

GUIDELINES
FIRE SAFETY REQUIREMENTS

CONSTRUCTION OF BUILDINGS

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FIRE SAFETY REQUIREMENTS

1.0: GENERAL REQUIREMENTS

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

- (a) the safety of occupiers therein or users thereof is ensured and provision is made for the safe evacuation of such occupiers or users;
- (b) the risk of spread and intensity of such fire within such building and the risk of spread of fire to any other building will be minimized;
- (c) the spread and generation of smoke will be minimised 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 occupiers 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 more than 150 square metres.
- (b) satisfies these fire safety requirements.

1.3 Every person who intends to construct a building to be used as such place of work shall –

- i. make a written application to the Service for a fire certificate; and
- ii. furnish to the Service such drawing, plan, document or other information as the Service may require.

On receipt of an application under paragraph (1.3) the Service may, after making such enquiries as it deems necessary, issue a fire certificate and subject to such conditions as it thinks fit to impose, or refuse to grant such certificate stating the reason for doing so.

2.0: CLASSIFICATION OF BUILDINGS

For the purpose of these guidelines, buildings shall be classified in purpose groups as per Table 1.

TABLE 1 - CLASSIFICATION OF PURPOSE GROUPS

Purpose Group	Descriptive Title	Purpose for which building or part of the building is used or intended to be used.
1	Small Residential	Private dwelling house such as bungalows, semi-detached houses and terrace houses.
2	Other Residential	Accommodation for residential purposes other than any premises comprised in Group 1 to include flats, maisonettes, apartments etc.
3	Institutional	Establishments used for treatment, care or maintenance of persons suffering from disabilities, or educational purposes and accommodations, including hospitals, clinics, polyclinics student hostels, dormitories, old folks homes, orphanages, children's homes, day-care centres, infant care, kindergartens, army camps, detention/ correction centres, schools, colleges, commercial schools, vocational institutions, polytechnics and universities.
4	Office	Office or premises used for office purposes meaning the purposes of administration, clerical work (including book-keeping, accounting, drawing and editorial work etc) telephone and telegraph operating and banking or as premises occupied with an office for the purposes of the activities therein carried on.
5	Shop	Shop or shopping centre including departmental stores, shopping arcades, supermarkets, drugstores, showrooms for sale of goods, hairdressing and beauty salons, ticketing agencies, pawnshops, laundries and/or any other similar trades or businesses.
6	Factory	A factory refers to any industrial premises with manufacturing, processing, servicing or testing activities.
7	Place of public resort	Premises used for social, recreational or business purposes to include hotels, holiday resorts, boarding houses, service apartments, convention centres, private clubs, community centres, museums, public art galleries, exhibition centres, theatres, cinemas, concert halls, public libraries, religious buildings, public sports complex, stadium, public swimming complex, recreational buildings, amusement centres, eating houses, restaurants, coffee shops, hawker centres, fast food outlets, bus terminals, train stations, airport and ferry terminals.
8	Storage	Place of storage (including godowns, warehouses, stores, coldrooms, explosive stores, etc), deposit or parking of goods, materials and/or vehicles.

3.0: MEANS OF ESCAPE

The basic principles for the design of means of escape are:

- (a) that there should be alternative means of escape from most situations;
- (b) where direct escape to a place of safety is not possible, it should be possible to reach a place of relative safety, such as a protected stairway, which is on a route to an exit, within a reasonable travel distance.

3.1 Occupant Capacity

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

TABLE 2 - OCCUPANT CAPACITY

Type of Accommodation/ Use	Area per person in m ²
Dance halls, Assembly halls, Bingo halls, Concert halls, Clubs, Amusement arcade, Sport pavillions.	0.5
Stadia and Grandstand (standing) bar, Gymnasium.	0.6
Dining room, Restaurant, Café bar, Kiosks, Canteens, Conference and committee rooms, Lounge, Reading room (standing).	1.0
Exhibition halls, Banking Halls, Prayer halls.	1.5
Library - reading room (seated), school- general classrooms Passengers station and terminals.	2.0
Banking Halls.	3.0
Dormitories, Showrooms, Display area, covered malls, Art galleries, Museums, Factory, Workshop and other work place, Office –individual rooms.	5.0
Shops, Sales area.	7.0
Office-Multiple occupation.	8.0
Laundry, Bowlings halls, Billard halls, Library- Stack area.	10
Boarding House, Guest house, Hostels, Lodging house, Hotel, Motels, Car park – open.	15
Warehouse, other storage place, Garage.	30

3.2 Provision of Escape Routes

1. One or more escape routes shall be provided in any building.
2. The minimum requirements of escape routes shall be as per Table 3.

