GUIDELINES FOR THE CONSTRUCTION OF BUILDINGS

Contents:-

1. General requirement
2. Classification of buildings
3. Means of escape
4. Provision of escape routes
5. Internal fire spread structural protection
6. Internal fire spread (surfaces)
7. External fire spread
8. Access and facilities for the fire services
9. Definitions

GUIDELINES FOR THE CONSTRUCTION OF BUILDINGS

1. GENERAL REQUIREMENTS

1.1 Every building shall be so designed, constructed and equipped that in case of fire:

(a) The protection of occupants or users therein is ensured and that provision is made for the safe evacuation of such occupants or users.

(b) The spread and intensity of such fire within such building and the spread of fire to any other building will be minimized.

(c) The spread and generation of smoke will be minimized or controlled to the greatest extent as reasonably as practicable.

(d) Provision is made for such means of detection of fire, means for giving warning to the occupants or users and means for controlling such fire (in the building) as may be necessary.

1.2 The requirements of para 1.1 **shall be deemed to be satisfied** where the design, construction and equipment of any building:-

(a) Is the subject of an acceptable rational design prepared by a registered architect (or other approved competent person) for a building of less than 400 meter square.

(b) Complies with the requirements of these guidelines.

2. CLASSIFICATION OF BUILDINGS

For the purpose of these regulations, buildings shall be classified in purpose groups as per table 1

TABLE 1 - CLASSIFICATION OF PURPOSE GROUPS

TITLE	*GROUP*	*PURPOSE*
Residential (Dwelling)	1	One or more building which in association constitute (a) A detached house. (b) One or more attached dwellings, each being a building separated by a **fire-resisting wall**. (c) A boarding house, hotel or the like with a total floor area not exceeding 300 m^2, in which not more than 12 persons would ordinarily be resident, and which is not located above or below another group of building. (d) A building containing two or more "sole – occupancy" units each being a separate dwelling. (e) Flats or maisonnettes more than three storey.
Residential (Institutional)	2	A residential building other than group 1 which is a common place of long term or transient living for a group of persons including (a) A boarding house, guest house, hostel, lodging – house, or (b) The residential part of an hotel or motel, or (c) The residential part of a school, or training institutions, or (d) Accommodation for the aged, disabled, or children or (e) The residential part of a health care building . (f) The residential part of a place of detention. (g) A place where people sleep other than group one and two (a) to (f).
Health Care Institution	3	A health care building including:- Non residential day care centers Clinics, health centers Hospitals Dispensaries Private consulting / surgical rooms
Office	4	An office building used for administrative and clerical work of professional or commercial purposes excluding building of group 1,2 ,3,5,6,7 and 8.

TITLE	*GROUP*	*PURPOSE*
Shop and Commercial	5	A shop or other building for the sale of goods by retail, auction, self – selection, over-the-counter wholesale trading or the supply of services direct to the public including:- (a) Café, restaurant, milk or soft drink bar or (b) Dining rooms, bar, shop kiosk or part of a hotel. (c) Hairdresser's or barber's shop, public laundry, or undertaker's establishment. (d) Market, salesroom, showroom or service station.
Assembly and recreational	6	Place of public assembly, entertainment or recreation including. (a) Bingo halls, bowling halls, billiard rooms, casinos, dance halls (b) Exhibition, leisure and conference centers (c) Fun fairs and amusement arcades (d) Museums and art galleries (e) Non residential clubs and holiday centers (f) Theatres, cinema and concert halls (g) Educational establishments and libraries open to the public (h) Sport pavilions, stadia, swimming pool and gymnasium buildings (i) Churches and other places of workshop (j) Passenger stations, terminal and public toilets.
Industrial	7	A building used for manufacturing, assembling, altering repairing, packing, finishing, cleaning, washing, breaking-up adapting or processing any article and generating power
Storage and other non residential	8 (i)	Place of storage or deposit of goods or materials and any buildings not within any of the purpose groups 1 to 6 and including (a) An atrium (b) A warehouse, bonded warehouse (c) Cold rooms (d Explosive store (e) Chemical store
	(ii)	**Car parks designed to admit and accommodate only cars, motorcycles, passengers and light good vehicles weighing not more than 2500 kilograms gross.**
	(iii)	**A private garage; shed or the like to admit and accommodate vehicles above 2500 kilograms.**
	(iv)	**Temporary structure**

3. MEANS OF ESCAPE

In order to determine escape facilities, the occupant capacity as per table 2 shall be considered.

TABLE 2 - OCCUPANT CAPACITY

TYPE OF ACCOMODATION /USE	AREA PER PERSON IN M^2
Dance halls, Assembly halls, Bingo halls, Concert halls, Clubs, Amusement arcade, Sport pavillions, stadia, Grand Stand (standing) Bar.	0.5
Dining room, Restaurant, Café bar, Kiosks, Canteens, Conference and committee rooms.	1.0
Exhibition halls, Banking Halls, Prayer halls, Gymnasium, Theatres, cinema, Seating gallery.	1.5
Shops, Sales area, Lounge, library - reading room, school- general classrooms .	2.0
Passengers station and terminals	2.25
Office-individual rooms	3.5
Dormitories, Showrooms, Display area, covered malls, Art galleries, Museums, Factory, Work rooms and other work place.	5.0
Office-Multiple occupation	5.5
Laundry, Bowlings halls, Billard halls, Library- Stack area.	10
Boarding House, Guest house, Hostels, Lodging house, Hotel, Motels, Car park – open	15
Ware house, other storage place, Garage	30

4.3 PROVISION OF ESCAPE ROUTES:-

1. One or more escape routes shall be provided in any building.

The minimum requirements of escape routes shall be as per table 3.

