.3.2 Every sleeping room in ground, first and second floors shall have at least one openable window or door for emergency escape which shall open directly into the exterior or an interior courtyard. The units shall be openable from the inside without the use of any tool to provide a minimum clear opening of 500 mm width by 600 mm height with a maximum sill height of 1 m above the floor.

2.5.4 **Lighting, Ventilation and Sanitation**
Daylighting and natural ventilation along with artificial lighting and mechanical ventilation required by this Code are specified in Sec 1.17 and Chapters 1 and 3, Part 8.

2.5.5 **Minimum Dimensions of Habitable and Nonhabitable Rooms**
The minimum dimensions of habitable and nonhabitable rooms are specified in Sec 1.12.2. The minimum dimensions of A4 housing (Minimum Standard Housing) are specified in Appendix A.

2.5.6 **Smoke Detectors and Sprinkler Systems**
The requirements for smoke detectors and sprinkler systems are specified in Chapters 4 and 5 Part 4 and those shall be installed according to manufacturer's instructions.

2.5.7 **Shaft and Exit Enclosures**
Elevator shafts, vent shaft, dumbwaiter shaft, garbage chute and other vertical openings shall be enclosed at least by a four hour resistive construction. Exit requirements are specified in Chapter 3, Part 4.

2.5.8 **Fire Alarm Systems**
Requirements for fire alarm systems in Occupancy A buildings are specified in Chapters 4 and 5, Part 4. Fire alarms shall be installed in the following residential occupancies :

a) Occupancy A2 (Flats or Apartments) having more than 16 dwelling units in a single building or more than 4 occupancy floors shall be provided with an approved manual or automatic fire alarm system.

b) Occupancy A3 (Mess, Boarding Houses and Hostels) buildings of five storey or more in height or having an occupant load of 30 persons or more shall be equipped with an approved manual or automatic fire alarm system

c) Fire alarm systems need not be required for residential buildings of not over two storey in height provided it has adequate exit facilities.

d) A5 (Hotels and Lodging Houses) with three storey or more in height or containing 20 or more guest rooms shall be provided with an approved manual or automatic fire alarm system.

e) Multi-storeyed blocks of Occupancy A4 (Minimum Standard Housing) with more than 4 occupancy floors each accommodating 4 or more dwelling units shall be provided with an approved manual fire alarm system.

2.6 REQUIREMENTS FOR OCCUPANCY B - EDUCATIONAL BUILDINGS

Buildings shall be classified as Occupancy B in accordance with Sec 2.1.2.

2.6.1 **Construction, Height and Allowable Area**
Buildings or parts of buildings classified as Occupancy B shall be limited to type of construction set forth in Table 3.2.4 and comply with the provisions of Sec 1.8 and 2.4.2, to meet the requirements of height and area limitations.

2.6.1.1 For the purpose of this section, the following terminology are applicable:
a) Common Space Condition : A common space condition exists between rooms, spaces or areas within a building or part of a building which are not separated by an approved smoke or draft barrier.

b) Separate Space Condition : A separate space condition exists between rooms, spaces or areas when separated by approved smoke or draft barrier.

c) Smoke and Draft Barrier : A smoke or draft barrier is a wall or floor or partition with or without openings therein of such construction that will prevent transmission of smoke or gases through them.

2.6.1.2 Automatic closing fire assemblies installed in separate space conditions shall be activated by approved smoke detectors.

2.6.1.3 The areas of common and separate space conditions served by one side open corridor or verandah in a building having a height of not more than 14 m or 4 storeys will not require smoke detectors and standpipes or sprinkler systems except hazardous laboratories, vocational shops and other similar areas containing hazardous materials. Such hazardous materials shall not exceed the quantities as specified in Sec 2.13.1.3.

2.6.1.4 Rooms or groups of rooms sharing a common space where flammable liquids, combustible dust or hazardous materials are used, stored, developed or handled in an amount exceeding that specified in Sec 2.13.1.3 shall be classified as Occupancy J. Such rooms or groups of rooms shall comply with the requirements of fire protection as specified in Chapters 4 and 5, Part 4.

2.6.1.5 Rooms or groups of rooms, sharing a common space or having separate spaces, served by a common corridor or passage with less than 20 per cent outdoor opening of wall in a building of height 11 m or less, or three storeys or less, need not be provided with smoke detectors and standpipe or sprinkler system for fire protection provided it conforms with the access and exit requirements specified in Sec 1.6, and Chapters 4 and 5, Part 4.

2.6.1.6 Buildings of Occupancy B situated outside the jurisdiction of any municipality shall have a construction of at least two hours fire resistance.

2.6.2 **Location on Property**
Buildings of Occupancy B shall comply with the requirements for location on property and fire resistive exterior walls and openings as specified in Sec 2.4.1.

2.6.3 **Access and Exit Facilities and Emergency Escapes**
Facilities for access and exit and emergency escape shall comply with the provisions set forth in Sec 1.6; Chapter 3, Part 4.

2.6.4 **Lighting, Ventilation and Sanitation**
2.6.4.1 Lighting, ventilation and sanitation facilities provided in all Occupancy B buildings shall conform to Sec 1.17, and Chapters 1 and 3, Part 8.

2.6.4.2 The ratio of number of water closets to number of students shall be as follows:

	Boys	Girls
For primary schools	1:100	1:35
For secondary schools and above	1:100	1:45

In addition to this, urinals shall be provided for boys at the ratio of 1:30 for all schools.

There shall be at least one drinking fountain on each floor.

2.6.5 **Minimum Dimensions of Class Rooms, Common Toilets and Staircases**
The dimension of a class room shall be not less than 4 m on any side and shall have an area of not less than 0.75 m^2 per student. Other provisions for minimum dimensions shall comply with the requirements set forth in Sec 1.8.

2.6.6 **Shaft and Exit Enclosures**
Elevator shafts, vent shafts and other vertical openings shall be enclosed with a construction of at least 3 hour fire resistance. Exit requirements shall comply with Chapter 3 Part 4.

2.6.7 **Sprinkler and Standpipe System**
Sprinkler and standpipe systems shall be installed as specified in Chapters 4 and 5, Part 4.

2.6.8 **Fire Alarm Systems**
Requirements for fire alarm systems in Occupancy B buildings are specified in Chapters 4 and 5, Part 4.

2.7 REQUIREMENTS FOR OCCUPANCY C - INSTITUTIONAL BUILDINGS

Buildings shall be classified as Occupancy C in accordance with Sec 2.1.3.

2.7.1 **Construction, Height and Allowable Area**
The buildings or parts thereof classified as Occupancy C shall be limited to the type of construction set forth in Table 3.2.4 and shall comply with the provisions of Sec 1.8 and 2.4.2 to meet the requirements of height and area limitations.

2.7.2 **Location on Property**
Buildings of Occupancy C shall comply with the requirements for location on property and fire resistive exterior walls and openings as specified in Sec 2.4.1.

2.7.3 **Access and Exit Facilities and Emergency Escapes**
Facilities for access and exit and emergency escape shall comply with the provisions set forth in Sec 1.6, and Chapter 3, Part 4.

2.7.4 **Lighting, Ventilation and Sanitation**
All buildings or part of a building classified as Occupancy C shall conform with the provisions of Sec 1.17, and Chapters 1 and 3, Part 8.

2.7.5 **Shaft and Exit Enclosures**
Elevator shafts, vent shafts and other vertical openings shall be enclosed with a construction of at least 4 hour fire resistance. Exit requirements shall comply with Chapter 3, Part 4.

2.7.6 **Sprinkler and Standpipe Systems**
Sprinkler and standpipe systems shall be installed as specified in Chapters 4 and 5, Part 4.

2.7.7 **Fire Alarm Systems**
Requirements for fire alarm systems in Occupancy C buildings are specified in Chapters 4 and 5, Part 4.

2.8 REQUIREMENTS FOR OCCUPANCY D - HEALTH CARE BUILDINGS

Buildings shall be classified as Occupancy D in accordance with Sec 2.1.4.

2.8.1 **Construction, Height and Allowable Area**
The buildings or parts thereof classified as Occupancy D shall be limited to the type of construction set forth in Table 3.2.4 and shall comply with the provisions of Sec 1.8 and 2.4.2 to meet the requirements of height and area limitations.

2.8.2 **Location on Property**
Buildings of Occupancy D shall comply with the requirements for location on property and fire resistive exterior walls and openings as specified in Sec 2.4.1.

2.8.3 **Access and Exit Facilities and Emergency Escapes**
Facilities for access and exit and emergency escape shall comply with the provisions set forth in Sec 1.6; Chapter 3 of Part 4.

2.8.4 **Lighting, Ventilation and Sanitation**
All buildings or part of a building classified as Occupancy D shall conform with the provisions of Sec 1.17, Chapters 1 and 3 of Part 8.

2.8.5 **Shaft and Exit Enclosures**
Elevator shafts, vent shafts and other vertical openings shall be enclosed with a construction of at least four hour fire resistance. Exit requirements shall comply with Chapter 3 of Part 4.

2.8.6 **Sprinkler and Standpipe Systems**
Sprinkler and standpipe systems shall be installed as specified in Chapters 4 and 5 of Part 4.

2.8.7 **Fire Alarm Systems**
Requirements for fire alarm systems in buildings of Occupancy A are specified in Chapters 4 and 5 of Part 4.

2.9 REQUIREMENTS FOR OCCUPANCY E - ASSEMBLY BUILDINGS

Buildings shall be classified as Occupancy E in accordance with Sec 2.1.5.

2.9.1 **Construction, Height and Allowable Area**
The buildings or parts thereof classified as Occupancy E shall be limited to the type of construction set forth in Table 3.2.4 and shall comply with the provisions of Sec 1.8 and 2.4.2 to meet the requirements of height and area limitations.

2.9.2 **Location on Property**
Buildings of Occupancy E shall comply with the requirements for location on property and fire resistive exterior walls and openings as specified in Sec 2.4.1.

2.9.3 **Access and Exit Facilities and Emergency Escapes**
Facilities for access and exit and emergency escape shall comply with the provisions set forth in Sec 1.6, Part 3 and Chapter 3, Part 4.

2.9.4 **Lighting, Ventilation and Sanitation**
All buildings or part of a building classified as Occupancy E shall conform with the provisions of Sec 1.17, Part 3 and Chapters 1 and 3, Part 8.

2.9.5 **Shaft and Exit Enclosures**
Elevator shafts, vent shafts and other vertical openings shall be enclosed with a construction of at least 4 hour fire resistance. Exit requirements shall comply with Chapter 3, Part 4.

2.9.6 **Smoke Detectors**
Smoke detectors of approved quality shall be installed in stage area, assembly rooms with more than 50 occupancy load, projection and control rooms, back stage storage and dressing rooms (see Chapter 5, Part 4).

2.9.7 Sprinkler and Standpipe Systems
Sprinkler and standpipe systems shall be installed as specified in Chapters 4 and 5, Part 4.

2.9.8 **Fire Alarm Systems**
Requirements for fire alarm systems in Occupancy E buildings are specified in Chapters 4 and 5, Part 4.