TABLE 3 - REQUIREMENTS OF ESCAPE ROUTES

Purpose Group	Requirement of routes
All except Group 1 (Small Residential)	In addition to any horizontal exits not less than two exits staircases shall be provided where the habitable height exceeds 9 metres.
	In addition to any horizontal exits not less than two exits or exit staircases shall be provided for each storey if the travel distance exceeds 15m.

Note: The exits shall be alternate.

3.2 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 maybe used for assessment. The direct distance is taken as $\frac{2}{3}$ of the travel distance.

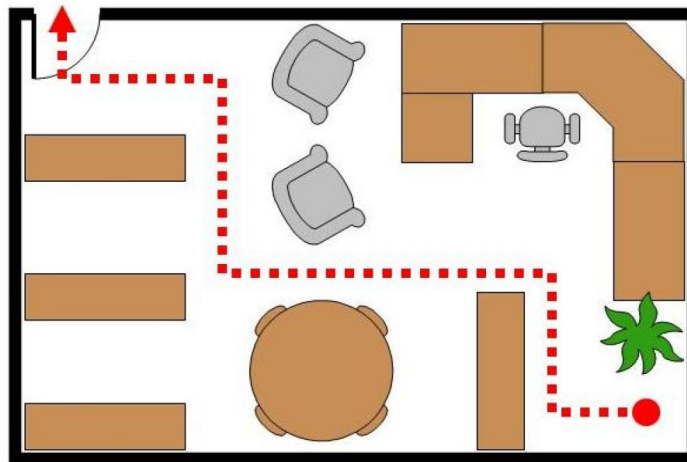


Figure 1: Orthogonal Path

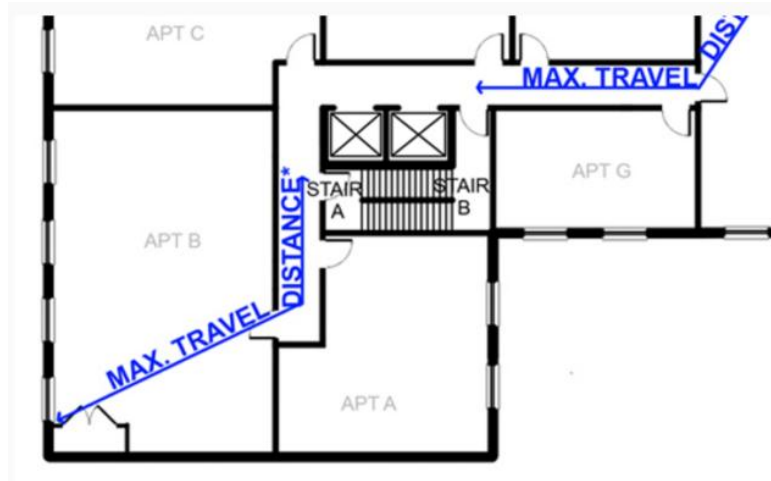


Figure 2: Adequate Path

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

TABLE 4 - TRAVEL DISTANCE

Type of Occupancy	Max Travel Distance (m) (One-way travel)		Max Travel Distance (m) (Two-way travel)	
	Unsprinklered	Sprinklered	Unsprinklered	Sprinklered
High hazard	10	20	20	35
Industrial buildings (factories, workshops, godown/warehouse)	15	25	30	60
Shops	15	25	45	60
Offices	15	30	45	75
Places of public resort & carparks	15	25	45	60
Schools & educational buildings	15	25	45	60
Hospitals	15	25	30	45
Hotels, Boarding Houses, Serviced Apartments, Hostels, Backpackers Hotel, Dormitories	15	20	30	60
Blocks of flats/maisonettes	15	30	30	75

3.3 Exits Requirements

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.

3.4 Minimum Width of Exits

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.

3.5 Minimum height of exits

All exits shall have a clear headroom of not less than 2 m.

3.6 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 45°.
4. There shall be not more than 16 risers in a flight.
5. There shall not be 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 constructed of non - combustible and shall be protected against corrosion and slips.
8. All doors giving access to the staircase shall, except in the case of sliding door, be constructed to open outwards;
9. Handrails, walls or grills with minimum height of 900 mm shall be provided on open sided staircases.
10. Railings shall be provided for stability or support on both sides, except staircases that are less than 1250 mm can have a handrail on one side only.