TABLE 3 - REQUIREMENTS OF ESCAPE ROUTES

Purpose Group	Requirement of routes
1 (e), 2 4 5 & 7	In addition to any horizontal exits not less than two exits shall be provided where the number of storey exceeds three.
3, 6 and 8	In addition to any horizontal exits not less than two exits shall be provided from each storey.

Note: The exits shall be alternate.

4.4 TRAVEL DISTANCE

1. Travel distance is measured by the way of the shortest route if

(i.) There is fixed seating or other fixed obstructions, is along the centre line of travel– ref figure 1.

(ii.) It includes a stair, is along the pitch line on the centre line of travel – ref figure 2.

(iii.) The internal layout of partitions is not known when plans are deposited, direct distances may be used for assessment. The direct distance is taken as 2/3 of the travel distance.

2. The travel distance in relation to the purpose group of building shall be as per table 4.

TABLE 4 - TRAVEL DISTANCE

Purpose Group	Maximum travel distance where travel is possible in:	
	One direction	More than one direction
1 (e)	9 M	18 M
2	The travel distance shall not exceed 15m	
3	The travel distance shall not exceed 15m	
4	18 M	40 M
5	12 M	36 M
6 except public toilets in para (j)	The travel distance shall not exceed 15m	
7	12 M	36 M
8(i) except private garage and Temporary structure	The travel distance shall not exceed 15m	
8(ii) Car Parks	Travel distance 36 m	

4.5 **The number of exits required shall be determined according to table 5.**

Table 5 - EXITS REQUIREMENTS

Occupant capacity of room or storey	Number of exits
1 - 60	1
61 - 600	2
601 - 1000	3
1001 - 1400	4
1401 - 1700	5
1701 - 2000	6
2001 - 2250	7
2251 - 2500	8
2501 - 2700	9
Over 2700	One additional exits for every 300 persons or part thereof.

4.6 The determination of width of exits and stairs shall be calculated as per table 6.

Table 6 - MINIMUM WIDTH OF STAIRWAYS AND EXITS

Number of Persons	Total width of stairway or exit (in m)
0 - 50	0.90
50 - 150	1.20
150 - 200	1.80
200 - 225	2.10
225 - 250	2.40
250 - 275	2.70
275 - 300	3.00

Where the number of persons exceeds 300 but does not exceed 600, the width of the stairway or exit shall be increased by 0.30m for each additional 25 persons or part thereof.

4.7 CONSTRUCTION OF STAIRCASES.

1. Treads shall not be less than 255 mm wide.
2. Risers shall not be more than 190 mm high.
3. The angle of descent shall not exceed 45º.
4. There shall be not more than 16 risers in a flight.
5. There shall be not more than 2 flights without a change in direction.
6. External staircase shall not be sited near windows or other such openings.
7. Materials used for external staircase shall be protected against corrosion and slips.

4.8 CONSTRUCTION OF RAMPS

1. Any ramps forming part of an exit shall be constructed in unbroken flights, each having a uniform slope having a gradient of not greater than 1 in 12.
2. The ramp shall be guarded on each side by a wall or secure balustrade or railing in each case to a height of not less than 900 mm measured vertically from the surface of the ramp.
3. Between any two successive flights of the ramp there shall be a landing not less in length in the direction of travel and measured on the centre line of the ramp than:
   (i.) In the case of buildings of purpose group 2 and 6, 2 m.
   (ii.) In the case of any other building, 1.2 m.

4.9 PROTECTION OF ESCAPE ROUTES

4.9.1 Fire doors

All fire doors shall have a minimum fire resistance as per table 7.

All fire doors shall be fitted with an automatic self closing device.

Where a self closing device is considered a hindrance to the normal use of the building, such doors may be held open by:

(a) A fusible link connected to a fire detection system

(b) An automatic release mechanism.

4. Any hinge on which a fire door is hung shall be made entirely of :-

(a) Non combustible materials

(b) Materials having a melting point of at least 800°C

Table 7 - Provision for fire doors

Position of door	Minimum fire resistance of door in terms of integrity (minutes)
1. In a compartment wall separating buildings	As for the wall in which door is fitted, but a minimum of 60
2. In a compartment wall:	
a. If it separates a flat or maisonette from a space in common use,	FD 30S
b. Enclosing a protected shaft forming a stairway situated wholly or partly above the adjoining ground in a building used for Flats, Other Residential, Assembly & Recreation,or Office purposes,	FD 30S
c. Enclosing a protected shaft forming a stairway not described in (b) above,	Half the period of fire resistance of the wall in which it is fitted but 30 minutes and with suffix S.
3. In a compartment floor	As for the floor in which it is fitted
Forming part of the enclosures of:	
a. a protected stairway (except where described in item 9)	FD 30S
b. lift shaft, or	
c. service shaft,	FD 30
which does not form a protected shaft in 2(c) above	FD 30
Forming part of the enclosure of:	
a. a protected lobby approach (or protected corridor) to a stairway	FD 30S
b. any other protected corridor	FD 20S
6. Affording access to an external escape route	FD 30
1. Sub-dividing	
a. corridors connecting alternative exits	FD 20S
b. dead-end portions of corridors from the reminder of the corridors from the reminder of the corridor	FD 20S
2. Any door:	
a. forming part of the enclosures to a protected stairway in a single family dwelling house	FD 20
b. forming part of the enclosures to a protected entrance hall or protected landing in a flat or maisonette	FD 20
c. within any other fire resisting construction in a dwelling not described elsewhere in this table	FD 20

4.9.2 STAIRCASE ENCLOSURES

Every stairway forming part of the escape route shall be enclosed in a protected shaft constructed of non combustible materials.