2.9.9 **Stage, Platform, Proscenium Wall and Curtain**
2.9.9.1 The specification of this section shall apply to all parts of buildings and structures that contain stages or platforms and other similar appurtenances as herein defined.

a) Stages : A stage is a three side enclosed or partially enclosed portion of a building which is designed or used for presentation of plays or lectures or other entertainment. A stage shall be further classified as legitimate stage, regular stage and thrust stage.

b) Stage, Legitimate : A stage wherein curtains, drops, leg drops, scenery, lighting devices or other stage effects are adjustable horizontally or vertically or suspended over head.

c) Stage, Regular : A stage wherein curtains, fixed drops, valances, scenery and other stage effects are suspended and are not adjustable or retractable.

d) Stage, Thrust : A stage or platform extended beyond the proscenium line and into the audience.

2.9.9.2 Stage, Legitimate : Legitimate stage shall be constructed as specified in Table 3.2.4, specifying the type of construction but shall not be less than construction Type 2. The position of the legitimate stage extending beyond the proscenium opening line shall be permitted to be constructed with two hour fire-resistive materials.

The floor of the stage may be constructed with one hour fire rating materials. Thickness of a wooden floor shall not be less than 50 mm.

2.9.9.3 Stage, Regular and Thrust : Regular stages and thrust stages shall be constructed by not less than two hour fire resistive materials. Wooden floor when required in a stage shall not be less than 50 mm in thickness with one hour fire resistive rating.

2.9.9.4 All trap doors and any other opening in stage floors shall be equipped with tight fitting solid wood trap doors with thickness not less than 50 mm.

2.9.9.5 Stage Rigging Loft : The grid iron frame in the loft housing lighting and audio equipment, all the machinery for flying scenery and fly galleries along with their installations shall be constructed of approved noncombustible materials.

2.9.9.6 Foot Lights and Stage Electrical Equipment : Foot lights and border lights shall be installed in a protective cover constructed of noncombustible materials.

2.9.9.7 Trim, Finish and Decorative Hangings : All materials used in moulding and decoration around the proscenium shall be noncombustible.

2.9.9.8 Proscenium Curtain : The proscenium curtain shall be of approved fire retardant material and shall protect against passage of flame and smoke for at least 30 minutes.

2.9.10 **Motion Picture Projection Rooms**
Every projection room shall be constructed in conformity with the construction requirements for the type of the building in which the projection room is located. The wall opening required for projection need not have a fire protection assembly but shall be closed with glass or other approved materials.

The floor area of a projection room shall not be less than 8 m^2 for a single machine. The working space between the machines when more than one machine are used shall not be less than 0.75 m.

The height of the projection room shall have a minimum clear space of 2.5 m.

2.9.11 **Sports Facilities**

2.9.11.1 Vomiters, Aisles and Exits of Seating Galleries

a) There shall be a minimum of two exits remotely located from each other immediately to the outside for each balcony or tier. There shall be three exits when seating capacity exceeds 1000 persons and four exits when it exceeds 4000 persons.

b) There shall be at least 0.6 m^2 of space per person in the gallery. Minimum width of a seat in the gallery shall be 0.45 m.

c) There shall be a maximum of 33 seats on each side of the aisle. Maximum width of the main aisles and the secondary aisles shall be 1.0 m and 0.7 m respectively.

d) Entrance and exits shall be protected by safety railings.

e) Back to back space between two rows of seats shall not be less than 0.80 m.

f) The evacuation time in the galleries shall not be more than 10 minutes.

2.9.11.2 Swimming Pools

a) Any swimming pool used or constructed for the exclusive use by the Occupancy A1 and is available only to the occupants and private guests shall be classified as a private swimming pool. Any swimming pool other than private swimming pool shall be classified as a public swimming pool.

b) There shall be at least 1.5 m space between any side of a swimming pool and a rear or side property lines. For street property lines, this distance shall be at least 2.0 m.

c) Swimming pools shall be provided with overflow provision to remove scum and other materials from the surface of the water. When water skimmers are used for private pools there shall be one skimming device for each 50 m^2 of surface area or fraction thereof.

d) The overflow gutters shall not be less than 75 mm deep and shall be pitched to slope of one unit vertical to 50 units horizontal (1:50) toward drains.

e) Public swimming pools shall be so designed that the pool water turnover is at least once every 8 hours.

f) Private swimming pools shall be designed so that there is a pool water turnover at least once every 18 hours.

g) Public swimming pools shall be equipped with filters the capacity of which shall be controlled to filter 140 litres per minute per m^2 of surface area. Private swimming pool filters shall not filter more than 230 litres per minute per m^2 of the surface area.

h) The acidity and alkalinity of the pool water shall be between 7.0 and 7.5.

i) All recirculating systems shall be equipped with an approved hair and lint strainer installed in the system ahead of the pump.

j) All swimming pool and equipment shall be designed to be emptied completely of water and the discharged water shall be disposed in an approved manner and shall not create problems in the neighbouring property.

k) Pumps, filters and other mechanical and electrical equipment shall be placed in enclosed spaces and shall not be accessible to the bathers.

2.9.12 **Amusement Building Alarm System**

An approved smoke detection system shall be installed in an amusement building according to the fire protection provisions specified in Chapters 4 and 5, Part 4.

2.9.13 **Public Address System**

A public address system may be installed when required to act as alarm system.

2.10 REQUIREMENTS FOR OCCUPANCY F - BUSINESS AND MERCANTILE BUILDINGS

Buildings shall be classified as Occupancy F in accordance with Sec 2.1.6.

2.10.1 **Construction, Height and Allowable Area**
The buildings or parts thereof classified as Occupancy F shall be limited to the type of construction set forth in Table 3.2.4 and shall comply with the provisions of Sec 1.8 and 2.4.2 to meet the requirements of height and area limitations.

Special provisions for the buildings of Occupancy F are specified in the following sections.

2.10.1.1 Ground floor or basement of a building used for car parking and separated from the building above by at least three hour fire resistive construction shall not be included in the area calculation of the building nor shall it be included in the calculation of number of storeys provided the floors above accommodate one or more of the following occupancies:

i) A2, A5
ii) E2, E3, E4
iii) F1, F2, F3

Entry lobbies, mechanical and electrical rooms and other similar uses incidental to the operation of the building may be provided in the car parking floor provided the total area of such uses remains within $\frac{1}{3}$ of the parking floor area.

2.10.1.2 The storage area in Occupancy F2 and F3 in connection with whole sale or retail sales shall be separated from public area by a one hour fire resistive construction.

Exceptions :
Occupancy separation need not be provided when any one or more of the following conditions prevail:
i) The storage area does not exceed 100 m^2,
ii) The storage area is protected with approved sprinkler system and does not exceed 300 m^2.

2.10.2 **Location on Property**
Buildings of Occupancy F shall comply with the requirements for location on property and fire resistive exterior walls and openings as specified in Sec 2.4.1.

2.10.3 **Access and Exit Facilities and Emergency Escapes**
Facilities for access and exit and emergency escape shall comply with the provisions set forth in Sec 1.6; Chapter 3, Part 4.

2.10.4 **Lighting, Ventilation and Sanitation**
All buildings or part of a building classified as Occupancy F shall conform with the provisions of Sec 1.17; Chapters 1 and 3, Part 8.

2.10.5 **Shaft and Exit Enclosures**
Elevator shafts, vent shafts and other vertical openings shall be enclosed with a construction of at least 4 hour fire resistance. Exit requirements shall comply with Chapter 3, Part 4.

2.10.6 **Highrise Buildings**
The provision of this section shall apply to all buildings having floors used for human occupancy located more than 20 m from ground level or the lowest level of fire department vehicle access.

Exceptions :
The provisions of this section may not be required for the following buildings and structures:
i) Airport traffic control towers notwithstanding other provisions of this Code,
ii) Open parking structures,
iii) Buildings used for low hazard special uses which are approved by the Authority.

2.10.6.1 Maintenance and Inspection : All fire protection systems shall be maintained and inspected on a regular basis to keep them in operative condition. The maintenance inspection shall be performed quarterly.

All plumbing installations shall be maintained and inspected periodically to keep them in operative conditions.

2.10.6.2 Type of Construction : All highrise buildings shall be of Type 1 construction.

2.10.7 **Sprinkler and Standpipe System**
When required by other provisions of this Code, sprinkler system shall be installed according to the specifications set forth in Chapters 4 and 5, Part 4.

2.10.8 **Special Hazards**
Installation of chimneys, heating apparatus, boiler, central heating or air-conditioning plant shall conform to the provisions of this Code as specified in Chapter 3, Part 8.

2.10.9 **Open Parking Garages**
Open parking garages used exclusively for car parking or storage of private or pleasure type motor vehicles shall have Type 1 or Type 2 construction.

2.10.9.1 Openings : The exterior opening of a garage structure shall not be less than 20 per cent of the floor area in any floor.

2.10.9.2 Ramps, exit stair and elevators shall be provided as specified in Sec 1.12, and Chapter 3, Part 4.

2.10.10 **Helistops**
2,10.10.1 General : Helistops on the roof top of a building or other locations shall be constructed in accordance with this section.

2.10.10.2 Size : The minimum dimension of the landing area for helicopters weighing less than 1600 kg shall be 6 m x 6 m. There shall be an average clearance of 4 m surrounding and at the level of the landing area which shall not be less than 2 m at any point.

2.10.10.3 Construction : Helicopter landing areas and supports shall be constructed with non-combustible material.

2.10.10.4 Aviation Approval : Before helistops start operating formal approval shall be obtained from the civil aviation authority.

2.10.11 **Smoke Detectors**
Smoke detectors of approved quality shall be installed in storage areas of F2 and F3 occupancies and highrise F1 occupancies.

2.10.12 **Fire Alarm Systems**
Requirements for fire alarm systems in buildings of Occupancy F are specified in Chapter 5, Part 4.

2.11 REQUIREMENTS FOR OCCUPANCY G - INDUSTRIAL BUILDINGS

Buildings shall be classified as Occupancy G in accordance with Sec 2.1.7. An nonexhaustive and indicative list of low hazard and moderate hazard industrial uses are listed in Tables 3.2.5 and 3.2.6 respectively. Storage and use of hazardous materials shall not exceed the exempt amount specified in Sec 2.13.1.3.

2.11.1 **Construction, Height and Allowable Area**
The buildings or parts thereof classified as Occupancy G shall be limited to the type of construction set forth in Table 3.2.4 and shall comply with the provisions of Sec 1.8 and 2.4.2 to meet the requirements of height and area limitations.

2.11.2 **Location on Property**
Buildings of Occupancy G shall comply with the requirements for location on property and fire resistive exterior walls and openings as specified in Sec 2.4.1.

Table 3.2.5
Examples of Low Hazard Industries

Sl. No.	Description
1	Beverages, nonalcoholic
2	Brick and masonry
3	Ceramic products
4	Foundries
5	Glass products
6	Gypsum
7	Ice plants
8	Metal fabricator and assembly
9	Water pumping plants
10	Agricultural farms
11	Grain processing mills (agricultural products)
12	Silk processing and spinning

2.11.3 **Access and Exit Facilities and Emergency Escapes**
Facilities for access and exit and emergency escape shall comply with the provisions set forth in Sec 1.6; Chapter 3, Part 4.