3.7 Construction of Ramps

- (a) The slope of such exit ramps shall not be steeper than 1 in 10, and
- (b) Exit ramps shall be straight with changes in direction being made at level platforms or landings only, except that exit ramps having a slope not greater than 1 in 12 at any place may be curved, and
- (c) Platform
 - level platforms or landings shall be provided at the bottom, at intermediate levels where required and at the top of all exit ramps, and
 - level platforms shall be provided at each door opening into or from an exit ramp, and
 - the minimum width of a platform or landing and length shall be not less than the width of the ramp, except that on a straight run ramp, the length of the level platform or landing need not be more than 1m, and
- (d) Exit ramps shall have walls, guards or handrails, and
- (e) All exit ramps shall be provided with non-slip surface finishes, and
- (f) Exit ramps shall be ventilated to comply with the requirements for ventilation, and
- (g) Exit ramps serving as means of escape to only one basement storey need not be protected by enclosure walls.

3.8 Protection of Escape Routes

3.8.1 Fire Doors

1. All fire doors shall have a minimum fire resistance as per Table 7.
2. All fire doors shall be fitted with an automatic self-closing device.
3. 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;
5. All doors affording means of emergency from a building shall, except in the case of sliding door, be constructed to open outwards.

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: <ol style="list-style-type: none"> a. If it separates a flat or maisonette from a space in common use, 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, c. Enclosing a protected shaft forming a stairway not described in (b) above, d. Enclosing a protected shaft forming a lift or service shaft e. Not describe in (a), (b), (c) & (d) above. 	FD 30S FD 30S Half the period of fire resistance of the wall in which it is fitted but 30 minutes and with suffix S. Half the period of fire resistance of the wall in which it is fitted, but 30 minimum As for wall it is fitted in, but add S (2) if the doors is used for progressive horizontal evacuation under the guidance to B1
3. In a compartment floor	As for the floor in which it is fitted
4. Forming part of the enclosures of: <ol style="list-style-type: none"> a. a protected stairway b. lift shaft, or c. service shaft, which does not form a protected shaft in 2(c) above 	FD 30S FD 30 FD 30
5. 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
c. a protected lobby approach to a lift shaft	FD 30S
6. Affording access to an external escape route	FD 30
7. Sub-dividing	
a. corridors connecting alternative exits	FD 20S
b. dead-end portions of corridors from the remainder of the corridors from the remainder of the corridor	FD 20S
8. Any door within a cavity barrier	FD 30
9. Any door forming part of the enclosures to a protected entrance hall or protected landing in a flat or maisonette;	FD 20
10. Any door forming part of the enclosure	
a. to a place of special fire risk	FD 30
b. to ancillary accommodation in care homes	FD 30

3.8.2 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.

3.8.3 Emergency Lighting of Escape Routes

3.8.3.1 Exits

- (a) Exits of all buildings, except for Purpose Group 1, shall be provided with emergency lighting facilities.
- (b) The minimum illuminance to be provided for all exits and the spacing for luminaires shall be in accordance with the requirements in MS 63 or BS 5266 - Code of practice for the emergency lighting of premises.

- (c) The delay between the failure of the electrical supply to normal lighting and the energisation of the exit lighting shall not exceed 1 second.

3.8.3.2 Corridors and Lobbies

- (a) Emergency lighting shall be provided in all corridors and lobbies of all buildings except Purpose Group 1.
- (b) The minimum level of illuminance, the spacing of luminaires and the maximum delay for emergency lighting shall be the same as that for the exit lighting.

3.8.3.3 Occupied Areas

- (a) For all buildings except Purpose Group 1, emergency lighting shall be provided in the occupied areas following the guidelines below:
 - (i) along paths leading to corridors, lobbies and exits in all occupied areas
 - (ii) Over the whole of such area if there are no explicit paths leading to corridors, lobbies and exits.
- (b) Notwithstanding the requirements in (a) above, emergency lighting shall be provided in the following locations:
 - (i) Lift cars;
 - (ii) Generator rooms;
 - (iii) Basement car parks;
 - (iv) Fire pump rooms;
 - (v) Areas of refuge within the same building.
- (c) The minimum level of illuminance shall comply with the requirements in BS 5266.
- (d) The delay between the failure of the electrical supply to normal lighting and the energisation of the emergency lighting for occupied areas shall not exceed 15 seconds.