Where between a stairway and the access to the open air at ground level there is a vestibule forming part of the same exit, the stairway enclosure shall be so constructed as to separate the vestibule from the remainder of the building (lobby approach).

Every stairway enclosure shall be enclosed by a combination of any of the following:

(i.) Compartment walls

(ii.) Compartment floors

(iii.) External walls

(iv.) The lowest floor of the building

(v.) The roof of the building.

4.9.3 LIGHTING OF ESCAPE ROUTES

1. All escape routes shall have adequate artificial lighting. Routes and areas listed in table 8 shall have lighting which illuminates the route if the main supply fails.
2. Lighting to escape routes shall be on a separate circuit from that supplying any other part of the building.

Table 8 - PROVISIONS FOR ESCAPE LIGHTING

Purpose group of the building or part of the building	Areas requiring escape lighting
Residential	All common escape routes
Office, Shop and Commercial Industrial, Storage, Other non-residential	a. Underground or windowless accommodation b. Stairways in a central core or serving storey(s) c. Internal corridors more than 30m long d. Open-plan office areas of more than 60 m²
Shop and Commercial and car parks to which the public are admitted	All escape routes (except in shop of 3 or lower storeys with no sales floor more than 280 m² provided that the shop is not a restaurant or bar)
Assembly and Recreation	All escape routes and accommodation except for : a. accommodation open on one side to view sport or entertainment during normal daylight hours. b. Toilet accommodation having a gross floor area not more than 8 m².
Any purpose group	a. electricity generator rooms b. switch room/battery room for emergency lighting system c. emergency control room

4.9.4 SAFETY SIGNS

Except in dwellings, every doorway or other exit providing access to a means of escape, other than exits in ordinary use shall be marked by an exit sign in green marking / drawing of minimum size 100 mm high on a white background.

Illuminated directional signs shall be displayed to indicate the escape routes.

4.9.5 GLAZING ELEMENTS

1. The use of glazed elements on escape routes shall be limited as per table 9 unless they provide the same fire resistance as the structure where the glazed elements are fitted.

Table 9 – LIMITATIONS OF GLAZING ELEMENTS

Position of glazed element	Maximum total glazed area in part of a building with access to:			
	A single stairway		more than one stairway	
	Walls	door leaf	walls	door leaf
1. single family dwellinghouses within the enclosures of a protected stairway or within fire resisting separation	Fixed fanlights only	unlimited	Fixed fanlights only	unlimited
2. within the enclosures of a protected entrance hall or protected landing of a flat or maisonette	Fixed fanlights only	Unlimited above 1.1m from floor	Fixed fanlights only	Unlimited above 1.1m from floor
3. Between residential/sleeping accommodation and a common escape route (corridor, lobby or stair)	nil	nil	nil	nil
4. Between a protected stairway (1) and: i. the accommodation; or ii. a corridor which is not a protected corridor. Other than in item 3 above	nil	25% of door area	Unlimited above 1.1m(2)	50% of door area
5. Between: i. a protected stairway and a protected lobby or protected corridor; or ii. accommodation and a protected lobby. Other than in item 3 above	Unlimited above 1.1m from floor	Unlimited above 0.1m from floor	Unlimited above 0.1m from floor	Unlimited above 0.1 from floor
6. Between the accommodation and a protected corridor forming a dead end. Other than in item 3 above.	Unlimited above 1.1m from floor	Unlimited above 0.1m from floor	Unlimited above 0.1m from floor	Unlimited above 0.1m from floor

4.9.6 VENTILATION

Any system of ventilation shall be designed so that in case of a fire the air movement in the building is directed away from protected escape routes and exits; or that the system is closed down.

2. Where a pressurisation system is installed, ventilation and air conditioning systems in the building shall be compatible with it when operating under fire conditions.

5. INTERNAL FIRE SPREAD STRUCTURAL PROTECTION

5.1 The building shall be so constructed that, in the event of fire, its stability will be maintained for a reasonable period.

5.2 The building or any altered part of the building shall be sub-divided into compartments where there is necessary to inhibit the spread of fire in the building.

5.3 Concealed spaces in the structure or fabric of the building or any extended part of the building shall be fire stopped and sub-divided where this is necessary to inhibit the unseen spread of fire and smoke.

