



Civil Defence Technical Requirements Guide

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General Directorate of Civil Defence (QCD) – Fire and Life Safety Requirements:

This document provides the minimum fire and life safety requirements for buildings and structures of various occupancies prescribed by the General Directorate of Civil Defense (GDCD). It establishes the guidelines in determining the minimum design and construction requirements, firefighting, fire alarm and detection, smoke control provisions, as well as other valuable life safety concerns necessary in the protection of precious lives and properties.

This document also adopts the National Fire Protection Association (NFPA) codes and standards as principal reference for provisions or requirements not specifically addressed in this document. In the event of any conflict concerning requirements under this document and requirements under NFPA, the requirements under this document shall be upheld.

Adoption of requirements from other fire and engineering codes and standards should have the prior concurrence of GDCD before its application.

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This document is an updated version of the Fire Safety Guidelines and Annex published in 2015 (FSG_2015), and further supersedes and replaces that previous FSG_2015 documents.



MASJID AND MOSQUE



MASJID AND MOSQUE

| 1.0 | GENERAL REQUIREMENTS | The fire and life safety requirements in this chapter shall apply to buildings or portions thereof used as Masjids and Mosques.. | | | |
|----------------------------------|--|---|----------|--|--|
| | Assembly occupancies or places of religious worship - Daily or Friday Mosques or Masjids with an occupant load exceeding fifty (50) persons. | | | | |
| FIRE AND LIFE SAFETY REQUIREMENT | | | | | |
| Item | Fire Safety Provisions | Minimum Requirements | Remarks | | |
| 1.1 | (Reserved) | | | | |
| 1.2 | CLASSIFICATION OF OCCUPANCIES | The classification of occupancies of Masjids, Mosques and Prayer Halls shall be Assembly Occupancies. | Required | | |
| 1.2.1 | SEPARATED OCCUPANCIES | Where separated occupancies are provided, each part of the building comprising a distinct occupancy, shall be completely separated from other occupancies by fire-resistive assemblies. | Required | | |
| 1.2.1.1 | IMAM HOUSE | Imam and Muazen House shall be separated from the Masjid and Moques areas by fire barrier of not less than 2-hrs fire resistance rating | Required | | |
| 1.2.2 | ASSEMBLY OCCUPANCIES IN MASJIDS | The provisions of this Masjid and Mosque FLS Requirements shall apply to the assembly occupancy Prayer Halls. | Required | | |
| 1.2.3 | RESIDENTIAL OCCUPANCIES IN MASJIDS | The Fire Safety Requirements on Dwellings shall apply to residential occupancies Imam/Muezzin House. | Required | | |
| 1.3 | OCCUPANT LOAD | The occupant load shall be determined on the basis of the occupant load factors that are characteristic of the use of the space as specified in 1.2.1, 1.2.2 and 1.2.3. | Required | | |
| 1.3.1 | PRAYER HALL | Prayer Halls/Musallah occupant load shall not exceed one person per 1.0 m ² | Required | | |
| 1.3.2 | COURTYARD | Courtyard/Sahan occupant load shall not exceed one person per 1.4 m ² . | Required | | |
| 1.3.3 | IMAM and MUEZIN HOUSE | Imam and Muazen House occupant load shall not exceed one person per 18.6 m ² . | Required | | |
| 1.4 | CLASSIFICATION OF HAZARD OF CONTENTS. | The Contents of assembly occupancies Masjid and Mosques shall be classified as Ordinary Hazards. | Required | | |

| Item | Fire Safety Provisions | Minimum Requirements | Remarks |
|------------|-------------------------------------|---|-----------|
| 1.5 | MINIMUM CONSTRUCTION REQUIREMENTS. | Masjid and Mosques shall be limited to the building construction Type I, Type II and Type III in accordance with NFPA 5000 Section 7.2 | Required |
| 1.6 | ACCESSIBILITY. | Accessibility shall be in accordance with NFPA 5000 Chapter 12. | Required |
| 2.0 | MEANS of EGRESS REQUIREMENTS | Means of egress shall comply with NFPA 101 Chapter 7, and as modified in item 2.0 of this FLS Occupancy Chapter. | |
| 2.1 | MEANS OF EGRESS COMPONENTS | Means of egress components shall be limited to the types described in 2.1.1 through 2.1.3. | Required |
| 2.1.1 | DOORS | Doors shall be in accordance with NFPA 101 section 7.2.1, and the requirements in items 2.1.1. | Required |
| 2.1.1.1 | Door Openings | Door openings in the means of egress shall not be less than 810 mm in clear width, except under any of the following conditions: | Required |
| 2.1.1.1(1) | Pair of Doors | Where a pair of door leaves is provided, one door leaf shall provide not less than 810 mm clear width opening. | Required |
| 2.1.1.1(2) | Accessible Doors | Door openings serving a building or portion thereof not required to be accessible to persons with severe mobility impairments shall be permitted to be 710 mm in door leaf width. | Permitted |
| 2.1.1.2 | Door Swing Direction | Door leaves required to be of the side-hinged or pivoted-swinging type shall swing in the direction of egress travel under any of the following conditions: | Required |
| 2.1.1.2(1) | With 50 or more Occupants | Where serving a room or area with an occupant load of 50 or more. | Required |
| 2.1.1.2(2) | In Exit Enclosures | Where the door assembly is used in an exit enclosure. | Required |
| 2.1.2 | STAIRS | Stairs complying with NFPA 101 section 7.2.2 and as specified in 2.1.2. | Required |
| 2.1.2.1 | Stair Width | The minimum width clear of all obstructions, except projections not more than 114 mm at or below handrail height on each side, shall be in accordance with the following: | Required |
| 2.1.2.1(1) | Less than 2000 Occupants | Where the total occupant load of all stories served by the stair is fewer than 2000, the minimum clear width, shall be 1200 mm. | Required |
| 2.1.2.1(2) | Equal or More than 2000 Occupants | Where stairs serve occupant loads exceeding 2000, the minimum clear width shall be 1420 mm. | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Remarks |
|----------|--------------------------------|--|----------|
| 2.1.3 | RAMPS | Ramps complying with NFPA 101 section 7.2.5. | Required |
| 2.1.3.1 | Ramp Minimum Width | Every ramp used as a component in a means of egress shall have a minimum width clear of all obstructions of 1500 mm. | Required |
| 2.1.3.2 | Ramp Slope | Maximum slope shall be 1 in 12 and the maximum cross slope shall be 1 in 48. | Required |
| 2.1.3.3 | Ramp Rise | Maximum rise for a single ramp run shall not be more than 760mm. | Required |
| 2.1.3.4 | Ramp Aisles | Ramped aisles not part of an accessible means of egress shall be permitted to have a slope not steeper than 1 in 8. | Required |
| 2.2 | CAPACITY OF MEANS OF EGRESS | The capacity of means of egress shall be in accordance with NFPA 101 section 7.3 and shall be sized appropriately as specified in 2.2. | Required |
| 2.2.1 | MAIN ENTRANCE/EXIT | The main entrance/exit shall be of a width that accommodates two-thirds of the total occupant load. | Required |
| 2.2.2 | OTHER EXITS | Each level of the Masjid shall have access to the main entrance/exit and shall be provided with additional exits of a width to accommodate not less than one-half of the total occupant load served by that level. | Required |
| 2.2.3 | CORRIDOR WIDTH | The minimum width of any exit access corridor serving occupant loads not exceeding 2000 shall be not less than 1200 mm. | Required |
| 2.3 | NUMBER OF MEANS OF EGRESS | The number of means of egress shall be in accordance with NFPA 101 section 7.4. | Required |
| 2.3.1 | GENERAL | The number of means of egress from any story, shall be not less than two (2). | Required |
| 2.3.2 | | The number of means of egress from any story or portion thereof, shall be as follows: | Required |
| 2.3.2(1) | | Occupant load more than 500 but not more than 1000 – not less than three (3). | Required |
| 2.3.2(2) | | Occupant load more than 1000 – not less than four (4). | Required |
| 2.4 | ARRANGEMENT OF MEANS OF EGRESS | Access to all required exits shall be arranged in accordance with NFPA 101 section 7.5. and as modified by 2.5. | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Remarks |
|---------|-----------------------------------|---|----------|
| 2.4.1 | LOCATION OF EXITS | Exits shall be located as far apart as practicable and as far from the main entrance/ exit as practicable. | Required |
| 2.4.2 | EXIT REMOTENESS | Exits, exit accesses, or exit discharges shall be located at a distance from one another not less than one-half the length of the maximum overall diagonal dimension of the building or area to be served, measured in a straight line between the nearest edges of the exits, exit accesses, or exit discharges. | Required |
| 2.4.3 | IMAM/MUEZIN HOUSE EXIT | Exits through an enclosed or protected stair serving the Imam House from the upper stories shall not pass through areas of the Masjid at the level of exit discharge. | Required |
| 2.4.4 | COMMON PATH LIMIT (>50 Occupants) | A common path of travel shall be permitted for the first 6 m from any point where the common path serves any number of occupants. | Required |
| 2.4.5 | COMMON PATH LIMIT (<50 Occupants) | A common path of travel shall be permitted for the first 23 m from any point where the common path serves not more than 50 occupants. | Required |
| 2.4.6 | DEAD-END | Dead-end corridors shall not exceed 6 m. | Required |
| 2.4.7 | FIRE ASSEMBLY POINT | A fire assembly point for the total worshipper population of the masjid. | Required |
| 2.4.7.1 | | If the fire assembly point is not within the masjid plot, it should be directly accessible and clearly signposted from it. | Required |
| 2.5 | TRAVEL DISTANCE (TD) TO EXITS | Travel distance shall be measured in accordance with NFPA 101 Section 7.6. | Required |
| 2.5.1 | MAXIMUM TRAVEL DISTANCE | Exits shall be arranged so that the total length of travel from any point to reach an exit shall not exceed 61 m in the Masjid. | Required |
| 2.5.2 | | Exits shall be arranged so that the total length of travel from any point to reach an exit shall not exceed 76 m in the Masjid that is protected throughout by an automatic sprinkler system. | Required |
| 2.6 | DISCHARGE FROM EXITS | Exit discharge shall comply with NFPA 101 section 7.7. | Required |
| 2.6.1 | EXIT TERMINATION | Exits shall terminate directly, at a public way or at an exterior exit discharge. | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Remarks |
|---------|----------------------------------|--|----------|
| 2.6.1.1 | Exit Discharge at Courtyard/Sahn | Means of egress shall be permitted to terminate in the Sahn or Courtyard provided that it is open to the sky and have the required number of exit that can accommodate 100 percent of the required egress capacity from both the courtyard and the main areas of the Masjid. | Required |
| 2.6.2 | ARRANGEMENT OF EXIT DISCHARGE | Exit discharges shall be arranged to meet the remoteness criteria of item 2.4.2 of this requirement. | Required |
| 2.7 | ILLUMINATION OF MEANS OF EGRESS | Illumination of means of egress in accordance with NFPA 101 section 7.8, shall be continuous during the time that the conditions of occupancy require that the means of egress be available for use. | Required |
| 2.8 | EMERGENCY LIGHTING | Emergency lighting facilities for means of egress in accordance with NFPA 101 7.9. | Required |
| 2.8.1 | COURTYARD | Emergency lighting in the courtyard should provide illumination to a public way. | Required |
| 2.8.2 | PRAYER HALLS | Masjids, mosques prayer halls and any interior open area (or anti-panic area) larger than 60 m ² shall be provided with emergency lighting. | Required |
| 2.8.2.1 | | Masjids and mosques without windows opening outside the building shall be provided with emergency lighting | Required |
| 2.9 | MARKINGS OF MEANS OF EGRESS | Means of egress shall have signs in accordance with NFPA 101 section 7.10. | Required |
| 2.9.1 | EXIT SIGNS | Exits, other than main exterior exit doors that obviously and clearly are identifiable as exits, shall be marked by an approved sign that is readily visible from any direction of exit access. | Required |
| 2.9.1.1 | EXIT SIGNS | Access to exits shall be marked by approved, readily visible signs in all cases where the exit or way to reach the exit is not readily apparent to the occupants. | Required |
| 2.9.2 | EVACUATION DIAGRAM | Evacuation diagrams shall be provided. | Required |
| 2.9.2.2 | | Where a posted floor evacuation diagram is required, floor evacuation diagrams reflecting the actual floor arrangement and exit locations shall be posted and oriented in a location and manner acceptable to the authority having jurisdiction. | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Remarks |
|----------|---|---|-----------|
| 2.10 | SPECIAL PROVISIONS for QURAN TEACHING CENTERS | | |
| 2.10.1 | LOCATION | All rooms and spaces intended for Quran teaching and memorization shall not be located in basements or any level below the level of discharge. | Required |
| 2.10.2 | MULTIPLE OCCUPANCIES | Each portion of the Quran Teaching Centers shall be classified as to its use and shall comply with the most restrictive requirements of the occupancies involved. | Required |
| 2.10.3 | MEANS OF EGRESS | The means of egress shall be based on the means of egress requirements applicable to the occupancy use of the area. | Required |
| 2.10.3.1 | Arrangement of Means of Egress | In case where rooms and spaces intended for Quran teaching and memorization are located in mezzanines or in floors above the level of exit discharge (average ground level), the travel distance shall not exceed 30 m to the nearest exit or exit enclosures that directly discharge to the building external. | Required |
| 2.11 | (Reserved). | | |
| 3.0 | PROTECTION | Protection shall comply with the applicable NFPA codes and standards, QCD FLS Annex and as modified in item 3.0 of this FLS Occupancy Chapter. | |
| 3.1 | PROTECTION FROM HAZARDS | | |
| 3.1.1 | COOKING FACILITIES/KITCHEN/ PANTRY | Only the following types of cooking equipment shall be permitted. | Required |
| 3.1.1(1) | | Portable equipment not flue-connected | Permitted |
| 3.1.1(2) | | Equipment used only for food warming | Permitted |
| 3.2 | PROTECTION OF VERTICAL OPENINGS | | |
| 3.2.1 | OPEN STAIRS/RAMPS | Stairs or ramps shall be permitted to be unenclosed between balconies or mezzanines and main assembly areas located below, provided that the balcony or mezzanine is open to the main assembly area. | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Remarks |
|----------|--|---|--------------|
| 3.3 | INTERIOR FINISH | | |
| 3.3.1 | INTERIOR WALL/CEILING FINISH | | |
| 3.3.1(1) | Corridors, Lobbies, and Enclosed Stairways. | Interior wall and ceiling finish materials shall be Class A or Class B in all corridors and lobbies and shall be Class A in enclosed stairways. | Required |
| 3.3.1(2) | Masjid Areas | Interior wall and ceiling finish materials shall be Class A or Class B in the Masjid Areas. | Required |
| 3.3.2 | INTERIOR FLOOR FINISH | | |
| 3.3.2(1) | Carpet Interior Floor Finishes | Interior floor finish in exit enclosures and exit access corridors and in spaces not separated from them by fire rated corridor walls shall be not less than Class II. | Required |
| 3.3.2(2) | Floor Coverings | Carpet and carpet like interior floor finish shall comply with ASTM D2859 Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials. | Required |
| 3.4 | DETECTION, ALARM & COMMUNICATION REQUIREMENTS | | |
| 3.4.1 | IMAM HOUSE & MOSQUE/MASJID | | |
| 3.4.1.1 | IMAM HOUSE (GROUND ONLY) | Stand alone smoke alarms battery operated | Required |
| 3.4.1.2 | IMAM HOUSE [Ground with a maximum one(1) level below (Basement or one (1) level above (Mezzanine) – (B+G, B+G+M OR G+M)] | Stand alone smoke alarms battery operated | Required |
| 3.4.1.3 | MOSQUE OR MASJIDS (GROUND ONLY) | Fire Detection and Alarm System Requirements | Not Required |

| Item | Fire Safety Provisions | Minimum Requirements | Remarks |
|------------|--|--|--------------|
| 3.4.2 | QURAN TEACHING CENTERS & MOSQUE/MASJIDS | | |
| 3.4.2.1 | QURAN TEACHING CENTERS (GROUND ONLY) | Fire Detection and Alarm System Requirements | Required |
| 3.4.2.2 | QURAN TEACHING CENTERS [Ground with a maximum one(1) level below (Basement or one (1) level above (Mezzanine) – (B+G, B+G+M OR G+M)] | Fire Detection and Alarm System Requirements | Required |
| 3.4.2.3 | MOSQUE OR MASJIDS [Ground with a maximum one(1) level below (Basement or one (1) level above (Mezzanine) – (B+G, B+G+M OR G+M)] | Fire Detection and Alarm System Requirements | Required |
| 3.4.2.1 | GENERAL | Complete coverage of Fire Detection and Alarm System. | Required |
| 3.4.2.1(1) | | Fire Alarm Control Panel. | Required |
| 3.4.2.2 | INITIATION | Complete coverage of an Automatic Detection and Manual Initiating Devices. | Required |
| 3.4.2.3 | OCCUPANT NOTIFICATION | Complete coverage of an Occupant Notification. | Required |
| 3.4.2.3(1) | Emergency Voice Evacuation System | | Not Required |
| 3.4.2.3(2) | Audible notification | Sounder | Required |
| 3.4.2.3(3) | Visible notification | Flasher | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Remarks |
|----------------|---|--|--------------|
| 3.4.2.4 | SUPPLEMENTARY | | |
| 3.4.2.4(1) | Fire Telephone | | Not Required |
| 3.4.2.4(2) | Graphic Annunciator (PC panel) or Mimic Panel | | Not Required |
| 3.4.3 | Mezzanine Prayer Halls | | |
| 3.4.3.1 | Enclosed Mezzanines. | Prayer halls located in enclosed mezzanines, and its means of egress is arranged to pass through areas in the ground floor or does not directly discharge to the building external, the requirements for fire detection and alarm system in accordance with 3.4.2 shall be provided. | Required |
| 3.4.3.1(1) | | Prayer halls located in enclosed mezzanines, but its means of egress is arranged to directly discharge to the building external at the ground floor level, shall be exempted from the requirements in 3.4.2. | Permitted |
| 3.4.3.2 | Open Mezzanines. | Prayer halls located in open mezzanines shall not be required to comply with the fire detection and alarm system requirements in 3.4.2. | Permitted |
| 3.5 | EXTINGUISHMENT REQUIREMENTS | | |
| 3.5.1 | QURAN TEACHING CENTERS, IMAM HOUSE AND MOSQUES OR MASJIDS | Prayer halls located in the Ground Floor with a maximum one (1) level above (mezzanine) - (G or G+M) | |
| 3.5.2 | MOSQUES OR MASJIDS | Prayer halls located in the Ground Floor, Mezzanine level and in maximum one (1) Basement level (B+G or B+G+M). | |
| 3.5.2.1 | Automatic Sprinkler System | Throughout approved and supervised automatic sprinkler system in all floor levels where the occupant load in the basement level exceeds 1000 persons. | Required |
| 3.5.2.1(1) | Exemption | The automatic sprinkler system in 3.5.2.1 shall not be required subject to all of the following conditions: | Permitted |
| 3.5.2.1 (1)(a) | | Occupant load is less than 1000 person (gross) in the basement level. | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Remarks |
|-------------------|--|---|----------|
| 3.5.2.1 (1)(b) | | Fire Alarm and Detection System in accordance with item 3.4.2 are provided. | Required |
| 3.5.2.1 (1)(c) | | The required number of exits in item 2.3, that is separate and remotely located in accordance with item 2.4. shall be provided. | Required |
| 3.5.2.1 (1)(c)(i) | | A minimum of two (2) exits required in 3.5.2.1 (1)(c), shall discharge and lead directly to the building external at the ground level. | Required |
| 3.5.2.1 (1)(d) | | Travel distance from any portion of the basement to an exit enclosures or to the building external at the ground level shall not exceed 46 m. | Required |
| 3.5.2.1 (1)(d) | | At the ground floor level, exits shall be distributed around the perimeter of the building in accordance with item 2.4.2. | Required |
| 3.5.3 | Fire Hose Reel | Fire hose reels are required in buildings protected by an approved supervised automatic sprinkler system. | Required |
| 3.5.4 | Portable Fire Extinguisher | Applicable Portable Fire Extinguishers required in all buildings. | Required |
| 3.5.5 | Rising Main (Dry or Wet Standpipe) | Refer to Annex Fire Fighting System Annex_FFS_G1 Revisions_2021. | Required |
| 3.6 | SMOKE CONTROL / VENTILATION REQUIREMENTS | Design conditions per FLS Annex_ACMV_N1 Revisions_2021. | |
| 3.6.1 | BASEMENT/BASEMENT PRAYER HALLS | The basement portions of mosques and masjids, shall be provided with automatic smoke control where the basement has the following features: | |
| 3.6.1.1 | | Occupant load of more than 100 persons in the basement portions of the building. | Required |
| 3.6.1.2 | | Basement level located more than 9.1 m below the lowest level of exit discharge. | Required |
| 3.6.1.3 | | Combustible contents, combustible interior finish, or combustible construction. | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Remarks |
|------------|---|--|-----------------|
| 3.7 | (Reserved). | | |
| 4.0 | SPECIAL PROVISIONS. | Special Provisions for Firefighting and Rescue shall comply with QCD FLS Annex and as modified in item 4.0 of this FLS Occupancy Chapter. | |
| 4.1 | FIRE COMMAND CENTER (FCC) | QCD FLS Annex_A5 – Revisions_2021. | NR-Not Required |
| 4.2 | FIREMAN'S ACCESS PANELS/OPENINGS | QCD FLS Annex_A3 – Revisions_2021 | Required |
| 4.3.1 | SITE ACCESS/ACCESS ROAD | For gated facility development a 4.0 m wide access road and 4.5 m clear height vertical clearance entry gate or site access shall be provided. | Required |
| 4.3.2 | FIRE ENGINE HARDSTANDING | Fire engine hardstandings with longer side parallel to the façade of the building shall be provided in buildings exceeding the habitable height of 10 m. | Required |
| 4.4 | (Reserved). | | |
| 5.0 | BUILDING SERVICES and FIRE PROTECTION EQUIPMENT | Building Services and Fire Protection Equipment shall comply with the applicable NFPA codes and standards and QCD FLS Annex. | |
| 5.1 | ELECTRICAL SYSTEM | Electrical wiring and equipment shall be in accordance with NFPA 70. | Required |
| 5.1.1 | ELECTRICAL EQUIPMENT/PANEL ROOMS AND SIMILAR ROOMS/SPACES | QCD FLS Annex _A7 – Revisions_2021 | Required |
| 5.1.2 | EMERGENCY GENERATORS AND STANDBY POWER SYSTEMS. | Emergency generators and standby power systems shall be installed, tested, and maintained in accordance with NFPA 110. | Required |
| 5.1.3 | STORED ELECTRICAL ENERGY SYSTEMS | Stored electrical energy systems shall be installed, tested, and maintained in accordance with NFPA 111. | Required |
| 5.2 | ELEVATORS and ESCALATORS | An elevator, shall not be considered a component in a required means of egress and shall be in accordance with NFPA 101 section 9.4. | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Remarks |
|----------|-------------------------------------|---|----------|
| 5.2.1 | NUMBER OF CARS | The number of elevator cars permitted in a hoistway shall be not more than three (3). | Required |
| 5.2.2 | OPENINGS TO EXIT ENCLOSURES | Conveyors, elevators, dumbwaiters, and pneumatic conveyors serving various stories of a building shall not open to an exit enclosure. | Required |
| 5.3 | FIRE PUMPS | | |
| 5.3.1 | FIRE PUMPS ROOM | QCD FLS Annex _A6 – Revisions_2021 | Required |
| 5.4 | SUBSTATION and SWITCHGEARS | QCD FLS Annex _A8 – Revisions_2021 | Required |
| 5.5 | (Reserved). | | |
| 6.0 | LIFE SAFETY EVALUATION (LSE) | Life Safety Evaluation shall be in accordance with NFPA 101 section 12.4.1 and as specified in item 6.0 of this FLS Occupancy Chapter. | |
| 6.1 | LIFE SAFETY EVALUATION | Where the occupant load exceeds 6000, a life safety evaluation (LSE) shall be performed in accordance with the following: | Required |
| 6.1.1 | QUALIFIED LSE PREPARER | The life safety evaluation shall be performed by persons acceptable to the authority having jurisdiction. | Required |
| 6.1.2 | SAFETY MEASURES | The life safety evaluation shall include a written assessment of safety measures for the following conditions: | Required |
| 6.1.2(1) | | Nature of the events and the participants and attendees | |
| 6.1.2(2) | | Access and egress movement, including crowd density problems | |
| 6.1.2(3) | | Fire hazards | |
| 6.1.2(4) | | Permanent and temporary structural systems | |
| 6.1.2(5) | | Severe weather conditions | |



| Item | Fire Safety Provisions | Minimum Requirements | Remarks |
|----------|------------------------|---|----------|
| 6.1.2(6) | | Hazardous materials incidents within and near the facility | |
| 6.1.2(8) | | Relationships among facility management, event participants, emergency response agencies, and others having a role in the events accommodated in the facility | Required |
| 6.1.3 | LSE APPROVAL VALIDITY | The life safety evaluation shall be approved annually by the authority having jurisdiction and shall be updated for special or unusual conditions. | Required |
| 6.1.4 | LSE ASSESSMENT | Life safety evaluations shall include assessments of both building systems and management features upon which reliance is placed for the safety of facility occupants, and such assessments shall consider scenarios appropriate to the facility. | Required |
| 6.2 | (Reserved). | | |