3.8.3.4 Fire-Fighting Facilities

- (a) Fire alarm panels, fire alarm call points and fire-fighting equipment shall be adequately illuminated at all times so that they can be readily located.
- (b) The minimum level of illuminance shall comply with the requirements in BS 5266
- (c) The delay between the failure of the electrical supply to normal lighting and the energization of the emergency lighting for fire-fighting facilities shall not exceed 15 seconds.

3.8.4 Safety Signs

1. In all buildings, except for Purpose Group 1, the exits on every floor shall be clearly indicated by an exit sign placed over the exit door. Such signs shall be placed so as to be clearly visible at all times. Exit sign shall also be provided for rooms that require it.
2. 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 white marking / drawing of minimum size 100 mm high on a green background.
3. When the direction to the emergency exit may not be apparent to an occupant, an exit sign with an arrow indicating the direction to the exit shall be displayed.
4. If occupancy is permitted at night or if normal lighting levels are reduced during working times, exit signs shall be illuminated and emergency lighting shall be provided along escape routes.

3.8.5 Glazing Elements

1. The use of glazed elements on escape routes shall be limited as per Table 8 unless they provide the same fire resistance as the structure where the glazed elements are fitted.

TABLE 8 – LIMITATIONS OF GLAZING ELEMENTS

Construction and materials	Minimum thickness of glazing in mm for a period of	
	1 hour	½ hour
1. Glass, in direct combination with metal, the melting point of which is not lower than 982.2 °C, in square not exceeding 0.015 sq.m. in area Thickness of glass.	-	6.35
2. Glass reinforced with wire not less than 0.46 mm in diameter laid to a square mesh measuring 12.70 mm from centre to centre of wire, and electrically welded at the intersections, or laid to a hexagonal mesh measuring 25.40 mm across the flat side Thickness of glass In windows, doors, borrowed lights, lanterns and skylights, glass complying with paragraphs 1 or 2 of this Table shall be fixed with wood or metal beads or with a glazing compound in conjunction with sprigs or clips in panels not exceeding 0.372 sq.m. in area in timber frames (fixed shut) having a minimum width and thickness of 44.45 mm clear of rebates.	-	6.35
3. Glass reinforced with wire as in paragraph 2 of this Table , in windows, doors, borrowed lights, lanterns and skylights, fixed with metal beads in panels not exceeding 1.115 sq.m in metal frames (fixed shut) all metal having a melting point not lower than 982.2°C, the thickness of glass	6.35	6.35

<p>4. Glass bricks or blocks in walls.</p> <p>Laid in cement/ lime/ sand mortar with light wire reinforcing mesh in every third horizontal joint in a panel not exceeding 2.438 m in width or height set along the sides and head into recesses in the surrounding non-combustible construction. The depth of such recessed shall be not less than 25.40 mm, the glass blocks extending into the recesses to a depth of 12.70 mm and bedded upon layer of glass fibre. A non-hardening mastic shall be used to fill the spaces between the sides of the recesses and the faces of the panels.</p>	-	98.43
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3.8.6 Ventilation

1. 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.
3. A mechanical ventilation system is required for car parking area in basement having a minimum of 9 air change per hour and shall be independent of any systems serving other parts of the building.
4. In any building of which the habitable height exceeds 24 m, any internal exit staircases without adequate provision for natural ventilation shall be pressurised.

4:0 INTERNAL FIRE SPREAD STRUCTURAL PROTECTION

- 4.1 The building shall be so constructed that, in the event of fire, its stability will be maintained for a reasonable period.
- 4.2 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.
- 4.3 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.
- 4.4 A wall common to two or more buildings shall offer adequate resistance to the spread of fire and smoke.

4.5 The fire resistance of an element of structure shall be in accordance to Table 9.

TABLE 9 – FIRE RESISTANCE OF ELEMENT OF STRUCTURE (IN MINUTES)