5.4 A wall common to two or more buildings shall offer adequate resistance to the spread of fire and smoke.

5.5 The fire resistance of an element of structure shall be in accordance to table 10

Table 10 – FIRE RESISTANCE OF ELEMENT OF STRUCTURE (In minutes)

	FIRE RESISTANCE		
ELEMENT OF STRUCTURE	**STABILITY**	**INTEGRITY**	**INSULATION**
1. Structural frame, beam or column	90	Not applicable	Not applicable
2. Load bearing wall	90	Not applicable	Not applicable
3. Floors			
(a) In upper storey of 2 storey	30	15	15
(b) Any other floor including compartment floor	60	60	60
4. Roofs			
(a) Any part forming an escape route.	30	30	30
(b) Any roof that performs the function of a floor	30	15	15
5. Compartments and separating wall	60	60	60
6. Protected shafts, excluding any fire fighting shaft			
(a) Glazing	Not applicable	30	Not applicable
(b) Any part between the shaft and a protected lobby / corridor	30	30	30
7. Enclosure			
Protected stairway	30	30	30
Lift shaft	30	30	30
Service shaft	30	30	30
8. Fire fighting shaft			
(a) Construction separating fire fighting shaft from rest of the building	120	120	120
(b) Construction separating fire fighting stair way, fire fighting lift shaft and fire fighting lobby	60	60	60

5.6 Buildings shall be compartmented to reduce the risk of internal fire spread as provision made in table 11& 12.

Table 11 - PROVISION OF COMPARTMENTATION

GROUP	CONDITIONS
1	Residential Dwelling (a) Any wall which separate a house in terrace is to be constructed as a compartment wall. (b) Any floor except when it is in a maisonette. (c) Any wall separating a flat or maisonette from another part of the buildings (d) Any wall enclosing a refuge chamber
2 & 3	(a) Any floor. (b) Any wall dividing a building into compartments with a floor space not exceeding (i.) 3000 m² for single storey building. (ii.) 2000 m² for multi – storey building.
4, 5, 6, 7, & 8	(a) Except in single storey building, any wall required to sub divide a building must follow the size limit on compartments in table 12. (b) Any floor, if the building or separated part has a storey with a floor in excess of 30 metres above ground level. (c) If the building has one or more basements, the floor of ground storey. (d) If the building is part of a shopping complex, any wall or floor. (e) Special risks:- generator room, spraying room, boiler room, storage of dangerous goods & chemicals.

Table 12 - MAXIMUM DIMENSION OF BUILDING OR COMPARTMENT

PURPOSE GROUP	HEIGHT OF FLOOR OF TOP STOREY ABOVE GROUND LEVEL (m)	FLOOR ARE OF ANY ONE STOREY IN THE BUILDING OR COMPARTMENT (m²)
Group 4	No limit	No limit
Group 5 & 6 except para 6 (j) public toilets		
Not sprinklered	No limit	2000
Spinklered	No limit	4000
Group 7 & 8 except 8 (iv) temporary structure		
Not sprinklered	Not more than 20	5000
	More than 20 but less than 24	2000
Sprinklered	Not more than 20	10000
	More than 20	4000

5.7 PERMITTED OPENINGS IN COMPARTMENT WALLS AND FLOORS

1. Any compartment wall or compartment floor shall be imperforate except for any one or more of the following;

(i.) an opening fitted with a door, which complies with the same fire resistance as that required for the wall.

(ii.) An opening for a protected shaft.

(iii.) An opening for a ventilation duct provided that the space surrounding the duct is fire stopped and that any duct of greater cross sectional area than 0.02 m^3 is fitted with an automatic fire shutter where it passes through a compartment wall or compartment floor.

(iv.) An opening for a pipe which

(a) Is not a flue pipe and

(b) Does not exceed 150mm diameter where the pipe is made of non combustible material and

(c) Where the space surrounding the pipe is fire stopped at the point it passes through the compartment floor.

(v.) An opening for a chimney, ventilation duct or duct encasing one or more flues or a refuse duct where a construction is made of non combustible material with a period of fire resistance equal to that of the compartment wall or compartment floor and the space surrounding the chimney or duct is fire stopped.

5.8 JUNCTIONS WITH COMPARTMENT WALLS, FLOORS AND ROOF

1. Where a compartment wall or compartment floor forms a junction with any other element of structure comprising:

(i.) Any other compartment wall or compartment floor or
(ii.) any external wall or
(iii.) any part of a structure enclosing a protected shaft

such elements shall be bonded together or shall be fire stopped.

2. Where any compartment wall forms a junction with the roof, the junction shall be so formed as to ensure that the effectiveness of the fire resistance is not impaired.
3. No combustible material shall be built into, carried through, or across the ends of any compartment wall or compartment floor in such a manner as to render ineffective the resistance of the wall or floor to the effects and spread of fire.

5.9 PROTECTED SHAFT

1. A protected shaft shall not be used for any purpose other than that specified in the definition except that if required it may contain
   (i.) Any pipe or duct other than specified in paragraph 3(I) below
   (ii.) Sanitary accommodation or wash or both

2. Every protecting structure required to have a fire resistance of one hour or more shall be constructed wholly of non-combustible materials.

3. The permitted opening in a protecting structure shall be either one or more of the following:-
   (i.) An opening for a pipe the periphery of which is fire stopped;
   (ii.) An opening fitted with a door which has half the fire resistance as that of the protecting structure.
   (iii.) An opening for a ventilation duct; the periphery of which is fire stopped.

4. A protected shaft containing a stairway, escalator or lift.
   (i.) Shall not contain a pipe conveying gas or oil or a ventilating duct;
   (ii.) May have an opening for the passage of cables operating the lift into the room containing the lift motor provided that the opening is at the bottom of the shaft and is as small as practicable.