2.11.4 **Lighting, Ventilation and Sanitation**
All buildings or part of a building classified as Occupancy G shall conform with the provisions of Sec 1.17; Chapters 1 and 3, Part 8.

Special provisions: Industrial buildings having roof opening for daylighting and natural ventilation shall comply with the following requirements:

i) The aggregate opening in roof and external windows shall not be less than 10 per cent of the floor area.

ii) For natural ventilation by means of exterior window openings, the operable window area shall not be less than 5 per cent of the total floor area.

Exception :
Industrial buildings wherein artificial lighting and mechanically operated ventilation systems of approved quality are installed need not be provided with natural ventilation or natural lighting.

2.11.5 **Shaft and Exit Enclosures**
Elevator shafts, vent shafts and other vertical openings shall be enclosed with a construction of at least 4 hour fire resistance. Exit requirements shall comply with Chapter 3, Part 4.

2.11.6 **Sprinkler and Standpipe System**
When required by other provisions of this Code, sprinkler system shall be installed according to the specifications set forth in Chapters 4 and 5, Part 4.

2.11.7 **Special Hazards**
Chimneys, vents and ventilation ducts shall be constructed with noncombustible materials. Every bailer, central heating plants, electrical rooms, or hot water supply bailer shall be separated from the rest of the occupancy or use by not less than two hour fire resistive construction.

2.11.8 **Fire Alarm Systems**
Requirements for fire alarm systems in Occupancy G buildings are specified in Chapters 4 and 5, Part 4.

2.12 REQUIREMENTS FOR OCCUPANCY H - STORAGE BUILDINGS

Buildings shall be classified as Occupancy H in accordance with Sec 2.1.8.

2.12.1 **Construction, Height and Allowable Area**
The buildings or parts thereof classified as Occupancy H shall be limited to the type of construction set forth in Table 3.2.4 and shall comply with the provisions of Sec 1.8 and 2.4.2 to meet the requirements of height and area limitations.

2.12.2 **Location on Property**
The location on property for Occupancy H shall conform with Sec 2.4.1.

2.12.3 **Access and Exit Facilities and Emergency Escapes**
Facilities for access and exit and emergency escape shall comply with the provisions set forth in Sec 1.6; Chapter 3, Part 4.

2.12.4 **Lighting, Ventilation and Sanitation**
All buildings or part of a building classified as Occupancy H shall conform with the provisions of Sec 1.17; Chapters 1 and 3, Part 8.

Special Provision : The provisions of Sec 1.17, does not apply to nonhabitable spaces of H1 and H2 occupancies unless otherwise required by this Code. Ventilators of size not less than 0.25 m^2 shall be provided where suitable 0.30 m above the floor level for floor level ventilators and 0.30 m below the roof level for roof level ventilators. There shall be one floor level ventilator and one roof level ventilator for every 0.25 m^2 of the floor area. Mechanized ventilation system of approved quality shall be installed where required.

2.12.5 **Shaft and Exit Enclosures**
Elevator shafts, vent shafts and other vertical openings shall be enclosed with a construction of at least 4 hour fire resistance. Exit requirements shall comply with Chapter 3, Part 4.

2.12.6 **Sprinkler and Standpipe System**
When required by other provisions of this Code, sprinkler system shall be installed according to the specifications set forth in Chapters 4 and 5, Part 4.

2.12.7 **Special Hazards**
The storage of hazardous materials shall not exceed the exempt amount as specified in Table 3.2.7. The storage of moderate and low hazardous materials shall be separated at least by a two hour fire resistive construction.

Table 3.2.6
Moderate Hazard Industrial uses

1.	Aircraft
2.	Appliances
3.	Athletic equipment
4.	Automobiles and other motor vehicles
5.	Bakeries
6.	Beverages (alcoholic)
7.	Bicycles
8.	Boat building
9.	Bailer works
10.	Brooms or brushes
11.	Business machines
12.	Cameras and photo equipment
13.	Canneries, including food products
14.	Clothing
15.	Condensed and powdered milk
16.	Construction and agricultural machinery
17.	Disinfectants
18.	Dry Cleaning using other than flammable liquids in cleaning or dyeing operations
19.	Electric light plants and power houses
20.	Electrolytic reducing works
21.	Electronics
22.	Engines, including rebuilding or reconditioning
23.	Film, photographic
24.	Food processing
25.	Furniture
26.	Garments industries
27.	Hemp and Jute products
28.	Laundries (mechanized)
29.	Leather and tanneries, excluding enareding or japanning
30.	Machinery
31.	Mill works, and woodworking, wood distillation and particle boards
32.	Motion picture and television filming
33.	Musical instruments
34.	Pharmaceutical
35.	Paper mills or products
36.	Packaging
37.	Plastic products
38.	Printing or publishing or dyeing and printing
39.	Recreational vehicles
40.	Refuse incinerators
41.	Shoes
42.	Soaps and detergents
43.	Sugar production and refineries
44.	Textile and jute mills including canvas, cotton cloth, bagging burlap, carpet and rags
45.	Tobacco
46.	Trailers
47.	Upholstery and manufacturing shops

2.12.8 **Smoke Detectors**
Smoke detectors of approved quality shall be installed in the Occupancy H2 having more than 100 m^2 of area. Other provisions for smoke detectors shall comply with Chapters 4 and 5, of Part 4.

2.12.9 **Fire Alarm System**
Fire alarm systems of approved type shall be installed in the buildings having Occupancy H1 and Occupancy H2 when required according to the specification of fire protection provisions of Chapters 4 and 5, Part 4.

2.13 REQUIREMENTS FOR OCCUPANCY J - HAZARDOUS BUILDINGS

Buildings shall be classified as Occupancy J in accordance with Sec 2.1.9.

2.13.1 **General**
The plans for buildings and structures accommodating Occupancy J shall clearly indicate the type and intended use of materials and its processing or handling methods so as to reflect the nature of use of each portion of such buildings.

2.13.1.1 Occupancy J1 : Any building or portion thereof containing the following shall be classified as Occupancy J1.

a) Combustible dusts and any similar solid material sufficiently comminuted for suspension in still air which, when so suspended, is capable of self-sustained combustion.

b) Combustible liquids - Any liquid having a flash point at or above 40°C shall be known as class II and class III liquids. Combustible liquids shall be classified as follows:

Class II Liquids having flash point at or above 40°C and below 60°C.
Class III Liquids having flash points at or above 60°C and below 95°C.

Cryogenic liquids (flammable or oxidizing): Any liquid that has a boiling point below -130°C.

Flammable Gases : Any gas when mixed with air in a proportion of 13% (by volume) forms a flammable mixture under atmospheric temperature and pressure.

Flammable Liquids : Any liquid that has a flash point below 40°C and has a net vapour pressure exceeding 275 kPa at 40°C. Flammable liquids shall be known as Class I liquid and shall be further classified as follows:

Class I. A	:	Liquids having flash point below 25°C and having a boiling point below 40°C.
Class I. B	:	Liquids having flash point below 25°C and having a boiling point at or above 40°C.
Class I. C	:	Liquids having flash points at or above 25°C and below 40°C.
Oxidizers class 3	:	As determined in accordance with NFPA 43A.
Oxidizing gases	:	As determined in accordance with NFPA 43C.

Pyrophoric liquids, solids and gases that will ignite spontaneously in air at a temperature of 55°C or below.

Unstable (reactive) materials class 3, nondetonatable as determined in accordance with NFPA 704.

Combustible fibres: Includes readily ignitable fibres like cotton, sisal, jute hemp, tow, cocoa fibre, oakum, baled waste, baled waste paper, kapok, hay, straw, excelsior, Spanish moss and other similar materials.

Flammable solid: Any solid including blasting agent or explosive that is liable to cause fire through absorption of moisture, spontaneous chemical change or retained heat from manufacturing or processing, or which when ignited burns so vigorously and persistently as to create a serious hazard.

Organic peroxides, Class II and Class III as determined in accordance with NFPA 43B.

Oxidizers Class I and Class II as determined in accordance with NFPA 43A.

The bulk storage of-Unstable (reactive) materials Class 1 and Class 2 as determined in accordance with NFPA 704, water reactive materials, Class 2 and Class 3 which react with water to release a gas that is either flammable or present a health hazard as determined in accordance with NFPA 704.

2.13.1.2 Occupancy J2

a) Any building or portion thereof containing the following shall be classified as Occupancy J2:
Corrosives: Any substance that causes visible destruction of or irreversible alteration in living tissues by chemical action at the site of contact.

Highly toxic materials: The materials falling in this category are as follows:

i) Oral Toxicity : A chemical that has a median lethal dose of 50 mg or less per kg of body weight when administered orally to albino rats weighing between 200 and 300 gms each.

ii) Toxicity of Inhalation : A chemical that has a median lethal concentration in air of 200 ppm or less by volume of gas or vapour, or 2 mg per litre or less of mist, fume or dust, when administered by continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 grams each.

iii) Toxicity by Skin Absorption : A chemical that has median lethal dose of 200 mg or less per kg of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 kg each.

iv) Irritants : Any noncorrosive chemical or substance which causes a reversible inflammatory effect on living tissues by chemical action at the site of contact.

v) Radioactive Material : Any material or combination of materials that spontaneously emit ionizing radiation.

vi) Sensitizers : A chemical or substance that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

b) The Occupancy J2 shall also include among others the followings:

i) Dry cleaning establishments using flammable solvents.
ii) Explosive manufacturing.
iii) Paint or solvent manufacturing (flammable base).
iv) Pyrexin plastic manufacturing.
v) Sodium nitrate or ammonium nitrate.
vi) Storage of combustible film.

2.13.1.3 Special Provisions : The following shall not be included in Occupancy J but shall be classified in the occupancy group which they most nearly resemble and such classification shall be approved by the Authority:

i) All buildings and structures and parts thereof which contain less than the exempt quantities as specified in Table 3.2.7, when such buildings comply with the fire protection provisions of this Code.

ii) Rooms containing flammable liquid in lightly closed containers of 4 litre capacity or less for retail sales or private use on the premises and in quantities not exceeding 820 litre/m^2 of room area.

iii) Retail paint sales rooms with quantities not exceeding 820 litre/m^2 of room area.

iv) Closed systems housing flammable or combustible liquids or gases used for the operation of machinery or equipment.

v) Cleaning establishments.

vi) Liquor stores and distributors without bulk storage.

vii) Tyre storage containing less than 10,000 vehicle tyres.

viii) The storage or use of materials for agricultural purposes for use on the premises.

ix) Pyrophoric solids or liquids not exceeding 3 m^3 in storage cabinet located in a building that is equipped throughout with an automatic sprinkler system provided in accordance with the fire protection provisions of this Code.

x) Pyrophoric solids or liquids not exceeding 3 kg in storage cabinet located in a building that is provided with an automatic sprinkler system installed in accordance with the fire protection provisions of this Code.

xi) Class 2 water reactive materials not exceeding 100 kg in an approved storage cabinet located in a building that is provided with automatic sprinkler installed in accordance with the fire protection provisions of this Code.

2.13.2 Construction, Height and Allowable Area

2.13.2.1 The buildings or parts thereof classified as Occupancy J shall be limited to the type of construction set forth in Table 3.2.4 and shall comply with the provisions of Sec 1.8 and 2.4.2 to meet the requirements of height and area limitations.