Part of building	Minimum provisions when tested to BS 476: Part 20-23 (minutes)			Method of exposure
	Stability	Integrity	Insulation	
1. Structural frame, beam or column	*	no requirement	no requirement	exposed faces
2. Loadbearing wall which is not also an external wall, separating wall, compartment wall or protecting structure (See 4, 5, 6 or 7)	*	no requirement	no requirement	each side separately
3. Floors				
(a) floor in upper storey of a 2- storey dwelling house (but not over a garage)	30	15	15	from underside (Note 1)
(b) any other floor (including a compartment floor)	*	*	*	from underside (Note 1)
4. External walls				
(a) any part less than 1m from point on relevant boundary	*	*	*	each side separately
(b) any part of the wall of a building used for Assembly purposes which is 1m or more from the relevant boundary and is described in Note 2	* * (max. 60)	* * (max. 60)	15 * (max. 60)	from inside from outside
(c) any part 1 m. or more from the relevant boundary and is not a part described in (b) above	*	*	15	from inside
5. Separating wall	* (min.60)	* (min.60)	* (min.60)	each side separately
6. Compartment wall	*	*	*	each side separately
7. Protecting structure any part	*	*	*	each side separately
8. Wall separating an attached or integral garage from a dwelling house	*	*	*	from garage side
9. Doors				
(a) in a separating wall	no provision	+ (min. 60)	no provision***	each side separately when fitted in its frame
(b) in a compartment wall if it separates a flat or maisonette from a space in common use	no provision	30	no provision***	each side separately when fitted in its frame
(c) in a compartment wall or floor not described in (b) above	no provision	+	no provision***	each side separately when fitted in its frame

(d) in a protecting protecting situated wholly or partly adjoining ground in a building used for Flats, building Other Residential, Assembly or Office purposes	no provision	30	no provision***	each side separately when fitted in its frame
(e) in a protecting structure not described in (d) above	no provision	** (min. 30)	no provision***	each side separately when fitted in its frame
(f) any other door (including a door in a cavity barrier and a door between a dwelling house and garage)	no provision	30	no provision***	each side separately when fitted in its frame
10. Casing around a drainage system	30	30	30 + +	from outside
11. Cavity Barriers				
(a) cavity barrier 1m x 1m or Larger	30	30	15	each side separately
(b) any other cavity barrier	30	30	no provision	each side separately
(c) ceiling	30	30	30	from underside

++ No provision for insulation if the casing is more than 50mm from any pipe in the enclosure (except a pipe passing through the casing).

Notes

* Period of fire resistance as specified.

+ Period of fire resistance for the wall or floor in which the door is situated.

** Half the period of fire resistance for the wall or floor in which the door is situated.

*** This exemption does not apply to fire-rated glass door.

1 A suspended ceiling should only be relied on to contribute to the fire resistance of the floor if the ceiling meets the appropriate provisions given in Table 14.

2 Any part of the wall which is 7.5m or less above the ground, or above a roof or any other part of the building to which people have access, if the building has 2 or more storeys.

4.6 Buildings shall be compartmented to reduce the risk of internal fire spread as provision made in Tables 10 & 11.

TABLE 10 - 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 m ² for single storey building. (ii) 2000 m ² 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 11. (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 11 - MAXIMUM DIMENSION OF BUILDING OR COMPARTMENT

Compartments	Maximum Floor Area	Maximum Cubical Extent
Compartment below ground level. No compartment to comprise more than one storey.	2000m ²	7500m ³
Compartments between average ground level and a height of 24m. No compartment to comprise more than 3 storeys.	4000m ²	15000m ³
Compartments above a height of 24m from average ground level. No compartment to comprise more than one storey.	2000m ²	7500m ³

4.7 Permitted Openings in Compartment Walls and Floors

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 m³ 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.

4.8 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 shaftsuch 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.

4.9 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 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;

4.10 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 12.

TABLE 12 – 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.

4.11 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.
6. It is constructed of timber not less than 40mm thick.

5:0 INTERNAL FIRE SPREAD (SURFACES)

5.1 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.

5.2 The surface linings of walls and ceilings shall meet the classification as per Table 13

TABLE 13 - CLASSIFICATION OF LININGS

Location	Class
Small rooms of area not more than 4m ² in a residential building and 30m ² 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

5.3 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.

5.4 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.

5.5 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 14.

TABLE 14 - LIMITATION ON FIRE-PROTECTING SUSPENDED CEILINGS

Height of building	Type of floor	Required fire resistance of floor	Description of suspended ceiling
less than 15m	Non-Compartment	1 hour or less	Surface of ceiling exposed within the cavity not lower than
	Compartment	Less than 1 hour	Class I (as to surface spread of flame).
	Compartment	1 hour	Surface of ceiling exposed within the cavity not lower than Class O (as to surface spread of flame); supports and fixing for the ceiling non-combustible.
15 m or more	Any	1 hour or less	Surface of ceiling exposed within the cavity not lower than Class O (as to surface spread of flame) and jointless; supports and fixing for the ceiling non-combustible.
Any	Any	More than 1 hour	Ceiling of non-combustible construction and jointless; supports and fixings for the ceiling non-combustible.