NURSERY - CHILD CARE OCCUPANCIES



NURSERY - CHILD CARE OCCUPANCIES

| | | | | |
|-----------------------------------|--|--|---|---|
| 1.0 | GENERAL REQUIREMENTS. | The requirements of this chapter shall apply to buildings or portions thereof used as nurseries or day-care occupancies. | | |
| | An occupancy in which four or more clients (children) receive care, maintenance, and supervision, by other than their relatives or legal guardians, for less than 24 hours per day. | | | |
| | Nursery | Preschool | Incidental Kindergarten Classes | Child Care |
| | EXCLUDE rooms or spaces used for TEMPORARY CHILD CARE, during short term activities of the child's relative or guardian within the same building or day-care uses that are part of some other occupancy. In such cases, the requirements of the predominant occupancy apply: | | | |
| | (1) Rooms located within places of worship used as nurseries or for supervision of children or religious education while services are being held in the building. | | | |
| | (2) Rooms used for temporary child care during short-term recreational activities of the child's relative or guardian, such as within a health club or park district. | | | |
| | (3) Rooms used for temporary child care during short-term activities such as court hearings, medical appointments, libraries, or other similar circumstances. | | | |
| | (4) Rooms used for temporary child care during short-term shopping and recreational activities of the child's relative or guardian, such as within a mall, theaters or cinemas. | | | |
| | Occupancies that include preschools, kindergartens, and other schools whose purpose is primarily educational for children 24 months of age or older, even though the children who attend such schools are of preschool age, SHALL COMPLY WITH the provisions of EDUCATIONAL OCCUPANCIES. | | | |
| 1.1 | GENERAL CONDITIONS AND BUILDING LIMITS | | | |
| 1.1.1 | School/Grade Level | Location or Floor Level/s | Floor Area (m ²) | Basement Level Usage |
| | NURSERY - Child Care Occupancy | Ground Floor or in Level of Exit Discharge | No Limit [see requirements for Fire Sprinkler System] | Car parking exclusively for the building employees only |
| FIRE AND LIFE SAFETY REQUIREMENTS | | | | |
| Item | Fire Safety Provisions | Minimum Requirements | | Nursery/Child Care |
| 1.2 | CLASSIFICATION OF OCCUPANCIES | | | |
| 1.2.1 | MULTIPLE OCCUPANCIES | A child-care use with more than three children is not permitted to be considered incidental to a predominant occupancy within the same building. | | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Nursery/Child Care |
|---------|--|---|--------------------|
| 1.2.1.1 | | Except for a specialized case involving temporary care during short-term activities of the relative or guardian within the same building as specified in 1.0. | Permitted |
| 1.2.1.2 | Atrium Walls Used in an Occupancy Separation | Atrium walls shall be permitted to serve as part of the separation for creating separated occupancies on a story-by-story basis. | Permitted |
| 1.3 | OCCUPANT LOAD | Determined on the basis of the occupant load factors (OLF) that are characteristic of the use of the space as specified in 1.3.1. | Required |
| 1.3.1 | OCCUPANT LOAD FACTOR (OLF) | The occupant load in Classrooms shall be not less than the number of persons determined by dividing the floor area by the OLF of 3.5 m ² / person (net). | Required |
| 1.3.2 | MODIFIED OCCUPANT LOAD | An approved aisle or seating diagram (number of fixed seats) shall be provided to substantiate the modification permitted. | Required |
| 1.4 | CLASSIFICATION OF HAZARD OF CONTENTS | The contents of day-care occupancies shall be classified as ordinary hazard. | |
| 1.5 | MINIMUM CONSTRUCTION REQUIREMENTS. | Construction shall be in accordance with NFPA 5000 Chapters 7–8, 13–14, 31, and 35–40. | Required |
| 1.6 | ACCESSIBILITY. | Accessibility shall be in accordance with NFPA 5000 Chapter 12. | Required |
| 1.7 | (Reserved). | | |
| 2.0 | MEANS of EGRESS REQUIREMENTS. | Means of egress shall comply with NFPA 101 Chapter 7, and as modified in item 2.0 of this FLS Occupancy Chapter. | |
| 2.1 | GENERAL | Rooms normally occupied by students shall be located as specified in 2.1.1. | Required |
| 2.1.1 | Locations | Rooms normally occupied by nursery or child care occupancies shall be located in the ground floor or on a level of exit discharge. | Required |
| 2.2 | MEANS OF EGRESS COMPONENTS | Components of means of egress shall be limited to the types described in 2.2.1 through 2.2.6. | Required |
| 2.2.1 | DOORS | Doors shall be in accordance with NFPA 101 section 7.2.1, and the requirements in 2.2.1 through 2.2.2.1. | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Nursery/Child Care |
|---------|-----------------------------|--|--------------------|
| 2.2.1.1 | Locks | Any door in a required means of egress from an area having an occupant load of 100 or more persons shall be permitted to be provided with a latch or lock only if the latch or lock is panic hardware or fire exit hardware complying with NFPA 101 7.2.1.7. | Permitted |
| 2.2.1.2 | Special Locking | Delayed-egress electrical locking systems complying with NFPA 101 section 7.2.1.6.1. | Permitted |
| 2.2.1.3 | | Sensor-release of electrical locking systems complying with NFPA 101 section 7.2.1.6.2 | Permitted |
| 2.2.1.4 | | Elevator lobby exit access door assemblies locking in accordance with NFPA 101 section 7.2.1.6.3 | Permitted |
| 2.2.1.5 | Door Latches | Every door latch to closets, storage areas, kitchens, and other similar spaces or areas shall be such that children can open the door from inside the space or area. | Required |
| 2.2.1.6 | Bathroom Doors | Every bathroom door lock shall be designed to allow opening of the locked door from the outside by an opening device that shall be readily accessible to the staff. | Required |
| 2.2.2 | STAIRS | Stairs complying with NFPA 101 section 7.2.2. | Permitted |
| 2.2.2.1 | Additional Handrails | Additional handrails on stairs that are used extensively by children 5 years of age or less at a height in the range of 710 mm to 810 mm shall be permitted. | Permitted |
| 2.2.2.2 | Lifts/Elevators | Lift or elevators, serving various stories of a building located within an exit stair enclosure. | Not Permitted |
| 2.2.3 | SMOKEPROOF ENCLOSURES | Smokeproof enclosures complying with NFPA 101 section 7.2.3. | Permitted |
| 2.2.4 | HORIZONTAL EXITS | Horizontal exit as a component in a means of egress or used as substitute for other exits shall comply with all the criteria in NFPA 101 section 7.2.4. | Permitted |
| 2.2.5 | RAMPS | Ramps complying with NFPA 101 section 7.2.5. | Permitted |
| 2.2.6 | EXIT PASSAGEWAY | Exit passageways complying with NFPA 101 section 7.2.6 | Permitted |
| 2.3 | CAPACITY OF MEANS OF EGRESS | Capacity of means of egress shall be in accordance with NFPA 101 section 7.3. | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Nursery/Child Care |
|---------|--|--|--------------------|
| 2.3.1 | MINIMUM CORRIDOR WIDTH | Exit access corridors shall have not less than 1830 mm of clear width. | Required |
| 2.3.2 | | Exit access corridors with a required capacity of less than 100 persons shall have not less than 1200 mm of clear width. | Required |
| 2.4 | NUMBER OF MEANS OF EGRESS | The number of means of egress shall be in accordance with NFPA 101 section 7.4. | |
| 2.4.1 | GENERAL | Not less than two separate exits shall be provided on every story and shall be accessible from every part of the building. | Required |
| 2.5 | ARRANGEMENT OF MEANS OF EGRESS | Means of egress shall be arranged in accordance with NFPA 101 section 7.5. | |
| 2.5.1 | ROOMS SUBJECT TO NURSERY/ CHILD CARE OCCUPANCY | Every room that is normally subject to children occupancy shall comply with the following: | Required |
| 2.5.1.1 | Exit Access Doors | The room or space shall have a minimum of two (2) exit access doors that provide access to separate exits. | Required |
| 2.5.1.2 | | One (1) of required access door shall be permitted to open onto a common corridor, provided that such corridor leads to separate exits located in opposite directions. | Required |
| 2.5.1.3 | | The other exit access door required in 2.5.1.1, shall open directly to the outside or to an open to sky courtyard, that have access directly to the building external. | Required |
| 2.5.2 | DOORS SWING | Doors that swing into an exit access corridor shall be arranged to prevent interference with corridor travel. | Required |
| 2.5.3 | AISLE WIDTH | Aisles shall be not less than 760 mm wide. | Required |
| 2.5.3.1 | | The space between parallel rows of seats shall not be subject to the minimum aisle width, provided that the number of seats that intervenes between any seat and an aisle does not exceed six. | Required |
| 2.5.4 | TRAVEL DISTANCE (TD) TO EXITS | Travel distance shall be measured in accordance with 2.5.4.1 through 2.5.4.3. | Required |
| 2.5.4.1 | Maximum Travel Distance | Travel distance to an exit shall not exceed 46 m from any point in a building. | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Nursery/Child Care |
|------------|---------------------------------|---|--------------------|
| 2.5.4.2 | TD in Protected Buildings | Travel distance shall not exceed 61 m in nursery and child care occupancies protected throughout by an automatic sprinkler system. | Required |
| 2.5.4.3 | TD Limit | Travel distance shall meet all of the following criteria, unless otherwise permitted by 2.5.4.4. | Required |
| 2.5.4.3(1) | | The travel distance between any room door intended as an exit access and an exit shall not exceed 30 m. | Required |
| 2.5.4.3(2) | | The travel distance between any point in a room and an exit shall not exceed 46 m. | Required |
| 2.5.4.3(3) | TD Limit within a Sleeping Room | The travel distance between any point in a sleeping room and an exit access door in that room shall not exceed 15 m. | Required |
| 2.5.4.4 | TD Increase | The travel distance required by 2.5.4.3(1) and 2.5.4.3(2) shall be permitted to be increased by 15 m in buildings protected throughout by an automatic fire sprinkler system. | Permitted |
| 2.5.5 | COMMON PATH (CP) OF TRAVEL | Limitations on common path of travel shall comply with 2.5.5.1 and 2.5.5.2. | Required |
| 2.5.5.1 | Common Path Limit | Common path of travel shall not exceed 23 m. | Required |
| 2.5.5.2 | CP Limit in Protected Buildings | Common path of travel in buildings protected throughout by an automatic sprinkler system shall not exceed 30 m. | Required |
| 2.5.6 | DEAD-END (DE) CORRIDOR | Dead-end corridors shall be permitted in accordance with 2.5.6.1 and 2.5.6.2. | Required |
| 2.5.6.1 | Dead-end Limit | No dead-end corridor shall exceed 6 m. | Required |
| 2.5.6.2 | DE Limit in Protected Buildings | Dead-end corridors in buildings protected throughout by an automatic sprinkler system shall not exceed 15 m. | Required |
| 2.6 | DISCHARGE FROM EXITS | Discharge from exits shall be arranged in accordance with NFPA 101 section 7.7. | Required |
| 2.6.1 | EXIT TERMINATION | Exits shall terminate directly, at a public way or at an exterior exit discharge, in accordance with NFPA 101 section 7.7. | Required |
| 2.7 | ILLUMINATION OF MEANS OF EGRESS | Means of egress shall be illuminated in accordance with NFPA 101 section 7.8. | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Nursery/Child Care |
|-------------|----------------------------------|--|--------------------|
| 2.8 | EMERGENCY LIGHTING | Emergency lighting shall be provided in accordance with NFPA 101 section 7.9. and in areas specified in 2.8.1 through 2.8.6. | Required |
| 2.8.1 | | Emergency lighting shall be provided in all areas accessible to children. | Required |
| 2.8.2 | | In all interior stairs and corridors. | Required |
| 2.8.3 | | In all assembly use space. | Required |
| 2.8.4 | | In flexible and open plan buildings. | Required |
| 2.8.5 | | Within interior or limited access portion of the buildings; | Required |
| 2.8.6 | | In instructional shops and laboratories. | Required |
| 2.9 | MARKINGS OF MEANS OF EGRESS | Means of egress shall have signs in accordance with NFPA 101 section 7.10. | Required |
| 2.10 | SPECIAL MEANS OF EGRESS FEATURES | Special Means of Egress Features in accordance with NFPA 101 section 14.2.11 | Required |
| 2.10.1 | WINDOWS FOR RESCUE | All windows shall be of a type that can be readily opened from inside and that they are large enough and low enough for use by students, teachers, and fire fighters. | Required |
| 2.10.1.1 | When and Where Required | Every room or space normally subject to children's occupancy, other than bathrooms, shall have not less than one outside window for emergency rescue. | Required |
| 2.10.1.1(1) | | Such windows shall be openable from the inside without the use of tools & shall provide a clear opening of not less than 510 mm in width, 610 mm in height, and 0.5m ² in area. | Required |
| 2.10.1.1(2) | | The bottom of the opening shall be not more than 1120 mm above the floor. | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Nursery/Child Care |
|-------------|---|--|--------------------|
| 2.10.1.1(3) | | The clear opening shall allow a rectangular solid, with a width and height that provides not less than the required 0.5 m ² opening and a depth of not less than 510 mm, to pass fully through the opening. | Required |
| 2.10.1.2 | Exemptions | Windows for Rescue shall not be required in buildings protected throughout by an approved, supervised automatic sprinkler system. | Permitted |
| 2.11.1 | HAZARDOUS MATERIALS | No hazardous materials shall be permitted to be stored, used, or handled within any nursery and child care occupancies. | Required |
| 2.11 | (Reserved) | | |
| 3.0 | PROTECTION. | Protection shall comply with the applicable NFPA codes and standards, QCD FLS Annex and as modified in item 3.0 of this FLS Occupancy Chapter. | |
| 3.1 | (Reserved) | | |
| 3.2 | PROTECTION FROM HAZARDS | Rooms or spaces for the storage or use of materials shall be protected in accordance with the following: | Required |
| 3.2.1 | Archives and rooms or spaces used for the storage of combustible supplies | A minimum 1-hour fire resistance rating OR protected by automatic extinguishing systems | Required |
| 3.2.2 | Janitor closets | A minimum 1-hour fire resistance rating OR protected by automatic extinguishing systems | Required |
| 3.2.3 | Laundries (using domestic type-clothes washer and dryer only) | A minimum 1-hour fire resistance rating OR protected by automatic extinguishing systems | Required |
| 3.2.4 | Maintenance shops excluding woodworking and painting areas | A minimum 1-hour fire resistance rating OR protected by automatic extinguishing systems | Required |
| 3.2.5 | Cooking Facilities/Kitchen/Pantry | Only cooking equipment used for food warming shall be permitted. | Required |
| 3.3 | INTERIOR FINISH | Interior finish shall be in accordance with NFPA 101 Section 10.2. | Required |
| 3.3.1 | INTERIOR WALL AND CEILING FINISH | Interior wall and ceiling finish material shall be permitted as follows: | Required |
| 3.3.1.1 | | Class A in stairways, corridors, and lobbies; | Required |
| 3.3.1.2 | | Class A or Class B in all other occupied areas. | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Nursery/Child Care |
|---------|---|--|--------------------|
| 3.3.2 | INTERIOR FLOOR FINISH | Interior floor finish in exit enclosures and exit access corridors and spaces not separated from them by walls having a 1-hour fire resistance rating shall be not less than Class II. | Required |
| 3.3.2.1 | Carpet Interior Floor Finishes | Carpet and carpet-like interior floor finishes shall comply with ASTM D2859, Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials. | Required |
| 3.3.2.2 | Floor Coverings | Floor coverings, other than carpet, shall have a min. critical radiant flux of 0.1 W/cm ² . | Required |
| 3.4 | DETECTION, ALARM & COMMUNICATION REQUIREMENTS | | |
| 3.4.1 | GENERAL | Complete coverage of Fire Detection and Alarm System. | Required |
| 3.4.2 | INITIATION | Complete coverage of an Automatic Detection and Manual Initiating Devices. | Required |
| 3.4.3 | OCCUPANT NOTIFICATION | Complete Coverage of an Occupant Notification (audible & visible). | Required |
| 3.4.3.1 | Emergency Voice Evacuation System | Mass Notification System. | NR-Not required |
| 3.4.4 | SUPPLEMENTARY | | Required |
| 3.4.4.1 | Fire Telephone | In every required provisions of a fire command center (FCC) or emergency control center (ECC). | Required |



| Item | Fire Safety Provisions | Minimum Requirements | | | Nursery/Child Care |
|-----------|--|--|--|-----------|----------------------------------|
| 3.4.4.2 | Graphic Announcer (PC Panel) or Mimic Panel | In every required provisions of a fire command center (FCC) or emergency control center (ECC). | | | Required |
| 3.5 | EXTINGUISHMENT REQUIREMENTS | | | | |
| 3.5.1 | AUTOMATIC FIRE SPRINKLER (AFS) SYSTEM | | | | |
| 3.5.1.1 | Area of Fire Compartment | Nursery or child-care occupancies located within a fire compartment exceeding 1120 m ² , the building shall be protected throughout by an automatic sprinkler system. | | | Required |
| 3.5.2 | OTHER AUTOMATIC SUPPRESSION SYSTEM | Where an automatic sprinkler system is required in Section 3.5.1.1, the appropriate type of automatic suppression system shall be permitted. | | | Permitted |
| 3.5.3 | Fire Hose Reel | Fire hose reels are required in buildings protected by an approved supervised automatic sprinkler system. | | | Required |
| 3.5.4 | Portable Fire Extinguisher | Applicable Portable Fire Extinguishers required in all buildings. | | | Required |
| 3.5.5 | Rising Main (Dry or Wet Standpipe) | Refer to Annex Fire Fighting System Annex_FFS_G1 Revisions 2021 | | | Required |
| 3.6 | SMOKE CONTROL / VENTILATION REQUIREMENTS | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.1 | CAR PARKS/PARKING STRUCTURES | Design conditions per Annex ACMV_N1 Revisions 2021. | | ≤6m Deep | >6m - ≤9.1 m Deep >9.1 m Deep |
| 3.6.1.3 | Belowground Car Parks | | | | |
| 3.6.1.3.1 | Aggregate floor area of ≤2000 m ² | Smoke Vents (Fixed or Automatic) | | Required | NP |
| | | Mechanical Smoke Purging/Clearance | | Permitted | Required |
| | | Engineered Smoke Control System | | Permitted | Permitted |
| 3.6.1.3.2 | Aggregate floor area of >2000 m ² | Smoke Vents (Fixed or Automatic) | | NP | NP |
| | | Mechanical Smoke Purging/Clearance | | Required | NP |
| | | Engineered Smoke Control System | | Permitted | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Nursery/Child Care |
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| 3.7 | CORRIDORS | | Nursery/Child Care |
| 3.7.1 | CORRIDOR WALLS | Corridors shall be separated from use areas by fire barriers having a minimum 1-hour fire resistance rating, unless one of the conditions in 3.7.1.2 and 3.7.1.3 exists: | Required |
| 3.7.1.1 | Doors | Doors shall have not less than 30 minutes fire protection rating. | Required |
| 3.7.1.2 | Exemption | Corridor protection shall not be required where all spaces normally subject to student occupancy have at least one door opening directly to the outside or to an exterior exit access balcony or corridor. | Permitted |
| 3.7.1.3 | Fire Sprinkler Protected Buildings | The following shall apply to buildings protected throughout by an approved, supervised automatic sprinkler system: | Permitted |
| 3.7.1.3(1) | Smoke Partitions | Corridor walls shall not be required to be rated, provided that such walls form smoke partitions to limit the transfer of smoke. | Permitted |
| 3.7.1.3(2) | Doors | The provisions for doors to be self-closing or automatic-closing shall not apply to normally occupied classrooms. | Permitted |
| 3.7.1.4 | | Where the corridor ceiling is an assembly having a 1-hour fire resistance rating where tested as a wall, the corridor walls shall be permitted to terminate at the corridor ceiling. | Permitted |
| 3.8 | SUBDIVISION OF BUILDING SPACES | | |
| 3.8.1 | GENERAL | In nursery or child-care occupancies with children who are 30 months old and with floor area exceeding 1120 m ² , smoke barriers shall be provided to divide the building into a minimum of two smoke compartments. | Required |
| 3.8.1.1 | Smoke Barriers | The smoke barriers shall be constructed with the purpose of restricting the movement of smoke. No fire resistance rating will be required. | Required |
| 3.9 | (Reserved) | | |
| 4.0 | SPECIAL PROVISIONS | Special Provisions for Firefighting and Rescue shall comply with QCD FLS Annex and as modified in item 4.0 of this FLS Occupancy Chapter. | |



| Item | Fire Safety Provisions | Minimum Requirements | Nursery/Child Care |
|-------|---|---|--------------------|
| 4.1 | FIRE (EMERGENCY) COMMAND CENTER | QCD FLS Annex_A5 – Revisions_2021. | Required |
| 4.1.1 | | Instead of a dedicated fire command center, the fire and life safety system (FLS) systems control panels/stations may be located in lobbies, guard rooms, or other spaces adjacent to the main entrances. | Permitted |
| 4.2 | EXTERNAL ACCESS TO SITE AND BUILDINGS | QCD FLS Annex_A3 – Revisions_2021 | Required |
| 4.2.1 | SITE ACCESS | For gated facility development a 4.0 m wide and 4.5 m clear height vertical clearance entry gate or site access shall be provided. | Required |
| 4.2.2 | ACCESS ROAD | 4 m-width firefighting appliance access or access road to every building shall be provided. | Required |
| 4.2.3 | FIRE ENGINE HARDSTANDING | Fire engine hardstandings with longer side parallel to the façade of the building shall be provided in buildings exceeding the habitable height of 10 m. | Required |
| 4.3 | (Reserved) | | |
| 5.0 | BUILDING SERVICES and FIRE PROTECTION EQUIPMENT | Building Services and Fire Protection Equipment shall comply with the applicable NFPA codes and standards and QCD FLS Annex. | |
| 5.1 | ELECTRICAL SYSTEM | Electrical wiring and equipment shall be in accordance with NFPA 70. | Required |
| 5.1.1 | ELECTRICAL EQUIPMENT/PANEL ROOMS AND SIMILAR ROOMS/SPACES | QCD FLS Annex _A7 – Revisions_2021 | Required |
| 5.1.2 | EMERGENCY GENERATORS AND STANDBY POWER SYSTEMS. | Emergency generators and standby power systems shall be installed, tested, and maintained in accordance with NFPA 110. | Required |
| 5.1.3 | STORED ELECTRICAL ENERGY SYSTEMS | Stored electrical energy systems shall be installed, tested, and maintained in accordance with NFPA 111. | Required |
| 5.2 | FIRE PUMPS | | |
| 5.2.1 | FIRE PUMPS ROOM | QCD FLS Annex _A6 – Revisions_2021 | Required |
| 5.3 | SUBSTATION and SWITCHGEARS | QCD FLS Annex _A8 – Revisions_2021 | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Nursery/Child Care |
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| 5.4 | (Reserved). | | |
| 6.0 | OPERATING FEATURES | Operating Features shall be provided in accordance with NFPA 101 section 14.7 and as modified in item 6.0 of this FLS Occupancy Chapter. | |
| 6.1 | EMERGENCY ACTION PLAN | Emergency action plans shall be provided in accordance with 6.1.1. | |
| 6.1.1 | PLAN REQUIREMENTS. | Items to be considered in preparing an emergency action plan shall include the following: | Required |
| 6.1.1.1 | | Purpose of plan. | Required |
| 6.1.1.2 | | Building description, including certificate of occupancy . | Required |
| 6.1.1.3 | | Appointment, organization, and contact details of designated building staff to carry out the emergency duties. | Required |
| 6.1.1.4 | | Identification of events (man-made and natural) considered life safety hazards impacting the building. | Required |
| 6.1.1.5 | | Responsibilities matrix (role-driven assignments). | Required |
| 6.1.1.6 | | Policies and procedures for those left behind to operate critical equipment. | Required |
| 6.1.1.7 | | Specific procedures to be used for each type of emergency. | Required |
| 6.1.1.8 | | Requirements and responsibilities for assisting people with disabilities. | Required |
| 6.1.1.9 | | Procedures for accounting for employees. | Required |
| 6.1.1.10 | | Training of building staff, building emergency response teams, and other occupants in their responsibilities. | Required |
| 6.1.2 | | Required emergency action plans shall be submitted to the authority having jurisdiction for review. | Required |
| 6.1.3 | | Emergency action plans shall be reviewed and updated as required by the authority having jurisdiction | Required |
| 6.2 | EMERGENCY EGRESS and RELOCATION DRILLS. | Emergency egress and relocation drills shall be conducted in accordance with 6.2.1 | |
| 6.2.1 | DRILL FREQUENCY | Emergency egress and relocation drills shall be conducted as follows: | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Nursery/Child Care |
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| 6.2.1.1 | | Not less than one emergency egress and relocation drill shall be conducted every month the facility is in session, unless both of the following criteria are met: | Required |
| 6.2.1.1(1) | | Where the weather is severe, the monthly emergency egress and relocation drills shall be permitted to be deferred. | Permitted |
| 6.2.1.1(2) | | The required number of emergency egress and relocation drills shall be conducted, and not less than four shall be conducted before the drills are deferred. | Required |
| 6.2.1.2 | | All occupants of the building shall participate in the drill. | Required |
| 6.2.1.3 | | One additional emergency egress and relocation drill, other than for day-care occupancies that are open on a year-round basis, shall be required within the first 30 days of operation. | Required |
| 6.2.2 | ORDERLY EVACUATION. | When conducting drills, emphasis shall be placed on orderly evacuation rather than on speed. | Required |
| 6.2.3 | SIMULATED CONDITIONS. | Drills shall be held at expected and unexpected times and under varying conditions to simulate the unusual conditions that can occur in an actual emergency. | Required |
| 6.2.4 | RELOCATION AREA | Drill participants shall relocate to a predetermined location and remain at such location until a recall or dismissal signal is given. | Required |
| 6.2.5 | WRITTEN RECORD OF DRILLS | A written record of each drill shall be completed by the person responsible for conducting the drill and maintained in an approved manner. | Required |
| 6.2.5.1 | | The written record should include such details as the date, time, participants, location, and results of that drill. | Required |
| 6.3 | INSPECTIONS. | | |



| Item | Fire Safety Provisions | Minimum Requirements | Nursery/Child Care |
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| 6.3.1 | | Fire prevention inspections shall be conducted monthly by a trained senior member of the staff, after which a copy of the latest inspection report shall be posted in a conspicuous place in the day-care facility. | Required |
| 6.3.2 | | It shall be the duty of site administrators and staff members to inspect all exit facilities daily to ensure that all stairways, doors, and other exits are in proper condition. | Required |
| 6.3.3 | | Open plan buildings shall require extra surveillance to ensure that exit paths are maintained clear of obstruction and are obvious. | Required |
| 6.3.4 | INSPECTION OF DOOR OPENINGS. | Door openings shall be inspected in accordance with 6.4.1. | Required |
| 6.3.4.1 | | The following door assemblies shall be inspected and tested not less than annually: | Required |
| 6.3.4.1(1) | | Door leaves equipped with panic hardware or fire exit hardware. | Required |
| 6.3.4.1(2) | | Door assemblies in exit enclosures. | Required |
| 6.3.4.1(3) | | Door hardware-release of electrically locked egress door assemblies | Required |
| 6.3.4.1(4) | | Door assemblies with special locking arrangements. | Required |
| 6.3.4.2 | | Door assemblies shall be visually inspected from both sides of the opening to assess the overall condition of the assembly. | Required |
| 6.3.4 | WRITTEN RECORD OF INSPECTION. | A written record of the inspections and testing shall be signed and kept for inspection by the authority having jurisdiction (QCD-Qatar Civil Defence). | Required |
| 6.4 | FURNISHING AND DECORATIONS | | |
| 6.4.1 | DRAPERIES, CURTAINS, and Other Similar Furnishings and Decorations | Draperies, curtains, and other similar loosely hanging furnishings and decorations shall meet the flame propagation performance criteria contained in Test Method 1 or Test Method 2, as appropriate, of NFPA 701. | Required |
| 6.4.2 | CLOTHING and PERSONAL EFFECTS | Clothing and personal effects shall not be stored in corridors, unless otherwise permitted by one of the following: | Permitted |
| 6.4.2.1 | | The requirements in 6.4.2 shall not apply to corridors protected by an automatic sprinkler system. | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | | Nursery/Child Care |
|---------|--------------------------------|--|---|---------------------------|
| 6.4.2.2 | | The requirements in 6.4.2 shall not apply to corridor areas protected by a smoke detection system. | | Permitted |
| 6.4.2.3 | | The requirements in 6.4.2 shall not apply to storage in metal lockers, provided that the required egress width is maintained. | | Permitted |
| 6.4.3 | ARTWORK and TEACHING MATERIALS | Artwork and teaching materials shall be permitted to be attached directly to the walls in accordance with the following: | | Required |
| 6.4.3.1 | | The artwork and teaching materials shall not exceed 20 percent of the wall area. | | Required |
| 6.4.3.2 | | The artwork and teaching materials shall not exceed 50 percent of the wall area in a building that is protected throughout by an automatic sprinkler system. | | Required |
| 6.4.3.3 | | Placing of artwork and teaching materials near a room's exit access doors shall be avoided. | | Required |
| 6.5 | CHILD-CARE STAFF | | | |
| 6.5.1 | | The minimum staff to-client ratio, that requires adequate adult staff be on duty and alert in the facility at all times when clients are present, shall be in accordance with 6.5.1.1. | | Required |
| 6.5.1.1 | STAFFING REQUIREMENTS. | The staff shall be equipped with the necessary trainings as per the requirements of the governing State Ministries (Social Affairs/Education). | | Required |
| | | Age in Months/Years | | Staff to Child Ratio |
| | | 00-24 (0-2 years) | - | 1:3 (1 Staff: 3 Children) |
| | | 25-36 (2-3 years) | - | 1:4 (1 Staff: 4 Children) |
| | | 37-49 (3-4 years) | - | 1:7 (1 Staff: 7 Children) |

| Item | Fire Safety Provisions | Minimum Requirements | Nursery/Child Care |
|---------|------------------------|---|--------------------|
| 6.5.2 | ADDITIONAL SAFEGUARDS | Evacuation cribs that will permits one staff member to evacuate multiple clients/children who are incapable of self-preservation, shall be provided. | Required |
| 6.5.2.1 | | The evacuation cribs shall be readily available at all times and shall be of size that will permit access to all rooms, spaces (i.e. classrooms and corridors) and all means of escape. | Required |
| 6.6 | (Reserved). | | |





EDUCATIONAL OCCUPANCY



EDUCATIONAL OCCUPANCY

| | | | | | | | |
|-------|--|-------------------|---|--|----------------------|--|--|
| 1.0 | GENERAL REQUIREMENTS. | | The requirements of this chapter shall apply to buildings or portions thereof used as educational occupancies. | | | | |
| | An occupancy used for educational purposes through the twelfth grade (K12) by six or more persons for 4 or more hours per day or more than 12 hours per week, with the same occupants regularly present. | | | | | | |
| | Kindergartens | | Academies | Schools | | | |
| | Educational facilities that do not meet the definition of an educational occupancy shall comply with the following requirements: | | | | | | |
| | (1) Instructional building – Business Occupancy; (2) Classrooms under 50 persons – business occupancy; (3) Classrooms, 50 persons and over – Assembly Occupancy; (4) Laboratories, instructional – Business Occupancy; (5) Laboratories, non-instructional – Industrial Occupancy. | | | | | | |
| 1.1 | GENERAL CONDITIONS AND BUILDING LIMITS | | | | | | |
| | School/Grade Level | | Location or Floor Level/s | Floor Area (m ²) | Basement Level Usage | | |
| 1.1.1 | KINDERGARTEN Level | KG Levels | Ground Floor or in Level of Exit Discharge | No Limit [see requirements for Fire Sprinkler System] | See Clause 2.1.5 | | |
| 1.1.2 | PRIMARY Level | Levels 1, 2, 3 | | | | | |
| | | Levels 4, 5, 6 | | | | | |
| 1.1.3 | PREPARATORY Level | Levels 7, 8, 9 | | | | | |
| 1.1.4 | SECONDARY Level | Levels 10, 11, 12 | Three (3) - story (G+2) maximum | | | | |



| FIRE AND LIFE SAFETY REQUIREMENTS | | | | | | |
|-----------------------------------|--|--|--------------|-----------|-------------|-----------|
| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
| 1.2 | CLASSIFICATION OF OCCUPANCIES | | | | | |
| 1.2.1 | GENERAL | Where multiple occupancies are to be protected as mixed occupancies, the most stringent requirement applicable to any of the occupancies present is to be applied to all occupancies. | Required | Required | Required | Required |
| 1.2.2 | atrium walls used in an occupancy separation | Atrium walls shall be permitted to serve as part of the separation for creating separated occupancies on a story-by-story basis. | Permitted | Permitted | Permitted | Permitted |
| 1.2.3 | ASSEMBLY AND EDUCATIONAL | Spaces subject to assembly occupancy shall comply with Assembly Occupancy. | Required | Required | Required | Required |
| 1.2.3.1 | Assembly and Educational | Where auditorium and gymnasium egress lead through corridors or stairways also serving as egress for other parts of the building, the egress capacity shall be sufficient to allow simultaneous egress from auditorium and classroom sections. | Required | Required | Required | Required |
| 1.2.4 | DORMITORY AND CLASSROOMS | Any building used for both classroom and dormitory purposes shall comply with the applicable provisions of the Dormitory Occupancy in addition to complying with Educational Occupancy. | Required | Required | Required | Required |
| 1.3 | OCCUPANT LOAD | Determined on the basis of the occupant load factors (OLF) that are characteristic of the use of the space as specified in 1.3.1 and 1.3.2 | Required | Required | Required | Required |
| 1.3.1 | OCCUPANT LOAD FACTOR (OLF) | The occupant load in Classrooms shall be not less than the number of persons determined by dividing the floor area assigned to that use by the OLF of 1.9 net m ² /person. | Required | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|-------|---|--|--------------|----------|-------------|-----------|
| 1.3.2 | | The occupant load in Shops, Laboratories, and Vocational Rooms shall be not less than the number of persons determined by dividing the floor area assigned to that use by the OLF of 4.6 net m ² /person. | Required | Required | Required | Required |
| 1.3.3 | MODIFIED OCCUPANT LOAD | An approved aisle or seating diagram (number of fixed seats) shall be provided to substantiate the modification permitted. | Required | Required | Required | Required |
| 1.4 | CLASSIFICATION OF HAZARD OF CONTENTS | In general, educational occupancies contain ordinary hazard contents. Some laboratories and storage areas might contain high hazard contents. | Required | Required | Required | Required |
| 1.5 | MINIMUM CONSTRUCTION REQUIREMENTS. | Construction shall be in accordance with NFPA 5000 Chapters 7-8, 13-14, 31, and 35- 40. | Required | Required | Required | Required |
| 1.6 | ACCESSIBILITY. | Accessibility shall be in accordance with NFPA 5000 Chapter 12. | Required | Required | Required | Required |
| 1.7 | (Reserved). | | | | | |
| 2.0 | MEANS of EGRESS REQUIREMENTS. | Means of egress shall comply with NFPA 101 Chapter 7, and as modified in item 2.0 of this FLS Occupancy Chapter. | | | | |
| 2.1 | GENERAL | Rooms normally occupied by students shall be located as specified in 2.1.1 through 2.1.4. | Required | Required | Required | Required |
| 2.1.1 | PRESCHOOL/KINDERGARTEN and PRIMARY LEVELS 1, 2 & 3 | Rooms normally occupied by preschool, kindergarten, or primary levels 1, 2 & 3 students SHALL be located in the ground floor or on a level of exit discharge (G). | Required | Required | - | - |
| 2.1.2 | PRIMARY LEVELS 4, 5 & 6 and PREPARATORY LEVELS 7, 8 & 9 | Rooms normally occupied by primary levels 4, 5 & 6 and preparatory levels 7, 8 & 9 students SHALL NOT be located more than one story above the ground floor or above a level of exit discharge (G+1). | - | Required | Required | - |

| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|------------|------------------------------|--|--------------|-----------|-------------|-----------|
| 2.1.3 | SECONDARY LEVELS 10,11 & 12 | Rooms normally occupied by secondary levels 10, 11 & 12 students SHALL NOT be located more than two story above the ground floor or above a level of exit discharge (G+2). | - | - | - | Required |
| 2.1.4 | LABORATORIES | Laboratories and other similar rooms SHALL NOT be located in levels below the level of exit discharge (LED) or in basement levels. | Required | Required | Required | Required |
| 2.1.4.1 | Means of Escape | Laboratories and other similar rooms shall be provided with not less than two (2) exit access doors leading to separate exits. | Required | Required | Required | Required |
| 2.1.5 | BASEMENT USAGE | Classrooms and other rooms that is normally subject to student occupancy SHALL NOT be located in levels below the level of exit discharge (LED) or in basement levels. | Required | Required | Required | Required |
| 2.1.5.1 | Swimming Pools | Swimming pools may be located in basement, provided the following conditions are met: | Permitted | Permitted | Permitted | Permitted |
| 2.1.5.1(1) | Use of Pools and Pool Decks | Pools and decks shall be dedicated for instructional purposes only. | Required | Required | Required | Required |
| 2.1.5.1(2) | Means of Egress (Pool Areas) | The pool area or swimming pool hall shall be provided with not less than two (2) independent means of egress dedicated for use by students using the pool at any given time. | Required | Required | Required | Required |
| 2.1.5.1(3) | Discharge of Means of Egress | The pool area's independent means of egress required in 2.1.5.1(2), shall terminate directly at the exterior of the building within the school grounds or premises. | Required | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|----------------|-------------------------------------|---|--------------|----------|-------------|-----------|
| 2.1.5.1(4) | Pool Barriers | Barriers to prevent unauthorized access to pools during use, and at times when not in use, shall be provided. | Required | Required | Required | Required |
| 2.1.5.1(5) | Pool Safety Equipment | Safety equipment, such as, but not limited, to shepherds crook or life saving hook and/or reaching pole, ring bouy and first aid kits shall be provided within the pool deck area. | Required | Required | Required | Required |
| 2.1.5.1(5) (a) | | The safety equipment and first aid kits required in 2.1.5.1(5) shall be kept in a location that will be visible and accessible to the lifeguard or swimming instructor. | Required | Required | Required | Required |
| 2.1.5.2 | Indoor Sports Facilities/Gymnasium | Indoor sports facilities, playing courts/field and or gymnasium may be located in basement, provided the following conditions are met: | Required | Required | Required | Required |
| 2.1.5.2(1) | Use of Sports Facilities | The sports facilities, courts or gym shall be dedicated for instructional purposes and use exclusively for school related activities only | Required | Required | Required | Required |
| 2.1.5.2(2) | Means of Egress (Sports Facilities) | The sports facilities shall be provided with not less than two (2)independent means of egress dedicated for use by students using the sports facilities at any given time. | Required | Required | Required | Required |
| 2.1.5.2(3) | Discharge of Means of Egress | The sports facilities independent means of egress required in 2.1.5.2(2), shall comply with the same requirements for pool areas in 2.1.5.1(3). | Required | Required | Required | Required |
| 2.1.5.3 | Multi-level Basement | Swimming pool halls, sports facilities and other spaces that is not normally subject to student occupancy, and that is permitted in basement, SHALL NOT be located more than one basement level or more than one level below the level of exit discharge. | Required | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|---------|----------------------------|--|---------------|---------------|---------------|---------------|
| 2.2 | MEANS OF EGRESS COMPONENTS | Components of means of egress shall be limited to the types described in 2.2.1 through 2.2.6. | | | | |
| 2.2.1 | DOORS | Doors shall be in accordance with NFPA 101 section 7.2.1, | Required | Required | Required | Required |
| 2.2.1.1 | Locks | Any door in a required means of egress from an area having an occupant load of 100 or more persons shall be permitted to be provided with a latch or lock only if the latch or lock is panic hardware or fire exit hardware complying with NFPA 101 7.2.1.7. | Permitted | Permitted | Permitted | Permitted |
| 2.2.1.2 | Special Locking | Delayed-egress electrical locking systems complying with NFPA 101 section 7.2.1.6.1. | Permitted | Permitted | Permitted | Permitted |
| 2.2.1.3 | | Sensor-release of electrical locking systems complying with NFPA 101 section 7.2.1.6.2 | Permitted | Permitted | Permitted | Permitted |
| 2.2.1.4 | | Elevator lobby exit access door assemblies locking in accordance with NFPA 101 section 7.2.1.6.3 | Permitted | Permitted | Permitted | Permitted |
| 2.2.2 | STAIRS | Stairs complying with NFPA 101 section 7.2.2. | Permitted | Permitted | Permitted | Permitted |
| 2.2.2.1 | Additional Handrails | Additional handrails on stairs that are used extensively by children 5 years of age or less at a height in the range of 710 mm to 810 mm shall be permitted. | Permitted | Permitted | Permitted | Permitted |
| 2.2.2.2 | Lifts/Elevators | Lift or elevators, serving various stories of a building located within an exit stair enclosure. | Not Permitted | Not Permitted | Not Permitted | Not Permitted |
| 2.2.3 | SMOKEPROOF ENCLOSURES | Smokeproof enclosures complying with NFPA 101 section 7.2.3. | Permitted | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|---------|--------------------------------|---|--------------|-----------|-------------|-----------|
| 2.2.4 | HORIZONTAL EXITS | Horizontal exit as a component in a means of egress or used as substitute for other exits shall comply with all the criteria in NFPA 101 section 7.2.4. | Permitted | Permitted | Permitted | Permitted |
| 2.2.5 | RAMPS | Ramps complying with NFPA 101 section 7.2.5. | Permitted | Permitted | Permitted | Permitted |
| 2.2.6 | EXIT PASSAGEWAY | Exit passageways complying with NFPA 101 section 7.2.6 | Permitted | Permitted | Permitted | Permitted |
| 2.3 | CAPACITY OF MEANS OF EGRESS | Capacity of means of egress shall be in accordance with NFPA 101 7.3. | Required | Required | Required | Required |
| 2.3.1 | EXIT ACCESS CORRIDOR WIDTH | Corridors shall have not less than 1830 mm of clear width. | Required | Required | Required | Required |
| 2.3.2 | | Exit access corridors with a required capacity of less than 100 persons shall have not less than 1200 mm of clear width. | Required | Required | Required | Required |
| 2.4 | NUMBER OF MEANS OF EGRESS | The number of means of egress shall be in accordance with NFPA 101 section 7.4. | Required | Required | Required | Required |
| 2.4.1 | GENERAL | Not less than two (2) separate exits shall be in accordance with the following criteria: | Required | Required | Required | Required |
| 2.4.1.1 | | Not less than two separate exits shall be provided on every story. | Required | Required | Required | Required |
| 2.4.1.2 | | The required exits shall be accessible from every part of every story and mezzanine. | Required | Required | Required | Required |
| 2.5 | ARRANGEMENT OF MEANS OF EGRESS | Means of egress shall be arranged in accordance with NFPA 101 section 7.5. | Required | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|------------|--|--|--------------|----------|-------------|-----------|
| 2.5.1 | ROOMS larger than 93 m ² or with more than 50 occupants | Every room or space larger than 93 m ² or with an occupant load of more than 50 persons shall comply with the following: | Required | Required | Required | Required |
| 2.5.1.1 | | The room or space shall have a minimum of two exit access doors. | Required | Required | Required | Required |
| 2.5.1.2 | | The required access doors shall provide access to separate exits. | Required | Required | Required | Required |
| 2.5.1.3 | | The required access doors shall be permitted to open onto a common corridor, provided that such corridor leads to separate exits located in opposite directions. | Required | Required | Required | Required |
| 2.5.2 | EXIT ACCESS DOORS in Rooms subject to student occupancy | Every room that is normally subject to student occupancy shall have an exit access door leading directly to an exit access corridor or exit, unless otherwise permitted by one of the following: | Required | Required | Required | Required |
| 2.5.2.1 | Exemption | This requirement shall not apply where an exit door opens directly to the outside or to an exterior balcony or exterior access corridor. | Required | Required | Required | Required |
| 2.5.2.2 | Intervening Rooms | One room shall be permitted to intervene between a normally occupied student room and an exit access corridor, provided that all of the following criteria are met: | Required | Required | Required | Required |
| 2.5.2.2(1) | Travel Distance through Intervening Rooms | The travel from a room served by an intervening room to the corridor door or exit shall not exceed 23 m. | Required | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|---------------|--|--|--------------|----------|-------------|-----------|
| 2.5.2.2(2) | Personal Effects | Clothing, personal effects, or other materials shall be stored in metal lockers, provided that they do not obstruct the exit access. | Required | Required | Required | Required |
| 2.5.2.2(3) | Protection | One of the following means of protection shall be provided: | Required | Required | Required | Required |
| 2.5.2.2(3)(a) | | The intervening room shall have approved fire detection that activates the building alarm. | Required | Required | Required | Required |
| 2.5.2.2(3)(b) | | The building shall be protected by an approved, supervised automatic sprinkler system | Required | Required | Required | Required |
| 2.5.3 | DOORS opening onto an exit access corridor | Doors that swing into an exit access corridor shall be arranged to prevent interference with corridor travel. | Required | Required | Required | Required |
| 2.5.4 | AISLE WIDTH | Aisles shall be not less than 760 mm wide. | Required | Required | Required | Required |
| 2.5.4.1 | | The space between parallel rows of seats shall not be subject to the minimum aisle width, provided that the number of seats that intervenes between any seat and an aisle does not exceed six. | Required | Required | Required | Required |
| 2.5.5 | EXTERIOR EXIT ACCESS | A corridor roofed over and enclosed on its long side and open to the atmosphere at the end is permitted to be considered an exterior corridor if either of the following criteria are met: | Required | Required | Required | Required |
| 2.5.5.1 | | Clear story openings for the corridor are provided on both sides of the corridor and above adjacent roofs or buildings, and such clear openings are not less than one-half the height of the corridor walls. | Required | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|---------|--|--|--------------|-----------|-------------|-----------|
| 2.5.5.2 | | The corridor roof has unobstructed openings to the sky not less than 50 percent of the area of the roof. | Required | Required | Required | Required |
| 2.5.5.3 | | The openings in 2.5.5.1 and 2.5.5.2 are to be equally distributed, and, if louvers are installed, they are to be fixed open with a clear area based on the actual openings between louver vanes. | Required | Required | Required | Required |
| 2.5.6 | TRAVEL DISTANCE (TD) TO EXITS | Travel distance shall be measured in accordance with 2.5.6.1 | Required | Required | Required | Required |
| 2.5.6.1 | Maximum Travel Distance | Travel distance to an exit hall not exceed 61.0 m from any point in a building (sprinkler protected). | Required | Required | Required | Required |
| 2.5.7 | COMMON PATH (CP) OF TRAVEL | Common path of travel shall comply with 2.5.7.1 | Required | Required | Required | Required |
| 2.5.7.1 | Common Path Limit | Common path shall be limited to 30.0 m (sprinkler protected). | Required | Required | Required | Required |
| 2.5.8 | DEAD-END (DE) | Dead-end corridors shall be permitted in accordance with 2.5.8.1 | Required | Permitted | Permitted | Permitted |
| 2.5.8.1 | Dead-end Limit | No dead-end corridor shall exceed 15.0 m (sprinkler protected). | Required | Permitted | Permitted | Permitted |
| 2.6 | DISCHARGE FROM EXITS | Discharge from exits shall be in accordance with NFPA 101 7.7. | Required | Required | Required | Required |
| 2.6.1 | EXIT TERMINATION | Exits shall terminate directly, at a public way or at an exterior exit discharge, in accordance with NFPA 101 section 7.7. | Required | Required | Required | Required |
| 2.6.2 | EXIT DISCHARGE THROUGH INTERIOR BUILDING AREAS | Exits shall be permitted to discharge through interior building areas, as permitted in NFPA 101 section 7.7.2. | Permitted | Permitted | Permitted | Permitted |
| 2.7 | ILLUMINATION OF MEANS OF EGRESS | Means of egress shall be illuminated in accordance with NFPA 101 section 7.8. | Required | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|----------|--|--|--------------|----------|-------------|-----------|
| 2.8 | EMERGENCY LIGHTING | Emergency lighting shall be provided in accordance with NFPA 101 section 7.9. and in additional locations specified in 2.8.1. | Required | Required | Required | Required |
| 2.8.1 | ADDITIONAL LOCATIONS | Emergency lighting shall be provided in every classroom, shops, laboratories, assembly use spaces (such as lecture halls, auditoriums, and dining rooms), all areas accessible to students, and interior and windowless portions of educational occupancies. | Required | Required | Required | Required |
| 2.9 | MARKINGS OF MEANS OF EGRESS | Means of egress shall have signs in accordance with NFPA 101 section 7.10. | Required | Required | Required | Required |
| 2.10 | SPECIAL MEANS OF EGRESS FEATURES | | | | | |
| 2.10.1 | WINDOWS FOR RESCUE | All windows shall be of a type that can be readily opened from inside and that they are large enough and low enough for use by students, teachers, and fire fighters. | NR | NR | NR | NR |
| 2.11 | HAZARDOUS MATERIALS | Where hazardous materials are stored, used, or handled, the provisions of 2.10.1 and 2.10.2 shall apply. | Required | Required | Required | Required |
| 2.11.1 | Hazardous materials classified as high-hazard contents | Hazardous materials that are stored, used, or handled, and that are also classified as high-hazard contents shall comply with the Special Provisions for Occupancies with High Hazard Contents in NFPA 101 section 7.12.2. | Required | Required | Required | Required |
| 2.11.2 | Hazardous Materials | Hazardous materials shall comply with both clause 2.10.2.1 and 2.10.2.2 | Required | Required | Required | Required |
| 2.11.2.1 | | The means of egress requirements of this Fire and Life Safety Requirements for Educational Occupancies. | Required | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|------------|---|--|--------------|----------|-------------|-----------|
| 2.11.2.2 | | Applicable means of egress requirements of NFPA 30, NFPA 45, NFPA 55, NFPA 58, NFPA 400, and NFPA 495 that are stricter than NFPA 101 Chapter 7 and this occupancy chapter. | Required | Required | Required | Required |
| 2.11 | (Reserved). | | | | | |
| 3.0 | PROTECTION. | Protection shall comply with the applicable NFPA codes and standards, QCD FLS Annex and as modified in item 3.0 of this FLS Occupancy Chapter. | | | | |
| 3.1 | PROTECTION OF VERTICAL OPENINGS | Vertical openings shall be enclosed or protected in accordance with NFPA 101 section 8.6. | - | - | Required | Required |
| 3.1.1 | TWO-STORY OPENINGS WITH PARTIAL ENCLOSURE | A vertical opening serving as other than an exit enclosure, connecting only two adjacent stories and piercing only one floor, shall be permitted to be open to one of the two stories. | - | - | Permitted | Permitted |
| 3.1.2 | CONVENIENCE OPENINGS | Convenience openings in accordance with NFPA 101 section 8.6.9. | - | - | Permitted | Permitted |
| 3.1.2.1 | Convenience Stairway | Unenclosed vertical openings created by convenience stairways complying with the conditions in NFPA 101 section 8.6.9.2. | - | - | Permitted | Permitted |
| 3.1.3 | COMMUNICATING SPACES | Where an open and unobstructed communicating space connecting three floors or less is used, the requirements in 3.5.1.2 shall be met. | - | - | Permitted | Permitted |
| 3.2 | PROTECTION FROM HAZARDS | | | | | |
| 3.2.1 | GENERAL | Rooms or spaces for the storage, processing, or use of materials shall be protected in accordance with the following: | Required | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|---------|--|--|--------------|--------------|--------------|--------------|
| 3.2.1.1 | Boiler rooms | Fire barriers having a minimum 1-hour FR rating or AFSS. | Required | Required | Required | Required |
| 3.2.1.2 | Rooms or spaces used for storage of combustible supplies | A minimum 1-hour fire resistance rating or an approved automatic fire suppression system (AFSS). | Required | Required | Required | Required |
| 3.2.1.3 | Janitor closets | A min. 1-hour fire resistance rating or AFSS. | Required | Required | Required | Required |
| 3.2.1.4 | Rooms or spaces used for the storage of hazardous materials/ flammable/ combustible liquids | A minimum 1-hour fire resistance rating and AFSS or 2-hrs enclosures in non-sprinklered buildings. | Required | Required | Required | Required |
| 3.2.1.5 | Maintenance shops, including woodworking and painting areas | A minimum 1-hour fire resistance rating and AFSS or 2-hrs enclosures in non-sprinklered buildings. | Required | Required | Required | Required |
| 3.2.1.6 | Rooms or spaces used for processing or use of combustible supplies (hazardous) | A minimum 1-hour fire resistance rating and AFSS or 2-hrs enclosures in non-sprinklered buildings. | Required | Required | Required | Required |
| 3.2.1.7 | Rooms or spaces used for processing or use of hazardous materials/flammable or combustible liquids | A minimum 1-hour fire resistance rating and AFSS or 2-hrs enclosures in non-sprinklered buildings. | Required | Required | Required | Required |
| 3.2.2 | COOKING FACILITIES | Commercial cooking operations shall be protected as per NFPA 96, unless the cooking equipment used is for food warming only. | Required | Required | Required | Required |
| 3.2.2.1 | Opening between Kitchen and Other Areas | Openings shall not be required to be protected between food preparation areas and dining areas. | Not Required | Not Required | Not Required | Not Required |

| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|---------|----------------------------------|--|--------------|----------|-------------|-----------|
| 3.2.3 | STAGES AND PLATFORM | Materials, Design, Construction, Fire Protection and Smoke Control, shall be in accordance with the requirements for Stages and Platform in Assembly Occupancies. | Required | Required | Required | Required |
| 3.2.4 | LABORATORIES | Educational occupancy laboratories using chemicals shall comply with NFPA 45 Standard on Fire Protection for Laboratories Using Chemicals. | Required | Required | Required | Required |
| 3.2.4.1 | | A list of all laboratory equipment and safety data sheets of materials, including all type of supplies, chemicals and liquids used shall be provided. | Required | Required | Required | Required |
| 3.2.5 | HAZARDOUS MATERIALS | Educational occupancies with storage, use, handling of hazardous materials and in areas where hazardous materials are present in excess of the maximum allowable quantities shall comply with the following codes: NFPA 30, NFPA 54, NFPA 55, NFPA 58, NFPA 400, and NFPA 495. | Required | Required | Required | Required |
| 3.2.5.1 | | No storage, use, or handling of hazardous materials shall be permitted in any location where such storage, use, or handling would jeopardize egress from the structure, unless otherwise permitted by a document listed in 3.2.5. | Required | Required | Required | Required |
| 3.2.6 | MSDS-Material Safety Data Sheets | Provide MSDS and chemical information documents for the hazardous storage chemical warehouse and facility that shall be properly placed/situated at the warehouse and chemical store entrance. | Required | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|------------|---|--|--------------|----------|-------------|-----------|
| 3.2.6.2 | Warehouse and Chemical Stores - Laboratory Scale Chemical Reagents. | Implement strict chemical compatibility storage arrangement as per approved Chemical Compatibility Matrix for Laboratories. See Matrix in Table 3.2.6.2. | Required | Required | Required | Required |
| 3.2.6.3 | | Storage of Class 5.1, 5.2 chemicals and Class 4.3 chemicals shall be separated or placed in approved hazardous material storage cabinets. See 3.2.6.3(1) | Required | Required | Required | Required |
| 3.2.6.3(1) | Chemicals Class | Class 4.3 - Water Reactive Materials | | | | |
| | | Class 5.1 - Oxidizers Materials | | | | |
| | | Class 5.2- Organic Peroxides Materials | | | | |
| 3.2.6.4 | | Individual containers less than 5gal (19L) or less than 25lb (11kg) shall be stored or displayed on pallets, racks, or shelves. Containers shall be listed or approved for the intended use. | Required | Required | Required | Required |
| 3.2.7 | (Reserved) | | | | | |



| Item | Fire Safety Provisions | Minimum Requirements | | | | | Kindergarten | Primary | Preparatory | Secondary | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--|------------------------|----------------------|----------------------|----------------------|---------------------------|-----------------------------|--------------------------|-------------------------------|----------------------|------------------|----------------|-----------------|-----------|----------------------|-----------------------|------------------|--------------------------|------------------------|---|---|---|---|---|---|---|---|---|------------------------|---|---|---|---|---|---|---|---|---|----------------------|---|---|---|---|---|---|---|---|---|----------------------|---|---|---|---|---|---|---|---|---|----------------|---|---|---|---|---|---|---|---|---|------------------------|---|---|---|---|---|---|---|---|---|--------------------------|---|---|---|---|---|---|---|---|---|------------------------|---|---|---|---|---|---|---|---|---|----------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|--|---|--|--|---|---|---|---|
| <p style="text-align: center;">CHEMICAL COMPATIBILITY MATRIX FOR LABORATORIES</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Category</th> <th>1 FLAMMABLE LIQUIDS</th> <th>2a ACIDS, INORGANIC</th> <th>2b ACIDS, ORGANIC</th> <th>3 ALKALIS (BASES)</th> <th>4 OXIDIZERS</th> <th>5 ORGANIC PEROXIDES</th> <th>6a POISONS, INORGANIC</th> <th>6b POISONS, ORGANIC</th> <th>7 AIR / WATER REACTIVES</th> </tr> <tr> <th>FLAMMABLE LIQUIDS</th> <th>ACIDS, INORGANIC</th> <th>ACIDS, ORGANIC</th> <th>ALKALIS (BASES)</th> <th>OXIDIZERS</th> <th>ORGANIC PEROXIDES</th> <th>POISONS, INORGANIC</th> <th>POISONS, ORGANIC</th> <th>AIR / WATER REACTIVES</th> </tr> </thead> <tbody> <tr> <td>1 FLAMMABLE LIQUIDS</td><td>✓</td><td>✗</td><td>✓</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✓</td><td>✗</td></tr> <tr> <td>2a ACIDS, INORGANIC</td><td>✗</td><td>✓</td><td>✗</td><td>✗</td><td>✓</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td></tr> <tr> <td>2b ACIDS, ORGANIC</td><td>✓</td><td>✗</td><td>✓</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td></tr> <tr> <td>3 ALKALIS (BASES)</td><td>✗</td><td>✗</td><td>✗</td><td>✓</td><td>✓</td><td>✗</td><td>✓</td><td>✗</td><td>✗</td></tr> <tr> <td>4 OXIDIZERS</td><td>✗</td><td>✓</td><td>✗</td><td>✓</td><td>✓</td><td>✗</td><td>✓</td><td>✗</td><td>✗</td></tr> <tr> <td>5 ORGANIC PEROXIDES</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✓</td><td>✗</td><td>✗</td><td>✗</td></tr> <tr> <td>6a POISONS, INORGANIC</td><td>✗</td><td>✗</td><td>✗</td><td>✓</td><td>✓</td><td>✗</td><td>✓</td><td>✗</td><td>✗</td></tr> <tr> <td>6b POISONS, ORGANIC</td><td>✓</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✓</td><td>✗</td></tr> <tr> <td>7 AIR / WATER REACTIVES</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✓</td></tr> </tbody> </table> <p>NOTES AND GUIDANCE:</p> <p>A. KEY:</p> <table border="1" style="margin-left: 20px; border-collapse: collapse; text-align: center;"> <tr> <td>✓</td> <td>MAYBE Compatible (Consult Material Safety Data Sheets-MSDS / Safety Data Sheets-SDS)</td> </tr> <tr> <td>✗</td> <td>NOT Compatible (do NOT store TOGETHER in the same cabinet)</td> </tr> </table> <p>B. QUANTITY LIMITATIONS:</p> <table border="1" style="margin-left: 20px; border-collapse: collapse; text-align: center;"> <tr> <td>Storage in laboratory work areas / per room SHALL not exceed 50liters (13.2gallons) for flammable liquids.</td> </tr> </table> <p>C. INSTRUCTIONS FOR STORAGE AND HANDLING:</p> <table border="1" style="margin-left: 20px; border-collapse: collapse; text-align: center;"> <tr> <td>The air extraction outlet shall be at least 3m away from any building opening</td> </tr> <tr> <td>The minimum Ventilation of a laboratory containing chemicals shall be 5 air changes per hour</td> </tr> <tr> <td>All chemical Bottles and containers shall be sealed and airtight and placed inside the designated cabinet.</td> </tr> <tr> <td>All chemical bottles and containers/cabinets shall be properly labeled addressing the hazard group/severity</td> </tr> <tr> <td>Drip pans/trays shall be used for liquid chemicals.</td> </tr> <tr> <td>Drip pans/trays material shall not react with the contained chemical.</td> </tr> <tr> <td>Storage cabinets in laboratory work areas / per room shall be at least 30minutes (0.5-hr) fire resistive construction material and shall be manufactured as per BS 476.</td> </tr> </table> | Category | 1 FLAMMABLE LIQUIDS | 2a ACIDS, INORGANIC | 2b ACIDS, ORGANIC | 3 ALKALIS (BASES) | 4 OXIDIZERS | 5 ORGANIC PEROXIDES | 6a POISONS, INORGANIC | 6b POISONS, ORGANIC | 7 AIR / WATER REACTIVES | FLAMMABLE LIQUIDS | ACIDS, INORGANIC | ACIDS, ORGANIC | ALKALIS (BASES) | OXIDIZERS | ORGANIC PEROXIDES | POISONS, INORGANIC | POISONS, ORGANIC | AIR / WATER REACTIVES | 1 FLAMMABLE LIQUIDS | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | 2a ACIDS, INORGANIC | ✗ | ✓ | ✗ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | 2b ACIDS, ORGANIC | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | 3 ALKALIS (BASES) | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | 4 OXIDIZERS | ✗ | ✓ | ✗ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | 5 ORGANIC PEROXIDES | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | ✗ | ✗ | 6a POISONS, INORGANIC | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | 6b POISONS, ORGANIC | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | 7 AIR / WATER REACTIVES | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | MAYBE Compatible (Consult Material Safety Data Sheets-MSDS / Safety Data Sheets-SDS) | ✗ | NOT Compatible (do NOT store TOGETHER in the same cabinet) | Storage in laboratory work areas / per room SHALL not exceed 50liters (13.2gallons) for flammable liquids. | The air extraction outlet shall be at least 3m away from any building opening | The minimum Ventilation of a laboratory containing chemicals shall be 5 air changes per hour | All chemical Bottles and containers shall be sealed and airtight and placed inside the designated cabinet. | All chemical bottles and containers/cabinets shall be properly labeled addressing the hazard group/severity | Drip pans/trays shall be used for liquid chemicals. | Drip pans/trays material shall not react with the contained chemical. | Storage cabinets in laboratory work areas / per room shall be at least 30minutes (0.5-hr) fire resistive construction material and shall be manufactured as per BS 476. |
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| | FLAMMABLE LIQUIDS | ACIDS, INORGANIC | ACIDS, ORGANIC | ALKALIS (BASES) | OXIDIZERS | ORGANIC PEROXIDES | POISONS, INORGANIC | POISONS, ORGANIC | AIR / WATER REACTIVES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 FLAMMABLE LIQUIDS | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2a ACIDS, INORGANIC | ✗ | ✓ | ✗ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2b ACIDS, ORGANIC | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 ALKALIS (BASES) | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 OXIDIZERS | ✗ | ✓ | ✗ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 ORGANIC PEROXIDES | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | ✗ | ✗ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6a POISONS, INORGANIC | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6b POISONS, ORGANIC | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 AIR / WATER REACTIVES | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ✓ | MAYBE Compatible (Consult Material Safety Data Sheets-MSDS / Safety Data Sheets-SDS) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ✗ | NOT Compatible (do NOT store TOGETHER in the same cabinet) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Storage in laboratory work areas / per room SHALL not exceed 50liters (13.2gallons) for flammable liquids. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| The air extraction outlet shall be at least 3m away from any building opening | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| The minimum Ventilation of a laboratory containing chemicals shall be 5 air changes per hour | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| All chemical Bottles and containers shall be sealed and airtight and placed inside the designated cabinet. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| All chemical bottles and containers/cabinets shall be properly labeled addressing the hazard group/severity | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Drip pans/trays shall be used for liquid chemicals. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Drip pans/trays material shall not react with the contained chemical. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Storage cabinets in laboratory work areas / per room shall be at least 30minutes (0.5-hr) fire resistive construction material and shall be manufactured as per BS 476. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.3 | INTERIOR FINISH | Interior finish shall be in accordance with NFPA 101 Section 10.2. | | | | | Required | Required | Required | Required | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|-----------|--|--|--------------|----------|-------------|-----------|
| 3.3.1 | INTERIOR WALL AND CEILING FINISH | Interior wall & ceiling finish material shall be permitted as follows: | Required | Required | Required | Required |
| 3.3.1 (1) | | Exits – Class A | Required | Required | Required | Required |
| 3.3.1 (2) | | Other than exits – Class A or Class B | Required | Required | Required | Required |
| 3.3.1 (3) | | Low-height partitions not exceeding 1525 mm and used in locations other than exits – Class A, Class B, or Class C | Required | Required | Required | Required |
| 3.3.1.1 | Interior Wall Finish | The interior wall finish requirements shall include washroom water closet partitions. | Required | Required | Required | Required |
| 3.3.2 | INTERIOR FLOOR FINISH | Interior floor finish in exit enclosures and exit access corridors and spaces not separated from them by walls having a 1-hour fire resistance rating shall be not less than Class II. | Required | Required | Required | Required |
| 3.3.2.1 | Carpet Interior Floor Finishes | Carpet and carpet-like interior floor finishes shall comply with ASTM D2859, Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials. | Required | Required | Required | Required |
| 3.3.2.2 | Floor Coverings | Floor coverings, other than carpet, shall have a minimum critical radiant flux of 0.1 W/cm ² . | Required | Required | Required | Required |
| 3.4 | DETECTION, ALARM AND COMMUNICATIONS REQUIREMENTS | | | | | |
| 3.4.1 | GENERAL | Complete coverage of Fire Detection and Alarm System. | Required | Required | Required | Required |
| 3.4.2 | INITIATION | Complete coverage of an Automatic Detection and Manual Initiating Devices. | Required | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|---------|---|--|--------------|-----------|-------------|-----------|
| 3.4.3 | OCCUPANT NOTIFICATION | Complete Coverage of an Occupant Notification (audible & visible). | Required | Required | Required | Required |
| 3.4.3.1 | Emergency Voice Evacuation System | Mass Notification System | NR | NR | NR | Required |
| 3.4.4 | SUPPLEMENTARY | | | | | |
| 3.4.4.1 | Fire Telephone | In every required provisions of a fire command center (FCC) or emergency control center (ECC). | Required | Required | Required | Required |
| 3.4.4.2 | Graphic Annunciator (PC Panel) / Mimic Panel | In every required provisions of a fire command center (FCC) or emergency control center (ECC). | Required | Required | Required | Required |
| 3.5 | EXTINGUISHMENT SYSTEM REQUIREMENTS | | | | | |
| 3.5.1 | AUTOMATIC FIRE SPRINKLER (AFS) SYSTEM | Educational occupancy buildings shall be protected throughout by an automatic fire sprinkler system. | Required | Required | Required | Required |
| 3.5.1.1 | Basements or Floors Below Level of Exit Discharge | Every portion of educational buildings below the level of exit discharge shall be protected throughout by an automatic fire sprinkler system. | Required | Required | Required | Required |
| 3.5.2 | OTHER AUTOMATIC SUPPRESSION SYSTEM | Where an automatic sprinkler system is required in Section 3.5.1 and 3.5.1.1 and 3.5.1.2, the appropriate type of automatic suppression system shall be permitted. | Permitted | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|---------|--|---|--------------|-------------|-------------|-----------|
| 3.5.1.2 | Vertical Openings | Where unenclosed vertical openings created by convenience stairways (3.1.2.1) and the communicating space exemption (3.1.3) is used, educational occupancy buildings shall be protected throughout by an automatic fire sprinkler system. | - | - | Required | Required |
| 3.5.3 | Fire Hose Reel | Fire hose reels are required in buildings protected by an approved supervised automatic sprinkler system. | Required | Required | Required | Required |
| 3.5.4 | Portable Fire Extinguisher | Applicable Portable Fire Extinguishers required in all buildings. | Required | Required | Required | Required |
| 3.5.5 | Rising Main (Dry or Wet Standpipe) | Refer to Annex Fire Fighting System Annex_FFS_G1 Revisions 2021 | Required | Required | Required | Required |
| 3.6 | SMOKE CONTROL / VENTILATION REQUIREMENTS | Design conditions per Annex ACMV_N1 Revisions 2021. | | | | |
| 3.6.1 | STAIRWELL/LOBBY | Design conditions per Annex ACMV_N1 Revisions 2021. | <15m | ≥15m - <28m | ≥28m | |
| 3.6.1.1 | Less than 9 m habitable height | | No Reqmt | No Reqmt | No Reqmt | |
| 3.6.1.2 | 9 m to 15 m habitable height | Vent at top of stairwell | Required | NA | NA | |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | Permitted | NA | NA | |
| | | Stairwell Pressurization | NR | NA | NA | |

| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|---------|---|---|--------------|-------------|-------------|-----------|
| 3.6.1.3 | >15 m to < 28 m habitable height | Vent at top of stairwell | NA | NP | NA | |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | NA | Required | NA | |
| | | Stairwell Pressurization | NA | Permitted | NA | |
| | STAIRWELL/LOBBY | Design conditions per Annex ACMV_N1 Revisions 2021. | <15m | ≥15m - <28m | ≥28m | |
| 3.6.1.4 | ≥28 m habitable height | Vent at top of stairwell | NA | NA | NP | |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | NA | NA | NP | |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | NA | NA | Required | |
| | Connecting Basement Levels | | | | | |
| 3.6.1.5 | Two basement levels or ≤6 m deep, ≤2000 m ² floor area | Vent at top of stairwell : * Permitted up to five (5) connecting above floors (2B+G+4 or less) or 12 m habitable height ; whichever is less; otherwise next below provisions shall apply. | *Required | NP | NP | |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | Permitted | Required | NP | |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Required | |
| 3.6.1.6 | Three basement levels or ≤ 9.1m deep, ≤2000 m ² floor area | Vent at top of stairwell : * Permitted up to three (3) connecting above floors only (3B+G+2 or less) or 6m habitable height, whichever is less; otherwise next below provisions shall apply | *Required | NP | NP | |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | NA | NA | NA | |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Permitted | |



| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|---------|--|--|--|----------|-------------|-----------|
| 3.6.1.7 | Two basement levels or ≤ 6 m deep, >2000 m ² floor area | Vent at top of stairwell: * Permitted up to four (4) connecting floors (2B+G+3 or less) or 9 m habitable height ; whichever is less; otherwise next below provisions shall apply. | *Required | NP | NP | |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | Required | NP | NP | |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Required | Required | |
| 3.6.1.8 | Three basement levels or ≤ 9.1 m deep, >2000 m ² floor area, connecting one floor above only | Vent at top of stairwell : * Permitted up to two connecting above floors or 3 m habitable height only (3B+G+1 or less); whichever is less, otherwise next below provisions shall apply | *Required | NP | NP | |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | NA | NA | NA | |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization. | Permitted | Required | Required | |
| 3.6.1.9 | Lowest basement level >9.1 m below ground level, regardless of floor area | Vent at top of stairwell | NP | NP | NP | |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | NP | NP | NP | |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Required | Required | Required | |
| 3.6.2 | ESCAPE CORRIDOR | Design conditions per Annex ACMV_N1 Revisions 2021. | Required in specific type of Occupancy: Healthcare Occupancies and in Detention and Correctional Occupancies | | | |
| 3.6.2.1 | Interior Corridors | Vents (Fixed or Automatic Opening) | | | | |
| | | Mechanical Ventilation of Corridor | | | | |
| | | Pressurization of Corridor | | | | |
| 3.6.2.2 | Corridor with side/s located along exterior walls | Vents (Fixed or Automatic Opening) | | | | |
| | | Mechanical Ventilation of Corridor | | | | |
| | | Pressurization of Corridor | | | | |

| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|-----------|--|--|--------------|-------------------|-------------|-----------|
| 3.6.3 | atrium and other floor openings protection | Design conditions per Annex ACMV_N1 Revisions 2021. | Kindergarten | Primary | Preparatory | Secondary |
| 3.6.3.1 | Malls (with floor openings connecting >2 floors) | Smoke Vents (Fixed or Automatic Opening) | NA | NA | NA | NA |
| | | Mechanical Smoke Exhaust Ventilation System/ Engineered | NA | NA | NA | NA |
| 3.6.3.2 | Other Occupancies (connecting >3 floor levels) | Smoke Vents (Fixed or Automatic Opening) | NA | NA | NA | Permitted |
| | | Mechanical Smoke Exhaust Ventilation System/ Engineered | NA | NA | NA | Permitted |
| 3.6.4 | Car Parks/Parking Structures Protection | Design conditions per Annex ACMV_N1 Revisions 2021. | <15m | ≥15m - <28m | ≥28m | |
| 3.6.4.1 | Open Parking Structures | The open parking structure shall justify that no smoke stagnation will occur such as from a fire located somewhere in the middle of the car park; otherwise mechanical equipment that will aid in effective dispersal of smoke shall be provided | Required | Required | Required | |
| 3.6.4.2 | Aboveground Enclosed Car Parks | | | | | |
| 3.6.4.2.1 | Aggregate floor area of ≤2000 m ² | Smoke Vents (Fixed or Automatic) | Required | Required | Permitted | |
| | | Mechanical Smoke Purging/Clearance | Permitted | Permitted | Required | |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted | |
| 3.6.4.2.2 | Aggregate floor area of >2000 m ² | Smoke Vents (Fixed or Automatic) | Required | NP | NP | |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | NP | |
| | | Engineered Smoke Control System | Required | Permitted | Required | |
| 3.6.4.3 | Belowground Car Parks | | ≤6m Deep | >6m - ≤9.1 m Deep | >9.1 m Deep | |
| 3.6.4.3.1 | Aggregate floor area of ≤2000 m ² | Smoke Vents (Fixed or Automatic) | Required | NP | NP | |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | Required | |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted | |



| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|------------|--|--|--------------|-----------|-------------|-----------|
| 3.6.4.3.2 | Aggregate floor area of >2000 m ² | Smoke Vents (Fixed or Automatic) | NP | NP | NP | |
| | | Mechanical Smoke Purging/Clearance | Required | NP | NP | |
| | | Engineered Smoke Control System | Permitted | Required | Required | |
| 3.7 | CORRIDORS | | Kindergarten | Primary | Preparatory | Secondary |
| 3.7.1 | CORRIDOR WALLS | Corridors shall be separated from use areas by fire barriers having a minimum 1-hour fire resistance rating, unless one of the conditions in 3.7.1.2 and 3.7.1.3 exists: | Required | Required | Required | Required |
| 3.7.1.1 | Doors | Doors shall have not less than 30 minutes fire protection rating. | Required | Required | Required | Required |
| 3.7.1.2 | Exemption | Corridor protection shall not be required where all spaces normally subject to student occupancy have at least one door opening directly to the outside or to an exterior exit access balcony or corridor. | Permitted | Permitted | Permitted | Permitted |
| 3.7.1.3 | Fire Sprinkler Protected Buildings | The following shall apply to buildings protected throughout by an approved, supervised automatic sprinkler system: | Permitted | Permitted | Permitted | Permitted |
| 3.7.1.3(1) | Smoke Partitions | Corridor walls shall not be required to be rated, provided that such walls form smoke partitions to limit the transfer of smoke. | Permitted | Permitted | Permitted | Permitted |
| 3.7.1.3(1) | Doors | The provisions for doors to be self-closing or automatic-closing shall not apply to normally occupied classrooms. | Permitted | Permitted | Permitted | Permitted |
| 3.7.1.4 | | Where the corridor ceiling is an assembly having a 1-hour fire resistance rating where tested as a wall, the corridor walls shall be permitted to terminate at the corridor ceiling. | Permitted | Permitted | Permitted | Permitted |

| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|---------|------------------------------------|---|--------------|-----------|-------------|-----------|
| 3.8 | SUBDIVISION OF BUILDING SPACES | | | | | |
| 3.8.1 | GENERAL | Educational occupancies shall be subdivided into compartments by smoke partitions having not less than a 1-hour fire resistance rating and complying with the general requirements for smoke partitions, where one or both conditions in 3.8.1.1 and 3.8.1.2 exist: | Required | Required | Required | Required |
| 3.8.1.1 | | The maximum floor area, including the aggregate area of all floors having a common atmosphere, exceeds 2800 m ² . | Required | Required | Required | Required |
| 3.8.1.2 | | The length or width of the building exceeds 91 meters. | Required | Required | Required | Required |
| 3.8.2 | EXEMPTIONS | The requirement of 3.8.1 shall not apply to 3.8.2.1 and 3.8.2.2. | NA | NA | NA | NA |
| 3.8.2.1 | Rooms with exterior exit access | Where all spaces normally subject to student occupancy have not less than one door opening directly to the outside or to an exterior or exit access balcony or corridor. | Permitted | Permitted | Permitted | Permitted |
| 3.8.2.2 | Fire Sprinkler Protected Buildings | The educational buildings' protected throughout by an approved supervised automatic sprinkler system | Permitted | Permitted | Permitted | Permitted |
| 3.8.3 | SIZE LIMIT | The area of any smoke compartment required by 3.8.1 shall not exceed 2800 m ² , with no dimension exceeding 91 m. | Required | Required | Required | Required |
| 3.9 | (Reserved) | | | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|-------|--|---|--------------|-----------|-------------|-----------|
| 4.0 | SPECIAL PROVISIONS | Special Provisions for Firefighting and Rescue shall comply with QCD FLS Annex and as modified in item 4.0 of this FLS Occupancy Chapter. | | | | |
| 4.1 | FIRE (EMERGENCY) COMMAND CENTER | QCD FLS Annex_A5 – Revisions_2021. | Required | Required | Required | Required |
| 4.1.1 | | Instead of a dedicated fire command center, the fire and life safety system Systems control panels/stations may be located in lobbies, guard rooms, or other spaces adjacent to the main entrances. | Permitted | Permitted | Permitted | Permitted |
| 4.2 | EXTERNAL ACCESS TO SITE AND BUILDINGS | QCD FLS Annex_A3 – Revisions_2021 | Required | Required | Required | Required |
| 4.2.1 | SITE ACCESS | For gated facility development a 4.0 m wide and 4.5 m clear height vertical clearance entry gate or site access shall be provided. | Required | Required | Required | Required |
| 4.2.2 | ACCESS ROAD | 4 m-width firefighting appliance access or access road to every building shall be provided. | Required | Required | Required | Required |
| 4.2.3 | FIRE ENGINE HARDSTANDING | Fire engine hardstandings with longer side parallel to the façade of the building shall be provided in buildings exceeding the habitable height of 10 m. | Required | Required | Required | Required |
| 4.3 | (Reserved) | | | | | |
| 5.0 | BUILDING SERVICES and FIRE PROTECTION EQUIPMENT | Building Services and Fire Protection Equipment shall comply with the applicable NFPA codes and standards and QCD FLS Annex. | | | | |

| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|---------|---|---|--------------|----------|-------------|-----------|
| 5.1 | ELECTRICAL SYSTEM | Electrical wiring and equipment in accordance with NFPA 70. | Required | Required | Required | Required |
| 5.1.1 | ELECTRICAL EQUIPMENT/PANEL ROOMS AND SIMILAR ROOMS/SPACES | QCD FLS Annex _A7 – Revisions_2021 | Required | Required | Required | Required |
| 5.1.2 | EMERGENCY GENERATORS AND STANDBY POWER SYSTEMS. | Emergency generators and standby power systems shall be installed, tested, and maintained in accordance with NFPA 110. | Required | Required | Required | Required |
| 5.2 | FIRE PUMPS | | | | | |
| 5.2.1 | FIRE PUMPS ROOM | QCD FLS Annex _A6 – Revisions_2021 | Required | Required | Required | Required |
| 5.3 | SUBSTATION and SWITCHGEARS | QCD FLS Annex _A8 – Revisions_2021 | Required | Required | Required | Required |
| 5.1.3 | STORED ELECTRICAL ENERGY SYSTEMS | Stored electrical energy systems shall be installed, tested, and maintained in accordance with NFPA 111. | Required | Required | Required | Required |
| 5.4 | (Reserved). | | | | | |
| 6.0 | OPERATING FEATURES | Operating Features shall be provided in accordance with NFPA 101 14.7 and as modified in item 6.0 of this FLS Occupancy Chapter. | | | | |
| 6.1 | EMERGENCY ACTION PLAN | Emergency action plans shall be provided in accordance with 6.1.1 | | | | |
| 6.1.1 | PLAN REQUIREMENTS. | Items to be considered in preparing an emergency action plan shall include the following: | Required | Required | Required | Required |
| 6.1.1.1 | | Purpose of plan. | Required | Required | Required | Required |
| 6.1.1.2 | | Building description, including certificate of occupancy . | Required | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|----------|------------------------|--|--------------|----------|-------------|-----------|
| 6.1.1.3 | | Appointment, organization, and contact details of designated building staff to carry out the emergency duties. | Required | Required | Required | Required |
| 6.1.1.4 | | Identification of events (man-made and natural) considered life safety hazards impacting the building. | Required | Required | Required | Required |
| 6.1.1.5 | | Responsibilities matrix (role-driven assignments). | Required | Required | Required | Required |
| 6.1.1.6 | | Policies and procedures for those left behind to operate critical equipment. | Required | Required | Required | Required |
| 6.1.1.7 | | Specific procedures to be used for each type of emergency. | Required | Required | Required | Required |
| 6.1.1.8 | | Requirements and responsibilities for assisting people with disabilities. | Required | Required | Required | Required |
| 6.1.1.9 | | Procedures for accounting for employees. | Required | Required | Required | Required |
| 6.1.1.10 | | Training of building staff, building emergency response teams, and other occupants in their responsibilities. | Required | Required | Required | Required |
| 6.1.2 | | Required emergency action plans shall be submitted to the authority having jurisdiction for review. | Required | Required | Required | Required |
| 6.1.3 | | Emergency action plans shall be reviewed and updated as required by the authority having jurisdiction | Required | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|------------|---|---|--------------|-----------|-------------|-----------|
| 6.2 | EMERGENCY EGRESS and RELOCATION DRILLS. | Emergency egress and relocation drills shall be conducted in accordance with 6.2.1 | Required | Required | Required | Required |
| 6.2.1 | DRILL FREQUENCY | Emergency egress and relocation drills shall be conducted as follows: | Required | Required | Required | Required |
| 6.2.1.1 | | Not less than one emergency egress and relocation drill shall be conducted every month the facility is in session, unless both of the following criteria are met: | Required | Required | Required | Required |
| 6.2.1.1(1) | | Where the weather is severe, the monthly emergency egress and relocation drills shall be permitted to be deferred. | Required | Required | Permitted | Required |
| 6.2.1.1(2) | | The required number of emergency egress and relocation drills shall be conducted, and not less than four shall be conducted before the drills are deferred. | Required | Required | Required | Required |
| 6.2.1.2 | | All occupants of the building shall participate in the drill. | Required | Required | Required | Required |
| 6.2.1.3 | | One additional emergency egress and relocation drill, other than for day-care occupancies that are open on a year-round basis, shall be required within the first 30 days of operation. | Required | Required | Required | Required |
| 6.2.2 | APPROVED TRAINING PROGRAMS | Approved training programs designed for education, training and for the practice of emergency egress to familiarize occupants with the drill procedure, and to establish conduct of the emergency egress as a matter of routine complying with 6.2.2.1. | Permitted | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|---------|------------------------------|---|--------------|----------|-------------|-----------|
| 6.2.2.1 | | Approved training programs shall be permitted to receive credit on a one-for-one basis for not more than four of the emergency egress drills required by 6.2.1, provided that a minimum of four emergency egress drills are completed prior to the conduct of the first such training and practice program. | Required | Required | Required | Required |
| 6.2.3 | ORDERLY EVACUATION. | When conducting drills, emphasis shall be placed on orderly evacuation rather than on speed. | Required | Required | Required | Required |
| 6.2.4 | SIMULATED CONDITIONS. | Drills shall be held at expected and unexpected times and under varying conditions to simulate the unusual conditions that can occur in an actual emergency. | Required | Required | Required | Required |
| 6.2.5 | RELOCATION AREA | Drill participants shall relocate to a predetermined location and remain at such location until a recall or dismissal signal is given. | Required | Required | Required | Required |
| 6.2.6 | WRITTEN RECORD OF EACH DRILL | A written record shall be completed by the person responsible for conducting the drill and maintained in an approved manner. | Required | Required | Required | Required |
| 6.2.6.1 | | The written record should include such details as the date, time, participants, location, and results of that drill. | Required | Required | Required | Required |
| 6.2.7 | | All emergency drill alarms shall be sounded on the fire alarm system. | Required | Required | Required | Required |
| 6.3 | INSPECTIONS. | | | | | |

| Item | Fire Safety Provisions | Minimum Requirements | Kindergarten | Primary | Preparatory | Secondary |
|------------|-------------------------------|---|--------------|----------|-------------|-----------|
| 6.3.1 | | It shall be the duty of principals, teachers, or staff to inspect all exit facilities daily to ensure that all stairways, doors, and other exits are in proper condition. | Required | Required | Required | Required |
| 6.3.2 | | Open plan buildings shall require extra surveillance to ensure that exit paths are maintained clear of obstruction and are obvious. | Required | Required | Required | Required |
| 6.3.4 | INSPECTION OF DOOR OPENINGS. | Door openings shall be inspected in accordance with 6.4.1. | Required | Required | Required | Required |
| 6.3.4.1 | | The following door assemblies shall be inspected and tested not less than annually: | Required | Required | Required | Required |
| 6.3.4.1(1) | | Door leaves equipped with panic hardware or fire exit hardware. | Required | Required | Required | Required |
| 6.3.4.1(2) | | Door assemblies in exit enclosures. | Required | Required | Required | Required |
| 6.3.4.1(3) | | Door hardware-release of electrically locked egress door assemblies. | Required | Required | Required | Required |
| 6.3.4.1(4) | | Door assemblies with special locking arrangements. | Required | Required | Required | Required |
| 6.3.4.2 | | Door assemblies shall be visually inspected from both sides of the opening to assess the overall condition of the assembly. | Required | Required | Required | Required |
| 6.3.4 | WRITTEN RECORD OF INSPECTION. | A written record of the inspections and testing shall be signed and kept for inspection by QCD-Qatar Civil Defence. | Required | Required | Required | Required |
| 6.4 | FURNISHING AND DECORATIONS | | | | | |



| | | | | | | |
|---------|--|--|-----------|-----------|-----------|-----------|
| 6.4.1 | DRAPERIES, CURTAINS, and Other Similar Furnishings and Decorations | Draperies, curtains, and other similar loosely hanging furnishings and decorations shall meet the flame propagation performance criteria contained in Test Method 1 or Test Method 2, as appropriate, of NFPA 701. | Required | Required | Required | Required |
| 6.4.2 | CLOTHING and PERSONAL EFFECTS | Clothing and personal effects shall not be stored in corridors, unless otherwise permitted by one of the following: | Required | Required | Required | Required |
| 6.4.2.1 | | The requirements in 6.4.2 shall not apply to corridors protected by an automatic sprinkler system. | Permitted | Permitted | Permitted | Permitted |
| 6.4.2.2 | | The requirements in 6.4.2 shall not apply to corridor areas protected by a smoke detection system. | Permitted | Permitted | Permitted | Permitted |
| 6.4.2.3 | | The requirements in 6.4.2 shall not apply to storage in metal lockers, provided that the required egress width is maintained. | Permitted | Permitted | Permitted | Permitted |
| 6.4.3 | ARTWORK and TEACHING MATERIALS | Artwork and teaching materials shall be permitted to be attached directly to the walls in accordance with the following: | Required | Required | Required | Required |
| 6.4.3.1 | | The artwork and teaching materials shall not exceed 50 percent of the wall area. | Required | Required | Required | Required |
| 6.4.3.2 | | Placing of artwork and teaching materials near a room's exit access doors shall be avoided. | Required | Required | Required | Required |
| 6.5 | OPEN FLAMES | Approved open flames shall be permitted in laboratories and vocational/technical areas. | Required | Required | Required | Required |
| 6.6 | (Reserved). | | | | | |

AMBULATORY HEALTH CARE OCCUPANCIES



AMBULATORY HEALTH CARE OCCUPANCIES

| 1.0 | GENERAL REQUIREMENTS. | The requirements of this chapter shall apply to buildings or portions thereof used as ambulatory health care occupancies. | | |
|---|---|---|-----------------|--|
| | | <p>An occupancy used to provide services or treatment simultaneously to four (4) or more patients that provides, on an outpatient basis, one or more of the following:</p> <p>(1) Treatment for patients that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others;</p> <p>(2) Anesthesia that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others;</p> <p>(3) Treatment for patients who, due to the nature of their injury or illness, are incapable of taking action for self-preservation under emergency conditions without the assistance of others.</p> | | |
| Medical Services Clinics / Dispensaries (Ambulatory to > 3 patients) | | Dentists / Doctors Outpatient Clinics (Ambulatory to > 3 patients) | | Health Center (Ambulatory to > 3 patients) |
| 1.1 | GENERAL CONDITIONS AND BUILDING LIMITS | | | |
| Building Category | Building Height (m) | Floor Area (m ²) | Basement Levels | |
| 1.1.1 | LOW-RISE Ambulatory Health Care Occupancies | < 15.0 m Habitable Height | | |
| 1.1.2 | MID-RISE Ambulatory Health Care Occupancies | ≥ 15 m to < 28 m Habitable Height | No Limit | No Limit [in Floor Area/Fire Area, Depth or Levels] |
| 1.1.3 | HIGH-RISE Ambulatory Health Care Occupancies | ≥ 28 m Habitable Height | | |