2.13.2.2 Floors : The floors and spaces containing hazardous materials and in areas where motor vehicles, boats, helicopters or airplanes are stored, repaired or operated shall be of noncombustible, liquid-tight construction.

Exception :
In floors and areas where no repair works are carried out may be surfaced or waterproofed with asphaltic paving materials.

Table 3.2.7
Exempt Amounts of Hazardous Materials

	Material	Class/State	Maximum quantities
1.	Flammable liquids	Class I-A	115 litres*
		Class I-B	230 litres*
		Class I-C	340 litres*
2.	Combustible liquids	Class-II	455 litres*
		Class-III A	950 litres*
3.	Combination of flammable liquids		455 litres*
4.	Flammable gases		84,000 litres atmospheric pressure at 21°C
5.	Liquefied flammable		230 litres
6.	Combustible fibres	Loose	2800 litres
7.	Combustible fibres	Baled	28,000 litres
8.	Flammable solids		230 kg.
9.	Unstable materials		No exemptions
10.	Corrosive liquids		210 litres
11.	Oxidizing materials	Gases	168,000 litres
12.	Oxidizing materials	Liquids	190 litres
13.	Oxidizing materials	Solids	
		Class-1	1815 kg.
		Class-2	455 kg.
		Class-3	90 kg.
		Class-4	4.5 kg.
14.	Organic peroxides	Class-1	No exemptions
		Class-1 & 3	4.5 kg.
15.	Nitromethane	Unstable materials	No exemptions
16.	Ammonium nitrate		455 kg.
17.	Ammonium nitrate	Compound mixtures containing more than 60% nitrate by weight	455 kg.
18.	Highly toxic material and poisonous gas		No exemptions
19.	Irritants		2270 kg.
20.	Sensitizes		2270 kg.
21.	Smokeless Powder		9 kg.
22.	Black sporting powder		2.3 kg.

* The maximum quantities may be increased by 100 per cent in areas not accessible to the public in buildings provided with automatic sprinkler system.

2.13.2.3 Spill Control : The floors containing hazardous repair or other works shall be recessed a minimum of 100 mm so as to prevent flow of liquids to adjoining areas.

2.13.2.4 Drainage : The buildings and areas shall be provided with approved drainage system to direct the flow of liquids to an approved location or room or area designed to provide secondary containment of the hazardous materials and fire protection water.

The drains shall be designed with adequate slope and section to carry the design discharge of the sprinkler system. The material used in the drains shall be suitable for drainage of the storage materials.

Separate drainage system shall be designed for materials which react with each other producing undesirable results. They may be combined when they have been provided with approved means of discharge into the public sewer or natural stream or river.

2.13.2.5 Containment : The outflow from the drains shall be directed to a containment system or other area that provide a secondary storage for the hazardous materials and liquids and fire protection water. The containment capacity shall be capable of containing the outflow from the drains for a period of at least one hour.

The overflow from secondary containment system shall be directed to a safe location away from the building, adjoining properties and storm drain.

If the secondary containment storage area is open to rainfall it shall be designed to accommodate 24 hour rainfall or a continuous rainfall of 100 mm per day.

2.13.2.6 Smoke and Heat Vents : Smoke and heat vents shall be provided in areas or rooms containing hazardous materials exceeding the exempt amount of Table 3.2.7.

2.13.2.7 Standby Power : Standby power shall be provided in the occupancies where Class I, II or III organic peroxides are stored.

2.13.3 **Location on Property**
The location on property for Occupancy J shall conform with Sec 2.4.1.

2.13.4 **Access and Exit Facilities and Emergency Escapes**
Facilities for access and exit and emergency escape shall comply with the provisions set forth in Sec 1.6, and Chapter 3, Part 4.

2.13.5 **Lighting, Ventilation and Sanitation**
2.13.45.1 All spaces and rooms customarily occupied by human beings shall be provided with natural light by means of exterior glazing with an area of not less than 10 per cent of the floor area. Such rooms and spaces shall be provided with natural ventilation by means of exterior openings with an openable area not less than 5 per cent of the total floor area or artificial light and mechanically operated ventilation system.

2.13.5.2 Ventilation in Hazardous Locations : The rooms, spaces or areas where explosive, corrosive, combustible, flammable or highly toxic dust, mists, fumes, vapours or gases are stored or may be emitted due to the processing, use, handling or storage of materials shall be mechanically ventilated.

The mechanical ventilation of all hazardous uses shall be segregated or separated from the ventilation of other areas. The emissions generated at work areas shall be confined to the area in which they are generated and shall be removed or discharged outside the building and preventive measures against back flow of such hazardous fumes or gases inside the building shall be installed.

2.13.5.3 Ventilation of Toilets : Toilets shall be provided with fully openable exterior window of at least 0.3 m^2 in area or a vertical duct not less than 62500 mm^2 in cross-section for the first water closet, with 31250 additional mm^2 for each additional fixture or a mechanically operated exhaust system equipped to provide a complete change of air in every 15 minutes. Such system shall be connected to the outside air and the point of discharge shall be at least 1.0 m away from any other opening into the building.

Other requirements of water closets are specified in Sec 1.11.4.

2.13.6 **Shaft and Exit Enclosures**
Elevator shafts, vent shafts and other vertical openings shall be enclosed with a construction of at least 4 hour fire resistance. Exit requirements shall comply with Chapter 3, Part 4.

2.13.7 **Sprinkler and Standpipe Systems**
When required by other provisions of this Code, sprinkler system shall be installed according to the specifications set forth in Chapters 4 and 4, Part 4.

2.13.8 **Explosion Control**
Explosion control, equivalent protective devices or suppression systems or barricades shall be installed to control or vent the gases resulting from deflagrations of dusts, gases or mists in a room or area, building or other enclosures to minimize structural or mechanical damage.

Walls, floors and roofs separating a use from explosion exposure shall be designed according to the provisions of Chapter 1, Part 6.

Explosion venting shall be designed in exterior walls or roof only. The venting shall be provided to prevent serious structural damage and production of lethal projectiles. The venting design shall recognize the natural characteristics and behaviours of building materials in an explosion. The vents shall be designed to relieve at a maximum internal pressure of 1 kPa but not less than the loads required by Chapter 2, Part 6. One or more of the following systems shall be installed to relieve explosion, where applicable:

a) Light weight materials in walls.
b) Light fastening devices with hatch covers.
c) Light fastening with outward opening swing doors in exterior walls.
d) Nonbearing walls with light ties.

The venting devices shall discharge vertically or horizontally directly to an unoccupied yard having a width of not less than 16 m on the same plot.

The releasing devices shall be so located that the discharge end shall not be less than 3 m vertically and 6 m horizontally from window openings or exits in the same or adjoining buildings.

2.13.9 **Fire Alarm Systems**
A manual fire alarm system shall be installed in Occupancy J2 and an automatic smoke detection system shall be installed in rooms, spaces or buildings with Occupancy J1 in accordance with the provisions of Chapters 4 and 5, Part 4.

2.13.10 **Special Hazards**
Chimneys and vents and ventilation ducts shall be of noncombustible materials.

Every bailer, central heating plants, electrical rooms or hot water supply bailer shall be separated from the rest of the occupancies or uses by not less than 2 hour fire resistive construction.

The devices that generate a spark, flame or glow capable of igniting gasoline shall not be installed or used within 0.5 m of the floor.

Equipment or machinery that produces or emits combustible or explosive dust or fibres shall be provided with an approved dust collecting and exhaust system.

The equipment or system that are used to collect, process or convey combustible dust or fibres shall be installed with explosion venting or containment system.

2.14 REQUIREMENTS FOR OCCUPANCY K - MISCELLANEOUS BUILDINGS

Buildings shall be classified as Occupancy K in accordance with Sec 2.1.10.

2.14.1 **General**
The buildings or parts thereof classified as Occupancy K shall be limited to the type of construction set forth in Table 3.2.4 and shall comply with the requirements of Sec 1.8 and 2.4.2 to meet the requirements of height and area limitations.

Any building or portion thereof that exceeds the limitations provided in this chapter shall be classified in the occupancy group other than K that it most nearly resembles.

In mixed occupancy buildings, the exterior wall and opening protection for K1 occupancy shall follow the specification of the major occupancy of the building. For such mixed occupancy buildings, the allowable floor area for Occupancy K1 shall be as permitted for the major occupancy contained therein.

2.14.2 **Location on Property**
The location on property for Occupancy K shall conform with Sec 2.4.1.

2.14.3 **Access and Exit Facilities and Emergency Escapes**
Access and exit facilities for Occupancy K shall comply with the specification set forth in Sec 1.6; Chapter 3, Part 4.

2.14.4 **Lighting, Ventilation and Sanitation**
All buildings or part of a building classified as Occupancy K shall conform with the provisions of Sec 1.17; Chapters 1 and 3, Part 8.

2.14.5 **Shaft and Exit Enclosures**
Elevator shafts, vent shafts and other vertical openings shall be enclosed with a construction of at least 4 hour fire resistance. Exit requirements shall comply with the requirements of Chapter 3, Part 4.

2.14.6 **Sprinkler and Standpipe System**
When required by other provisions of this Code, sprinkler system shall be installed according to the specifications set forth in Chapters 4 and 5, Part 4.

2.14.7 **Fire Alarm Systems**
Requirements for fire alarm systems in Occupancy K buildings are specified in Chapters 4 and 5, Part 4.

2.14.8 **Special Hazards**
Chimneys and exhausts shall be constructed with noncombustible materials.

The garage floor shall be constructed with not less than 4 hour fire resistance materials.

Related Appendix

Appendix A	Guidelines for the Development of Minimum Standard Housing (Occupancy A4)

CHAPTER 3

Classification of Building Construction Types Based on Fire Resistance

3.1 CLASSIFICATION AND GENERAL REQUIREMENTS

3.1.1 Classification by Type of Construction

For the purpose of this Code, there shall be three types of construction based on fire resistance which are as follows:

Type 1	:	Highest degree of fire resistance
Type 2	:	Intermediate degree of fire resistance
Type 3	:	Lowest degree of fire resistance

The fire resistance ratings of various types of construction for structural and nonstructural members are specified in Table 3.3.1.

Buildings having a height of more than 20 m shall be constructed with noncombustible materials.

The fire resistance ratings of various building components shall conform to ASTM standards.

3.1.2 Fire Zones

The planning and development authority of the city, township, municipality or region where this Code is intended to be implemented shall divide the area under their jurisdiction into distinct fire zones. The basis for this zoning shall be the fire hazard inherent in the buildings and the degree of safety desired for the occupancy accommodated therein. The number of zones in an area shall depend on its size and the strategies undertaken for its development.