5.6 Rooflights

Rooflights shall meet the relevant classification in para 5.2. However plastic rooflights with at least a class 3 rating may be used where para 5.2 calls for a higher standard, provided the limitations in Table 15 and in Table 16 are observed.

**TABLE 15 - LIMITATIONS APPLIED TO THERMOPLASTIC ROOFLIGHTS IN
SUSPENDED CEILING AND 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 m ²	50	3m
	circulation spaces except protected stairways	5 m ²	15	3m

**TABLE 16 - 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, 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 m ²	6m	6m	20m
	d. circulation space(4) (except a protected stairway)	6m(5)	6m(5)	20m(5)

6:0 EXTERNAL FIRE SPREAD

6.1 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.

6.2 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.

6.3 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 Tables 17A & 17B.

TABLE 17 – FIRE RESISTANCE

In this Table -

“cubical extent” means the cubical extent of the building or, if the building is divided into compartments, the compartment of which the elements of structure forms part;

“floor area” means the floor area of each storey in the building or, if the building is divided into compartments, of each storey in the compartment of which the element of structure forms part;

“NL” means No limit applicable.

17A - Buildings other than Single Storey Buildings

Purpose group	Maximum dimensions			Minimum period of fire resistance (in hrs) for elements of structure (*) forming part of-	
	Height (in m)	Floor area (in m ²)	Cubical Extent (in m ³)	Above Ground storey	Basement storey
1 (Small residential)					
House having not more than 3-storeys	NL	NL	NL	½	1(a)
House having 4-storeys	NL	250	NL	1(b)	1
House having any number of storey	NL	NL	NL	1	1½
2 (Other residential)					
Building or part (+) having not more than two storeys	NL	500	NL	½	1
Building or part (+) having 3-storeys	NL	250	NL	1(b)	1
Building having any number of storeys	28	3,000	8,500	1	1½
Building having any number of storeys	NL	2,000	5,500	1½	2
3 (Institutional)					
	28	2,000	NL	1	1½
	over 28	2,000	NL	1½	2

4 (Office)	7.5	250	NL	½	1(a)
	7.5	500	NL	½	1
	15	NL	3,500	1(b)	1
	28	5,000	14,000	1	1½
	NL	NL	NL	1½	2
5 (Shop)	7.5	150	NL	½	1(a)
	7.5	500	NL	½	1
	15	NL	3,500	1(b)	1
	28	1,000	7,000	1	2
	NL	2,000	7,000	2	4
6 (Factory)	7.5	250	NL	½	1(a)
	7.5	NL	1,700	½	1
	15	NL	4,250	1(b)	1
	28	NL	8,500	1	2
	28	NL	28,000	2	4
	over 28	2,000	5,500	2	4
7 (Place of public resort)	7.5	250	NL	½	1(a)
	7.5	500	NL	½	1
	15	NL	3,500	1(b)	1
	28	1,000	7,000	1	1½
	NL	NL	7,000	1½	2
8 (Storage and general)	7.5	150	NL	½	1(a)
	7.5	300	NL	½	1
	15	NL	1,700	1(b)	1
	15	NL	3,500	1	2
	28	NL	7,000	2	4(d)
	28	NL	21,000	4(c)	4(d)
	over 28	1,000	NL	4(c)	4(d)

- (*) A floor which is immediately over a basement storey shall be deemed to be an element of structure forming part of a basement storey.
- (+) The expression “part” means a part which is separated.
- (a) The period is half an hour for elements forming part of a basement storey which has an area not exceeding 50 m²
- (b) This period is reduced to half an hour in respect of a floor which is not a compartment floor, except as to the beams which support the floor or any part of the floor which contributes to the structural support of the building as a whole.
- (c) This period is reduced to 2-hours for:
- (1) unsprinklered, open-sided standalone car park buildings
 - (2) sprinkler protected, above-ground car park floors in standalone car park building or mixed-use building.
- (d) Single basement carpark storey, which is sprinklered protected, the element of structure can be reduced to half the minimum period of fire resistance.