FIRE AND LIFE SAFETY (FLS) REQUIREMENT

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|------------|--|---|-----------|-----------|-----------|
| 1.2 | CLASSIFICATION OF OCCUPANCIES | | | | |
| 1.2.1 | MULTIPLE OCCUPANCIES | Multiple occupancies shall be in accordance with NFPA 101 6.1.14. | Required | Required | Required |
| 1.2.1.1 | Atrium walls | Atrium walls in accordance with NFPA 101 6.1.14.4.6 shall be permitted to serve as part of the separation required by NFPA 101 6.1.14.4.1 for creating separated occupancies on a story-by-story basis, provided both of the following are met: | Permitted | Permitted | Permitted |
| 1.2.1.1(1) | | The provision is not used for occupancy separations involving industrial and storage occupancies. | Required | Required | Required |
| 1.2.1.1(2) | | Smoke partitions serving as atrium walls are not permitted to serve as enclosures for hazardous areas. | Required | Required | Required |
| 1.2.1.2 | Sections of Ambulatory Health Care Facilities | Sections of ambulatory health care facilities shall be permitted to be classified as other occupancies, provided that they meet both of the following conditions: | Permitted | Permitted | Permitted |
| 1.2.1.2(1) | | They are not intended to serve ambulatory health care occupants for purposes of treatment or customary access by patients incapable of self-preservation. | Required | Required | Required |
| 1.2.1.2(2) | | They are separated from areas of ambulatory health care occupancies by construction having a minimum 1-hour fire resistance rating. | Required | Required | Required |
| 1.2.1.3 | Egress Provisions of Ambulatory Health Care Facilities | All means of egress from ambulatory health care occupancies that traverse nonambulatory health care spaces shall conform to the requirements for ambulatory health care occupancies. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|---|-----------|-----------|-----------|
| 1.2.1.4 | | Exit through a horizontal exit into other contiguous occupancies that do not conform to ambulatory health care egress provisions but that do comply with the requirements of the nonambulatory health care occupancy, shall be permitted, provided that the occupancy does not contain high hazard contents. | Permitted | Permitted | Permitted |
| 1.2.1.5 | | Egress provisions for areas of ambulatory health care facilities that correspond to other occupancies shall meet the requirements for such occupancies. Where the clinical needs of the occupant necessitate the locking of means of egress, staff shall be present for the supervised release of occupants during all times of use. | Required | Required | Required |
| 1.2.1.6 | | Any area with a hazard of contents classified higher than that of the ambulatory health care occupancy and located in the same building shall be protected as required for hazardous areas in item 3.2. | Required | Required | Required |
| 1.2.1.7 | High Hazard Non-Health care-related Occupancies | Non-health care-related occupancies classified as containing high hazard contents shall not be permitted in buildings housing ambulatory health care occupancies. | Permitted | Permitted | Permitted |
| 1.3 | OCCUPANT LOAD (OL) | Determined on the basis of the occupant load factors (OLF) that are characteristic of the use of the space as specified in 1.3.1. | Required | Required | Required |
| 1.3.1 | OCCUPANT LOAD FACTOR (OLF) Ambulatory Health Care | The occupant load shall be not less than the number of persons determined by dividing the floor area assigned to that use by the occupant load factor of 14 m ² per person. | Required | Required | Required |
| 1.4 | CLASSIFICATION OF HAZARD OF CONTENTS | Hazard of contents shall be classified in accordance with NFPA 101 section 6.2. | Required | Required | Required |
| 1.4.1 | HIGH-HAZARD CONTENTS | Buildings or areas in which high-hazard contents are stored, used, or handled shall comply with NFPA 101 section 7.11. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|------------------------------------|--|-----------|-----------|-----------|
| 1.5 | MINIMUM CONSTRUCTION REQUIREMENTS. | Construction shall be in accordance with NFPA 5000 Chapters 7–8, 13–14, 31, and 35– 40, except as modified in 1.5.1 and 1.5.2. | Required | Required | Required |
| 1.5.1 | | Any level below the level of exit discharge shall be separated from the level of exit discharge by not less than Type II (111). | Required | Required | Required |
| 1.5.1.1 | | Any hazardous spaces within any level below the level of exit discharge, shall be protected in accordance with NFPA 101 section 8.7. | Required | Required | Required |
| 1.5.2 | | Interior nonbearing walls in buildings of Type I or Type II construction shall be constructed of noncombustible or limited-combustible materials. | Required | Required | Required |
| 1.6 | ACCESSIBILITY. | Accessibility shall be in accordance with NFPA 5000 Chapter 12. | Required | Required | Required |
| 1.7 | (Reserved). | | | | |
| 2.0 | MEANS of EGRESS REQUIREMENTS | Means of egress shall comply with NFPA 101 Chapter 7, and as modified in item 2.0 of this FLS Occupancy Chapter. | | | |
| 2.1 | GENERAL | Every aisle, passageway, corridor, exit discharge, exit location, and access shall be in accordance with NFPA 101 chapter 7, unless otherwise modified in this occupancy chapter. | Required | Required | Required |
| 2.2 | MEANS OF EGRESS COMPONENTS | Means of egress components shall be limited to the types described in 2.2.1 through 2.2.7. | Required | Required | Required |
| 2.2.1 | DOORS | Doors shall be in accordance with NFPA 101 section 7.2.1. | Required | Required | Required |
| 2.2.1.1 | Self-closing Doors | Any door required to be self-closing shall be permitted to be held open only by an automatic release device that complies with NFPA 101 7.2.1.8.2. | Permitted | Permitted | Permitted |
| 2.2.1.2 | Doors in Stair Enclosure | Where doors in a stair enclosure are held open by an automatic release device as permitted in 2.2.1.1, initiation of a door closing action on any level shall cause all doors at all levels in the stair enclosure to close. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------------|-------------------------------------|---|-----------|-----------|-----------|
| 2.2.1.3 | Locks | Locks complying with NFPA 101 7.2.1.5.5 shall be permitted only on principal entrance/exit doors. | Permitted | Permitted | Permitted |
| 2.2.1.4 | Door-locking Arrangements | Door-locking arrangements shall be permitted where patient special needs require specialized protective measures for their safety, provided that all of the following criteria are met: | Permitted | Permitted | Permitted |
| 2.2.1.4(1) | | Staff can readily unlock doors at all times. | Required | Required | Required |
| 2.2.1.4(2) | | A total (complete) smoke detection system is provided throughout the locked space, or locked doors can be remotely unlocked at an approved, constantly attended location within the locked space. | Required | Required | Required |
| 2.2.1.4(3) | | The building is protected throughout by an approved, supervised automatic sprinkler system. | Required | Required | Required |
| 2.2.1.4(4) | | The locks are electrical locks that fail safely so as to release upon loss of power to the device. | Required | Required | Required |
| 2.2.1.4(5) | | The locks release by independent activation of each of the following: | Required | Required | Required |
| 2.2.1.4(5)(a) | | Activation of the smoke detection system required by 2.2.1.4(2). | Required | Required | Required |
| 2.2.1.4(5)(b) | | Waterflow in the automatic sprinkler system required by 2.2.1.4(3) | Required | Required | Required |
| 2.2.1.5 | Locked Doors in the Means of Egress | Doors that are located in the means of egress and are permitted to be locked under other provisions of 2.2.1.4 shall comply with both of the following: | Permitted | Permitted | Permitted |
| 2.2.1.5(1) | | Provisions shall be made for the rapid removal of occupants by means of one of the following: | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------------|--|---|-----------|-----------|-----------|
| 2.2.1.5(1)(a) | | Remote control of locks from within the locked smoke compartment. | Required | Required | Required |
| 2.2.1.5(1)(b) | | Keying of all locks to keys carried by staff at all times. | Required | Required | Required |
| 2.2.1.5(1)(c) | | Other such reliable means available to the staff at all times. | Required | Required | Required |
| 2.2.1.5(2) | | Only one locking device shall be permitted on each door. | Required | Required | Required |
| 2.2.1.6 | Delayed-Egress Electrical Locking Systems | Delayed-egress electrical locking system complying with NFPA 101 section 7.2.1.6.1 shall be permitted. | Permitted | Permitted | Permitted |
| 2.2.1.7 | Sensor-Release of Electrical Locking Systems | Sensor-release of electrical locking systems complying with NFPA 101 section 7.2.1.6.2. | Permitted | Permitted | Permitted |
| 2.2.1.8 | Elevator Lobby Exit Access Door Assemblies Locking | Elevator lobby exit access door-locking arrangements in accordance with NFPA 101 section 7.2.1.6.3. | Permitted | Permitted | Permitted |
| 2.2.1.9 | Horizontal or Vertical Security Grilles or Doors | As part of the required means of egress from a tenant space complying with NFPA 101 section 7.2.1.4.1(3) | Permitted | Permitted | Permitted |
| 2.2.1.10 | Revolving Doors | Revolving door assemblies, used or not used in the means of egress, complying with NFPA 101 section 7.2.1.10. | Permitted | Permitted | Permitted |
| 2.2.2 | STAIRS | Stairs complying with NFPA 101 section 7.2.2 shall be permitted | Permitted | Permitted | Permitted |
| 2.2.2.1 | Spiral Stairs | Spiral stairs as a component in a means of egress complying with NFPA 101 section 7.2.2.2.3. | Permitted | Permitted | Permitted |
| 2.2.3 | SMOKEPROOF ENCLOSURES | Smokeproof enclosures complying with NFPA 101 section 7.2.3. | Permitted | Permitted | Permitted |
| 2.2.4 | HORIZONTAL EXITS | Horizontal exit and used as substitute for other exits complying with NFPA 101 section 7.2.4. | Permitted | Permitted | Permitted |
| 2.2.5 | RAMPS | Ramps complying with NFPA 101 section 7.2.5. | Permitted | Permitted | Permitted |
| 2.2.6 | EXIT PASSAGEWAY | Exit passageways complying with NFPA 101 section 7.2.6. | Permitted | Permitted | Permitted |
| 2.2.6.1 | | An exit passageway shall serve as a horizontal means of exit travel that is protected from fire in a manner similar to an enclosed interior exit stair. | Required | Required | Required |
| 2.2.7 | AREA OF REFUGE | Areas of refuge complying with NFPA 101 section 7.2.12. | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|------------|--|--|-----------|-----------|-----------|
| 2.3 | CAPACITY OF MEANS OF EGRESS | The capacity of means of egress shall be in accordance with NFPA 101 section 7.3 and as modified in 2.3.1. | Required | Required | Required |
| 2.3.1 | CORRIDOR OR PASSAGEWAY | The clear width of any corridor or passageway required for exit access shall be not less than 1200mm. | Required | Required | Required |
| 2.3.2 | DOORS in Diagnostic or Treatment Areas | Doors in the means of egress from diagnostic or treatment areas, such as x-ray, surgical, or physical therapy, shall provide a clear width of not less than 810 mm. | Required | Required | Required |
| 2.4 | NUMBER OF MEANS OF EGRESS | The number of means of egress shall be in accordance with NFPA 101 7.4. | Required | Required | Required |
| 2.4.1 | NUMBER of EXITS | | Required | Required | Required |
| 2.4.1.1 | Minimum Two (2) Exits | Not less than two separate exits shall be provided on every story. | Required | Required | Required |
| 2.4.1.2 | Exits from Every Part of Every Story. | Not less than two separate exits shall be accessible from every part of every story. | Required | Required | Required |
| 2.4.1.3 | Exits from Each Smoke Compartment | Not less than two exits shall be accessible from each smoke compartment. | Required | Required | Required |
| 2.4.1.3(1) | | Egress from smoke compartments shall be permitted through adjacent compartments provided that the two required egress paths are arranged so that both do not pass through the same adjacent smoke compartment. | Permitted | Permitted | Permitted |
| 2.5 | ARRANGEMENT OF MEANS OF EGRESS | Access to all required exits shall be arranged in accordance with NFPA 101 section 7.5. and as modified by 2.5. | Required | Required | Required |
| 2.5.1 | TRAVEL DISTANCE (TD) | Travel distance shall comply with 2.5.1.1 and 2.5.1.2. | Required | Required | Required |
| 2.5.1.1 | TD between any Point in a Room and an Exit | Travel distance shall not exceed 46 m. | Required | Required | Required |
| 2.5.1.2 | | Travel distance shall not exceed 60 m (sprinkler protected). | Required | Required | Required |
| 2.5.2 | COMMON PATH (CP) OF TRAVEL | Limitations on common path shall comply with 2.5.2.1 thru 2.5.2.3. | Permitted | Permitted | Permitted |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|---|-----------|-----------|-----------|
| 2.5.2.1 | Common Path Limit | Common path shall be limited to 23 m. | Required | Required | Required |
| 2.5.2.2 | | Common path shall not exceed 30 m (sprinkler protected). | Required | Required | Required |
| 2.5.2.3 | | Common path of travel within a single tenant space having an occupant load not exceeding 25 persons shall not exceed 30 m. | Required | Required | Required |
| 2.5.3 | DEAD-END (DE) CORRIDOR | Dead-end corridors shall be in accordance with 2.5.3.1 and 2.5.3.2. | Permitted | Permitted | Permitted |
| 2.5.3.1 | | Dead-end corridors shall not exceed 6 m. | Required | Required | Required |
| 2.5.3.2 | | Dead-end corridors shall not exceed 15 m (sprinkler protected). | Required | Required | Required |
| 2.6 | DISCHARGE FROM EXITS | Exit discharge shall comply with NFPA 101 section 7.7. | Required | Required | Required |
| 2.6.1 | EXIT TERMINATION | Exits shall terminate directly, at a public way or at an exterior exit discharge. | Required | Required | Required |
| 2.6.2 | EXIT DISCHARGE through Interior Building Areas | Exits shall be permitted to discharge through interior building areas, provided that all of the criteria in NFPA 101 section 7.7.2 are met. | Permitted | Permitted | Permitted |
| 2.7 | ILLUMINATION OF MEANS OF EGRESS | Means of egress shall be illuminated in accordance with NFPA 101 7.8. | Required | Required | Required |
| 2.8 | EMERGENCY LIGHTING | Emergency lighting facilities shall be provided in accordance with NFPA 101 section 7.9. | Required | Required | Required |
| 2.8.1 | | Emergency lighting shall be provided in any building where any one of the conditions in 2.8.1.1 through 2.8.1.3 exists: | Required | Required | Required |
| 2.8.1.1 | Number of Stories | The building is three (3) or more stories in height. | Required | Required | Required |
| 2.8.1.2 | Number of Occupants | The occupancy is subject to 50 or more occupants above or below the level of exit discharge. | Required | Required | Required |
| 2.8.1.3 | Total Number of Occupants | The occupancy is subject to 300 or more total occupants. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-------|---------------------------------|--|-----------|-----------|-----------|
| 2.8.2 | | Where general anesthesia or life-support equipment is used, each ambulatory health care facility shall be provided with an essential electrical system in accordance with NFPA 99. | Required | Required | Required |
| 2.9 | MARKINGS OF MEANS OF EGRESS | Means of egress shall have signs in accordance with NFPA 101 section 7.10. | Required | Required | Required |
| 2.10 | (Reserved). | | | | |
| 3.0 | PROTECTION | Protection shall comply with the applicable NFPA codes and standards, QCD FLS Annex and as modified in item 3.0 of this FLS Occupancy Chapter. | | | |
| 3.1 | PROTECTION OF VERTICAL OPENINGS | Vertical openings shall be enclosed or protected in accordance with NFPA 101 section 8.6. | Required | Required | Required |
| 3.1.1 | CONVENIENCE OPENINGS | Convenience openings in accordance with NFPA 101 section 8.6.9. | Permitted | Permitted | Permitted |
| 3.1.2 | COMMUNICATING SPACE and ATRIUM | Where the provisions Communicating Space and Atrium in accordance with NFPA 101 section 8.6.6 and section 8.6.7 are used, the building shall comply with 3.5.1.2. | Required | Required | Required |
| 3.1.5 | FLOORS BELOW STREET FLOOR | Floors that are below the street floor and are used for storage or other than an ambulatory health care occupancy shall have no unprotected openings to ambulatory health care occupancy floors. | Required | Required | Required |
| 3.2 | PROTECTION FROM HAZARDS | Hazardous areas including, but not limited to, areas used for general storage, boiler rooms, and maintenance shops that include woodworking and painting areas shall be protected in accordance with NFPA 101 section 8.7. | Required | Required | Required |
| 3.2.1 | DOORS | Doors to hazardous areas shall be self-closing or automatic-closing. | Required | Required | Required |
| 3.2.2 | HIGH HAZARD CONTENTS AREAS | High hazard contents areas, shall meet all of the following criteria: | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|---|-----------|-----------|-----------|
| 3.2.2.1 | Enclosures/Separation from Other Areas | The area shall be separated from other parts of the building by fire barriers having a min. 1-hour FR rating, with all openings therein protected by self-closing fire door assemblies having a min. 3/4-hour fire protection rating. | Required | Required | Required |
| 3.2.2.2 | Extinguishing Requirements | The area shall be protected by an automatic extinguishing system. | Required | Required | Required |
| 3.2.3 | LABORATORIES | Laboratories in which chemicals are handled or stored shall comply with NFPA 45 and the requirements in section 3.2.1 and section 3.2.2 of the FLS Storage Occupancy Chapter. | Required | Required | Required |
| 3.2.4 | MEDICAL GAS | Medical gas storage areas and the operation, management, and maintenance of medical gases shall be in accordance with NFPA 99. | Required | Required | Required |
| 3.2.5 | COMMERCIAL COOKING OPERATIONS | Cooking facilities shall be protected in accordance with NFPA 96. | Required | Required | Required |
| 3.2.5.1 | Domestic Cooking Equipment is used for Food Warming or Limited Cooking | The protection or separation of food preparation facilities in 3.2.5 shall not be required. | Permitted | Permitted | Permitted |
| 3.2.6 | HAZARDOUS MATERIALS | Ambulatory health care occupancies with Storage, use, and handling of hazardous materials shall comply with the following codes unless otherwise modified by other provisions of this Code: NFPA 30, NFPA 54, NFPA 55, NFPA 58, NFPA 400, and NFPA 495. | Required | Required | Required |
| 3.3 | INTERIOR FINISH | Interior finish shall be in accordance with NFPA 101 section 10.2. | Required | Required | Required |
| 3.3.1 | INTERIOR WALL AND CEILING FINISH | Interior wall and ceiling finish material shall be Class A or Class B in exits and in exit access corridors. | Required | Required | Required |
| 3.3.1.1 | | Interior wall and ceiling finishes shall be Class A, Class B, or Class C in areas other than those specified in 3.3.1 | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|------------|---|---|----------|----------|-----------|
| 3.3.2 | INTERIOR FLOOR FINISH | Interior floor finish in exit enclosures shall be Class I or Class II. | Required | Required | Required |
| 3.4 | DETECTION, ALARM & COMMUNICATION REQUIREMENTS | | | | |
| 3.4.1 | GENERAL | Complete coverage of Fire Detection and Alarm System. | Required | Required | Required |
| 3.4.2 | INITIATION | Complete coverage of an Automatic Detection & Manual Initiating Devices. | Required | Required | Required |
| 3.4.3 | OCCUPANT NOTIFICATION | Complete Coverage of an Occupant Notification (audible & visible). | Required | Required | Required |
| 3.4.3.1 | Emergency Voice Evacuation System | Mass Notification System | NR | NR | Required |
| 3.4.4 | SUPPLEMENTARY | | | | |
| 3.4.4.1 | Fire Telephone | In every required provisions of a fire command center (FCC) or emergency control center (ECC). | Required | Required | Required |
| 3.4.4.2 | Graphic Annunciator (PC Panel) or Mimic Panel | In every required provisions of a fire command center (FCC) or emergency control center (ECC). | Required | Required | Required |
| 3.5 | EXTINGUISHMENT REQUIREMENTS | | | | |
| 3.5.1 | AUTOMATIC SPRINKLER (AS) SYSTEM | Ambulatory health care occupancies shall be protected throughout by an approved, supervised automatic sprinkler system. | NR | NR | Required |
| 3.5.1.1 | Basement Level/s | Basement level (car park/other usage) with fire area exceeding 1115 m ² . | Required | Required | Required |
| 3.5.1.1(1) | | Multiple-level Basement (car park/other usage) regardless of fire area. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|--|-----------|-----------|-----------|
| 3.5.1.2 | Vertical Openings: Convenience Stairways, Communicating Space & Atrium | Buildings with unprotected openings shall be protected throughout by an approved, supervised automatic sprinkler system. | Required | Required | Required |
| 3.5.1.3 | Isolated Hazardous Areas | Isolated hazardous areas shall be protected throughout by an approved, supervised automatic sprinkler system. | Required | Required | Required |
| 3.5.2 | OTHER AUTOMATIC SUPPRESSION SYSTEM | Where an automatic sprinkler system is required in Section 3.5.1 and 3.5.1.1 through 3.5.1.3, the appropriate type of automatic suppression system shall be permitted. | Permitted | Permitted | Permitted |
| 3.5.3 | Fire Hose Reel | Fire hose reels are required in buildings protected by an approved supervised automatic sprinkler system. | Required | Required | Required |
| 3.5.4 | Portable Fire Extinguisher | Applicable Portable Fire Extinguishers required in all buildings. | Required | Required | Required |
| 3.5.5 | Rising Main (Dry or Wet Standpipe) | Refer to Annex Fire Fighting System Annex_FFS_G1 Revisions 2021 | Required | Required | Required |
| 3.6 | SMOKE CONTROL / VENTILATION REQUIREMENTS | Legend: NR-Not Required; NA-Not Applicable; NP-Not Permitted | | | |
| 3.6.1 | STAIRWELL/LOBBY | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.1.1 | Less than 9 m habitable height | | No Reqmt | No Reqmt | No Reqmt |
| 3.6.1.2 | 9 m to 15 m habitable height | Vent at top of stairwell | Required | NA | NA |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | Permitted | NA | NA |
| | | Stairwell Pressurization | NR | NA | NA |
| 3.6.1.3 | >15 m to < 28 m habitable height | Vent at top of stairwell | NA | NP | NA |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | NA | Required | NA |
| | | Stairwell Pressurization | NA | Permitted | NA |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|---|---|-----------|-----------|-----------|
| 3.6.1.4 | ≥ 28 m habitable height | Vent at top of stairwell | NA | NA | NP |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | NA | NA | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | NA | NA | Required |
| | Connecting Basement Levels | | | | |
| 3.6.1.5 | Two basement levels or ≤ 6 m deep, ≤ 2000 m ² floor area | Vent at top of stairwell : * Permitted up to five (5) connecting above floors (2B+G+4 or less) or 12 m habitable height ; whichever is less; otherwise next below provisions shall apply. | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | Permitted | Required | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Required |
| 3.6.1.6 | Three basement levels or ≤ 9.1 m deep, ≤ 2000 m ² floor area | Vent at top of stairwell : * Permitted up to two connecting above floors only (3B+G+1 or less) or 6m habitable height, whichever is less; otherwise next below provisions shall apply | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | NA | NA |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Permitted |
| 3.6.1.7 | Two basement levels or ≤ 6 m deep, >2000 m ² floor area | Vent at top of stairwell: * Permitted up to four (4) connecting floors (2B+G+3 or less) or 9 m habitable height ; whichever is less; otherwise next below provisions shall apply. | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | Required | NP | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|---|--|---|-----------|-----------|
| 3.6.1.8 | Three basement levels or $\leq 9.1\text{ m}$ deep, $>2000\text{ m}^2$ floor area, connecting one floor above only | Vent at top of stairwell : * Permitted up to two connecting above floors or 3 m habitable height only ($3B+G+1$ or less); whichever is less, otherwise next below provisions shall apply | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | NA | NA |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization. | Permitted | Required | Required |
| 3.6.1.9 | Lowest basement level $>9.1\text{ m}$ below ground level, regardless of floor area | Vent at top of stairwell | NP | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NP | NP | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Required | Required | Required |
| 3.6.2 | ESCAPE CORRIDOR PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.2.1 | Interior Corridors | Vents (Fixed or Automatic Opening) | Required in specific type of Occupancy: Healthcare Occupancies and in Detention and Correctional Occupancies | | |
| | | Mechanical Ventilation of Corridor | | | |
| | | Pressurization of Corridor | | | |
| 3.6.2.2 | Corridor with side/s located along exterior walls | Vents (Fixed or Automatic Opening) | Required in specific type of Occupancy: Healthcare Occupancies and in Detention and Correctional Occupancies | | |
| | | Mechanical Ventilation of Corridor | | | |
| | | Pressurization of Corridor | | | |
| 3.6.3 | atrium and OTHER FLOOR OPENINGS PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.3.1 | Malls (with floor openings connecting >2 floors) | Smoke Vents (Fixed or Automatic Opening) | Required | NP | NP |
| | | Mechanical Smoke Exhaust Ventilation System/Engineered | Permitted | Required | Required |
| 3.6.3.2 | Other Occupancies (connecting >3 floor levels) | Smoke Vents (Fixed or Automatic Opening) | Required | Permitted | NP |
| | | Mechanical Smoke Exhaust Ventilation System/Engineered | Permitted | Permitted | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-----------|---|--|--------------------------|---|--------------------------|
| 3.6.4 | CAR PARKS/PARKING STRUCTURES PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.4.1 | Open Parking Structures | The open parking structure shall justify that no smoke stagnation will occur such as from a fire located somewhere in the middle of the car park; otherwise mechanical equipment that will aid in effective dispersal of smoke shall be provided | Required | Required | Required |
| 3.6.4.2 | Aboveground Enclosed Car Parks | | | | |
| 3.6.4.2.1 | Aggregate floor area of $\leq 2000 \text{ m}^2$ | Smoke Vents (Fixed or Automatic) | Required | Required | Permitted |
| | | Mechanical Smoke Purging/Clearance | Permitted | Permitted | Required |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted |
| 3.6.4.2.2 | Aggregate floor area of $> 2000 \text{ m}^2$ | Smoke Vents (Fixed or Automatic) | Required | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | NP |
| | | Engineered Smoke Control System | Required | Permitted | Required |
| 3.6.4.3 | Belowground Car Parks | | $\leq 6\text{m}$ Deep | $> 6\text{m} - \leq 9.1\text{ m}$ Deep | $> 9.1\text{ m}$ Deep |
| 3.6.4.3.1 | Aggregate floor area of $\leq 2000 \text{ m}^2$ | Smoke Vents (Fixed or Automatic) | Required | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | Required |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted |
| 3.6.4.3.2 | Aggregate floor area of $> 2000 \text{ m}^2$ | Smoke Vents (Fixed or Automatic) | NP | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Required | NP | NP |
| | | Engineered Smoke Control System | Permitted | Required | Required |
| 3.7 | CORRIDORS | | Low-rise | Mid-rise | High-rise |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|-------------------------------|--|-----------|-----------|-----------|
| 3.7.1 | Exit Access Corridor WALLS | Where access to exits is provided by corridors, such corridors shall be separated from use areas by fire barriers having a minimum 1-hour fire resistance rating, unless one of the following conditions exists: | Required | Required | Required |
| 3.7.1.1 | | Where exits are available from an open floor area, such as open plan buildings, corridors are not required to be separated. | Permitted | Permitted | Permitted |
| 3.7.1.2 | | Within a space occupied by a single tenant limited to an area occupied under a single management and work the same hours. | Permitted | Permitted | Permitted |
| 3.7.1.3 | | Within buildings protected throughout by an automatic sprinkler system. | Permitted | Permitted | Permitted |
| 3.7.2 | OPENINGS Exit Access Corridor | All doors and other openings onto the exit access corridors shall have not less than 30 minutes fire protection rating unless the corridor serves spaces occupied by a single tenant. | Required | Required | Required |
| 3.7.2.1 | Self-closing Devices | Doors required to be protected in accordance with 3.7.2, shall be self-closing and self-latching. | Required | Required | Required |
| 3.8 | SUBDIVISION OF BUILDING SPACE | | | | |
| 3.8.1 | OCCUPANCY SEPARATION | Ambulatory health care occupancies shall be separated from other tenants and occupancies and shall meet all of the following requirements: | Required | Required | Required |
| 3.8.1.1 | Walls | Walls shall have not less than a 1-hour fire resistance rating and shall extend from the floor slab below to the floor or roof slab above. | Required | Required | Required |
| 3.8.1.2 | Doors | Doors shall be constructed of not less than 44 mm thick, solid-bonded wood core or the equivalent and shall be equipped with positive latches. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|----------------|-----------------------------|---|-----------|-----------|-----------|
| 3.8.1.3 | | Doors shall be self-closing and shall be kept in the closed position, except when in use. | Required | Required | Required |
| 3.8.1.4 | Windows | Any windows in the barriers shall be of fixed fire window assemblies in accordance with NFPA 101 Section 8.3. | Required | Required | Required |
| 3.8.2 | SMOKE COMPARTMENTS | Every story of an ambulatory health care occupancy shall be divided into not less than two smoke compartments, unless otherwise permitted by one of the following: | Required | Required | Required |
| 3.8.2.1 | Area < 465 m ² | Where the area of the ambulatory health care occupancy is less than 465 m ² per story and that area is protected by an approved automatic smoke detection system. | Required | Required | Required |
| 3.8.2.2 | Area < 929 m ² | Where the area of the ambulatory health care occupancy is less than 929 m ² per story and the building is protected throughout by an approved, supervised automatic sprinkler system | Required | Required | Required |
| 3.8.2.3 | Area in Adjoining Occupancy | An area in an adjoining occupancy shall be permitted to serve as a smoke compartment for an ambulatory health care occupancy if all of the following criteria are met: | Permitted | Permitted | Permitted |
| 3.8.2.3(1) | | The separating wall and both compartments meet the requirements of 3.7. | Required | Required | Required |
| 3.8.2.3(2) | | The ambulatory health care occupancy does not exceed 2100 m ² , or | Required | Required | Required |
| 3.8.2.3 (2)(a) | | 3720 m ² in buildings protected throughout by an approved, supervised automatic sprinkler system. | Required | Required | Required |
| 3.8.2.3(3) | | Access from the ambulatory health care occupancy to the other occupancy is unrestricted. | Required | Required | Required |
| 3.8.3 | SIZE of SMOKE COMPARTMENTS | Smoke compartments shall not exceed one of the following: | | | |
| 3.8.3.1 | | An area of 2100 m ² . | Required | Required | Required |
| 3.8.3.2 | | An area of 3720 m ² in buildings protected throughout by an approved, supervised automatic sprinkler system. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|--------|------------------------------------|--|-----------|-----------|-----------|
| 3.8.4 | TRAVEL Distance | The travel distance from any point to reach a door in a smoke barrier shall not exceed 61 m. | Required | Required | Required |
| 3.8.5 | atrium within Smoke Compartments | The area of an atrium separated in accordance with NFPA 101 section 8.6.7 shall not be limited in size. | Permitted | Permitted | Permitted |
| 3.8.6 | SMOKE BARRIERS | Required smoke barriers shall be constructed in accordance with NFPA 101 section 8.5 and shall have a minimum 1-hour fire resistance rating, unless otherwise permitted by 3.8.9. | Required | Required | Required |
| 3.8.7 | | The provisions of NFPA 101 section 8.5.6.5 and section 8.5.7.2 shall not apply. | Required | Required | Required |
| 3.8.8 | | Smoke barriers shall be permitted to terminate at the required occupancy separation where the ambulatory health care occupancy is constructed as a separated multiple occupancy and the separation also meets the requirements for a smoke barrier. | Permitted | Permitted | Permitted |
| 3.8.9 | SMOKE Dampers | Smoke dampers shall not be required in duct penetrations of smoke barriers in fully ducted heating, ventilating, and air-conditioning systems for buildings protected throughout by an approved, supervised automatic sprinkler system. | Permitted | Permitted | Permitted |
| 3.8.10 | WINDOWS | Windows in the smoke barrier shall be of fixed fire window assemblies in accordance with NFPA 101 section 8.3. | Required | Required | Required |
| 3.8.11 | OCCUPANT LOAD (SMOKE COMPARTMENTS) | Not less than 1.4 net m ² per ambulatory health care facility occupant shall be provided within the aggregate area of corridors, patient rooms, treatment rooms, lounges, and other low hazard areas on each side of the smoke compartment for the total number of occupants in adjoining compartments. | Required | Required | Required |
| 3.8.12 | DOORS in SMOKE BARRIER | Doors in smoke barriers shall be not less than 44 mm thick, solid-bonded wood core or the equivalent and shall be self-closing or automatic-closing. | Required | Required | Required |
| 3.8.13 | HARDWARE in Doors | Latching hardware shall not be required on smoke barrier cross-corridor doors. | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|--------|--|--|------------------|------------------|------------------|
| 3.8.14 | VISION PANELS in Doors | A vision panel consisting of fire-rated glazing in approved frames shall be provided in each cross-corridor swinging door and at each cross-corridor horizontal-sliding door in a smoke barrier. | Required | Required | Required |
| 3.8.15 | | Vision panels in doors in smoke barriers, if provided, shall be of fire-rated glazing in approved frames. | Required | Required | Required |
| 3.8.16 | | Rabbets, bevels, or astragals shall be required at the meeting edges, and stops shall be required at the head and sides of door frames in smoke barriers. | Required | Required | Required |
| 3.8.17 | | Center mullions shall be prohibited in smoke barrier door openings where pairs of cross-corridor doors are provided. | NP-Not Permitted | NP-Not Permitted | NP-Not Permitted |
| 3.9 | (Reserved). | | | | |
| 4.0 | SPECIAL PROVISIONS | Special Provisions for Firefighting and Rescue shall comply with QCD FLS Annex and as modified in item 4.0 of this FLS Occupancy Chapter. | | | |
| 4.1 | FIRE (EMERGENCY) COMMAND CENTER (FCC) | QCD FLS Annex_A5 – Revisions_2021. | Not Required | Not Required | Required |
| 4.1.1 | Exemptions | In other than high-rise buildings, instead of a dedicated FCC; lobbies or other spaces adjacent to the main entrance/s may be permitted. | Permitted | Permitted | NP-Not Permitted |
| 4.2 | FIREMAN'S ACCESS PANELS/OPENINGS | QCD FLS Annex_A3 – Revisions_2021 | Required | Required | Required |
| 4.3 | FIRE LIFTS (FIRE SERVICE ACCESS ELEVATORS) | QCD FLS Annex_A4 – Revisions_2021 | Not Required | Not Required | Required |
| 4.3.1 | | The building basement/s is more than nine (9) meters below the average ground level (grade plane). | Required | Required | Required |
| 4.3.2 | FIREFIGHTING LOBBY | QCD FLS Annex_A2 – Revisions_2021 | Required | Required | Required |
| 4.3.3 | SMOKE-STOP LOBBY | QCD FLS Annex_A2 – Revisions_2021 | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-------|---|--|-------------------|-------------------|-----------|
| 4.4 | AMBULANCE STRETCHER ACCOMMODATION | QCD FLS Annex_A4 – Revisions_2021 | Not Required | Required | Required |
| 4.5 | EXTERNAL ACCESS TO SITE AND BUILDINGS | QCD FLS Annex_A3 – Revisions_2021 | Required | Required | Required |
| 4.5.1 | SITE ACCESS/ACCESS ROAD | For gated facility development a 4.0 m wide access road and 4.5 m clear height vertical clearance entry gate or site access shall be provided. | Required | Required | Required |
| 4.5.2 | FIRE ENGINE HARDSTANDING (FEH) | FEH with longer side parallel to the façade of the building shall be provided in buildings exceeding the habitable height of 10 m. | Required | Required | Required |
| 4.6 | REFUGE FLOORS | QCD FLS Annex_A1 – Revisions_2021 | NA-Not Applicable | NA-Not Applicable | Required |
| 4.7 | (Reserved). | | | | |
| 5.0 | BUILDING SERVICES and FIRE PROTECTION EQUIPMENT | Building Services and Fire Protection Equipment shall comply with the applicable NFPA codes and standards and QCD FLS Annex. | | | |
| 5.1 | ELECTRICAL SYSTEM | Electrical wiring and equipment shall be in accordance with NFPA 70. | Required | Required | Required |
| 5.1.1 | ELECTRICAL EQUIPMENT/PANEL ROOMS AND SIMILAR ROOMS/SPACES | QCD FLS Annex _A7 – Revisions_2021 | Required | Required | Required |
| 5.1.2 | EMERGENCY GENERATORS AND STANDBY POWER SYSTEMS. | Emergency generators and standby power systems shall be installed, tested, and maintained in accordance with NFPA 110. | Required | Required | Required |
| 5.1.3 | STORED ELECTRICAL ENERGY SYSTEMS | Stored electrical energy systems shall be installed, tested, and maintained in accordance with NFPA 111. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--------------------------------------|--|----------|----------|-----------|
| 5.2 | COMMERCIAL COOKING OPERATIONS | Where permitted, commercial cooking operations shall be protected in accordance with NFPA 96. | Required | Required | Required |
| 5.3 | ELEVATORS, ESCALATORS, and CONVEYORS | An elevator, shall not be considered a component in a required means of egress and shall be in accordance with NFPA 101 section 9.4. | Required | Required | Required |
| 5.3.1 | NUMBER OF CARS | The number of elevator cars permitted in a hoistway shall be not more than three (3). | Required | Required | Required |
| 5.3.2 | OPENINGS TO EXIT ENCLOSURES | Conveyors, elevators, dumbwaiters, and pneumatic conveyors serving various stories of a building shall not open to an exit enclosure. | Required | Required | Required |
| 5.4 | WASTE and LINEN HANDLING SYSTEM | Chutes and its associated trash collection storage rooms and service opening rooms, when provided shall comply with NFPA 101 section 9.5. | Required | Required | Required |
| 5.4.1 | | Approved waste/linen chutes and transport systems, including gravity waste chutes, full pneumatic waste conveying systems, and gravity pneumatic waste conveying systems, shall comply with the provisions of NFPA 82. | Required | Required | Required |
| 5.4.1.1 | Construction | Chutes, shall be separately enclosed by walls or partitions of not less than 2-hrs fire resistance rating and chute intake openings protection of 1.5-hour fire protection rating. | Required | Required | Required |
| 5.4.1.2 | Trash/Linen Collection Storage Rooms | Chutes, shall have its associated trash collection, service opening rooms separately enclosed by walls of not less than 1-hr fire resistance rating and openings protection of 3/4-hour fire protection rating. | Required | Required | Required |
| 5.4.1.3 | | The doors of chutes shall open only to a trash/linen collection, service opening room, laundry storage room or to a room that is designed and used exclusively for accessing the chute opening. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|----------------------------|---|----------|----------|-----------|
| 5.4.2 | GRAVITY CHUTES | A waste/linen chute shall extend (full size) at least 0.90 m. above the roof of a building. | Required | Required | Required |
| 5.4.2.1 | Chute Venting | The chute shall be open to the atmosphere, with the opening being the same cross-sectional area as the chute. | Required | Required | Required |
| 5.5 | FIRE PUMPS | | | | |
| 5.5.1 | FIRE PUMPS ROOM | QCD FLS Annex _A6 – Revisions_2021 | Required | Required | Required |
| 5.6 | SUBSTATION and SWITCHGEARS | QCD FLS Annex _A8 – Revisions_2021 | Required | Required | Required |
| 5.7 | (Reserved). | | | | |





HOTEL BUILDINGS



HOTEL BUILDINGS

| | | | | | | | | |
|-------|---|-----|--|-------------------|---|--|--|--|
| 1.0 | GENERAL REQUIREMENTS | | The requirements of this chapter shall apply to buildings or portions thereof used as hotel occupancies. | | | | | |
| | A building or groups of buildings under the same management in which there are sleeping accommodations for more than 16 persons and primarily used by transients for lodging with or without meals. | | | | | | | |
| | Apartment Hotel | Inn | Motel | Bed and Breakfast | Other Structure meeting the definition of Hotel | | | |
| 1.1 | GENERAL CONDITIONS & BUILDING LIMITS | | | | | | | |
| | Building Category | | Building Height (m) | | Floor Area (m ²) | | Basement Levels | |
| 1.1.1 | LOW-RISE Hotel Building | | < 15.0 m Habitable Height | | | | | |
| 1.1.2 | MID-RISE Hotel Building | | ≥ 15 m to < 28 m Habitable Height | | No Limit [in Floor Area] | | No Limit [in Floor/Fire Area, Depth or Levels] | |
| 1.1.3 | HIGH-RISE Hotel Building | | ≥ 28 m Habitable Height | | | | | |