Table 3.3.1
Required Fire Resistance Ratings of Building Elements (in hours)
for Various Types of Construction

Building Element	Type of Construction		
	Type 1	Type 2	Type 3
(1) Exterior bearing walls	4 ←	2 (see Note a)	1 →
(2) Exterior nonbearing walls and curtain walls	2 ←	1.5 (see Note a)	1 →
(3) Interior bearing walls, bearing partitions, columns, girders, trusses (other than roof trusses) and framing			
a) Supporting more than one floor	4	2	2
b) Supporting one floor only or a roof only	3	1.5	1
(4) Structural frame and structural members supporting wall	3 ←	1.5 (see Note b)	1 →
(5) Floor construction including beams	3	1.5	1
(6) Roof construction, including beams, trusses and framing, arches and roof deck			
a) 5 m or less in height to lowest member	2	1.5	1
b) More than 5 m but less than 7 m in height to lowest member	1	1	1
c) 7 m or more in height to lowest member	0.5	0.5	0.5
(7) Fire walls and party walls	4 ←	2 (see Note c)	2 →
(8) Enclosure of fire exits	2	2	2
(9) Shafts (other than exits) and elevator hoistways	2	2	2
(10) Access corridors leading to fire exits	1	1	1
(11) Vertical separation of tenant spaces	1	1	1
(12) Nonbearing partition walls	0.5	0.5	0.5
(13) False/suspended ceilings	0.5	0.5	0.5
(14) Smoke barriers	1	1	1
(15) Mixed occupancy separation	←	(see Note d)	→

Note : a : Not less than the rating based on fire separation distance (see Table 3.2.2)
b : Not less than fire resistance rating of wall supported
c : Not less than the rating required in Table 3.2.1
d : Fire resistance ratings of mixed occupancy separation, where permitted, shall be as required in Table 3.2.1.

3.1.2.1 Fire Zone 1 : The following occupancy groups shall comprise this zone:

Occupancy A	:	Residential
Occupancy B	:	Educational
Occupancy C	:	Institutional
Occupancy D	:	Health Care
Occupancy E	:	Assembly
Occupancy F1, F2, F3	:	Business and Mercantile (Offices, small shops and markets, large shops and markets)
Occupancy H1	:	Storage Buildings (Low fire risk storage)
Occupancy K	:	Miscellaneous Buildings

3.1.2.2 Fire Zone 2 : The following occupancy groups shall comprise this zone:

Occupancy F4, F5	:	Business and Mercantile (Garages and petrol stations, essential services)
Occupancy G	:	Industrial Buildings
Occupancy H2	:	Storage Buildings (Moderate fire risk storage)

3.1.2.3 Fire Zone 3 : The only occupancy falling in this zone shall be Occupancy J, Hazardous Buildings.

3.1.2.4 Change in Fire Zone Boundaries : The demarcations of fire zones may be changed or new occupancies may be included in any fire zone through the same procedure as for promulgating new rules or ordinances or both.

3.1.2.5 Buildings on Overlapping Fire Zones : Buildings falling on more than one fire zones shall be considered to be situated on the zone in which the major portion of the building falls. If a building is divided equally between more than one fire zone, it shall be considered as falling in the fire zone having more hazardous occupancy buildings.

3.1.2.6 Restrictions on Temporary Constructions : Permission may be granted by the Authority for temporary constructions only in fire zones 1 and 2 and not in fire zone 3. Such temporary constructions shall adhere to the conditions of the permission and shall be demolished and removed completely after the expiry of the duration of the permission unless it is extended by the Authority or a new permission is obtained.

3.1.3 **Permissible Types of Construction for Various Occupancies**

3.1.3.1 New Buildings : Types of constructions permitted for various buildings on the basis of fire zones are specified in Table 3.2.4.

3.1.3.2 Existing Buildings : Existing buildings in any fire zone need not comply with the provision of this Code for type of construction unless they are altered or in the opinion of the Authority they constitute a hazard to the safety to the occupants of the buildings or the adjacent properties.

3.1.4 **Exterior Walls**

The fire resistance rating of the exterior walls shall conform with the provisions set forth in Table 3.2.2 and 3.2.3.

3.1.5 **Mixed Occupancy Separation**

When a building accommodates more than one occupancy, each such occupancy shall be separated from the others according to the provisions specified in Sec 2.3.

3.1.6 **Basement Floor**

Basement floor of a building shall be enclosed with a one hour fire resistive construction. Doors in such constructions shall be made of noncombustible materials.

Exception :
Occupancies F4 and K need not conform with these requirements.

3.1.7 **Restricting Vertical Spread of Fire**

3.1.7.1 Interior Walls : Propagation of fire, smoke, gas or fume through the voids of fire resistive floors and walls shall be restricted by sealing such voids with an approved material which shall have a fire resistance rating of at least equal to that of the floor-wall assembly. The sealing material shall be capable of preventing passage of flame and hot gases sufficient to ignite cotton waste when tested in accordance with ASTM E119-8.

3.1.7.2 Exterior Walls : Openings in the exterior wall in two consecutive floors lying within 1.5 m laterally shall be separated with a flame barrier projecting at least 75 cm from the external face of the exterior wall. The flame barrier shall have a fire resistance rating of not less than three-fourths hour.

3.1.8 **Exceptions to Fire Resistance Requirements**

The provisions of this section are exceptions to the occupation separation requirements of Table 3.2.1.

3.1.8.1 Fixed Partitions

a) Stores and Offices : In such cases where offices, stores and similar places occupied by one tenant are separated by nonload bearing walls that do not form a corridor serving an occupant load, the partition walls may be constructed of any one of the following :

i) Noncombustible materials;

ii) Fire retardant treated wood;

iii) One hour fire resistive construction;

iv) Wood panels or similar light construction up to three fourths the height of the room in which placed; and

v) Wood panels or similar light construction more than three-fourths the height of the room in which placed with not less than upper one fourth of the partition constructed of glass.

b) Hotels and Apartments : In such cases where nonload bearing walls act as interior partitions in individual dwelling units in apartment houses and guest rooms or suites in hotels when such dwelling units, guest rooms or suites are separated from each other and from corridors by not less than one-hour fire-resistive construction, the partition walls may be constructed of any one of the following:

i) Noncombustible materials of fire retardant treated wood in buildings of any type of construction; or

ii) Combustible framing with noncombustible materials applied to the framing in buildings of Type 3 construction.

c) Folding, Portable or Movable Partitions : Folding, portable or movable partitions need not have a fire resistance rating if the following conditions are satisfied:

i) Required exits are not blocked without providing alternative conforming exits;

ii) Tracks, guides or other approved methods are used to restrict their locations; and

iii) Flammability shall be limited to materials having a flame-spread classification as set forth in Tables 3.3.2 and 3.3.3 for rooms or areas.

Table 3.3.2
Flame Spread Classification

Class	Flame Spread Index
I	0-25
II	26-75
III	76-200

Table 3.3.3
Maximum Flame Spread Class

Occupancy Group	Enclosed Vertical Exit Ways	Other Exit Ways	Rooms or Areas
E	I	II	II
B	I	II	III
C, D	I	I	II
J	I	II	III
F, G, H	I	II	III
A2, A5	I	II	III
A1, A3, A4	III	III	IH
K	No restrictions		

d) Walls Fronting on Streets or Yards : For walls fronting on a street or yard having a width of at least 12 m, certain elements of the wall may be constructed as follows regardless of their fire-resistive requirements:

i) Bulkheads below show windows, show window frames, aprons and show-cases may be of combustible materials provided the height of such construction does not exceed 5 m above grade.

ii) Wood veneer of boards not less than 25 mm in nominal thickness or exterior type panels not less than 10 mm in nominal thickness may be used in walls provided:

1. the veneer does not extend beyond 5 m above grade; and

2. the veneer is placed either directly against noncombustible surface or furred out from such surfaces not to exceed 40 mm with all concealed spaces fire blocked.

e) Trim : Wood may be used to construct trim, picture moulds, chair rails, baseboards, handrails and show window backing. If there is no requirement for using fire protected construction, unprotected wood doors and windows may be used.

f) Loading Platform : Noncombustible construction of heavy timber may be used for exterior loading platforms with wood floors not less than 50 mm in nominal thickness. Such wood construction shall not be carried through the exterior walls.

g) Insulating Boards : Combustible finished boards may be used under finished flooring.

3.1.9 **Shaft Enclosures**

3.1.9.1 General : Construction requirement for shafts through floors shall conform to the provisions of Table 3.3.1.

3.1.9.2 Extent of Enclosures : Shaft enclosures shall extend from the lowest floor opening through successive floor openings and shall be enclosed at the top and bottom.

Exceptions:
1. Shafts need not be enclosed at the top if it extends through or to the underside of the roof sheathing, deck or slab.
2. Noncombustible ducts carrying vapours, dusts or combustion products may penetrate the enclosure at the bottom.
3. Shafts need not be enclosed at the bottom when protected by fire dampers conforming to "Test Methods for Fire Dampers and Ceiling Dampers" (U.B.C. Standard No. 43-7), installed at the lowest floor level within the shaft enclosure.

3.1.9.3 Special Provision : In groups other than Occupancies C and D, openings which penetrate only one floor and are not connected with any other floor or basement and which are not concealed within building construction assemblies need not be enclosed.

3.1.9.4 Protection of Openings : Openings in shaft enclosures shall be protected with a self-closing or an automatic-closing fire assembly having a fire resistance rating of

i) one hour for one hour fire resistive walls
ii) one and one-half hours for two hour fire resistive walls

3.1.9.5 Rubbish and Linen Chute Termination Rooms : Rubbish and linen chute shall terminate in rooms separate from the remaining of the building having the same fire resistance as required for shafts in Table 3.3.1 but not less than one hour.

3.1.10 **Expansion and Contraction Joints**

Expansion and contraction joints provided to accommodate expansion, contraction, wind or seismic movement shall be protected with an approved material having the same degree of fire resistance as that of the wall or floor in which it is installed.

3.1.11 **Weather Protection**

3.1.11.1 Weather Resistive Barrier : All weather exposed surfaces shall have a weather barrier to protect the interior wall from damping. Such weather barriers shall have a fire resistance rating of at least equal to that of the wall or floor on which it is applied. Weather resistive barrier need not be used in the following cases:

i) When exterior covering is of approved waterproof panels
ii) In back plastered construction
iii) When there is no human occupancy
iv) Over water repellent panel sheathing
v) Under approved paper backed metal or wire fabric lath
vi) Behind lath and portland cement plaster applied to the underside of roof and eave projections.

3.1.11.2 Flashing and Counter Flashing : Exterior openings exposed to the weather shall be flashed to make them weather proof. There shall be copings with all parapets. Corrosion resistant metals shall be used for flashing, counter flashing and coping.

3.1.11.3 Waterproofing Weather-exposed Areas : Waterproofing shall be applied to exposed surfaces like balconies, external stairways and landings.

3.1.11.4 Damp-proofing Foundation Walls : Outside of foundation walls enclosing a basement floor below finished grade shall be damp-proofed from outside.

3.1.12 **Members Carrying Walls**
All members carrying masonry or concrete walls shall be fire protected as specified in Table 3.3.1.

3.1.13 **Parapets**
Parapets constructed on exterior wall of a building shall have the same degree of fire resistance required for the wall upon which they are erected and there shall be noncombustible faces on the side adjacent to the roof surface for the uppermost 405 mm including counter flashing and coping materials. The height of the parapet shall be at least 750 mm from the upper surface of the roof.