17B - Single Storey Buildings

Purpose group		Maximum floor area (in m²)	Minimum period of fire resistance (in hours) for elements of structure
1	(Small residential)	NL	½
2	(Other residential)	3,000	½
3	(Institutional)	3,000	½
4	(Office)	3,000	½
		NL	1
5	(Shop)	2,000	½
		3,000	1
		NL	2
6	(Factory)	2,000	½
		3,000	1
		NL	2
7	(Place of public resort)	3,000	½
		NL	1
8	(Storage and general)	500	½
		1,000	1
		3,000	2
		NL	4(a)

(a) This period is reduced to 2-hours for open-sided buildings which are used solely for car parking.

6.4 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.

6.5 Openings in external walls shall be permitted in accordance with Table 18.

TABLE 18 - 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.

6.6 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 materials listed in sub section 6.6.1 or the minimum distance from the roof to the boundary of the plot is as per Table 19.

6.6.1 *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 19 - LIMITATIONS ON ROOF COVERINGS

Designation of covering of roof or part of roof		Minimum distance from any point on relevant boundary			
		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

O 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.

6.6.2 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.

7:0 ACCESS AND FIRE FIGHTING FACILITIES

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

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

7.3 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 manoeuvring 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.

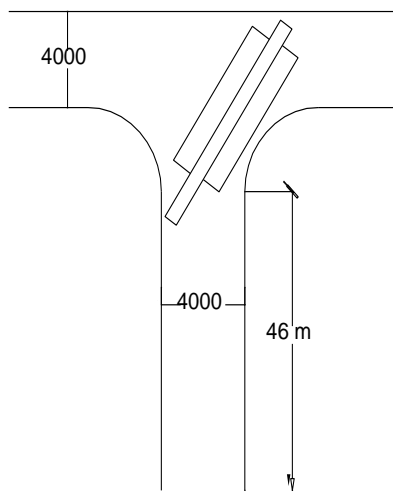


Figure 3

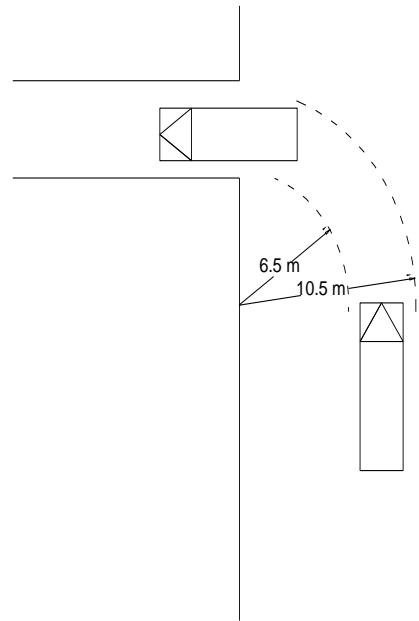


Figure 4

7.4 Fire Alarm System

- 1) A fire alarm system shall be installed in building;
 - (i) classified in all purpose groups except Group 1, where the number of persons exceeds 60, or
 - (ii) if the habitable height exceeds 9 metres, or
 - (iii) where a Certificate of Registration is issued under Inflammable Liquids and Substances Act 1952, or
 - (iv) where persons with impaired vision or hearing are working, or
 - (v) depending upon the level of risk.
- 2) A fire alarm system shall be installed in accordance to British Standard or any other equivalent standard.

7.5 Fire Detection System

- 1) A fire detection system shall be installed in buildings to enhance the fire alarm system described in paragraph 7.4 depending upon the risk and level of protection to be provided for life safety and property.
- 2) A fire detection system shall be installed in accordance to the British Standard or any other equivalent standard.

7.6 Fire Suppression System

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

TABLE 20 – PROVISION OF FIRE SUPPRESSION SYSTEM

Purpose Group	Requirements
4 except building with low fire risk	Habitable height exceeds 8 storeys above ground level
6	Height – 8 storeys or floor area of more than 2000 m ²
7 & 8 except building with low fire risk	Floor area of more than 1000 m ²

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

7.7 Hose Reel

1. Hose reels shall be installed, for the purpose of fire fighting, in any building of more than 500 m² except buildings in Group 1, depending upon the risk and level of protection to be provided for life safety and property.
2. A hose reel system shall be installed in accordance to the British Standard or any other equivalent standard.

7.8 Portable Fire Extinguisher

1. Fire extinguishers shall be installed in buildings classified in all purpose groups. Buildings in Group 1 may be exempted.
2. 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, 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. Fire extinguishers shall be sited in such a place so that no person shall travel more than 30 meters to reach them.
5. Fire extinguisher shall be sited in such a way that its carrying handle lies 1 metre from the floor level.