5. If a protected shaft serves or contains a ventilating duct, the duct:

(i.) Shall be fitted with automatic fire shutters in such positions so as to reduce as far as practicable the risk of fire spreading to any other compartment;

5.10 CONCEALED SPACES

1. Concealed spaces in building shall be interrupted by construction of cavity barriers to restrict the spread of smoke and flame.
2. Cavity barriers shall be used to close the edges of cavities around openings through a wall, floor and any other part of the construction which contain a cavity.

3. Cavity including roof spaces and suspended ceilings shall be interrupted by cavity barriers formed by a wall , floor, ceiling, roof or other part of the construction around the cavity.
4. Such cavity barriers shall be of fire resisting construction equal to the provision for that required of the element of structure around the cavity.
5. Cavities including roof spaces, unless otherwise permitted, shall be sub divided so that the maximum distance between cavity barriers shall not exceed the relevant dimensions given in table 13.

Table 13 – MAXIMUM DIMENSIONS OF CAVITIES

LOCATION OF CAVITY	PURPOSE GROUP OF BUILDING OR COMPARTMENT	*CLASS OF SURFACE EXPOSE IN CAVITY	MAX. DIMENSION IN ANY DIRECTION
Between roof and ceiling	I & II	any	No limit
	other	any	20m
Any other cavity	any	Class O	20m
	any	any	8m

* excluding surface of any pipe, cable, conduit or insulation of any pipe

5.11 FIRE STOP

(1) Every fire stop required by the provisions of these regulation shall be so formed and positioned as to prevent or retard the passage of fire.

(2) Any fire stop provided around a pipe duct or in a cavity shall be:
Made of non-combustible materials and so formed as not to restrict essential thermal movement.

(3) Every fire stop formed as a seal between two or more elements of structure shall be made of non-combustible material.

(4) Every cavity in an element of structure which is continuous throughout the whole or part of the element of structure shall be fire stopped at the junction with another element of structure or in a roof space ;

(5) The requirement in a wall or floor for a fire stop if it is constructed of combustible material shall be deemed to be satisfactory if ;
It is constructed of timber not less than 40mm thick .

6 INTERNAL FIRE SPREAD (SURFACES*)*

6.1 In order to inhibit the spread of fire within the building surfaces of materials used on walls and ceilings.

(a) Shall offer adequate resistance to the spread of flame over their surfaces and

(b) Shall have, if ignited, a rate of heat release which is reasonable in the circumstances.

6.2 The surface linings of walls and ceilings shall meet the classification as per table 14

Table 14 - Classification of linings

Location	**Class**
Small rooms of area not more than 4m² in a residential building and 30m² in a non residential building	3
Other rooms	1
Circulation spaces within dwellings	
Other circulation spaces including the common areas of flats and maisonettes	0

6.3 For the purpose of the performance of wall linings, a wall includes:

(a) The surface of glazing (except glazing in doors), and

(b) Any part of a ceiling which slopes at an angle of more than 70° to the horizontal.

6.4 For the purposes of the performance of ceiling linings a ceiling includes:

(a) The surface of glazing

(b) Any part of a wall which slopes at an angle of 70° less to the horizontal.

6.5 Suspended ceilings

A suspended ceiling shall satisfy paragraph 6.2. If the assembly is to achieve 60 minutes fire resistance or more, shall also meet the provisions of a type D ceiling of the table 15.

Table 15 - Limitation on fire-protecting suspended ceilings

Height of building or separated part(m)	Type of floor	Provision for fire resistance of floor (minutes)	Description of suspended ceiling
less than 20	not compartment	60 or less	Type A,B,C or D
	compartment	less than 60	
		60	Type B,C or D
20 or more	any	60 or less	Type C or D
No limit	any	more than 60	Type D

Ceiling type and description

A. Surface of ceiling exposed to the cavity shall be of Class O or Class 1
B. Surface of ceiling exposed to the cavity shall be of Class 0.
C. Surface of ceiling exposed to the cavity shall be of Class 0.
D. Ceiling shall be of a material of limited combustibility and not contain easily openable access panels. Any insulation above the ceiling shall be of a material of limited combustibility.

Any access panels provided in fire-protecting suspended ceilings of type C or D should be secured in position by releasing devices or screw fixings and they should be shown to have been tested in the ceiling assembly in which they are incorporated.

6.6 Rooflights

Rooflights shall meet the relevant classification in para 6.2. However plastic rooflights with at least a class 3 rating may be used where para 6.2 calls for a higher standard, provided the limitations in table 16 and in table 17 are observed.