3.1.14 **Projections**
Sunshades, cornices, projected balconies and overhangings beyond walls of Type 1 or 2 construction shall be of noncombustible materials. Projections from walls of Type 3 may be of combustible or noncombustible materials.

3.1.15 **Guardrails and Barriers**
3.1.15.1 Guardrails : Guardrails shall be provided to protect unenclosed floor and roof openings, open and glazed sides of stairways, landings and ramps, balconies or porches, which are more than 750 mm above the grade or floor below, and roofs accessible for purposes other than service works.

3.1.15.2 Barrier : Barriers shall be provided in parking garages located more than 1.5 m above the adjacent grade. The height of the barrier shall be at least 300 mm and it shall be centred at 450 mm above the parking surface.

3.1.16 **Insulation**
The provisions of this section are applicable to thermal and acoustical insulations located on or within floor-ceiling and roof ceiling assemblies, crawl spaces, walls, partitions and insulation on pipes and tubings.

Materials used for such insulation and covering shall have a flame spread rating not more than 25 and a smoke density not more than 450.

3.1.17 **Atria**
3.1.17.1 General : Atria may be provided in all groups other than Occupancy J (Hazardous Buildings) provided there are sprinkler system installed throughout the building. Such atria shall have a minimum opening and are as specified in Table 3.3.4.

Table 3.3.4
Atrium Opening and Area

Height in Storeys	Minimum Clear Opening[1] (m)	Minimum Area (m^2)
3-4	6	40
5-7	9	90
8 or more	12	160

1 The specified dimensions are the diameters of inscribed circles whose centres fall on a common axis for the full height of the atrium.

3.1.17.2 Smoke Control System : A mechanically operated air-handling system shall be installed to exhaust the smoke either entering or developed within the atrium.

a) Exhaust Openings : The location of the exhaust openings shall be in the ceiling or in a smoke trap area immediately adjacent to the ceiling of the atrium above the top of the highest portion of door openings into the atrium.

b) Supply Openings : Supply openings designed for a minimum of 50 per cent of the exhaust volume shall be located at the lowest level of the atrium. Supply air may be introduced by gravity provided the height of the atrium is not more than 18 m and smoke control is established. For atria having height greater than 18 m, supply air shall be introduced mechanically from the floor of the atrium and directed vertically toward the exhaust outlets. Supplemental air supply may be introduced at upper levels in atria over six storeys in height or when tenant spaces above the second storey are open to the atrium.

c) Automatic Operation : The smoke control system for the atrium shall be activated automatically by the automatic sprinkler system or smoke detectors installed within the atrium or areas open to the atrium.

d) Manual Operation : The smoke control system shall also be manually operable for use by the fire department. The smoke control system may be separate from or integrated with other air handling systems. Air handling systems interfering with the smoke control system shall be shut down automatically when the smoke control system is activated.

e) Smoke Detector Location : Smoke detectors which will automatically operate the smoke control system of the atrium shall be accessible for maintenance, testing and servicing. Their locations shall be as follows:

i) At the atrium ceiling, spaced in accordance with the manufacturer's instructions.

ii) On the underside of projections into the atrium, in accordance with the manufacturer's instructions.

iii) Around the perimeter of the atrium opening on all floors open to the atrium. These detectors shall be spaced no more than 9 m on centre and shall be located within 5 m of the atrium opening.

If projected beam type smoke detectors are used, they shall be installed in accordance with manufacturer's instructions.

f) Enclosure of Atria : Atria shall be separated from the adjacent spaces with fire resistive separation of at least one hour.
Fire windows may be provided in fixed glazed openings when the window has a fire resistive rating of at least three-fourths hour and the area of the opening does not exceed 25 per cent of the wall common to the atrium and the room into which the opening is provided.

3.1.18 **Mezzanine Floors**
Construction of a mezzanine floor shall conform with the requirements of the floor in which it is constructed but the fire resistance rating need not exceed one hour for unenclosed mezzanines.

3.2 REQUIREMENTS OF TYPE 1 FIRE RESISTIVE BUILDINGS

3.2.1 **General**
Type 1 construction shall be of materials like steel, iron, concrete or masonry. Walls and permanent partitions shall be of noncombustible fire resistive construction except that permanent nonbearing partitions of one hour or two hour fire resistive construction which are not part of a shaft enclosure, may have fire retardant treated wood within the assembly.

3.2.2 **Exterior Wall**
Exterior walls and all structural members shall conform to the requirements of Tables 3.2.2 and 3.3.1 for fire resistance rating. Openings in the exterior walls shall have a fire-resistive assembly of not less than three-fourths hour when they are located at not less than 6 m from an adjacent property line or centre line of a public way.

For occupancy groups B, C, D, E, F, G1 and H1 located less than 1.5 m from the property line and A and M located less than 1 m from the property line, no opening shall be permitted.

Exceptions:
i) Fire resistive protection need not be used for nonbearing walls of noncombustible construction fronting on public ways or yards having a width of at least 12 m.
ii) In all occupancy groups other than Occupancy H, exterior nonbearing walls may be of
1. one hour fire resistive noncombustible construction where openings are permitted, and
2. two hour fire resistive noncombustible construction where fire protection of openings is required.

3.2.3 **Structural Frame**
Structural frame shall be of reinforced concrete, masonry or steel as per the provisions of Part 6.

3.2.4 **Floor Construction**
Materials of floor construction shall be noncombustible and shall have fire resistance rating in accordance with Table 3.3.1.

3.2.5 **Stairway Construction**
Stairways shall be constructed with reinforced concrete, steel, masonry or any other hard noncombustible materials. For finishing works, brick, marble or other noncombustible materials may be used. Stairways shall be constructed in accordance with the exit provisions specified in Chapter 3, Part 4.

3.2.6 Roof Construction
Roofs and their members, other than the structural frame, may be constructed with unprotected noncombustible materials in all occupancy groups other than Occupancy J when every part of the roof framing including the structural frame is at least 8 m above the floor, balcony or gallery immediately below.

When every part of the structural framework of the roof of a building of Occupancy B or E or of an atrium is not less than 8 m above any floor, balcony or gallery, fire protection of all members of the roof construction, including those of the structural frame, may be omitted.

Where every part of the structural steel framework of the roof of a building Occupancy A or B is more than 6 m and less than 8 m above any floor, balcony or gallery, the roof construction shall be protected by a ceiling of not less than one hour fire resistive construction.

3.3 REQUIREMENTS FOR TYPE 2 FIRE-RESISTIVE BUILDINGS

3.3.1 General
Type 2 construction shall be of noncombustible materials like steel, iron, concrete, masonry or any other material permitted in this Code.

3.3.2 Exterior Walls and Openings
3.3.2.1 Exterior Walls : Exterior walls shall be constructed of noncombustible materials and shall comply with the fire resistive requirements set forth in Tables 3.2.2 and 3.3.1.

Exceptions:
1. Nonbearing walls fronting on public ways or yards having a width of at least 13 m may be unprotected when entirely of noncombustible material.
2. In Occupancies other than C, D and J, exterior nonbearing walls may be noncombustible one hour fire resistive where unprotected openings are permitted and noncombustible two hour fire resistive where protection of openings is required.
3. In buildings of Occupancy A2, A5 and F, exterior noncombustible bearing walls may be two hour fir resistive where openings are permitted.

3.3.2.2 Openings in Exterior Walls : Openings in exterior walls shall conform to the requirements of Table 3.2.3 and shall be protected by a fire assembly having a three-fourths hour fire resistive rating when they are less than 6 m from an adjacent property line or the centre line of a public way.

No openings shall be permitted in exterior walls of Occupancy B, C, D, E, F1, F2 and F4 less than 1.5 m from the property line, and no openings in Occupancy A, G1 and K less than 1 m from the property line.

3.3.3 Structural Frame
Structural frame shall be of reinforced concrete, masonry or steel as per the provisions of Part 6.

3.3.4 Floor Construction
Floors of construction Type 2 shall be of noncombustible materials permitted in this Code.

For wood flooring on masonry or concrete, the gap between the floor slab and the underside of the wood flooring shall be filled with noncombustible materials or fire blocked and there shall be no open spaces under the flooring exceeding 10 m^2.

Exception :
Fire blocking need not be provided in floors at or below the grade levels.

3.3.5 Stairway Construction
3.3.5.1 Stairways shall comply with the exit requirements of Chapter 3, Part 4.

3.3.5.2 Interior stairways serving buildings not exceeding three storeys in height may be constructed of any material permitted by this Code. In buildings more than three storeys in height, interior stairways shall be constructed as required for Type 1 buildings.

3.3.5.3 Exterior stairways shall be of noncombustible material except that on buildings not exceeding two storeys in height, they may be of wood of not less than 50 mm in nominal thickness.

3.3.6 Roof Construction
In all Occupancies other than F2, F4 and J, roofs and their members other than structural frame may be of unprotected noncombustible materials when every part of the roof framing, including the structural frame, is 8 m or more above the floor, balcony or gallery immediately below.

3.4 REQUIREMENTS FOR TYPE 3 FIRE RESISTIVE BUILDINGS

3.4.1 General
Structural and nonstructural elements of Type 3 construction may be any material permitted in this Code.

3.4.2 Exterior Wall
Exterior walls shall be constructed of in accordance with the provisions of Tables 3.2.2, 3.2.3 and 3.3.1. Openings in exterior walls shall be protected by a fire assembly having a fire resistance rating of at least three-fourths hour.

3.4.3 Structural Frame
Structural frame shall be of concrete, masonry or steel as specified in Chapter 2, Part 5.

3.4.4 Floor Construction
Floors shall have a fire resistance rating of one hour and shall comply with the requirements of Chapter 2, Part 5.

3.4.5 **Stairway Construction**
Interior stairway may be constructed of any materials permitted in this Code. Exterior walls shall be constructed of noncombustible materials or of wood not less than 50 mm in nominal thickness.

3.4.6 **Roof Construction**
Roof construction shall be of any materials permitted in this Code.

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Appendices

APPENDIX A	**Guidelines for the Development of Minimum Standard Housing (Occupancy A4)**
APPENDIX B	**Suggestive Typical Termite Proof Constructions and Pre-constructional Measures**

Appendix A
Guidelines for the Development of Minimum Standard Housing (Occupancy A4)

A 1 GENERAL

A 1.1 Government bodies or public agencies may designate an area in the master plan for the development of mass housing projects for the low income people. It may not be convenient or practicable for the dwelling units in such projects to be in full compliance with all the requirements of this Code. All such dwelling units in planned layouts of an approved settlement shall be classified as Occupancy A4 : Minimum Standard Housing. The guidelines of this appendix cover the planning and the general building requirements of such minimum standard housing developments.

A 1.2 Only government bodies or public agencies should be responsible for planning the number and location of the settlements in a master plan and the layout of units within the settlement. The guidelines of this appendix regarding layout planning are applicable to government bodies or public agencies responsible for such planning.

A 1.3 The guidelines and requirements regarding design and construction of buildings for minimum standard housing in approved layouts are applicable to government bodies, public agencies, private developers or individual owners who undertake such constructions.

A 2 TYPES OF DEVELOPMENT

The developments of minimum standard housing may be any one or a combination of the following types :

a) Single unit plots of row type housing,
b) Multi-storied flats of row type housing,
c) Block development as group or cluster housing, and
d) Site and service schemes.