FIRE AND LIFE SAFETY REQUIREMENTS

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-------|-------------------------------|---|----------|----------|-----------|
| 1.2 | CLASSIFICATION OF OCCUPANCIES | | | | |
| 1.2.1 | MULTIPLE OCCUPANCIES | Guest rooms and guest suites of hotels shall be permitted to have their sole means of egress pass through a non-residential occupancy in the same building, provided that the sole means of egress from the dwelling unit shall not pass through a high hazard contents area. | Required | Required | Required |
| 1.3 | OCCUPANT LOAD | The occupant load shall be determined on the basis of the occupant load factors (OLF) that are characteristic of the use of the space. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|--|-----------|-----------|-----------|
| 1.3.1 | OCCUPANT LOAD FACTOR (OLF) | The occupant load shall be not less than the number of persons determined by dividing the floor area assigned to that use by the occupant load factor of 18.6 m ² per person. | Required | Required | Required |
| 1.3.2 | NON-RESIDENTIAL OCCUPANCIES in Hotel buildings | The occupant load calculations for areas of hotels used for non-residential purposes shall be based on the occupant load factors (OLF) applicable to the use of the area. | Required | Required | Required |
| 1.4 | CLASSIFICATION OF HAZARD OF CONTENTS | The contents of Residential Hotel Buildings shall be classified as Ordinary Hazard. | Required | Required | Required |
| 1.5 | MINIMUM CONSTRUCTION REQUIREMENTS. | Construction shall be in accordance with NFPA 5000 Chapters 7-8, 13-14, 31, and 35- 40. | Required | Required | Required |
| 1.6 | ACCESSIBILITY. | Accessibility shall be in accordance with NFPA 5000 Chapter 12 and as modified in Chapter 6.0 and Chapter 7.0 of this Hotel Occupancies FLS Occupancy Chapter. | Required | Required | Required |
| 1.7 | (Reserved). | | | | |
| 2.0 | MEANS OF EGRESS REQUIREMENTS | Means of egress shall comply with NFPA 101 Chapter 7, and as modified in item 2.0 of this FLS Occupancy Chapter. | | | |
| 2.1 | MEANS OF ESCAPE | | | | |
| 2.1.1 | NUMBER OF MEANS OF ESCAPE | In guest room or guest suite of two rooms or more, every sleeping room and every living area shall have not less than one primary means of escape and one secondary means of escape. | Required | Required | Required |
| 2.1.1.1 | Exemptions | A secondary means of escape shall not be required where the sleeping room or living area has a door leading directly to the outside of the building at or to the finished ground level. | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|---|---|----------|----------|-----------|
| 2.1.2 | PRIMARY MEANS OF ESCAPE | The primary means of escape shall be a door, stairway, or ramp providing a means of unobstructed travel to the outside of the guest room or guest suite at street or the finished ground level. | Required | Required | Required |
| 2.1.3 | SECONDARY MEANS OF ESCAPE | The secondary means of escape, shall be one of the following means: | Required | Required | Required |
| 2.1.3.1 | | It shall be a door, stairway, passage, or hall providing a way of unobstructed travel to the outside of the dwelling at street or the finished ground level that is independent of and remote from the primary means of escape. | Required | Required | Required |
| 2.1.3.2 | | It shall be a passage thru an adjacent nonlockable space, independent of & remote from the primary means of escape, to any approved means of escape. | Required | Required | Required |
| 2.1.3.3 | | It shall be an outside window or door operable from the inside without the use of tools, keys, or special effort and shall provide a clear opening of not less than 0.53 m ² . | Required | Required | Required |
| 2.1.3.4 | | The width shall be not less than 510 mm, and height not less than 610 mm. The bottom of the opening shall be not more than 1120 mm above the floor. | Required | Required | Required |
| 2.1.4 | TWO (2) PRIMARY MEANS OF ESCAPE | Any guest room or any guest suite of rooms in excess of 185 m ² shall be provided with not less than two exit access doors remotely located from each other. | Required | Required | Required |
| 2.1.5 | ARRANGEMENT OF MEANS OF ESCAPE within a Guest room or Guest Suite | Any required path of travel from any room to the outside shall not pass thru another room not under the immediate control of the occupant of the first room or thru a bathroom or other space subject to locking. | Required | Required | Required |
| 2.1.6 | DOORS (Width) within a Guest room or Guest Suite | Doors in the path of travel of a means of escape, other than bathroom doors and doors serving a room not exceeding 6.5 m ² shall be not less than 710 mm wide. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|---|-----------|-----------|-----------|
| 2.1.6.1 | Bathroom Doors (Width) | Bathroom doors and doors serving a room not exceeding 6.5 m ² shall be not less than 610 mm wide. | Required | Required | Required |
| 2.1.6.2 | Doors (Height) | Doors (within guest rooms, guest suites) nominal height shall be not less than 1980 mm. | Required | Required | Required |
| 2.1.7 | HALLWAYS (Width) | Hallways within a guest room or guest suite shall be not less than 915 mm | Required | Required | Required |
| 2.1.7.1 | Hallways (Height) within a Guest room or Guest Suite | Nominal height of hallways with clearance below projections from the ceiling of not less than 2030 mm shall be not less than 2135 mm. | Required | Required | Required |
| 2.2 | MEANS OF EGRESS COMPONENTS | Components of means of egress shall be limited to the types described in 2.2. | Required | Required | Required |
| 2.2.1 | GENERAL | Exit enclosures shall have a minimum 2-hour fire resistance rating, and doors shall have a minimum 1.5-hours fire protection rating. | Required | Required | Required |
| 2.2.2 | DOORS | Doors shall be in accordance with NFPA 101 section 7.2.1, and the requirements in 2.2.2.1 and 2.2.2.2. | Required | Required | Required |
| 2.2.2.1 | Installed Security Measures | No door in any means of egress shall be locked against egress when the building is occupied. | Required | Required | Required |
| | | Locks, if provided, must not require the use of a key, a tool, or special knowledge or effort for operation from the egress side of the building. | Required | Required | Required |
| 2.2.2.2 | Revolving Doors | Revolving door assemblies, whether used or not used in the means of egress, complying with NFPA 101 section 7.2.1.10. | Permitted | Permitted | Permitted |
| 2.2.3 | STAIRS | Stairs complying with NFPA 101 section 7.2.2. | Required | Required | Required |
| 2.2.3.1 | Spiral Stairs | Spiral stairs used as a component in the means of egress. | NP | NP | NP |
| 2.2.3.2 | Winders | Winders in stairs used as a component in the means of egress. | NP | NP | NP |
| 2.2.4 | SMOKE PROOF ENCLOSURES | Smokeproof enclosures complying with NFPA 101 section 7.2.3. | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-------|-----------------------------|--|-----------|-----------|-----------|
| 2.2.5 | HORIZONTAL EXITS | Horizontal exits complying with NFPA 101 section 7.2.4. | Permitted | Permitted | Permitted |
| 2.2.6 | RAMPS | Accessible ramps and ramps used as a component in the means of egress shall conform with the general requirements for ramps in NFPA 101 7.2.5. | Required | Required | Required |
| 2.2.7 | EXIT PASSAGEWAY | Exit passageways complying with NFPA 101 section 7.2.6 | Permitted | Permitted | Permitted |
| 2.2.8 | AREA OF REFUGE | Areas of refuge complying with NFPA 101 7.2.12, as modified in Chapter 6.0 and Chapter 7.0 of this Hotel Occupancies FLS Occupancy Chapter. | Required | Required | Required |
| 2.3 | CAPACITY OF MEANS OF EGRESS | The capacity of means of egress shall be in accordance with NFPA 101 section 7.3 and as modified in 2.3.2. | Required | Required | Required |
| 2.3.1 | STREET FLOOR EXIT | Street floor exits shall be sufficient for the occupant load of the street floor plus the required capacity of stairs and ramps discharging onto the street floor. | Required | Required | Required |
| 2.3.2 | CORRIDORS | Corridors, other than those within individual guest rooms or individual guest suites, shall be of sufficient width to accommodate the required occupant load and shall be not less than 1200 mm. | Required | Required | Required |
| 2.4 | NUMBER OF MEANS OF EGRESS | The number of means of egress shall be in accordance with NFPA 101 section 7.4 and as permitted in 2.4.3. | Required | Required | Required |
| 2.4.1 | NOT LESS THAN TWO (2) | Not less than two (2) separate exits shall be provided on every story. | Required | Required | Required |
| 2.4.2 | | Not less than two (2) separate exits shall be accessible from every part of every story. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|------------|--|--|-----------|------------------|-----------|
| 2.4.2.1 | | Exit access, shall be permitted to include a single exit access path for the distances permitted as common paths of travel by 2.5.2. | Permitted | Permitted | Permitted |
| 2.4.3 | SINGLE EXIT PROVISIONS | A single exit shall be permitted to serve all floor levels in hotel buildings protected throughout by an approved automatic sprinkler system, provided that all of the conditions for a single exit are met. | Permitted | NP-Not Permitted | NP |
| 2.4.3.1 | Floor Area | Gross floor area (GFA) is equal or less than 500 m ² per floor level . | Required | - | - |
| 2.4.3.2 | Common Path | Common path of travel from the entrance door of any guest room or guest suite to an exit does not exceed 15 m. | Required | - | - |
| 2.4.3.3 | Enclosures of Exit Stairway | Exit stairway is completely enclosed or separated from the rest of the building by a minimum 2-hour fire resistance rating (1.5-hrs doors) where the exit connects four or more stories. | Required | - | - |
| 2.4.3.4 | Number, Depth and Floor Area of Basement | Stairway serve only one (1) basement, that is equal or less than 500 m ² fire area and only has 6.0 m maximum depth. | Required | - | - |
| 2.4.3.5 | Opening Protective | All openings between the exit enclosure and the building are protected with self-closing door assemblies of 1-hour fire protection rating. | Required | - | - |
| 2.4.3.6 | Exit Access Corridors | All corridors serving as access to exits have a minimum of 1-hour fire resistance rating. | Required | - | - |
| 2.4.3.7 | Exit Discharge | Exits shall terminate directly, at a public way or at an interior exit discharge. | Required | - | - |
| 2.4.3.7(1) | | The interior exit discharge in accordance with 2.6.3, shall be within 11 m. from the exit enclosure door to an exterior door leading to the public way. | Required | - | - |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|------------|---|--|-----------|-----------|-----------|
| 2.4.3.7(2) | | The interior exit discharge shall be separated from the remainder of the level of discharge by fire barriers with a minimum 1-hour fire resistance rating | Required | - | - |
| 2.4.3.8 | Subdivisions of Building Spaces | Horizontal and vertical separation of 1.0-hr fire resistance rating is provided between guest room or guest suite. | Required | - | - |
| 2.4.3.9 | Smoke Vents | Provisions of fixed or permanent wall openings, automatic opening vents (AOV) at the top of the staircase. | Required | - | - |
| 2.5 | ARRANGEMENT OF MEANS OF EGRESS | Access to all required exits shall be in accordance with NFPA 101 section 7.5, as modified by 2.5.1 through 2.5.4. | Required | Required | Required |
| 2.5.1 | TRAVEL DISTANCE (TD) TO EXITS | Travel distance within a guest room or guest suite to a corridor door shall not exceed 38 m. | Required | Required | Required |
| 2.5.1.1 | TD from Room Door to an Exit | Travel distance from the corridor door of any guest room or guest suite to the nearest exit s shall not exceed 61 m. | Required | Required | Required |
| 2.5.1.2 | | Travel distance from the corridor door of any guest room or guest suite to the nearest exit, shall not exceed 61 m for exterior ways of exit access. | Required | Required | Required |
| 2.5.2 | COMMON PATH OF TRAVEL | Travel within a dwelling unit shall not be included when calculating common path of travel. | Permitted | Permitted | Permitted |
| 2.5.2.1 | Common Path Limit | Common path of travel shall not exceed 15 m. | Required | Required | Required |
| 2.5.3 | DEAD-END CORRIDOR | Dead-end corridors shall not exceed 15 m. | Required | Required | Required |
| 2.5.4 | EXIT ACCESS DOORS | Any guest room or any guest suite in excess of 185 m ² shall be provided with not less than two exit access doors remotely located from each other. | Required | Required | Required |
| 2.6 | DISCHARGE FROM EXITS | Exits shall terminate directly, at a public way or at an interior exit discharge in accordance with NFPA 101 7.7 and in 2.6.1 through 2.6.3. | Required | Required | Required |
| 2.6.1 | EXIT DISCHARGE THRU INTERIOR BUILDING AREAS | Any required exit stair that is located so that it is necessary to pass through the lobby or other open space to reach the outside of the building shall be continuously enclosed down to a level of exit discharge. | Permitted | Permitted | Permitted |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|---|---------------|---------------|---------------|
| 2.6.1.1 | | Where open stairways are permitted, the requirements for travel distance to exits shall include the travel on such stairs. | Required | Required | Required |
| 2.6.2 | | The distance of travel from the termination of the exit enclosure to an exterior door leading to a public way shall not exceed 30 m. | Required | Required | Required |
| 2.6.3 | | The interior exit discharge shall lead to a free and unobstructed way to the exterior of the building, and such way shall be readily apparent or shall be identifiable by exit signage from the point of discharge from the exit. | Required | Required | Required |
| 2.7 | ILLUMINATION OF MEANS OF EGRESS | Means of egress shall be illuminated in accordance with NFPA 101 7.8. | Required | Required | Required |
| 2.8 | EMERGENCY LIGHTING | Emergency lighting in accordance with NFPA 101 Section 7.9, and in additional locations in 2.8.1. | Required | Required | Required |
| 2.8.1 | ADDITIONAL LOCATIONS | In common areas and corridors within any multiple rooms' guest room or guest suite. | Required | Required | Required |
| 2.8.2 | Exemptions | The requirement for emergency lighting shall not apply where each guest room or guest suite has an exit direct to the outside of the building at street or the finished ground level. | Permitted | Permitted | Permitted |
| 2.9 | MARKINGS OF MEANS OF EGRESS | Means of egress shall have signs in accordance with NFPA 101 section 7.10. | Required | Required | Required |
| 2.9.1 | PWD REFUGE AREA MARKING IN HOTEL ROOMS | Refuge area for PWD shall be clearly marked in emergency plans located in all hotel rooms. | Required | Required | Required |
| 2.10 | NORMALLY UNOCCUPIED BUILDING SERVICE EQUIPMENT SUPPORT AREAS | Provisions for normally unoccupied service support areas in accordance with NFPA 101 section 7.14. | Not permitted | Not permitted | Not permitted |
| 2.11 | (Reserved). | | | | |
| 3.0 | PROTECTION. | Protection shall comply with the applicable NFPA codes and standards, QCD FLS Annex and as modified in item 3.0 of this FLS Occupancy Chapter. | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|---|---|-----------|-----------|-----------|
| 3.1 | PROTECTION OF VERTICAL OPENINGS | Vertical openings shall be enclosed or protected in accordance with NFPA 101 section 8.6. | Required | Required | Required |
| 3.1.1 | CONVENIENCE OPENINGS | Convenience openings in accordance with NFPA 101 section 8.6.9.1. | Permitted | Permitted | Permitted |
| 3.1.2 | WALLS Enclosing Vertical Openings | Walls enclosing vertical openings shall have a min. 1-hour fire resistance rating, and the doors shall have a min. 1-hour fire protection rating. | Required | Required | Required |
| 3.1.3 | FLOOR Below the Level of Exit Discharge | No floor below the level of exit discharge used only for storage, heating equipment, or purposes other than residential occupancy shall have unprotected openings to floors used for residential purposes. | Required | Required | Required |
| 3.2 | PROTECTION FROM HAZARDS | | | | |
| 3.2.1 | GENERAL | Rooms containing high-pressure boilers, refrigerating machinery, transformers, or other service equipment subject to possible explosion shall not be located directly under or directly adjacent to exits & shall be effectively cut off from other parts of the building as specified in NFPA 101 8.7. | Required | Required | Required |
| 3.2.2 | HAZARDOUS AREAS | Any hazardous area shall be protected in accordance with NFPA 101 section 8.7 and as specified in 3.2.2.1 through 3.3.2.9. | Required | Required | Required |
| 3.2.2.1 | Boiler and fuel-fired heater rooms serving more than a single guest room or guest suite | 1 hour and AFS-Automatic Sprinkler System | Required | Required | Required |
| 3.2.2.2 | Employee locker rooms | AFS-Automatic Sprinkler System | Required | Required | Required |
| 3.2.2.3 | Gift or retail shops | AFS-Automatic Sprinkler System | Required | Required | Required |
| 3.2.2.4 | Bulk laundries | 1 hour and AFS-Automatic Sprinkler System | Required | Required | Required |
| 3.2.2.5 | Guest Laundries $\leq 9.3 \text{ m}^2$ outside of rooms/suites | AFS-Automatic Sprinkler System | Required | Required | Required |
| 3.2.2.6 | Guest Laundries $> 9.3 \text{ m}^2$ outside of rooms/suites | 1 hour and AFS-Automatic Sprinkler System | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-----------|--|--|----------|----------|-----------|
| 3.2.2.7 | Maintenance shops | 1 hour and AFS-Automatic Sprinkler System | Required | Required | Required |
| 3.2.2.8 | Storage Rooms | 1 hour and AFS-Automatic Sprinkler System | Required | Required | Required |
| 3.2.2.8.2 | | Where storage areas not exceeding 2.2 m ² are directly accessible from the guest room or guest suite, no separation is required. | NR | NR | NR |
| 3.2.2.9 | Trash collection rooms | 1 hour and AFS-Automatic Sprinkler System. Also see 5.1. | Required | Required | Required |
| 3.3 | INTERIOR FINISH | Interior finish shall be in accordance with NFPA 101 Section 10.2. | Required | Required | Required |
| 3.3.1 | INTERIOR WALL AND CEILING FINISH | Interior wall and ceiling finish materials shall be permitted as follows: | Required | Required | Required |
| 3.3.1.1 | | Exit enclosures – Class A | Required | Required | Required |
| 3.3.1.2 | | Lobbies and corridors – Class A or Class B | Required | Required | Required |
| 3.3.1.3 | | Other spaces – Class A, Class B, or Class C | Required | Required | Required |
| 3.3.2 | INTERIOR FLOOR FINISH | Interior floor finish in exit enclosures and exit access corridors and spaces not separated by walls complying with 3.6 shall be not less than Class II. | Required | Required | Required |
| 3.4 | DETECTION, ALARM & COMMUNICATION REQUIREMENTS | | | | |
| 3.4.1 | GENERAL | Complete coverage of Fire Detection and Alarm System. | Required | Required | Required |
| 3.4.2 | INITIATION | Complete coverage of an Automatic Detection and Manual Initiating Devices. | Required | Required | Required |
| 3.4.3 | OCCUPANT NOTIFICATION | Complete coverage of an Occupant notification (audible & visible). | Required | Required | Required |
| 3.4.3.1 | Provision for Notification of Hearing impaired | Visible signals in units designed for the hearing impaired. (Refer to item 7.5). | Required | Required | Required |
| 3.4.3.2 | Emergency Voice Evacuation System | Mass Notification System | Required | Required | Required |
| 3.4.4 | SUPPLEMENTARY | | | | |
| 3.4.4.1 | Fire Telephone | | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|--|------------------|----------|-----------|
| 3.4.4.2 | Graphic Annunciator | Panel or PC based workstation with graphics user interface software | Required | Required | Required |
| 3.5 | EXTINGUISHMENT REQUIREMENTS | | | | |
| 3.5.1 | AUTOMATIC SPRINKLER SYSTEM | All hotels buildings shall be protected throughout by an approved, supervised automatic sprinkler system. | Required | Required | Required |
| 3.5.2 | DRAFT STOPS and CLOSELY SPACED SPRINKLERS in Vertical Openings | The provisions for draft stops and closely spaced sprinklers shall not be required for openings complying with 3.1.1 where the opening is within the guest room or guest suite. | NR- Not required | NR | NR |
| 3.5.4 | OPEN PARKING STRUCTURES | Open parking structures complying with the openings requirement for an open parking structure and are contiguous with or adjacent to hotels shall be exempt from the sprinkler requirements. | NR | NR | NR |
| 3.5.5 | Fire Hose Reel | Fire hose reels are required in buildings protected by an approved supervised automatic sprinkler system. | Required | Required | Required |
| 3.5.6 | Portable Fire Extinguisher | Applicable Portable Fire Extinguishers required in all buildings. | Required | Required | Required |
| 3.5.7 | Rising Main (Dry or Wet Standpipe) | Refer to Annex Fire Fighting System Annex_FFS_G1 Revisions 2021 | Required | Required | Required |
| 3.6 | SMOKE CONTROL / VENTILATION REQUIREMENTS | Legend: NR-Not Required; NA-Not Applicable; NP-Not Permitted | | | |
| 3.6.1 | STAIRWELL/LOBBY PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.1.1 | Less than 9 m habitable height | | No Reqmt | No Reqmt | No Reqmt |
| 3.6.1.2 | 9 m to 15 m habitable height | Vent at top of stairwell | Required | NA | NA |
| | | Stair ventilation openings at ever floor level (stairs along external walls) | Permitted | NA | NA |
| | | Stairwell Pressurization | NR | NA | NA |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|---|---|-----------|-----------|-----------|
| 3.6.1.3 | >15 m to < 28 m habitable height | Vent at top of stairwell | NA | NP | NA |
| | | Stair ventilation openings at ever floor level (stairs along external walls) | NA | Required | NA |
| | | Stairwell Pressurization | NA | Permitted | NA |
| 3.6.1.4 | ≥28 m habitable height | Vent at top of stairwell | NA | NA | NP |
| | | Stair ventilation openings at ever floor level (stairs along external walls) | NA | NA | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | NA | NA | Required |
| | Connecting Basement Levels | | | | |
| 3.6.1.5 | Two basement levels or ≤6 m deep, ≤2000 m ² floor area | Vent at top of stairwell : * Permitted up to five (5) connecting above floors (2B+G+4 or less) or 12 m habitable height ; whichever is less; otherwise next below provisions shall apply. | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | Permitted | Required | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Required |
| 3.6.1.6 | Three basement levels or ≤ 9.1m deep, ≤2000 m ² floor area | Vent at top of stairwell : * Permitted up to three (3) connecting above floors only (3B+G+2 or less) or 6m habitable height, whichever is less; otherwise next below provisions shall apply | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | NA | NA |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|--|---|----------|-----------|
| 3.6.1.7 | Two basement levels or ≤ 6 m deep, >2000 m ² floor area | Vent at top of stairwell: * Permitted up to four (4) connecting floors (2B+G+3 or less) or 9 m habitable height ; whichever is less; otherwise next below provisions shall apply. | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | Required | NP | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Required | Required |
| 3.6.1.8 | Three basement levels or ≤ 9.1 m deep, >2000 m ² floor area, connecting one floor above only | Vent at top of stairwell : * Permitted up to two connecting above floors or 3 m habitable height only (3B+G+1 or less); whichever is less, otherwise next below provisions shall apply | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | NA | NA |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization. | Permitted | Required | Required |
| 3.6.1.9 | Lowest basement level >9.1 m below ground level, regardless of floor area | Vent at top of stairwell | NP | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NP | NP | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Required | Required | Required |
| 3.6.2 | ESCAPE CORRIDOR PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.2.1 | Interior Corridors | Vents (Fixed or Automatic Opening) | Required in specific type of Occupancy: Healthcare Occupancies and in Detention and Correctional Occupancies | | |
| | | Mechanical Ventilation of Corridor | | | |
| | | Pressurization of Corridor | | | |
| 3.6.2.2 | Corridor with side/s located along exterior walls | Vents (Fixed or Automatic Opening) | | | |
| | | Mechanical Ventilation of Corridor | | | |
| | | Pressurization of Corridor | | | |
| 3.6.3 | atrium and OTHER FLOOR OPENINGS PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-----------|--|--|--------------------------|--|--------------------------|
| 3.6.3.1 | Malls (with floor openings connecting >2 floors) | Smoke Vents (Fixed or Automatic Opening) | Required | NP | NP |
| | | Mechanical Smoke Exhaust Ventilation System/Engineered | Permitted | Required | Required |
| 3.6.3.2 | Other Occupancies (connecting >3 floor levels) | Smoke Vents (Fixed or Automatic Opening) | Required | Permitted | NP |
| | | Mechanical Smoke Exhaust Ventilation System/Engineered | Permitted | Permitted | Required |
| 3.6.4 | CAR PARKS/PARKING STRUCTURES PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.4.1 | Open Parking Structures | The open parking structure shall justify that no smoke stagnation will occur such as from a fire located somewhere in the middle of the car park; otherwise mechanical equipment that will aid in effective dispersal of smoke shall be provided | Required | Required | Required |
| 3.6.4.2 | Aboveground Enclosed Car Parks | | | | |
| 3.6.4.2.1 | Aggregate floor area of $\leq 2000\text{ m}^2$ | Smoke Vents (Fixed or Automatic) | Required | Required | Permitted |
| | | Mechanical Smoke Purging/Clearance | Permitted | Permitted | Required |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted |
| 3.6.4.2.2 | Aggregate floor area of $> 2000\text{ m}^2$ | Smoke Vents (Fixed or Automatic) | Required | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | NP |
| | | Engineered Smoke Control System | Required | Permitted | Required |
| 3.6.4.3 | Belowground Car Parks | | $\leq 6\text{m}$ Deep | $> 6\text{m} -$ $\leq 9.1\text{ m}$ Deep | $> 9.1\text{ m}$ Deep |
| 3.6.4.3.1 | Aggregate floor area of $\leq 2000\text{ m}^2$ | Smoke Vents (Fixed or Automatic) | Required | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | Required |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted |
| 3.6.4.3.2 | Aggregate floor area of $> 2000\text{ m}^2$ | Smoke Vents (Fixed or Automatic) | NP | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Required | NP | NP |
| | | Engineered Smoke Control System | Permitted | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|------------|---------------------------------------|---|---------------|---------------|---------------|
| 3.7 | CORRIDORS | Exit access corridor shall be protected in accordance with 3.7.1 thru 3.7.4 | Low-rise | Mid-rise | High-rise |
| 3.7.1 | WALLS | Corridor walls shall have a minimum 1/2-hour fire resistance rating. | Required | Required | Required |
| 3.7.2 | DOORS | Doors that open onto exit access corridors shall have not less than 30-minute fire protection rating | Required | Required | Required |
| 3.7.2.1 | Self-closing/Self-Latching Devices | Doors that open onto exit access corridors shall be self-closing and self-latching. | Required | Required | Required |
| 3.7.3 | UNPROTECTED OPENINGS | Unprotected openings, other than those from spaces complying with 3.7.3.1, shall be prohibited in exit access corridor walls and doors. | Not permitted | Not permitted | Not permitted |
| 3.7.3.1 | Exemption | Spaces shall be permitted to be unlimited in area and open to the corridor, provided that all of the following criteria are met: | Permitted | Permitted | Permitted |
| 3.7.3.1(1) | | The space is not used for guest rooms or guest suites or hazardous areas. | Required | Required | Required |
| 3.7.3.1(2) | | The space does not obstruct access to required exits. | Required | Required | Required |
| 3.7.4 | TRANSOM, LOUVERS, OR TRANSFER GRILLES | Transoms, louvers, or transfer grilles shall be prohibited in walls or doors of exit access corridors. | Not permitted | Not permitted | Not permitted |
| 3.8 | SUBDIVISION OF BUILDING SPACES | Buildings shall be subdivided in accordance with 3.8.1. | | | |
| 3.8.1 | SEPARATION BETWEEN ROOMS | Each hotel guest room, including guest suites, shall be separated from other guest rooms by walls and floors constructed as fire barriers having a minimum 1/2-hour fire resistance rating. | Required | Required | Required |
| 3.8.2 | DOORS | Doors in the barriers required by 3.8.1 shall have a fire protection rating of not less than 30 minutes and shall not be required to be self-closing. | Required | Required | Required |
| 3.9 | (Reserved). | | | | |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-------|--|--|-------------------|-------------------|-----------|
| 4.0 | SPECIAL PROVISIONS | Special Provisions for Firefighting and Rescue shall comply with QCD FLS Annex and as modified in item 4.0 of this FLS Occupancy Chapter. | | | |
| 4.1 | FIRE (EMERGENCY) COMMAND CENTER (FCC) | QCD FLS Annex_A5 – Revisions_2021. | Required | Required | Required |
| 4.2 | FIREMAN'S ACCESS PANELS/OPENINGS | QCD FLS Annex_A3 – Revisions_2021 | Required | Required | Required |
| 4.3 | FIRE LIFTS (FIRE SERVICE ACCESS ELEVATORS) | QCD FLS Annex_A4 – Revisions_2021 | Not Required | Not Required | Required |
| 4.3.1 | | The building basement/s is more than nine (9) meters below the average ground level (grade plane). | Required | Required | Required |
| 4.3.2 | FIREFIGHTING LOBBY | QCD FLS Annex_A2 – Revisions_2021 | Required | Required | Required |
| 4.3.3 | SMOKE-STOP LOBBY | QCD FLS Annex_A2 – Revisions_2021 | Required | Required | Required |
| 4.4 | AMBULANCE STRETCHER ACCOMMODATION | QCD FLS Annex_A4 – Revisions_2021 | Not Required | Required | Required |
| 4.5 | EVACUATION LIFT | Evacuation lift in accordance with 7.4, shall be provided in hotel buildings. | Required | Required | Required |
| 4.6 | EXTERNAL ACCESS TO SITE AND BUILDINGS | QCD FLS Annex_A3 – Revisions_2021 | Required | Required | Required |
| 4.6.1 | SITE ACCESS/ACCESS ROAD | For gated facility development a 4.0 m wide access road and 4.5 m clear height vertical clearance entry gate or site access shall be provided. | Required | Required | Required |
| 4.6.2 | FIRE ENGINE HARDSTANDING (FEH) | FEH with longer side parallel to the façade of the building shall be provided in buildings exceeding the habitable height of 10 m. | Required | Required | Required |
| 4.7 | REFUGE FLOORS | QCD FLS Annex_A1 – Revisions_2021 | NA-Not Applicable | NA-Not Applicable | Required |
| 4.8 | (Reserved). | | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|------------|---|--|----------|----------|-----------|
| 5.0 | BUILDING SERVICES and FIRE PROTECTION EQUIPMENT | Building Services and Fire Protection Equipment shall comply with the applicable NFPA codes and standards and QCD FLS Annex. | | | |
| 5.1 | ELECTRICAL SYSTEM | Electrical wiring and equipment shall be in accordance with NFPA 70. | Required | Required | Required |
| 5.1.1 | ELECTRICAL EQUIPMENT/PANEL ROOMS AND SIMILAR ROOMS/SPACES | QCD FLS Annex _A7 – Revisions_2021 | Required | Required | Required |
| 5.1.2 | EMERGENCY GENERATORS AND STANDBY POWER SYSTEMS. | Emergency generators and standby power systems shall be installed, tested, and maintained in accordance with NFPA 110. | Required | Required | Required |
| 5.1.3 | STORED ELECTRICAL ENERGY SYSTEMS | Stored electrical energy systems shall be installed, tested, and maintained in accordance with NFPA 111. | Required | Required | Required |
| 5.2 | COMMERCIAL COOKING OPERATIONS | Where permitted, commercial cooking operations shall be protected in accordance with NFPA 96. | Required | Required | Required |
| 5.3 | ELEVATORS, ESCALATORS, and CONVEYORS | An elevator, shall not be considered a component in a required means of egress and shall be in accordance with NFPA 101 section 9.4. | Required | Required | Required |
| 5.3.1 | NUMBER OF CARS | The number of elevator cars permitted in a hoistway shall be not more than three (3). | Required | Required | Required |
| 5.3.2 | OPENINGS TO EXIT ENCLOSURES | Conveyors, elevators, dumbwaiters, and pneumatic conveyors serving various stories of a building shall not open to an exit enclosure. | Required | Required | Required |
| 5.4 | WASTE/LINEN HANDLING SYSTEM | Waste/Linen chutes and its associated trash collection storage rooms and service opening rooms, when provided shall comply with NFPA 101 9.5. | Required | Required | Required |
| 5.4.1 | | Approved chutes and transport systems, including gravity waste chutes, full pneumatic waste conveying systems, and gravity pneumatic waste conveying systems, shall comply with the provisions of NFPA 82. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--------------------------------------|---|----------|----------|-----------|
| 5.4.1.1 | Construction | Waste/linen chutes, shall be separately enclosed by walls or partitions of not less than 2-hrs fire resistance rating and chute intake openings protection of 1.5-hour fire protection rating. | Required | Required | Required |
| 5.4.1.2 | Waste/Linen Collection Storage Rooms | Waste/linen chutes, shall have its associated trash collection, service opening rooms separately enclosed by walls of not less than 1-hr fire resistance rating and openings protection of 3/4-hour fire protection rating. | Required | Required | Required |
| 5.4.1.3 | | The doors of chutes shall open only to a trash collection, service opening room, laundry storage room or to a room that is designed and used exclusively for accessing the chute opening. | Required | Required | Required |
| 5.4.2 | GRAVITY CHUTES | A waste/linen chute shall extend (full size) at least 0.92 m. above the roof of a building. | Required | Required | Required |
| 5.4.2.1 | Chute Venting | The chute shall be open to the atmosphere, with the opening being the same cross-sectional area as the chute. | Required | Required | Required |
| 5.5 | FIRE PUMPS | | | | |
| 5.5.1 | FIRE PUMPS ROOM | QCD FLS Annex _A6 – Revisions_2021 | Required | Required | Required |
| 5.6 | SUBSTATION and SWITCHGEARS | QCD FLS Annex _A8 – Revisions_2021 | Required | Required | Required |
| 5.7 | (Reserved). | | | | |
| 6.0 | EVACUATION MANAGEMENT PLANS | | | | |
| 6.1 | EMERGENCY ESCAPE PLAN | Emergency escape plan shall be required for all hotels and should include a specific section containing details for the evacuation of PWDs. | Required | Required | Required |
| 6.2 | EVACUATION MANAGEMENT PLAN | An evacuation management plan complimenting the provisions made in the building or premises shall be prepared by the responsible person at the hotel. | Required | Required | Required |
| 6.3 | | The plan shall include the name of all responsible people for the evacuation of PWDs and clearly indicate the roles of each person. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-------|------------------------|--|----------|----------|-----------|
| 6.4 | | The plan shall include the name of all responsible people for the evacuation of PWDs and clearly indicate the roles of each person. | Required | Required | Required |
| 6.5 | | The plan shall be constructed with a procedure for a wide range of people with disability including but not limited to: Mobility impairment [including but not limited to: Older people with limited movement ability, Pregnant Women, Inquired persons, Wheelchair users.] Visual impairment, Hearing impairment, Cognitive impairment. | Required | Required | Required |
| 6.6 | | The plan shall require a mandatory question at check-in to declare the number of people with disability, the type of disability, the contact info for the PWD or their primary care giver, and the room in which they are staying. | Required | Required | Required |
| 6.6.1 | | All above info shall be recorded and managed by the responsible person at the facility and provided for Qatar Civil Defence Operation Department at request. | Required | Required | Required |
| 6.6.2 | | PWDs evacuation features and procedures shall be explained to the PWD at check-in. | Required | Required | Required |
| 6.7 | | It shall be the duty of the responsible person to ensure that all PWDs have been evacuated. | Required | Required | Required |
| 6.8 | | It shall be the duty of the responsible person to conduct the evacuation of PWDs until the arrival of Qatar Civil Defence Operation Department. | Required | Required | Required |
| 6.9 | REFERENCES | Useful reference for preparing an evacuation plan dedicated for PWDs includes but not limited to: | - | - | - |
| 6.9.1 | | Emergency Evacuation Planning Guide for people with disabilities (NFPA) | - | - | - |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|------------|---|--|----------|----------|-----------|
| 6.9.2 | | Fire safety risk assessment means of escape for disabled people (by the UK government) | - | - | - |
| 6.10 | (Reserved). | | | | |
| 7.0 | PROVISIONS FOR PEOPLE WITH DISABILITIES (PWDs) | | | | |
| 7.1 | GENERAL | | | | |
| 7.1.1 | | These requirements shall apply when referred to by a specific occupancy section. | Required | Required | Required |
| 7.1.2 | | All buildings shall have emergency escape routes leading to places of safety or refuge that are accessible to all people regardless of their physical conditions. The requirements of emergency escape features shall depend on the size of the building, height or number of floors, as well as the proportion of persons with disabilities (PWDs) that may reasonably be expected to be present in the building at any given time. | Required | Required | Required |
| 7.1.3 | | The escape routes shall have sufficient space area free from any obstacles or obstructions that may cause tripping hazards and undue delay to people with disabilities during evacuation. | Required | Required | Required |
| 7.1.4 | | It is recommended that PWDs are given the closest room available to the ground floor of their selected hotel room tier to facilitate evacuation efforts | - | - | - |
| 7.2 | ACCESSIBLE REFUGE AREA | | | | |
| 7.2.1 | Refuge Area Locations | Refuge area shall be provided in all floors other than floors having direct escape route to a public way, for persons with disabilities (PWDs) to escape to without assistant. | Required | Required | Required |
| 7.2.2 | Number of Designated refuge areas per floor level | There shall be at least two (2) designated refuge areas for persons with disabilities (PWDs) on every floor of a building except for building permitted and designed to have single exit staircase. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-----------|---|---|----------|----------|-----------|
| 7.2.3 | Refuge Area | Refuge area shall be separated from the building floor by both a fire and smoke barrier having at least 60 minutes fire-resistance rating. Doors to the refuge area shall be designed to resist passage of smoke for the same period of the enclosure protection rating. | Required | Required | Required |
| 7.2.4 | Persons with disabilities (PWD) Designater Area Marking | The designated space for persons with disabilities (PWDs) shall be marked clearly on the floor. | Required | Required | Required |
| 7.2.5 | Refuge Area Configurations | Refuge area shall be served by an exit via an emergency staircase or fire-fighting lift. Same shall be free of obstruction and located in the building according to the following order of priority: | Required | Required | Required |
| | | Note: The Mandatory Requirement of 7.2.5 is to comply with only one of the following as minimum provision 7.2.5.1,7.2.5.2 or 7.2.5.3 whichever is applicable. (it is not the intent of this item to require on all locations). Refer to item 7.8 for illustrations. | Required | Required | Required |
| 7.2.5.1 | Smoke Proof Lobbies | Within a fire fighting lobby or smoke-stop lobby directly adjacent to an exit staircase. | Required | Required | Required |
| 7.2.5.1.1 | Fire Fighting Lobby | Where provided within a fire fighting lobby that is adjacent to a protected exit staircase, the designated space for persons with disabilities (PWDs) shall be marked clearly on the floor and shall at least be 500 mm away from the edge of the entrance to the staircase and occupant escape path towards the staircase. The designated space shall likewise not block entrance to the lifts. (See Figure 7.2.5.1.1 on item 7.8) | Required | Required | Required |
| 7.2.5.1.2 | Smoke Stop Lobby | Where provided within a smoke stop lobby, the designated space shall not reduce the area required for the smoke-stop lobby. (See Figure 7.2.5.1.2a and 7.2.5.1.2b on item 7.8) | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-----------|---|---|----------|----------|-----------|
| 7.2.5.2 | Corridors | Within a corridor positioned at least 2000 mm away from the edge of the entrance door to the exit staircase.(see figure 7.2.5.2a, figure 7.2.5.2b and figure 7.2.5.2c on item 7.8) | Required | Required | Required |
| 7.2.5.3 | Exist Staircase | Inside exit staircase, provided there is no firefighting lobby, smoke-stop lobby, or corridor. The designated space for persons with disabilities (PWDs) (or wheelchair) inside the staircase shall be adequately sized to accommodate at least one space measuring 900 mm width and 1200 mm deep, for a wheelchair which shall not encroach on the escape route. Appropriate markings shall be made on the floor to define the space designated for the persons with disabilities (PWDs) to stay and wait for rescue. (see figure 7.2.5.3a & 7.2.5.3b on item 7.8) | Required | Required | Required |
| 7.2.6 | Means of Communication / Fire Telephone | Refuge area for persons with disabilities (PWDs) shall be equipped with a telephone or means of communication connected to the Fire Command Centre that is manned on a 24-hour basis. | Required | Required | Required |
| 7.2.6.1 | General Installation | Device for means for communication shall comply with the following: | Required | Required | Required |
| 7.2.6.1.1 | | Located between 800 mm to 1200 mm above the finished floor level. | Required | Required | Required |
| 7.2.6.1.2 | | Appropriately marked or labelled. | Required | Required | Required |
| 7.2.6.1.3 | | Provided with prominently displayed and clear instruction of its use and operation. | Required | Required | Required |
| 7.2.6.1.4 | | Generate visual confirmation signal once activated and distress signal has been relayed to the emergency monitoring and response station or Fire Command Centre. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|---------------------------------|--|----------|----------|-----------|
| 7.2.7 | Designated area for wheel chair | Refuge area shall be adequately sized to accommodate at least one space measuring 900 mm width and 1200 mm deep for a wheelchair which shall not encroach on the escape route. Appropriate markings shall be made on the floor to define the space designated for persons with disabilities (PWDs) to stay and wait for rescue. (See Figure 7.2.7 on item 7.8) | Required | Required | Required |
| 7.2.8 | Floor Markings | Refuge area for persons with disabilities (PWDs) shall have their locations identified by directional signage labelled with international symbols of accessibility. | Required | Required | Required |
| 7.3 | ACCESSIBLE RAMPS | | | | |
| 7.3.1 | General | Any component of the means of egress other than the exit staircase containing steps shall be required to have a ramp to facilitate the movement of PWDs. | Required | Required | Required |
| 7.3.2 | Ramp Design | Ramps shall be designed to meet the following: | Required | Required | Required |
| 7.3.2.1 | Minimum Width | The unobstructed width of a ramp and landing measure between handrails shall not be less than 1000 mm. | Required | Required | Required |
| 7.3.2.2 | | Ramps shall be constructed of non-slip material. The surface should retain non-slip characteristics even when wet. | Required | Required | Required |
| 7.3.2.3 | | Ramps shall be constructed of the same or similar materials as the surrounding floor or ground materials. | Required | Required | Required |
| 7.3.2.4 | Ramp Slope & Ramp Rise | The max. slope shall be 1:12 and maximum ramp rise shall be 760 mm. | Required | Required | Required |
| 7.3.2.5 | | Ramps shall have landings at the top and bottom. The minimum length of a straight landing shall be 1200 mm. Landings that incorporates change in direction, 45 degrees or more, shall accommodate a turning circle of 1500 mm in diameter. (See Figure 7.3.2.5 on item 7.8) | Required | Required | Required |
| 7.3.2.6 | | Cross slope of ramps shall not exceeding 1:48 | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|----------|--------------------------|---|----------|----------|-----------|
| 7.3.2.7 | | Handrails shall have a round or oval profile with a minimum outside diameter of 35 mm and a maximum outside diameter of 50 mm. Oval profile handrails should be 50 mm wide and 40 mm deep, with rounded edges with radius of at least 15 mm. (see figure 7.3.2.7 in item 7.8) | Required | Required | Required |
| 7.3.2.8 | | Clear distance between the edge of the handrail and the walls shall not be less than 50 mm. (see figure 7.3.2.8 in item 7.8) | Required | Required | Required |
| 7.3.2.9 | | Ramps where crowding or heavy volumes are anticipated, shall additionally have a central handrail where the flight is wider than 3 m. | Required | Required | Required |
| 7.3.2.10 | | Handrails shall extend at least 300 mm beyond the top of the ramp and 300 mm beyond the bottom of the ramp. | Required | Required | Required |
| 7.3.2.11 | | Handrails shall be fixed at a height of 900 mm above the walking level of ramps and landings. | Required | Required | Required |
| 7.4 | EVACUATION LIFT FOR PWDs | | | | |
| 7.4.1 | | At least one of the lifts in buildings installed with number of lifts and required to have provisions for evacuation of persons with disabilities (PWDs) shall be designated as evacuation lift. | Required | Required | Required |
| 7.4.2 | Locations | Evacuation lift shall be located within a protected lobby such as a smoke stop lobby that is directly adjacent to a protected exit staircase, external passageway or external corridor. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--------------------------------------|---|----------|----------|-----------|
| 7.4.3 | Designated Evacuation Lifts for PWDs | Evacuation lifts shall be required as follow: | | | |
| 7.4.3.1 | | If two fire lifts are provided, then one of them can be designated as an evacuation lift for PWDs. | Required | Required | Required |
| 7.4.3.2 | | If only one fire lift is provided, or the building does not include a provision of a fire lift then an ambulance stretcher lift can be designated as an evacuation lift for PWDs. | Required | Required | Required |
| 7.4.3.3 | | If the building does not include a provision for a fire lift or an ambulance stretcher lift, then an occupant lift can be designated as an evacuation lift for PWDs. | Required | Required | Required |
| 7.4.4 | PWD Evacuation Elevator Requirements | Lifts designated as evacuation lifts for PWDs, shall comply with the requirement in item 7.4 of this document as well as NFPA 101-2018 clause 7.15. | Required | Required | Required |
| 7.4.5 | | The floor of the lift cabin shall be slip resistant and have similar frictional qualities to the floor of the lift landing to decrease the risk of stumbling. | Required | Required | Required |
| 7.4.6 | Visible Signage | Readily visible sign marked in english with "FIRE EVACUATION LIFT FOR PERSONS WITH DISABILITY" and in arabic : "مصعد مخصص لذلة الأشخاص ذوي الاعاقة". This shall be affixed adjacent to entrance of an evacuation lift lobby or lift door, in the case of lift not accessed via lobby, at every floor or landing of the evacuation lift. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-------|---|--|----------|----------|-----------|
| 7.4.7 | | A visual indicator shall be provided to confirm that an emergency call has been received. | Required | Required | Required |
| 7.4.8 | | The evacuation lift shall be provided with emergency power supply for continuous operation during power failure and/or fire emergency. | Required | Required | Required |
| 7.5 | NOTIFICATION APPLIANCE FOR HEARING IMPAIRED | | | | |
| 7.5.1 | | Visual notification shall be provided in Hotels to alert hearing impaired person of a fire or emergency. | Required | Required | Required |
| 7.5.2 | | Visual notification shall be provided in all common areas in the Hotel. | Required | Required | Required |
| 7.5.3 | | Ten percent (10%) of the hotel rooms shall be provided with visible notification devices for the purpose of notifying people with hearing impairment distributed over different room tiers. | Required | Required | Required |
| 7.5.4 | | Guest rooms/ Units required to have notification appliances shall have the appliances installed to cover every part of the unit, including but not limited to the living rooms, bathrooms, and kitchens. | Required | Required | Required |
| 7.5.5 | | The visual alarm shall comply with the visible notification as per NFPA 72. | Required | Required | Required |
| 7.6 | EVACUATION CHAIR | | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-------|--|---|----------|----------|-----------|
| 7.6.1 | Number of evacuation chairs | Evacuation chairs shall be located at every staircase every 5 floors, with 2 evacuation chairs provided as a spare in the fire command center. Note: Alternative stair descent measures (like Emergency Stair Travel Devices) for transporting PWD that are part of evacuation plan. | Required | Required | Required |
| 7.6.2 | Signage for Evacuation chair locations | Signages showing the evacuation chair locations shall be provided on each stair level. Such information shall be available indicating the current floor level location and the nearest floor level above and below with wheel chair provisions. | Required | Required | Required |
| 7.6.3 | | The signages mentioned in item 6.6.2 above shall also be shown on areas of refuge. Near the Designated areas for wheel chair on fire fighting lobby , smoke stop lobby, corridors or inside the stairs | Required | Required | Required |
| 7.7 | (Reserved). | | | | |