Limitations applied to thermoplastic rooflights in suspended ceiling and Table 16 - Class 3 plastic rooflights

Minimum classification of lower surface	Use of space below the rooflight	Maximum area of rooflight	Max total area rooflights as percentage of floor area of the space in which the ceiling is located	Minimum separation distance between rooflights
TP(a)	any except protected stairway	No limit	No limit	No limit
Class 3 or TP (b)	rooms	5 m²	50	3m
	circulation spaces except protected stairways	5 m²	15	3m

Table 17 - Plastic rooflights: limitations on use and boundary distance

Classification on lower surface(1)	Space which rooflight can serve	Minimum distance from any point on relevant boundary to rooflight with an external surface classification (2) of: TP(a) AD BD CA CB CC or TP(b) DA DB DC DD		
1. TP(a) rigid	any space except a protected stairway	6m(3)	6m(5)	20m
2. Class 3 or TP(b)	a. balcony, verandah, carport covered way or loading bay, which has at least one longer side wholly or permanently open b. detached swimming pool c. conservatory, garage or outbuilding, with a maximum floor area of 40 m²	6m	6m	20m
	d. circulation space(4) (except a protected stairway) e. room(4)	6m(5)	6m(5)	20m(5)

7. EXTERNAL FIRE SPREAD

7.1 The external walls of buildings shall offer adequate resistance to the spread of fire over the walls from one building to another with consideration given to the height, use and position of the building.

7.2 The roof of the building shall offer adequate resistance to the spread of fire over the roof and from one building to another with consideration given to the height, use and position of the building.

7.3 Every part of an external wall within one metre of the boundary of the plot shall be constructed of materials having a fire resistance as per table 18.

Table 18

PURPOSE GROUP	**MINIMUM PERIODS (MINUTES) OF FIRE RESISTANCE**			
	HEIGHT (m) OF TOP FLOOR ABOVE GROUND IN BUILDING			
	NOT MORE THAN 5	**NOT MORE THAN 20**	**NOT MORE THAN 30**	**MORE THAN 30**
GROUP 1 & 2	30	60	90	120
GROUP 3	30	60	90	Not permitted
GROUP 4, 5 & 6 NOT SPINKLERED	60	60	90	Not permitted
SPINKLERED	30	60	60	120
GROUP 7 & 8 NOT SPINKLERED	60	90	120	Not permitted
SPINKLERED	30	60	90	120

7.4 No opening shall be permitted in the wall except that:-

(i.) Where a part of a wall is set back from the boundary or where

(ii.) Any wall or part of a wall is located on the boundary of a permanent open space.

7.5 Openings in external walls shall be permitted in accordance with Table 19.

7.6 Every roof shall be so constructed, covered or isolated from other building as to provide adequate protection against spread of fire into buildings or to adjoining buildings. The roof coverings shall comply with Table 20 or the minimum distance from the roof to the boundary of the plot is as per Table 21.

Table 19 - PERMITTED OPENING IN EXTERNAL WALLS

Height of Wall (m)	Length of Wall (m)	Minimum distance (in m) from external face of wall to site boundary when the proportion of openings in the wall is			
		Less than 20%	20% to 30%	30% to 50%	50% or more
10	10	1.5	2.0	3.5	5.5
	20	2.0	2.5	4.5	7.5
	30	2.0	2.5	5.0	9.0
	40	2.0	2.5	5.5	9.5
	50	2.0	3.0	5.5	10.0
	60	2.0	3.0	5.5	11.0
	80	2.0	3.0	5.5	11.5
15	10	2.0	2.5	4.0	6.5
	20	2.5	4.0	6.5	10.5
	30	3.0	4.0	7.5	12.0
	40	3.0	4.5	8.0	13.5
	50	3.5	5.0	8.5	15.0
	60	3.5	5.0	8.5	15.5
	80	3.5	5.0	9.0	17.0
20	10	2.0	3.0	4.5	7.5
	20	3.0	4.5	7.5	12.5
	30	4.0	5.5	9.0	14.5
	40	4.5	6.0	10.0	16.5
	50	4.5	6.5	11.0	18.0
	60	4.5	6.5	11.5	19.5
	80	4.5	6.5	12.0	21.0
25	10	2.0	3.0	5.0	8.0
	20	3.5	5.0	8.0	13.0
	30	4.0	6.0	9.5	15.5
	40	4.5	6.5	11.0	18.0
	50	5.0	7.0	12.0	19.5
	60	5.0	7.5	12.5	21.0
	80	5.0	7.5	13.5	23.5
30	10	2.0	3.0	5.0	8.5
	20	3.5	5.0	8.5	14.0
	30	4.0	6.0	10.0	17.0
	40	5.0	7.0	11.5	19.0
	50	5.5	7.5	12.5	21.0
	60	5.5	8.0	13.5	22.5
	80	6.0	8.5	14.5	25.0

Note:

Openings in buildings where flammable liquids and substances are stored shall comply with either regulations made under the Inflammable Substances Act 1954 or this table whichever is the minimum.

Table 20 - MATERIALS USED FOR ROOF COVERING

i. Timber (shingles) / straw or thatch, treated with fire resistant substances.
ii. Slates, natural cement, or slates – natural cement or
iii. Slabs of natural stone, or
iv. Tiles of burnt clay or concrete
v. Corrugated sheets of galvanised steel, aluminium composite steel and PVC coated steel, or
vi. Sheets of aluminium, copper or zinc or vitreous enameled steel.
vii. Two layers of bitumen or felt covered with a 12 mm layer of natural stone chipping or
viii. Bitumen bedded tiles or a non-combustible material, or
ix. Sand and cement screen 12 mm thick.