The guidelines for planning and general building requirements shall be applicable to all types of development of minimum standard housing.

A 3 PLANNING

A 3.1 **Basic Master Plan Requirements**
Each cluster of minimum standard housing should accommodate a maximum of 400 dwelling units with an average of 5 persons per dwelling. The following common spaces should be provided in the layout plan of a settlement :

Community open spaces like park children's play area etc.	:	1000 m^2 per 1000 population
Internal roads and walkways	:	15 to 20 per cent of the site area
Primary school	:	1 school covering 1000 m^2 per 1500 population
Shopping centre	:	4 shops per 1000 population
Clinic/dispensary	:	175 m^2 per 2000 population
Places of worship	:	175 m^2 per 2000 population
Services	:	175 m^2 per 2000 population
Community welfare centre	:	400 m^2 per 1500 population

A 3.2 **Density**
The permissible density of dwelling units should be worked out in consideration of the minimum common space requirements given above and the size of the units. The density of minimum standard housing shall not be more than 175 units per hectare.

A 3.3 **Size of Plot**
A 3.3.1 Minimum standard housing with one room, cooking space, bathing facility and water closet in the ground floor and prospect of future extension of one room and bath/WC on the first floor or ground floor shall normally require a minimum plot size of 30 m^2. In areas other than metropolitan cities, with population less than 0.5 million, the minimum size of plot for such houses should be 40 m^2.

A 3.3.2 Developments having minimum standard houses with two rooms, kitchen, bathing facility and water closet in multi-storied flats, group housing or individual ownership houses shall require a minimum plot size of 40 m^2. In areas other than metropolitan cities, having a population less than 0.5 million, the minimum size of the plot for such houses should be 60 m^2. In dense inner city areas of metropolitan cities with population more than 1.5 million, the Government may decide to have a minimum plot size of 25 m^2 for such houses.

A 3.4 **Plot Frontage**
The minimum frontage of individual plots shall be 3.5 m. Plots for group housing developments in multi-storied blocks and plots for multi-storied flats will require a larger frontage.

A 3.5 **Site and Service Schemes**
A 3.5.1 Minimum Provisions : Site and service schemes shall delineate individual plots and provide for the infrastructural needs for the development of a permanent housing. Interim constructions by the allottees should also be permitted. Skeletal structures with a roof on columns and/or developed plinths may be provided if funds are available.

A 3.5.2 Sanitation : Sanitation and water supply must be provided in all site and service schemes. A sanitary service core or common water supply and sanitation facilities for planned groups of plots should normally suffice.

A 3.5.3 The developing agency shall install the services before handing over the plots.

A 3.6 **Internal Roads and Walkways**
Pedestrian walkways when provided as means of access, shall be at least 3 m wide. Such walkways shall not be longer than 60 m, nor serve more than 10 plots on each side of the path. Buildings on plots abutting such walkways shall not be higher than two times the sum of the width of the walkway and the front open space. Other internal roads shall be at least 6 m wide to allow emergency vehicles to enter. The paved portion of such roads, if used for pedestrian movement only, should be at least 2 m wide.

A 4 GENERAL BUILDING REQUIREMENTS

A 4.1 **Plinth Coverage**
The plinth area coverage of any plot of minimum standard housing shall not exceed 75 per cent of the plot area. There shall be a set back of minimum 1.5 m on the rear side of a plot. There is no requirement for such set back on the sides and front of a plot.

A 4.2 **Height Limitation**
The height of any building in a minimum standard housing scheme shall not exceed 6 storeys or 20 m. Whenever feasible, the height should be limited to 5 storeys. For buildings on internal pedestrian walkways, the provisions of Sec A 3.6 regarding height shall be applicable.

A 4.3 **Plinth Level**
The minimum height of the plinth shall be 300 mm from the surrounding ground level.

A 4.4 **Habitable Room**
A 4.4.1 One roomed dwelling units shall have a multi-purpose room which may include an alcove or space for cooking. The minimum area of the room shall be 12 m^2 with a minimum width of 2.5 m.

A 4.4.2 For dwelling units with two habitable rooms the minimum size of any room shall be 6 m^2 with a minimum width of 2.1 m. The total area of the two rooms shall not be less than 15 m^2.

A 4.4.3 One-roomed dwelling with plan for future extension into a two-roomed house in a staged construction scheme shall satisfy the requirement of A 4.4.2 regarding room sizes. The first room to be built in this type of development shall have a minimum area of 9 m^2 with a minimum width of 2.5 m. The total area of the two rooms after future extension shall be a minimum of 15 m^2.

A 4.4.4 All habitable rooms shall have a minimum clear height of 2.75 m. For sloped roofs the average height shall not be less than 2.75 m with a minimum of 2 m at the lowest side.

A 4.5 **Kitchen**
A 4.5.1 The size of the cooking alcove or cooking space provided in a multi-purpose room of a one-roomed house shall not be less than 2.25 m^2 with a minimum width of 1.2 m.

A 4.5.2 Separate kitchen provided in a two-roomed house shall have a minimum area of 3.25 m^2 with a minimum width of 1.6 m.

A 4.5.3 Minimum clear height of the kitchen or cooking space shall be 2.15 m.

A 4.6 **Bathroom and Water Closet**
A 4.6.1 Independent water closets shall have a minimum width of 0.9 m and a minimum length of 1.15 m. The water closet shall be fitted with a door.

A 4.6.2 Independent bathroom without water closet shall have a minimum width of 1 m and a minimum length of 1.4 m.

A 4.6.3 The minimum size of a combined bathroom and water closet shall be 1.8 m^2 with a minimum width of 1 m. The bathroom shall be fitted with a door.

A 4.6.4 The minimum clear height of bathrooms and water closets shall be 2.15 m.

A 4.7 **Balcony and Corridor**
The minimum width of individual balcony shall be 0.9 m. Corridors for use of more than one dwelling units shall have a minimum width of 1.2 m.

A 4.8 **Stairs**
A 4.8.1 Minimum Width : The minimum widths of stairs serving not more than two dwelling units per floor shall be as follows :

2 - storeyed buildings	0.75 m
3 - storeyed buildings	0.80 m
4 - storeyed buildings	0.90 m
5 or 6-storeyed buildings	1.00 m

A 4.8.2 Maximum Rise : The height of the riser shall not be more than 215 mm. The maximum number of risers per flight in a straight flight stair shall be 15.

A 4.8.3 Minimum Tread Depth : The minimum depth of the tread shall be as follows :

2 or 3-storeyed buildings	215 mm
4, 5 or 6-storeyed buildings	250 mm

A 4.8.4 Minimum Head Room : The minimum clear head room between flights of a staircase shall be 2.15 m. The clear head room may be reduced to 2.03 m for not more than three flights in any staircase.

A 4.8.5 Landing : The depth of landing at any level shall be at least equal to the width of the stair.

A 4.9 **Water Supply**
One water tap or hand tubewell pump per dwelling unit should be provided, if feasible. Each unit of public water hydrants or community hand pumps, if provided in lieu of individual water supply, shall serve not more than 10 dwelling units and shall not be farther than 15 m from any dwelling unit served.

A 4.10 **Lighting and Ventilation**
Every room, bathroom and kitchen shall have windows in an external wall opening on a courtyard, a balcony not wider than 2.5 m, or the exterior. The aggregate area of openings in the exterior wall of a habitable room or kitchen shall not be less than 12% of the floor area and that for a nonhabitable room such as bath room, water closet or stair shall be at least 8% of the floor area.

Appendix B
Suggestive Typical Termite Proof Constructions and Preconstructional Measures

B 1 GENERAL

Constructions and preconstructional measures presented in the following sections may be adopted for design and construction of termite proof buildings.

B 2 CONSTRUCTIONAL MEASURES

B 2.1 Suggested typical anti-termite constructions for brick masonry works are shown in Fig B1.

B 2.2 Fig B2 (a), (b) and (c) present termite shield, groove at entrance and arrangement at their junctions. Ends of termite shield shall overlap by at least 20 mm and soldered. A piece of 20x10 mm shall be cut off from the lower end portion of one of the pieces before soldering the two ends so that the thickness at the free edges remain constant.

B 2.3 Bottom of wooden columns supported directly on basement floors shall be protected with termite caps. Such caps shall be a metal sheet covering the whole section of the column and projecting 50 mm beyond the outer edge of the column.

B 3 PRECONSTRUCTIONAL MEASURES

B 3.1 For load bearing walls, treatment of soil shall be carried out at the bottom of the trenches and at the sides up to 300 mm above the bottom (Fig B3 and B4). In such cases, 5 litre of the chemical shall be sprayed per m^2 of the surface area. The backfill material in direct contact with the foundation shall be treated with 15 litre of chemical emulsion per m^2 of the surface area of the foundation. If water is used for compaction operation, it shall be done before applying the chemicals. Treatment shall follow the same layer wise sequence as that of the backfilling operation.

B 3.2 For frame structures, if the concrete mix of the foundation is 1:2:4 or richer, treatment of soil at the bottom of the trench is not needed. A layer of treated soil at a depth of 500 mm from the ground level shall be prepared. Details of this treatment is shown in Fig B5. The density of chemicals in such treatment shall be 15 litre/m^2.

B 3.3 The top surface of plinth in any building having a floor at the ground level shall be treated with a chemical emulsion at the rate of 5 litre/m^2.

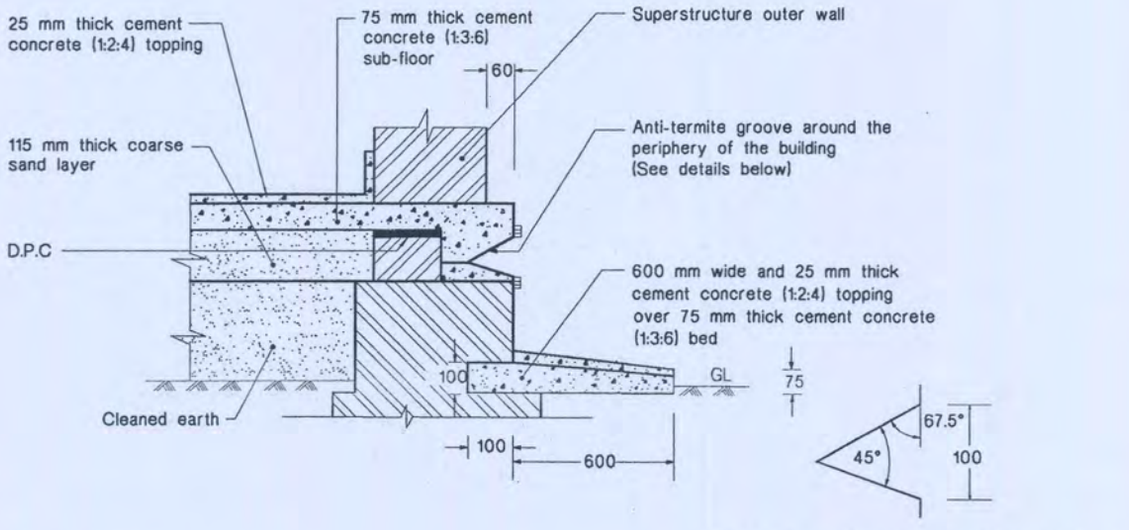


Fig. B1 Anti-Termite Construction in Masonry Works (Suggestive Typical)