7.9 Rising Mains for Fire Fighting

1. All buildings with a height exceeding 18 metres shall have dry rising fire mains.
2. All buildings with a height exceeding 30 metres shall have wet rising fire mains.
3. Rising mains shall be installed in accordance to British Standard or any other equivalent standard.
4. 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.

7.10 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 fireman 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 fireman 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 is provided.

7.11 Secondary Power Supply

Secondary power supply shall be provided to the emergency lighting systems, fire alarm systems and any power-generated fire-fighting equipment as backup to the normal systems in case of mains power failure.

8:0 FIRE SAFETY REQUIREMENTS FOR BUILDING UNDER CONSTRUCTION AND DEMOLITION

8.1 The responsibility of the main contractor of the project is to actively work closely with the registered engineer to ensure that all requirements for the provision of all fire safety requirements in the building are complied with and allowed for in the construction stage or demolition phase.

8.2 Means of Escape

- (a) If the building is over one storey in height, at least one staircase from each working level shall be provided that is in usable condition at all times to the ground.
- (b) A staircase shall be extended upward as each floor is installed with new construction.
- (c) Building exits shall not be blocked or locked while people are in the buildings
- (d) Existing exits shall not be impaired or impeded by new construction.
- (e) Fire compartment boundaries include fire doors, penetration seals and general protection of other openings shall be completed progressively throughout the project to minimize fire spread.

8.3 Means for Fire Fighting

- (a) Extinguishers shall be installed in unobstructed and easily accessible locations in accordance with BS EN 3. They shall be installed on each storey, adjacent to each required exit, temporary exit or stairway, and near areas where combustibles are stored and hot work is carried out.
- (b) When automatic fire sprinkler and other suppression systems are to be installed in the completed building, the project shall be planned to bring them into operation as early as possible during the course of construction.
- (c) All hose stations and hose reels required for the completed building shall be progressively installed on all levels of a building under construction as early as possible, and unobstructed access maintained. As well, they shall be made fully operational as soon as possible.
- (d) Dry & wet rising mains shall be installed progressively as the building gains height, in order to provide fire-fighting capabilities to all stages of construction. All outlets, landing valves inlets, water tanks and pumps, where required shall be provided and made readily operational.

8.4 Means for giving warning in case of fire

Where the installation of permanent automatic detection and alarm systems is not practical during construction, a temporary means of giving warning shall be established to allow staff to raise an alarm in case of fire or other emergency across the site.

8.5 Miscellaneous

- (a) All electrical systems and equipment, including temporary installations, shall be installed and maintained in accordance with MS 63.
- (b) Signage showing the fastest way out should be clearly visible, and should be regularly monitored and relocated as necessary as construction progresses and conditions change.
- (c) Open fires, including the burning of waste materials, should be prohibited on the construction site. Combustible waste materials should be regularly removed from the site rather than burned.
- (d) Flammable liquids and gases should be stored in closed, clearly labelled containers/cylinders, in a secure area.

9:0 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: - Surface of no Flame Spread.

Class 1: - Surface of Very Low Flame Spread. Those surfaces on which not more than 150mm mean spread of flames occurs under the relevant test conditions.

Class 2: - Surface of Low Flame Spread. Those surfaces on which during the first 1½ minutes of test, the mean spread of flame is not more than 375mm and the final spread does not exceed 450mm under the relevant test conditions.

Class 3: - Surface of Medium Flame Spread. Those surfaces on which during the first 1½ minutes of test, the mean spread of flame is not more than 375mm and during the first 10 minutes of test is not more than 825mm under the relevant test conditions.

Class 4: - Surface of Rapid Flame Spread. Those surfaces on which during the first 1½ minutes of test the mean spread of flame is more than 375mm and during the first 10 minutes of test is more than 825mm under the relevant conditions.

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 separation 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.

Habitable height: - the height measured from the lowest level of access road to the finished floor level of the highest habitable floor.

Headroom: - is the clear height from the floor to the underside of the structure above, e.g. a ceiling, a beam, etc.

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.

Place of relative safety: - defined as a place of comparative safety and includes any place that puts an effective barrier between the person escaping and the fire.

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.

Storey: - A storey means any floor or part thereof including platform, mezzanine, attic level and Mechanical & Electrical floor.

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.

Two way travel distance: - the distance between two exits or exit access doors shall be equal to or not less than half the length of the maximum overall diagonal dimension of the building or area to be served and shall not be less than 7m, measured in a straight line between the furthest edges of the exit doors or exit access doors.