Table 21 - LIMITATIONS ON ROOF COVERINGS

LIMITATIONS ON ROOF COVERINGS					
Designation of covering of roof		Minimum distance from any point on relevant boundary			
or part of roof		less than 6m	At least 6m	At least 12m	At least 20m
AA, AB, or AC		λ	λ	O	λ
BA, BB, or BC		O	λ	O	λ
CA, CB, or CC		O	λ (1)	λ (2)	λ
AD, BD, or CD		O	λ (1)	λ (2)	λ (2)
DA, DB, DC, or DD		O	O	O	λ (1)

λ Acceptable

0 Not acceptable

(1) Not acceptable on any of the following buildings:

(a) House in terraces of three or more houses,

(b) Industrial, Storage or Other non residential purpose group buildings of any size,

(c) Any other buildings with a cubic capacity of more than 1500 m³.

And only acceptable on other buildings if the part of the roof is no more than 3 m³ in area and is at least 1.5 metres from any similar part, with the roof between the parts covered with a material of limited combustibility.

(2) Not acceptable on any of the buildings listed under a, b or c above.

DESIGNATION OF ROOFS

The first letter in a roof designation relates to resistance to the penetration of fire as follows:

A Roofs which can withstand penetration for one hour.

B Roofs which can be penetrated between half-hour and one hour.

C Roofs which can be penetrated in less than half-hour.

D Roofs which are penetrated in the preliminary test.

The second letter relates to the spread of flame.

A Roofs where there is no spread of flame.

B Roofs where there is not more than 533.4 mm spread of flame.

C Roofs where there is more than 533.4 mm spread of flame.

D Roofs which continue to burn for 5 minutes after withdrawal of the flame, a spread more than 381 mm across the region of burning during the preliminary test.

It follows that an AA designation is the highest classification.

8 ACCESS AND FACILITIES FOR THE FIRE SERVICES

8.1 The building shall be designed and constructed so as to provide facilities to assist fire fighters in the protection of life.

8.2 Provision shall be made within the site of the building to enable fire appliances to gain access to the building.

8.3 VEHICULAR ACCESS FOR FIRE APPLIANCES

1. Access for vehicles to buildings shall be provided to enable fire appliances such as Turn Table Ladders and Aerial Ladders to get close to the building for rescue and fire fighting operations.

2. In buildings or part of a building where the habitable is below 9m, a working space of 4m X 4m shall be provided.

3. (a) In building or part of the building where the height of the habitable floor exceeds 9 metres a hardstanding shall be provided and located such as to provide free access to entry point .

   b) The hardstanding shall be able to accommodate the manoeuvering of Fire Engines.

4. The Hardstanding shall be not less than 6 metres wide and 15 metres long.

5. The Hardstanding shall be sited such that the near edge shall be not less than 2 metres or not more than 10 metres from the centre of access measured horizontally.

Other parts of the access way used for the passage of Fire Engines shall be not less than 4 metres in wide.

6. Hardstanding shall be metalled or paved or laid with strengthened perforated slabs to withstand the loading capacity of Fire Appliances.

7. Hardstanding shall be laid on a level platform or if on an incline; the gradient shall not exceed 1; 12. Access way may be laid on an incline not exceeding a gradient of 1:83.

8. Dead End Hardstanding or Access way shall not exceed 46 metres in length or if exceeding 46 metres, be provided with turning facilities as shown in figure 3.

9. The outer Radius of turning access way shall not be less than 10.5 metres and shall comply with the requirements as shown in figure 4.

10. Overhead Clearance of hard standing or access way shall be at least 4.5 metres for the passage of Fire Fighting appliances.

11. Public Roads may serve as Hardstanding provided the location of such public roads are in compliance with the requirements of distance from access openings.

12. Hardstanding shall be kept clear of obstructions projecting from the building, plants, trees or other fixtures.

13. Building fitted with rising mains and automatic sprinklers system shall have access way for pumping appliances within 18 metres of the breeching inlet.

8.4 FIRE ALARM SYSTEM

1. A Fire Alarm system shall be installed in building classified in the purpose groups except in Group 1(a), 1(b), 1(d), and 6(j) public toilets.
2. All buildings in purpose groups mentioned in Sub-Section 1 having a floor area less than 100 square metres and having a low fire risk are exempted.

3. A fire alarm system shall be installed in accordance to British Standard or any other approved standard.

8.5 FIRE DETECTION SYSTEM

1. A fire Detection System shall be installed in building classified in the purpose groups except for Group 1(a), 1(b), and 6(j) public toilets.
2. All building in purpose groups mentioned in sub section 1 having a floor area not less than 100 m² and having a low fire risk are exempted to the installation of a Fire Detection System.
3. A fire detection system shall be installed in accordance to the British Standard or any other approved standard.

8.7 FIRE SUPPRESSION SYSTEM

1. A Fire Suppression system shall be installed in buildings classified under purpose group as follows:-

Purpose Group	Requirements
4	Habitable height exceeds 8 storeys above ground level
6(a), (d), (f) & (g)	Height – 8 storeys or floor area of more than 2000 m²
7 & 8 except building with low fire risk	Floor area of more than 1000 m²

2. In all basement a fire suppression shall be installed.
3. A fire suppression system shall be installed in accordance to the British Standard or any other approved standard.

8.8 **HOSE REEL**

1. Hose reels shall be installed, for the purpose of fire fighting, in any single storey building of more than 500 m² and in any in any building of two or more storeys in height except buildings in purpose group 1 (a), 1 (b) and 1 (d).