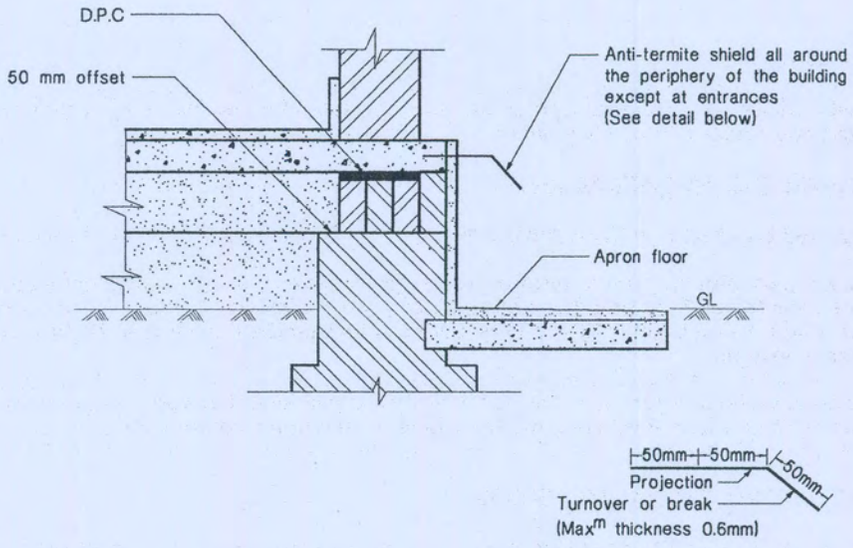


Fig. B2 (a) Termite Shield at Plinth Level (Suggestive Typical)

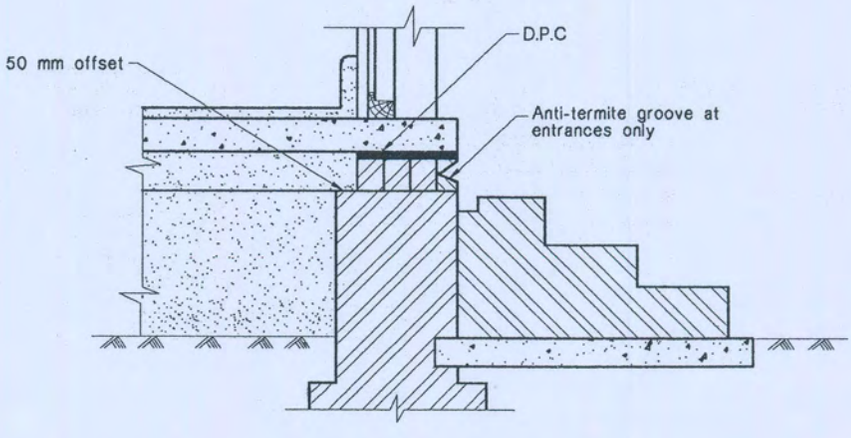


Fig. B2 (b) Anti-Termite Groove at Entrances (Suggestive Typical)

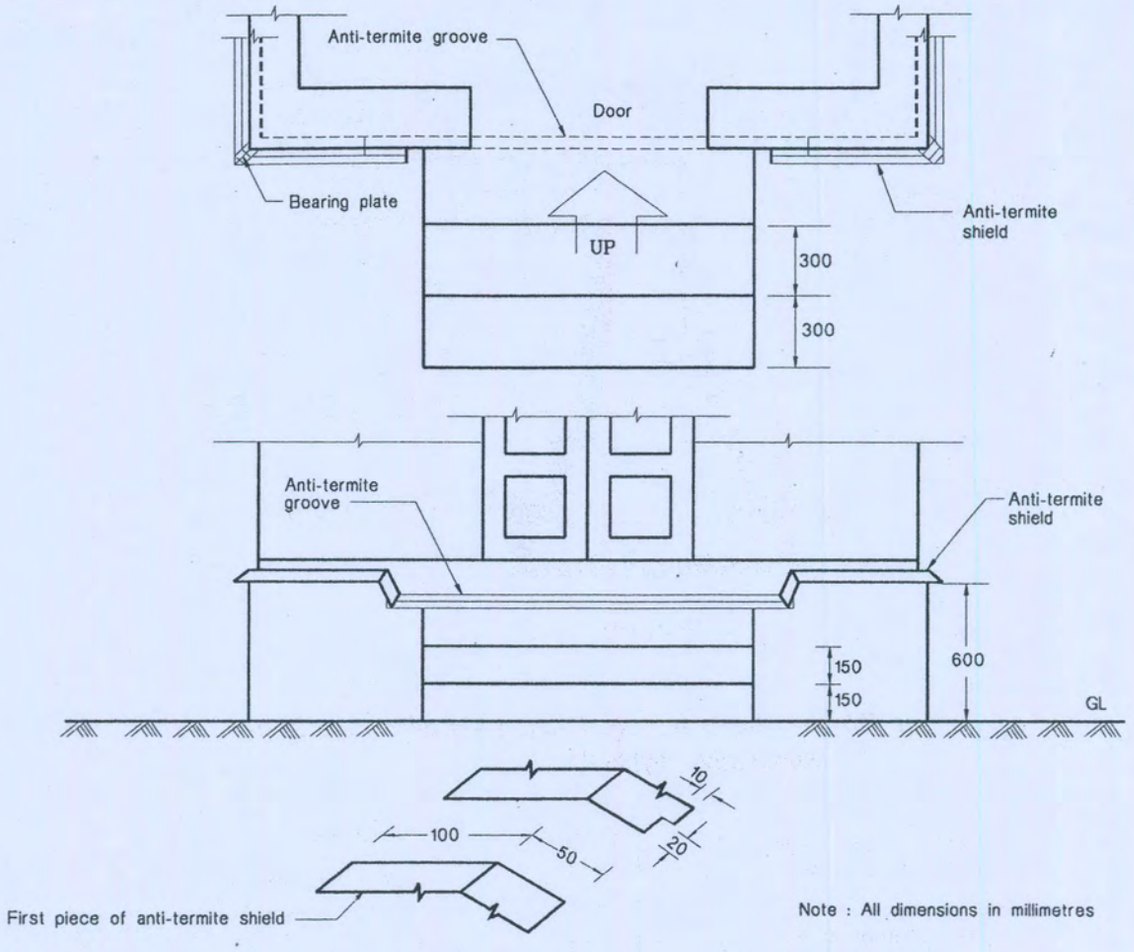


Fig. B2 (c) Construction Arrangement at the Junction of Termite Shield and Groove (Suggestive Typical)

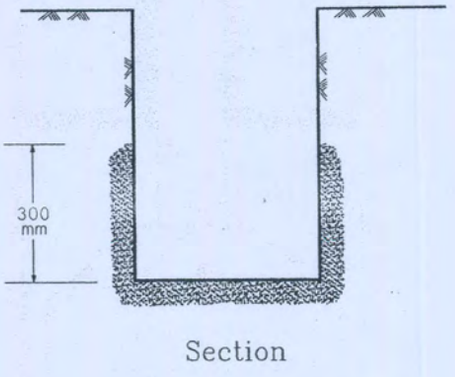
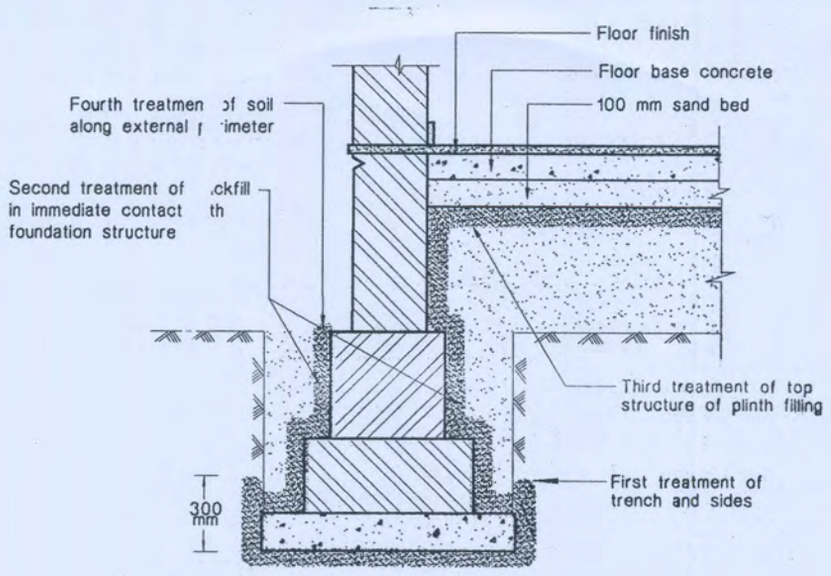


Fig. B3 Treatment of Trench Bottom and Sides (Suggestive Typical)



Section

Fig. B4 Treatment for Load Bearing Walled Structure (Suggestive Typical)

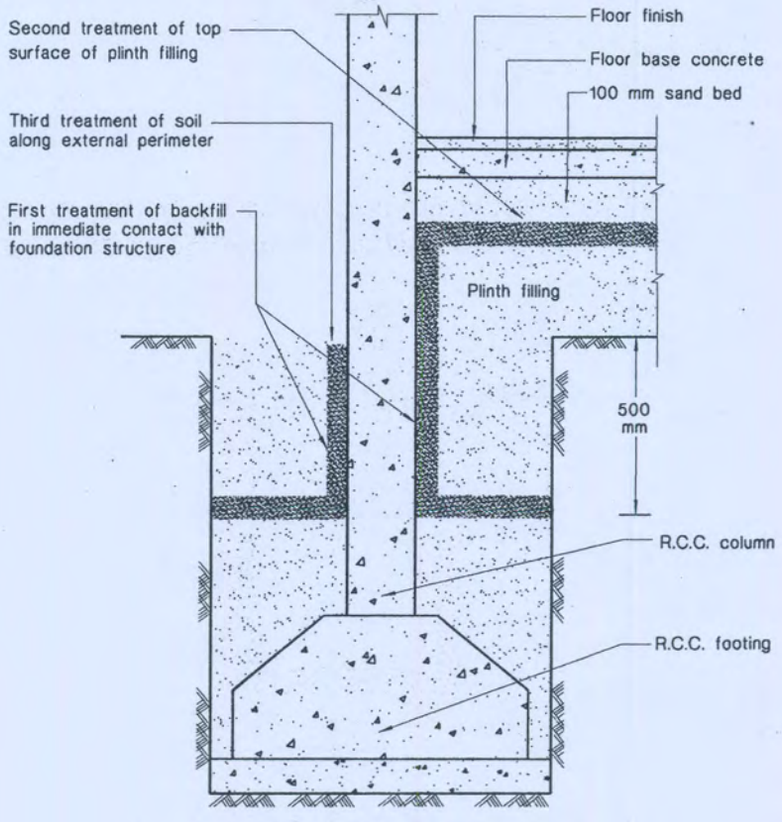


Fig. B5 Treatment for R.C. Framed Structure with Columns and Plinth Beams (Suggestive Typical)