ILLUSTRATIONS AND FIGURES

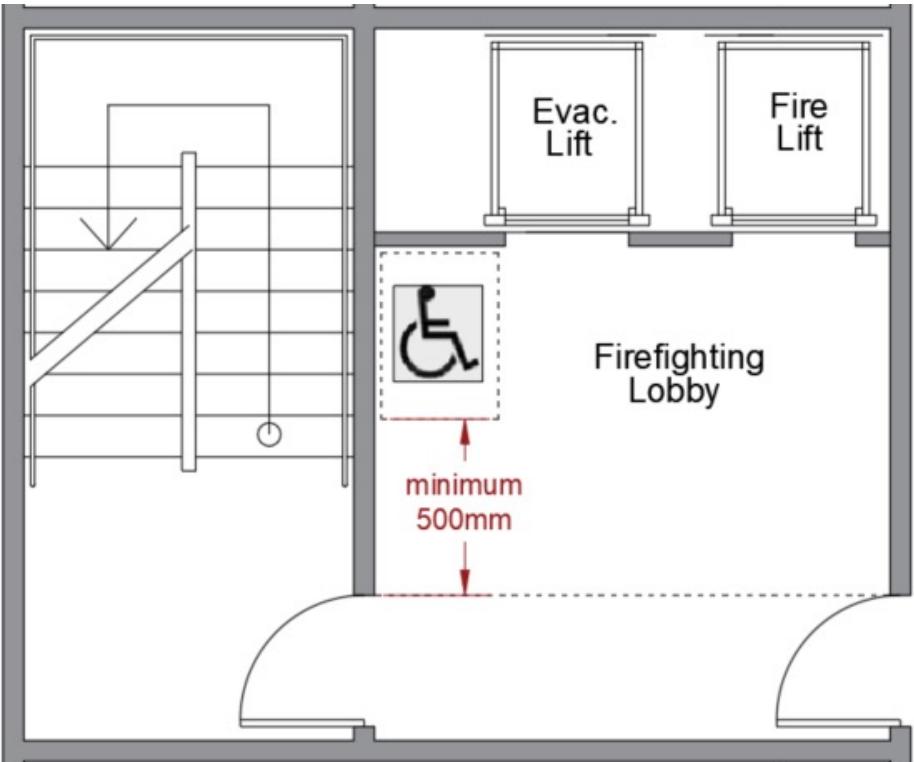


Figure 7.2.5.1.1- Designated space for persons with disabilities (PWDs) adjacent to protected stair case within a Fire Fighting Lobby



ILLUSTRATIONS AND FIGURES

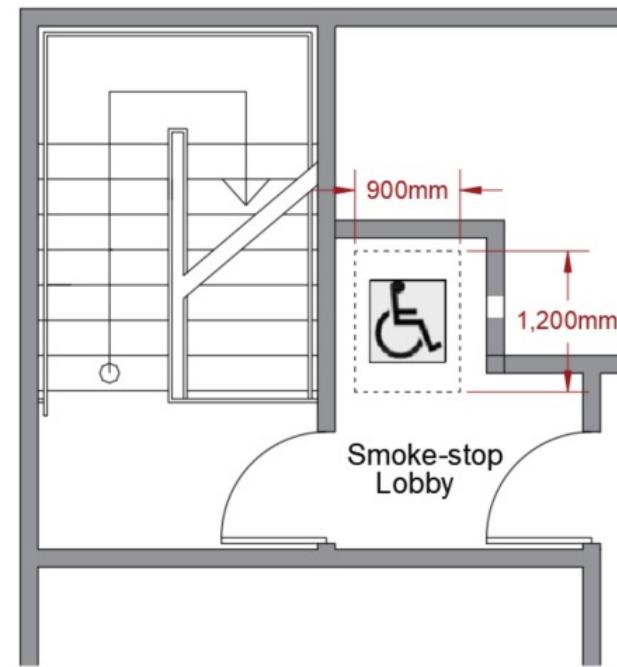


Figure 7.2.5.1.2a

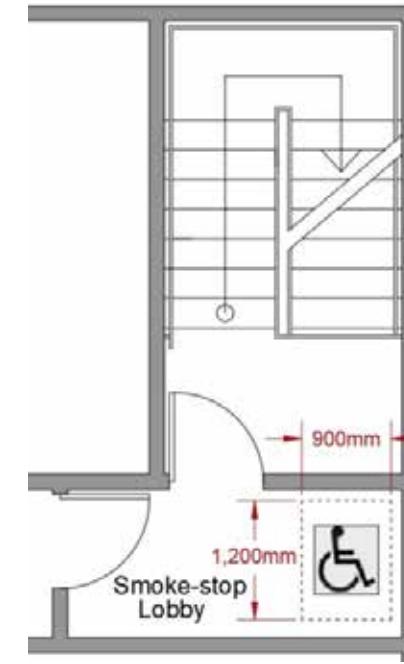


Figure 7.2.5.1.2b

Figure 7.2.5.1.2a and 7.2.5.1.2b - Designated space for persons with disabilities (PWDs) within a Smoke Stop Lobby

ILLUSTRATIONS AND FIGURES

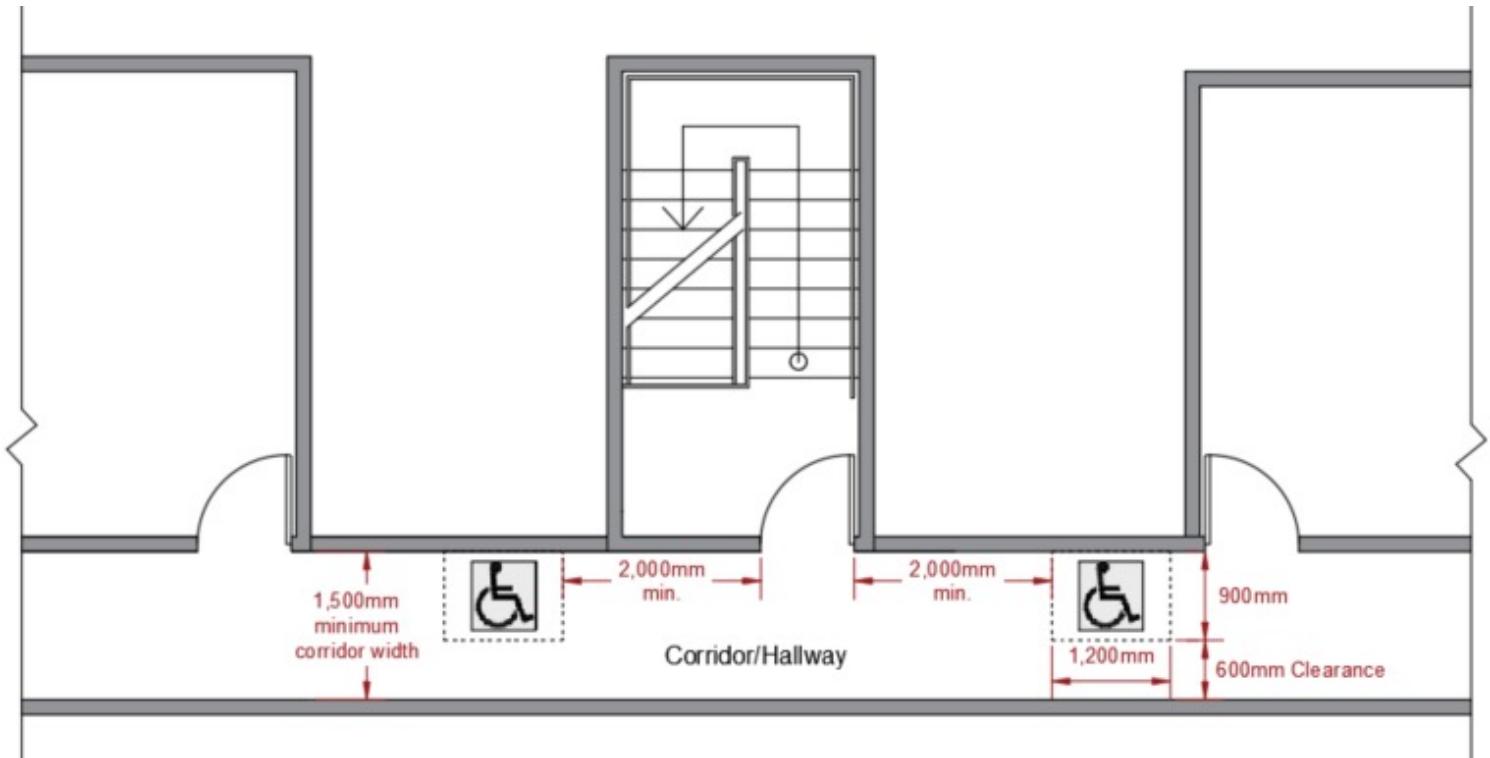


Figure 7.2.5.2a - Designated space for persons with disabilities (PWDs) within corridors



ILLUSTRATIONS AND FIGURES

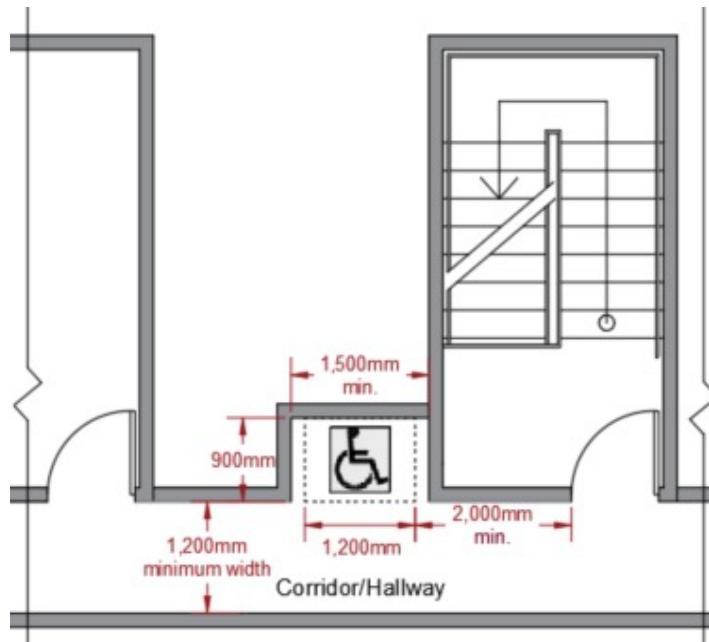


Figure 7.2.5.2b

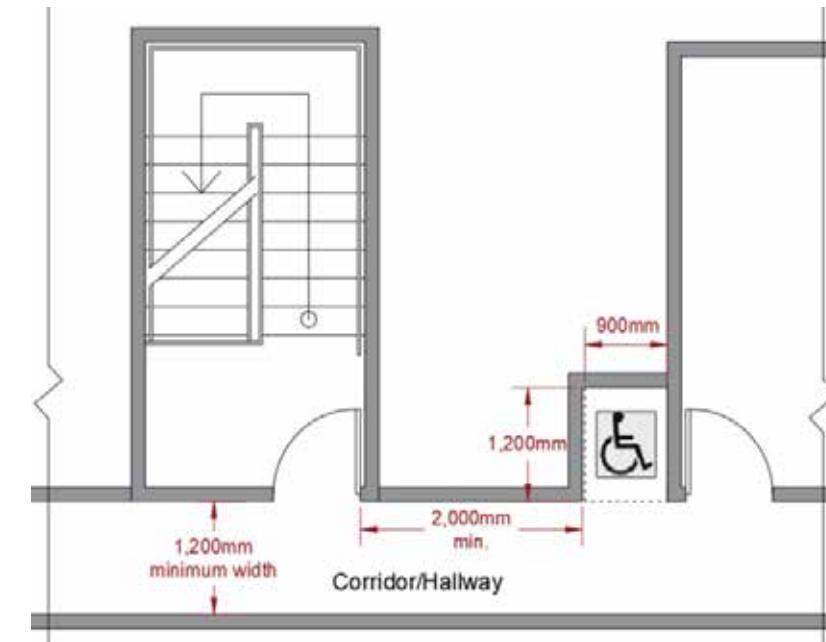


Figure 7.2.5.2c

Figure 7.2.5.2b 7.2.5.2c - Designated space for persons with disabilities (PWDs) within corridors

ILLUSTRATIONS AND FIGURES

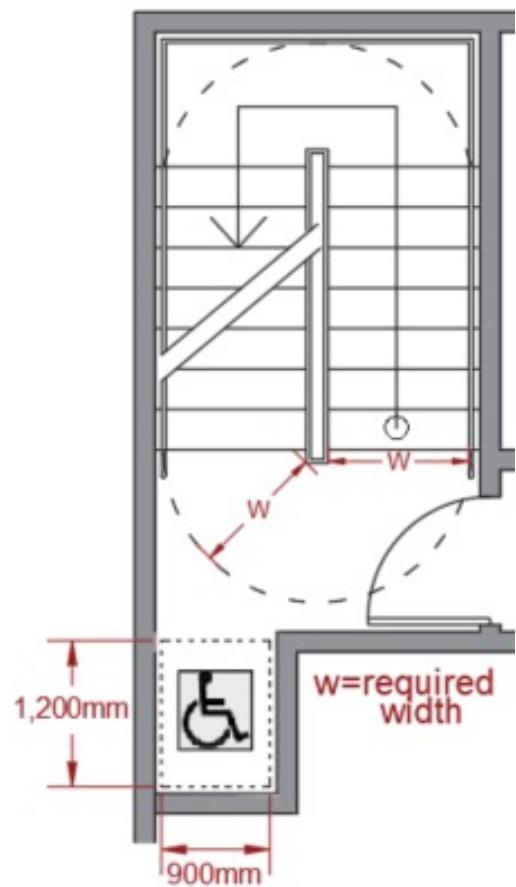


Figure 7.2.5.2b

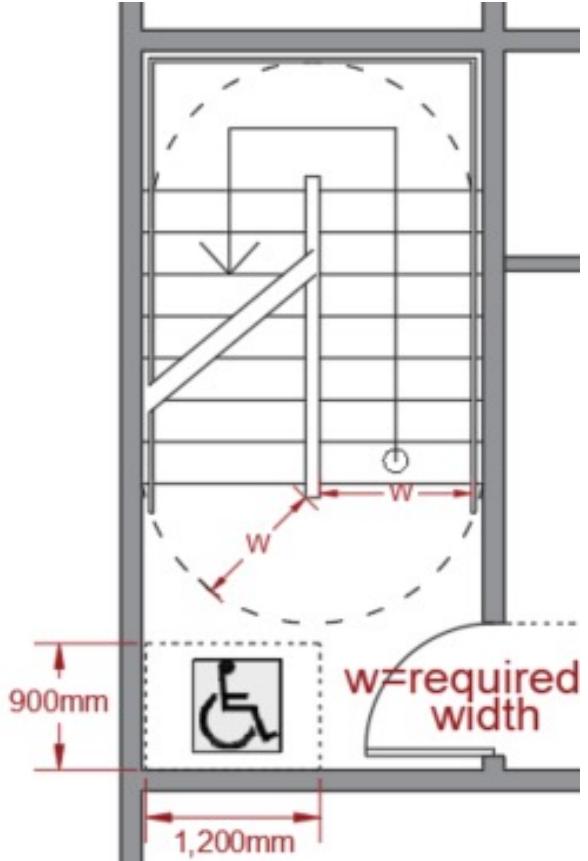


Figure 7.2.5.2b

Figure 7.2.5.3a & Figure 7.2.5.3b Designated space for persons with disabilities (PWDs) within an Exit Staircase

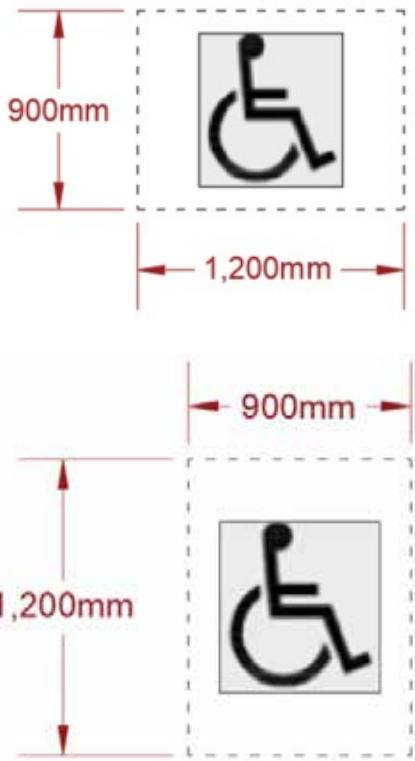


Figure 7.2.5.7 - Minimum Dimensions for designated space for persons with disabilities (PWDs)



ILLUSTRATIONS AND FIGURES

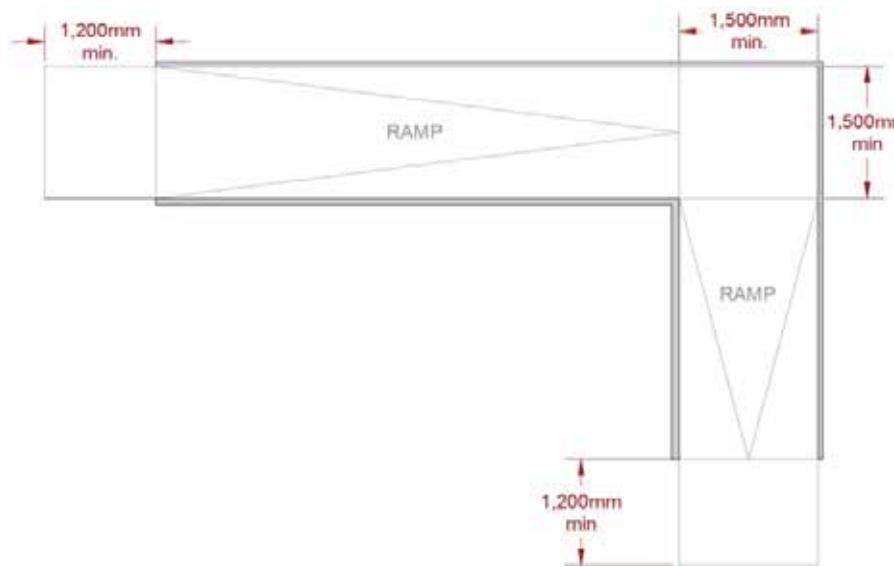


Figure 7.3.2.5- Minimum Width for Ramp Landings

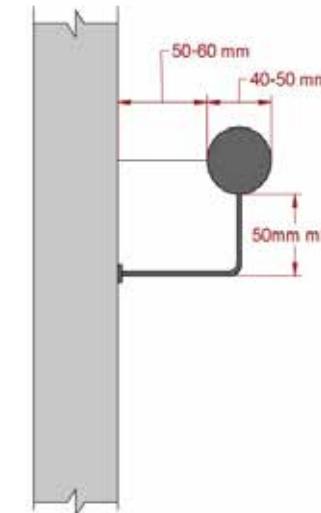


Figure 7.3.2.8 - Round Hand Rail detail

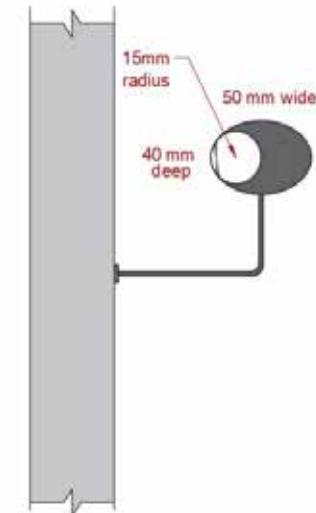


Figure 7.3.2.7 - Oval profile Hand rail detail

Figure 7.2.5.2b 7.2.5.2c - Designated space for persons with disabilities (PWDs) within corridors