2. A hose reel system shall be installed in accordance to the British Standard or any other approved system.

8.9 **FIRE EXTINGUISHER**

1 Fire extinguishers shall be installed in all buildings classified in purpose groups. Buildings in Group 1(a) & 1(b), 6(j) public toilets may be exempted.

2 Portable fire extinguishers shall always be sited on the line of escape routes near but not too near danger points, near to room exits inside or outside according to occupancy and / or risk

3 In multi Storey buildings portable fire extinguishers shall be sited at the same position on each floor i.e. top of stair flights or at corner of corridors where possible in groups forming fire points, where possible in shallow recess.

4 Portable fire extinguishers shall be sited in such a place so that no person shall travel more than 30 meters to reach them.

5 Portable fire extinguisher shall be sited in such a way that its carrying handle lies 1 metre from the floor level.

8.10 **WATER SUPPLIES FOR FIRE FIGHTING**

1. All buildings with a height exceeding 18 metres shall have internal **dry rising fire mains**. All buildings with a height exceeding 30 metres shall **have wet rising fire mains**.
2. Rising mains shall be installed in accordance to British Standard or any other approved standard.
3. A static water tank either above ground or below ground or on roof shall be installed in industrial premises and in buildings where the height exceeds six storeys.

8.11 FIREMAN LIFT

1. In any building or part thereof, in which the habitable heights exceeds six storeys above ground floor, there shall be provided at least one lift which can be solely used by fire officers.
2. The lift shall be contained within a protected shaft
3. A fire lift shall have access to every storey above the designated floor and shall be adjacent and accessible to an exit staircase and be approached by a fire fighting lobby at each storey.
4. The power supply to the lift shall be independent of any other main or sub-main circuit.
5. The firemen's lift shall

(a) Have internal dimensions of not less than 1,1 metre wide by 2,1 metre deep and have a clear door width of not less than 800 mm.

(b) Be clearly identified as a firemen's lift on every storey.

(c) Be capable of being stopped at any storey and have access to all such storeys.

(d) Be kept available for use at all times.

(e) Be subject to independent control during an emergency

(f) Continue to be workable during an emergency when all other lifts have been brought to the main entrance storey and

(g) Be provided with means of oral communication to a control point or to a control room where such a room where such a room is provided.

DEFINITIONS

Alternative exit:- One of the two or more exits each of which is separate from the other

Atrium:- Vertical space within a building (other than a shaft used solely for stairs, escalators, lift or services), openly connecting three or more storeys and enclosed at the top or roof.

Automatic release mechanism:- A device which will allow a door held open by it to close automatically in the event of detection of smoke by automatic apparatus, operation of hand operated switch, operation of a fire alarm system.

Boundary:- The boundary of the land belonging to the building or where the land abuts a road, river or canal, the centre line of that road, river or canal.

Cavity barrier:- A construction provided to close a concealed space against penetration of smoke or flame.

Class 0:- The material of which a wall, ceiling or roof is constructed with non-combustible throughout.

Class 1:- A material having a surface of very low flame spread.

Class 2:- A material having a surface of low flame spread.

Class 3:- A material having a surface of medium low flame spread.

Class 4:- A material having a surface of rapid low flame spread.

(Flame spread test as per British Standard or any other approved standard)

Common wall:- Means a wall that is common to adjoining buildings.

Compartment:- A building or part of a building comprising one or more rooms, spaces or storeys constructed to prevent the same building or adjoining building.

Compartment wall or floor:- A fire-resisting wall / floor in the seperation of one fire compartment from another.

Element of structure:- A member forming part of the structural frame of a building of any other beam, column, wall, a floor other than the ground floor or a gallery.

Emergency lighting:- lighting provided for use when the supply to the normal lighting fails.

External wall:- means an outer wall of a building which is not a common wall.

Final Exit:- The end of an escape route from a building giving direct access to an open space from where persons can disperse rapidly.

Fire - resisting:- The ability of a component or construction of a building to satisfy for a stated period of time some or all the appropriate criteria of stability, integrity and insulation.

Fire door:- A door provided for the passage of persons, air or objects which together with its frame as installed in a building is intended to resist the passage of fire or products of combustion.

Fire stop:- A seal provided for the passage of persons, air or objects which together with its frame as installed in a building is intended to resist the passage of fire or products of combustion.

Insulation:- The ability of an element of structure to keep the unexposed part to remain relatively cool.

Integrity:- The ability of an element of structure to resist the passage of flame and hot gases.

Means of escape:- Structural means whereby safe routes are provided for persons to travel from any point in a building to a place of safety.

Occupant capacity:- The number of persons which a room or a storey is capable of holding which is calculated by dividing the floor area in square meter by the nominal area occupied by one person in each purpose buildings. Ref Table 2.

Protected shaft:- means a stairway, escalator, chute, duct or other shaft compartments and is enclosed by a protecting structure.

Protecting structure:- any wall, floor or structure enclosing a protected shaft.

Registered architect:- A corporate member of the association of architects.

Shaft:- mean the walls and other parts of a building bounding a wall other than an atrium wall or a vertical chute, ducts or similar passage, but not a chimney or flue.

Stability:- The ability of an element of structure to resist deformation or collapse.

Temporary structure:- a building constructed to last for a limited time e.g tents.

Travel distance:- The actual distance to be travelled by a person from any point within the floor, area to the nearest storey exit, having regard to the layout of walls, partitions and fittings.