DORMITORY BUILDINGS



DORMITORY BUILDINGS

| | | | | | |
|--|--|---|---|--|------------------|
| 1.0 | GENERAL REQUIREMENTS. | The requirements of this chapter shall apply to buildings or portions thereof used as dormitory occupancies. | | | |
| | | | | | |
| | A building or a space in a building in which group sleeping accommodations are provided for more than 16 persons who are not members of the same family in one room, or a series of closely associated rooms, under joint occupancy and single management, with or without meals, but without individual cooking facilities. | | | | |
| | College/Student Dormitories | Military/Police Barracks | Other Structure meeting the definition of Dormitory | | |
| 1.1 | GENERAL CONDITIONS & BUILDING LIMITS | | | | |
| | Building Category | Building Height (m) | Floor Area (m ²) | Basement Levels | |
| 1.1.1 | LOW-RISE Dormitory Buildings | < 15.0 m Habitable Height | Permitted with No Limit [in Floor/Fire Area/or Number of Person] | Permitted with No Limit [in Floor/Fire Area, Depth or Levels] | |
| 1.1.2 | MID-RISE Dormitory Buildings | ≥ 15 m to < 28 m Habitable Height | | | |
| 1.1.3 | HIGH-RISE Dormitory Buildings | ≥ 28 m Habitable Height | | | |
| FIRE AND LIFE SAFETY REQUIREMENTS | | | | | |
| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
| 1.2 | CLASSIFICATION OF OCCUPANCIES | | | | |
| 1.2.1 | MULTIPLE OCCUPANCIES | Dormitories shall be permitted to have their sole means of egress pass through a nonresidential occupancy in the same building, provided that the sole means of egress from the dwelling unit shall not pass through a high hazard contents area. | Required | Required | Required |
| 1.3 | OCCUPANT LOAD | Determined on the basis of the occupant load factors (OLF) that are characteristic of the use of the space. | | | |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|--|-----------|-----------|-----------|
| 1.3.1 | OCCUPANT LOAD FACTOR (OLF) | The occupant load shall be not less than the number of persons determined by dividing the floor area assigned to that use by the occupant load factor of 18.6 m ² per person. | Required | Required | Required |
| 1.3.2 | ACTUAL NUMBER OF OCCUPANTS | If the actual population of a bunk room in Dormitory Buildings, exceeds one person per 18.6 m ² , the egress capacity features (e.g., door widths) shall be designed based on the actual number of occupants. | Required | Required | Required |
| 1.3.3 | NON-RESIDENTIAL OCCUPANCIES in Dormitory Buildings | The occupant load calculations for areas of dormitories used for non-residential purposes shall be based on the occupant load factors (OLF) applicable to the use of the area. | Required | Required | Required |
| 1.4 | CLASSIFICATION OF HAZARD OF CONTENTS | The contents of Residential Dormitory Buildings shall be classified as Ordinary Hazard. | Required | Required | Required |
| 1.5 | MINIMUM CONSTRUCTION REQUIREMENTS. | Construction shall be in accordance with NFPA 5000 Chapters 7–8, 13–14, 31, and 35–40. | Required | Required | Required |
| 1.6 | ACCESSIBILITY. | Accessibility shall be in accordance with NFPA 5000 Chapter 12. | Required | Required | Required |
| 1.7 | (Reserved). | | | | |
| 2.0 | MEANS OF EGRESS REQUIREMENTS | Means of egress shall comply with NFPA 101 Chapter 7, and as modified in item 2.0 of this FLS Occupancy Chapter. | | | |
| 2.1 | MEANS OF ESCAPE | | | | |
| 2.1.1 | NUMBER OF MEANS OF ESCAPE | In every sleeping room and every living area shall have not less than one primary means of escape and one secondary means of escape. | Required | Required | Required |
| 2.1.1.1 | Exemptions | A secondary means of escape shall not be required where the sleeping room or living area has a door leading directly to the outside of the building at or to the finished ground level. | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|--|----------|----------|-----------|
| 2.1.2 | PRIMARY MEANS OF ESCAPE | The primary means of escape shall be a door, stairway, or ramp providing a means of unobstructed travel to the outside of the dormitory sleeping room at street or the finished ground level. | Required | Required | Required |
| 2.1.3 | SECONDARY MEANS OF ESCAPE | The secondary means of escape, shall be one of the following means: | Required | Required | Required |
| 2.1.3.1 | | It shall be a door, stairway, passage, or hall providing a way of unobstructed travel to the outside of the dwelling at street or the finished ground level that is independent of and remote from the primary means of escape. | Required | Required | Required |
| 2.1.3.2 | | It shall be a passage through an adjacent non-lockable space, independent of and remote from the primary means of escape, to any approved means of escape. | Required | Required | Required |
| 2.1.3.3 | | It shall be an outside window or door operable from the inside without the use of tools, keys, or special effort and shall provide a clear opening of not less than 0.53 m ² . | Required | Required | Required |
| 2.1.3.4 | | The width shall be not less than 510 mm, and height not less than 610 mm. The bottom of the opening shall be not more than 1120 mm above the floor. | Required | Required | Required |
| 2.1.4 | TWO (2) PRIMARY MEANS OF ESCAPE | Any dormitory sleeping room in excess of 185 m ² shall be provided with not less than two exit access doors remotely located from each other. | Required | Required | Required |
| 2.1.5 | ARRANGEMENT OF MEANS OF ESCAPE within a Dormitory Room | Any required path of travel in a means of escape from any room to the outside shall not pass through another room not under the immediate control of the occupant of the first room or through a bathroom or other space subject to locking. | Required | Required | Required |
| 2.1.6 | DOORS (Width) within a Dormitory Room | Doors in the path of travel of a means of escape, other than bathroom doors and doors serving a room not exceeding 6.5 m ² shall be not less than 710 mm wide. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|---|-----------|-----------|---------------|
| 2.1.6.1 | Bathroom Doors (Width) | Bathroom doors and doors serving a room not exceeding 6.5 m ² shall be not less than 610 mm wide. | Required | Required | Required |
| 2.1.6.2 | Doors (Height) | Doors (within guest rooms, guest suites) nominal height shall be not less than 1980 mm. | Required | Required | Required |
| 2.1.7 | HALLWAYS (Width) | Hallways within a guest room or guest suite shall be not less than 915 mm | Required | Required | Required |
| 2.1.7.1 | Hallways (Height) within a Dormitory Sleeping Room | Nominal height of hallways with clearance below projections from the ceiling of not less than 2030 mm shall be not less than 2135 mm. | Required | Required | Required |
| 2.2 | MEANS OF EGRESS COMPONENTS | Means of egress components shall be limited to the types described in 2.2. | Required | Required | Required |
| 2.2.1 | GENERAL | Exit enclosures shall have a minimum 1-hour fire resistance rating, and doors shall have a minimum 1-hour fire protection rating. | Required | Required | Not permitted |
| 2.2.2 | DOORS | Doors shall be in accordance with NFPA 101 section 7.2.1, and the requirements in 2.2.2.1 and 2.2.2.2. | Required | Required | Required |
| 2.2.2.1 | Installed Security Measures | No door in any means of egress shall be locked against egress when the building is occupied. | Required | Required | Required |
| | | Locks, if provided, must not require the use of a key, a tool, or special knowledge or effort for operation from the egress side of the building. | Required | Required | Required |
| 2.2.2.2 | Revolving Doors | Revolving door assemblies, whether used or not used in the means of egress, complying with NFPA 101 section 7.2.1.10. | Permitted | Permitted | Permitted |
| 2.2.3 | STAIRS | Stairs complying with NFPA 101 section 7.2.2. | Required | Required | Required |
| 2.2.3.1 | Spiral Stairs | Spiral stairs used as a component in the means of egress. | NP | NP | NP |
| 2.2.3.2 | Winders | Winders in stairs used as a component in the means of egress. | NP | NP | NP |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|-----------------------------|---|-----------|------------------|-----------|
| 2.2.4 | SMOKE PROOF ENCLOSURES | Smokeproof enclosures complying with NFPA 101 section 7.2.3. | Permitted | Permitted | Permitted |
| 2.2.5 | HORIZONTAL EXITS | Horizontal exits complying with NFPA 101 section 7.2.4. | Permitted | Permitted | Permitted |
| 2.2.6 | RAMPS | Accessible ramps and ramps used as a component in the means of egress shall conform with the general requirements for ramps in NFPA 101 7.2.5. | Required | Required | Required |
| 2.2.7 | EXIT PASSAGEWAY | Exit passageways complying with NFPA 101 section 7.2.6 | Permitted | Permitted | Permitted |
| 2.2.8 | AREA OF REFUGE | Areas of refuge complying with NFPA 101 section 7.2.12. | Required | Required | Required |
| 2.3 | CAPACITY OF MEANS OF EGRESS | The capacity of means of egress shall be in accordance with NFPA 101 section 7.3 and as modified in 2.3.2. | Required | Required | Required |
| 2.3.1 | STREET FLOOR EXIT | Street floor exits shall be sufficient for the occupant load of the street floor plus the required capacity of stairs discharging onto the street floor. | Required | Required | Required |
| 2.3.2 | CORRIDORS | Corridors, other than those within sleeping rooms, shall be of sufficient width to accommodate the required occupant load and shall be not less than 1200 mm. | Required | Required | Required |
| 2.4 | NUMBER OF MEANS OF EGRESS | The number of means of egress shall be in accordance with NFPA 101 section 7.4 and as permitted in 2.4.3. | Required | Required | Required |
| 2.4.1 | NOT LESS THAN TWO (2) | Not less than two (2) separate exits shall be provided on every story. | Required | Required | Required |
| 2.4.2 | | Not less than two separate exits shall be accessible from every part of every story. | Required | Required | Required |
| 2.4.2.1 | | Exit access, shall be permitted to include a single exit access path for the distances permitted as common paths of travel by 2.5.2. | Permitted | Permitted | Permitted |
| 2.4.3 | SINGLE EXIT PROVISIONS | A single exit shall be permitted to serve all floor levels, provided that all of the conditions for a single exit provisions are met. | Permitted | NP-Not Permitted | NP |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|------------|--|--|----------|----------|-----------|
| 2.4.3.1 | Floor Area | Gross floor area (GFA) is equal or less than 500 m ² per floor level | Required | - | - |
| 2.4.3.2 | Common Path | Common path of travel distance from the entrance door of any dormitory room to an exit does not exceed 15 m. | Required | - | - |
| 2.4.3.3 | Enclosures of Exit Stairway | Exit stairway is completely enclosed or separated from the rest of the building by a minimum 2-hour fire resistance rating (1.5-hrs doors) where the exit connects four or more stories. | Required | - | - |
| 2.4.3.4 | Number, Depth and Floor Area of Basement | Stairway serve only one (1) basement, that is equal or less than 500 m ² fire area or fire compartment and only has 6.0m maximum depth. | Required | - | - |
| 2.4.3.5 | Opening Protective | All openings between the exit enclosure and the building are protected with self-closing door assemblies of 1-hour fire protection rating. | Required | - | - |
| 2.4.3.6 | Exit Access Corridors | All corridors serving as access to exits have a minimum of 1-hour fire resistance rating. | Required | - | - |
| 2.4.3.7 | Exit Discharge | Exits shall terminate directly, at a public way or an interior exit discharge. | Required | - | - |
| 2.4.3.7(1) | | The interior exit discharge, shall be within 11 m. from the exit enclosure door to an exterior door leading to the public way. | Required | - | - |
| 2.4.3.7(2) | | The interior exit discharge shall be separated from the remainder of the level of discharge by fire barriers with a minimum 1-hour FR rating. | Required | - | - |
| 2.4.3.8 | Subdivisions of Building Spaces | Horizontal and vertical separation of 1.0-hr fire resistance rating is provided between dormitory room. | Required | - | - |
| 2.4.3.9 | Smoke Vents | Provisions of fixed or permanent wall openings, automatic opening vents (AOV) at the top of the staircase. | Required | - | - |
| 2.5 | ARRANGEMENT OF MEANS OF EGRESS | Access to all required exits shall be in accordance with NFPA 101 section 7.5, as modified by 2.5.1 through 2.5.4. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|---|--|-----------|-----------|-----------|
| 2.5.1 | TRAVEL DISTANCE (TD) TO EXITS | Travel distance within a dormitory room to a corridor door shall not exceed 38 m. | Required | Required | Required |
| 2.5.1.1 | TD from Room Door to an Exit | Travel distance from the corridor door of any dormitory room to the nearest exit s shall not exceed 61m. | Required | Required | Required |
| 2.5.1.2 | | Travel distance from the corridor door of any dormitory room to the nearest exit, shall not exceed 61 m for exterior ways of exit access. | Required | Required | Required |
| 2.5.2 | COMMON PATH OF TRAVEL | Travel within a dwelling unit shall not be included when calculating common path of travel. | Permitted | Permitted | Permitted |
| 2.5.2.1 | Common Path Limit | Common path of travel shall not exceed 15 m. | Required | Required | Required |
| 2.5.3 | DEAD-END CORRIDOR | Dead-end corridors shall not exceed 15 m. | Required | Required | Required |
| 2.5.4 | EXIT ACCESS DOORS | Any guest room or any guest suite in excess of 185 m ² shall be provided with not less than two exit access doors remotely located from each other. | Required | Required | Required |
| 2.6 | DISCHARGE FROM EXITS | Discharge from exits shall be in accordance with NFPA 101 7.7 and in 2.6.1 through 2.6.3. | Required | Required | Required |
| 2.6.1 | EXIT TERMINATION | Exits shall terminate directly, at a public way or an exterior exit discharge. | Required | Required | Required |
| 2.6.2 | EXIT DISCHARGE THRU INTERIOR BUILDING AREAS | Discharge thru interior building areas with not more than 50 percent of the required number of exits, and 50 percent of the required egress capacity. | Permitted | Permitted | Permitted |
| 2.6.3 | | Interior exit discharge as permitted in 2.6.2 shall be within a max. 11 m. travel distance to exit termination or the building external. | Permitted | Permitted | Permitted |
| 2.7 | ILLUMINATION OF MEANS OF EGRESS | Means of egress shall be illuminated in accordance with NFPA 101 section 7.8. | Required | Required | Required |
| 2.8 | EMERGENCY LIGHTING | Emergency lighting in accordance with NFPA 101 Section 7.9, and in additional locations in 2.8.1. | Required | Required | Required |
| 2.8.1 | ADDITIONAL LOCATIONS | In common areas and corridors within any multiple sleeping rooms> within a dormitory room. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-------|--|---|---------------|---------------|---------------|
| 2.8.2 | Exemptions | The requirement for emergency lighting shall not apply where each guest room or guest suite or dormitory room has an exit direct to the outside of the building at street or the finished ground level. | Permitted | Permitted | Permitted |
| 2.9 | MARKINGS OF MEANS OF EGRESS | Means of egress shall have signs in accordance with NFPA 101 section 7.10. | Required | Required | Required |
| 2.10 | NORMALLY UNOCCUPIED BUILDING SERVICE EQUIPMENT SUPPORT AREAS | Provisions for normally unoccupied service support areas in accordance with NFPA 101 section 7.14. | Not permitted | Not permitted | Not permitted |
| 2.11 | (Reserved). | | | | |
| 3.0 | PROTECTION. | Protection shall comply with the applicable NFPA codes and standards, QCD FLS Annex and as modified in item 3.0 of this FLS Occupancy Chapter. | | | |
| 3.1 | PROTECTION OF VERTICAL OPENINGS | Vertical openings shall be enclosed or protected in accordance with NFPA 101 section 8.6. | Required | Required | Required |
| 3.1.1 | CONVENIENCE OPENINGS | Convenience openings in accordance with NFPA 101 section 8.6.9.1. | Permitted | Permitted | Permitted |
| 3.1.2 | WALLS Enclosing Vertical Openings | Walls enclosing vertical openings shall have a min. 1-hour fire resistance rating, and the doors shall have a min. 1-hour fire protection rating. | Required | Required | Required |
| 3.1.3 | FLOOR Below the Level of Exit Discharge | No floor below the level of exit discharge used only for storage, heating equipment, or purposes other than residential occupancy shall have unprotected openings to floors used for residential purposes. | Required | Required | Required |
| 3.2 | PROTECTION FROM HAZARDS | | | | |
| 3.2.1 | GENERAL | All rooms containing high-pressure boilers, refrigerating machinery, transformers, or other service equipment subject to possible explosion shall not be located directly under or directly adjacent to exits and shall be effectively cut off from other parts of the building as specified in NFPA 101 section 8.7. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-----------|---|--|----------|----------|-----------|
| 3.2.2 | HAZARDOUS AREAS | Any hazardous area shall be protected in accordance with NFPA 101 section 8.7 and as specified in 3.2.2.1 through 3.3.2.9. | Required | Required | Required |
| 3.2.2.1 | Boiler and fuel-fired heater rooms | 1 hour and AFS-Automatic Sprinkler System | Required | Required | Required |
| 3.2.2.2 | Employee locker rooms | AFS-Automatic Sprinkler System | Required | Required | Required |
| 3.2.2.3 | Gift or retail shops | AFS-Automatic Sprinkler System | Required | Required | Required |
| 3.2.2.4 | Bulk laundries | 1 hour and AFS-Automatic Sprinkler System | Required | Required | Required |
| 3.2.2.5 | Guest Laundries $\leq 9.3\text{ m}^2$ outside of rooms/suites | AFS-Automatic Sprinkler System | Required | Required | Required |
| 3.2.2.6 | Guest Laundries $>9.3\text{ m}^2$ outside of rooms/suites | 1 hour and AFS-Automatic Sprinkler System | Required | Required | Required |
| 3.2.2.7 | Maintenance shops | 1 hour and AFS-Automatic Sprinkler System | Required | Required | Required |
| 3.2.2.8 | Storage Rooms | 1 hour and AFS-Automatic Sprinkler System | Required | Required | Required |
| 3.2.2.8.2 | | Where storage areas not exceeding 2.2 m^2 are directly accessible from the guest room or guest suite, no separation is required. | NR | NR | NR |
| 3.2.2.9 | Trash collection rooms | 1 hour and AFS-Automatic Sprinkler System. Also see 5.1. | Required | Required | Required |
| 3.3 | INTERIOR FINISH | Interior finish shall be in accordance with NFPA 101 Section 10.2. | Required | Required | Required |
| 3.3.1 | INTERIOR WALL AND CEILING FINISH | Interior wall and ceiling finish materials shall be permitted as follows: | Required | Required | Required |
| 3.3.1.1 | | Exit enclosures – Class A | Required | Required | Required |
| 3.3.1.2 | | Lobbies and corridors – Class A or Class B | Required | Required | Required |
| 3.3.1.3 | | Other spaces – Class A, Class B, or Class C | Required | Required | Required |
| 3.3.2 | INTERIOR FLOOR FINISH | Interior floor finish in exit enclosures and exit access corridors and spaces not separated by walls complying with 3.6 shall be not less than Class II. | Required | Required | Required |
| 3.4 | DETECTION, ALARM & COMMUNICATION REQUIREMENTS | | | | |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|--|------------------|----------|-----------|
| 3.4.1 | GENERAL | Complete coverage of a Fire Detection and Alarm System. | Required | Required | Required |
| 3.4.2 | INITIATION | Complete coverage of an Automatic Detection and Manual Initiating Devices. | Required | Required | Required |
| 3.4.3 | OCCUPANT NOTIFICATION | Complete Coverage of an Occupant Notification (audible & visible). | Required | Required | Required |
| 3.4.3.1 | Emergency Voice Evacuation System | Mass Notification System | NR | Required | Required |
| 3.4.4 | SUPPLEMENTARY | | | | |
| 3.4.4.1 | Fire Telephone | In every required provisions of a fire command center (FCC) or emergency control center (ECC). | NR | Required | Required |
| 3.4.4.2 | Graphic Annunciator (PC Panel) or Mimic Panel | In every required provisions of a fire command center (FCC) or emergency control center (ECC). | NR | Required | Required |
| 3.5 | EXTINGUISHMENT REQUIREMENTS | | Required | Required | Required |
| 3.5.1 | AUTOMATIC SPRINKLER SYSTEM | Dormitory buildings shall be protected throughout by an approved, supervised automatic sprinkler system. | Required | Required | Required |
| 3.5.2 | DRAFT STOPS and CLOSELY SPACED SPRINKLERS in Vertical Openings | The provisions for draft stops and closely spaced sprinklers shall not be required for openings complying with 3.1.1 where the opening is within the guest room or guest suite. | NR- Not required | NR | NR |
| 3.5.4 | OPEN PARKING STRUCTURES | Open parking structures complying with the openings requirement for an open parking structure and are contiguous with or adjacent to hotels shall be exempt from the sprinkler requirements. | NR | NR | NR |
| 3.5.5 | Fire Hose Reel | Fire hose reels are required in buildings protected by an approved supervised automatic sprinkler system. | Required | Required | Required |
| 3.5.6 | Portable Fire Extinguisher | Applicable Portable Fire Extinguishers required in all buildings. | Required | Required | Required |
| 3.5.7 | Rising Main (Dry or Wet Standpipe) | Refer to Annex Fire Fighting System Annex_FFS_G1 Revisions 2021 | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|---|---|------------|-----------|-----------|
| 3.6 | SMOKE CONTROL / VENTILATION REQUIREMENTS | Legend: NR-Not Required; NA-Not Applicable; NP-Not Permitted | | | |
| 3.6.1 | STAIRWELL/LOBBY | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.1.1 | Less than 9 m habitable height | | No Reqmt | No Reqmt | No Reqmt |
| 3.6.1.2 | 9 m to 15 m habitable height | Vent at top of stairwell | Required | NA | NA |
| | | Stair ventilation openings at every floor level (stairs along external walls) | Permitted | NA | NA |
| | | Stairwell Pressurization | NR | NA | NA |
| 3.6.1.3 | >15 m to < 28 m habitable height | Vent at top of stairwell | NA | NP | NA |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | Required | NA |
| | | Stairwell Pressurization | NA | Permitted | NA |
| 3.6.1.4 | ≥28 m habitable height | Vent at top of stairwell | NA | NA | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | NA | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | NA | NA | Required |
| | Connecting Basement Levels | | | | |
| 3.6.1.5 | Two basement levels or ≤6 m deep, ≤2000 m ² floor area | Vent at top of stairwell : * Permitted up to five (5) connecting above floors (2B+G+4 or less) or 12 m habitable height ; whichever is less; otherwise next below provisions shall apply. | * Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | Permitted | Required | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|---|-----------|-----------|-----------|
| 3.6.1.6 | Three basement levels or ≤ 9.1 m deep, ≤ 2000 m ² floor area | Vent at top of stairwell : * Permitted up to three (3) connecting above floors only (3B+G+2 or less) or 6m habitable height, whichever is less; otherwise next below provisions shall apply | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | NA | NA |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Permitted |
| 3.6.1.7 | Two basement levels or ≤ 6 m deep, >2000 m ² floor area | Vent at top of stairwell: * Permitted up to four (4) connecting floors (2B+G+3 or less) or 9 m habitable height ; whichever is less; otherwise next below provisions shall apply. | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | Required | NP | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Required | Required |
| 3.6.1.8 | Three basement levels or ≤ 9.1 m deep, >2000 m ² floor area, connecting one floor above only | Vent at top of stairwell : * Permitted up to two connecting above floors or 3 m habitable height only (3B+G+1 or less); whichever is less, otherwise next below provisions shall apply | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | NA | NA |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization. | Permitted | Required | Required |
| 3.6.1.9 | Lowest basement level >9.1 m below ground level, regardless of floor area | Vent at top of stairwell | NP | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NP | NP | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Required | Required | Required |
| 3.6.2 | ESCAPE CORRIDOR PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-----------|---|--|--|-----------|-----------|
| 3.6.2.1 | Interior Corridors | Vents (Fixed or Automatic Opening) | Required in specific type of Occupancy: Healthcare & Detention Occupancies | | |
| | | Mechanical Ventilation of Corridor | | | |
| | | Pressurization of Corridor | | | |
| 3.6.2.2 | Corridor with side/s located along exterior walls | Vents (Fixed or Automatic Opening) | Required in specific type of Occupancy: Healthcare & Detention Occupancies | | |
| | | Mechanical Ventilation of Corridor | | | |
| | | Pressurization of Corridor | | | |
| 3.6.3 | atrium and OTHER FLOOR OPENINGS | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.3.1 | Malls (with floor openings connecting >2 floors) | Smoke Vents (Fixed or Automatic Opening) | Required | NP | NP |
| | | Mechanical Smoke Exhaust Ventilation System/Engineered | Permitted | Required | Required |
| 3.6.3.2 | Other Occupancies (connecting >3 floor levels) | Smoke Vents (Fixed or Automatic Opening) | Required | Permitted | NP |
| | | Mechanical Smoke Exhaust Ventilation System/Engineered | Permitted | Permitted | Required |
| 3.6.4 | CAR PARKS/PARKING STRUCTURES | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.4.1 | Open Parking Structures | The open parking structure shall justify that no smoke stagnation will occur such as from a fire located somewhere in the middle of the car park; otherwise mechanical equipment that will aid in effective dispersal of smoke shall be provided | Required | Required | Required |
| 3.6.4.2 | Aboveground Enclosed Car Parks | | | | |
| 3.6.4.2.1 | Aggregate floor area of ≤2000 m ² | Smoke Vents (Fixed or Automatic) | Required | Required | Permitted |
| | | Mechanical Smoke Purging/Clearance | Permitted | Permitted | Required |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted |
| 3.6.4.2.2 | Aggregate floor area of >2000 m ² | Smoke Vents (Fixed or Automatic) | Required | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | NP |
| | | Engineered Smoke Control System | Required | Permitted | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|------------|--|---|---------------|-------------------|---------------|
| 3.6.4.3 | Belowground Car Parks | | ≤6m Deep | >6m - ≤9.1 m Deep | >9.1 m Deep |
| 3.6.4.3.1 | Aggregate floor area of ≤2000 m ² | Smoke Vents (Fixed or Automatic) | Required | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | Required |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted |
| 3.6.4.3.2 | Aggregate floor area of >2000 m ² | Smoke Vents (Fixed or Automatic) | NP | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Required | NP | NP |
| | | Engineered Smoke Control System | Permitted | Required | Required |
| 3.7 | CORRIDORS | Exit access corridor shall be protected in accordance with 3.7.1 thru 3.7.4 | Required | Required | Required |
| 3.7.1 | WALLS | Corridor walls shall have a minimum 1/2-hour fire resistance rating. | Required | Required | Required |
| 3.7.2 | DOORS | Doors that open onto exit access corridors shall have not less than 30-minute fire protection rating | Required | Required | Required |
| 3.7.2.1 | Self-closing/Self-Latching Devices | Doors that open onto exit access corridors shall be self-closing and self-latching. | Required | Required | Required |
| 3.7.3 | UNPROTECTED OPENINGS | Unprotected openings, other than those from spaces complying with 3.7.3.1, shall be prohibited in exit access corridor walls and doors. | Not permitted | Not permitted | Not permitted |
| 3.7.3.1 | Exemption | Spaces shall be permitted to be unlimited in area and open to the corridor, provided that all of the following criteria are met: | Permitted | Permitted | Permitted |
| 3.7.3.1(1) | | The space is not used for guest rooms or guest suites or hazardous areas. | Required | Required | Required |
| 3.7.3.1(2) | | The space does not obstruct access to required exits. | Required | Required | Required |
| 3.7.4 | TRANSOM, LOUVERS, OR TRANSFER GRILLES | Transoms, louvers, or transfer grilles shall be prohibited in walls or doors of exit access corridors. | Not permitted | Not permitted | Not permitted |
| 3.8 | SUBDIVISION OF BUILDING SPACES | Buildings shall be subdivided in accordance with 3.8.1. | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-------|--|--|-----------------|----------|-----------|
| 3.8.1 | SEPARATION BETWEEN ROOMS | Each dormitory room/sleeping room shall be separated from other guest rooms by walls and floors constructed as fire barriers having a minimum 1/2-hour fire resistance rating. | Required | Required | Required |
| 3.8.2 | DOORS | Doors in the barriers required by 3.8.1 shall have a fire protection rating of not less than 30 minutes and shall not be required to be self-closing. | Required | Required | Required |
| 3.9 | (Reserved). | | | | |
| 4.0 | SPECIAL PROVISIONS | Special Provisions for Firefighting and Rescue shall comply with QCD FLS Annex and as modified in item 4.0 of this FLS Occupancy Chapter. | | | |
| 4.1 | FIRE (EMERGENCY) COMMAND CENTER (FCC) | QCD FLS Annex_A5 – Revisions_2021. | Required | Required | Required |
| 4.2 | FIREMAN'S ACCESS PANELS/OPENINGS | QCD FLS Annex_A3 – Revisions_2021 | Required | Required | Required |
| 4.3 | FIRE LIFTS (FIRE SERVICE ACCESS ELEVATORS) | QCD FLS Annex_A4 – Revisions_2021 | NR-Not Required | NR | Required |
| 4.3.1 | | The building basement/s is more than nine (9) meters below the average ground level (grade plane). | Required | Required | Required |
| 4.3.2 | FIREFIGHTING LOBBY | QCD FLS Annex_A2 – Revisions_2021 | Required | Required | Required |
| 4.3.3 | SMOKE-STOP LOBBY | QCD FLS Annex_A2 – Revisions_2021 | Required | Required | Required |
| 4.4 | AMBULANCE STRETCHER ACCOMMODATION | QCD FLS Annex_A4 – Revisions_2021 | NR | Required | Required |
| 4.5 | EXTERNAL ACCESS TO SITE AND BUILDINGS | QCD FLS Annex_A3 – Revisions_2021 | Required | Required | Required |
| 4.5.1 | SITE ACCESS/ACCESS ROAD | For gated facility development a 4.0 m wide access road and 4.5 m clear height vertical clearance entry gate or site access shall be provided. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-------|--|---|-------------------|-------------------|-----------|
| 4.5.2 | FIRE ENGINE HARDSTANDING (FEH) | FEH with longer side parallel to the façade of the building shall be provided in buildings exceeding the habitable height of 10 m. | Required | Required | Required |
| 4.6 | REFUGE FLOORS | QCD FLS Annex_A1 – Revisions_2021 | NA-Not Applicable | NA-Not Applicable | Required |
| 4.7 | (Reserved). | | | | |
| 5.0 | BUILDING SERVICES and FIRE PROTECTION EQUIPMENT | Building Services and Fire Protection Equipment shall comply with the applicable NFPA codes and standards and QCD FLS Annex. | | | |
| 5.1 | ELECTRICAL SYSTEM | Electrical wiring and equipment shall be in accordance with NFPA 70. | Required | Required | Required |
| 5.1.1 | ELECTRICAL EQUIPMENT/ PANEL ROOMS AND SIMILAR ROOMS/SPACES | QCD FLS Annex _A7 – Revisions_2021 | Required | Required | Required |
| 5.1.2 | EMERGENCY GENERATORS AND STANDBY POWER SYSTEMS. | Emergency generators and standby power systems shall be installed, tested, and maintained in accordance with NFPA 110. | Required | Required | Required |
| 5.1.3 | STORED ELECTRICAL ENERGY SYSTEMS | Stored electrical energy systems shall be installed, tested, and maintained in accordance with NFPA 111. | Required | Required | Required |
| 5.2 | COMMERCIAL COOKING OPERATIONS | Where permitted, commercial cooking operations shall be protected in accordance with NFPA 96. | Required | Required | Required |
| 5.3 | ELEVATORS, ESCALATORS, and CONVEYORS | An elevator, shall not be considered a component in a required means of egress and shall be in accordance with NFPA 101 section 9.4. | Required | Required | Required |
| 5.3.1 | NUMBER OF CARS | The number of elevator cars permitted in a hoistway shall be not more than three (3). | Required | Required | Required |
| 5.3.2 | OPENINGS TO EXIT ENCLOSURES | Conveyors, elevators, dumbwaiters, and pneumatic conveyors serving various stories of a building shall not open to an exit enclosure. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--------------------------------|--|----------|----------|-----------|
| 5.4 | WASTE HANDLING SYSTEM | Waste chutes and its associated trash collection storage rooms and service opening rooms, when provided shall comply with NFPA 101 section 9.5. | Required | Required | Required |
| 5.4.1 | | Approved waste chutes and transport systems, including gravity waste chutes, full pneumatic waste conveying systems, and gravity pneumatic waste conveying systems, shall comply with the provisions of NFPA 82. | Required | Required | Required |
| 5.4.1.1 | Construction | Waste chutes, shall be separately enclosed by walls or partitions of not less than 2-hrs fire resistance rating and chute intake openings protection of 1.5-hour fire protection rating. | Required | Required | Required |
| 5.4.1.2 | Trash Collection Storage Rooms | Waste chutes shall have its associated trash collection, service opening rooms separately enclosed by walls of not less than 1-hr fire resistance rating and openings protection of 3/4-hour fire protection rating. | Required | Required | Required |
| 5.4.1.3 | | The doors of chutes shall open only to a trash collection, service opening room, laundry storage room or to a room that is designed and used exclusively for accessing the chute opening. | Required | Required | Required |
| 5.4.2 | GRAVITY CHUTES | A waste chute shall extend (full size) at least 0.92 m. above the roof of a building. | Required | Required | Required |
| 5.4.2.1 | | The chute shall be open to the atmosphere, with the opening being the same cross-sectional area as the chute. | Required | Required | Required |
| 5.5 | FIRE PUMPS | | | | |
| 5.5.1 | FIRE PUMPS ROOM | QCD FLS Annex _A6 – Revisions_2021 | Required | Required | Required |
| 5.6 | SUBSTATION and SWITCHGEARS | QCD FLS Annex _A8 – Revisions_2021 | Required | Required | Required |
| 5.7 | (Reserved). | | | | |



ACCOMMODATION BUILDINGS



ACCOMMODATION BUILDINGS

| | | | | |
|--------|--|---|--|---|
| 1.0 | GENERAL REQUIREMENTS | The fire and life safety requirements in this chapter shall apply to buildings or portions thereof used as accommodation occupancies. | | |
| | | A building or a space in a building in which group sleeping accommodations are provided and who are not members of the same family in one room, or a series of closely associated rooms, under joint occupancy and single management, with or without meals, but without individual cooking facilities. | | |
| | | Staff Accommodation | Workers / Labor Accommodation Buildings | |
| 1.1 | GENERAL CONDITIONS & BUILDING LIMITS | | | |
| | Building Types | Building Height (m) | Floor Area (m ²) /No. of Occupants | Basement Levels |
| 1.1.1 | SMALL TYPE Accommodation Buildings | G+3 (or maximum 4-Stories) | 50 - 500 persons (aggregate) | Not permitted |
| 1.1.2 | LARGE TYPE Accommodation Buildings | G+3 (or maximum 4-Stories) | 501 - 5000 persons (aggregate) | Not permitted |
| 1.1.3 | COMPLEX/COMPOUND (Landed Development) | Building Height or Number of Stories Limits applies for each Type of Accommodation Building | No. of Persons applies for each Type of Accommodation Building | Basement Levels in any Accommodation Building are not permitted |
| Notes: | Buildings that exceeds the General Conditions and Building Limits in item 1.1, SHALL comply with the requirements for DORMITORY Buildings. | | | |

FIRE AND LIFE SAFETY REQUIREMENTS

| Item | Fire Safety Provisions | Minimum Requirements | Small | Large |
|-------|-----------------------------------|--|----------|----------|
| 1.2 | OCCUPANT LOAD | The occupant load, in number of persons for whom means of egress and other provisions are required, shall be determined in accordance with 1.2.1 or 1.2.2, whichever is greater. | Required | Required |
| 1.2.1 | ACTUAL NUMBER OF OCCUPANTS | The occupant load shall be not less than the number of persons determined by the actual population of a bunk room in Accommodation Buildings. | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Small | Large |
|------------|--|---|----------|----------|
| 1.2.2 | NUMBER OF BEDS | If the number of single beds exceeds the actual population in a bunk room in Accommodation Buildings, the egress capacity features (e.g., door widths) shall be designed based on the actual number of single beds. | Required | Required |
| 1.2.3 | NON-RESIDENTIAL OCCUPANCIES in Accommodation Buildings | The occupant load calculations for areas of non-residential purposes shall be based on the occupant load factors applicable to the use of the area. | Required | Required |
| 1.3 | CLASSIFICATION OF HAZARD OF CONTENTS | The contents of Accommodation Buildings shall be classified as Ordinary Hazard | Required | Required |
| 1.4 | MINIMUM CONSTRUCTION REQUIREMENTS. | Construction shall be in accordance with NFPA 5000 Chapters 7–8, 13–14, 31, and 35– 40. | Required | Required |
| 1.5 | (Reserved). | | | |
| 2.0 | MEANS of EGRESS REQUIREMENTS. | Means of egress shall comply with NFPA 101 Chapter 7, and as modified in item 2.0 of this FLS Occupancy Chapter. | | |
| 2.1 | MEANS OF ESCAPE | | | |
| 2.1.1 | NUMBER AND TYPES OF MEANS OF ESCAPE | Every sleeping room shall have not less than one primary means of escape and one secondary means of escape. | Required | Required |
| 2.1.1.1 | Primary Means of Escape | The primary means of escape shall be an exit access door that provides a means of unobstructed travel to the exit access corridor, an exit enclosures or to the outside of the building at street or the finished ground level. | Required | Required |
| 2.1.1.2 | Secondary Means of Escape (Windows) | A secondary means of escape shall be an outside window operable from the inside without the use of tools, keys, or special effort and shall provide a clear opening of not less than 0.53 m ² | Required | Required |
| 2.1.1.2(1) | | A secondary means of escape shall not be required where the sleeping room has a door leading directly to the outside of the building at or to the finished ground level. | Required | Required |
| 2.1.1.3 | Two (2) Primary Means of Escape | Any sleeping room in excess of 185 m ² , or with travel distance within each room to the primary means of escape is more than 23 m, shall be provided with not less than two exit access doors remotely located from each other. | Required | Required |
| 2.1.1.4 | Dining Facilities or Mess Halls, Living Rooms and/or Multi-purpose Rooms | Not less than two (2) separate exit access doors shall be provided if the occupant load exceeds >50 persons. | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Small | Large |
|---------|-----------------------------|---|----------------|----------------|
| 2.2 | MEANS OF EGRESS COMPONENTS | Means of egress components shall be limited to the types described in 2.2. | Required | Required |
| 2.2.1 | STAIRS | Enclosed by fire barriers min. 1-hour fire resistance rating for G+2 and below and 2-hrs fire resistance rating for G+3. | Required | Required |
| 2.2.1.1 | | All openings protected with smoke-actuated automatic-closing or self-closing doors minimum 1-hr fire protection rating for G+2 and below and 1.5-hour fire protection rating for G+3. | Required | Required |
| 2.2.2 | DOORS | Stair Doors, not less than 810 mm wide Bedroom Doors, not less than 710 mm wide Bathroom Doors, not less than 610 mm wide | Required | Required |
| 2.2.2.1 | | Every bathroom door shall be designed to allow opening from the outside during an emergency when locked | Required | Required |
| 2.2.2.2 | | No door in any means of escape shall be locked against egress when the building is occupied | Required | Required |
| 2.3 | CAPACITY OF MEANS OF EGRESS | The capacity of means of egress shall be in accordance with NFPA 101 section 7.3 and as modified in 2.3.1. | Required | Required |
| 2.3.1 | STAIRS and CORRIDORS Width | Exit stairs and exit access corridor width shall not be less than 1200 mm clear. | Required | Not Applicable |
| 2.3.1.1 | | Exit stairs and exit access corridor width shall not be less than 1420 mm clear in buildings with occupant load exceeding 2000. | Not Applicable | Required |
| 2.4 | NUMBER OF MEANS OF EGRESS | The number of means of egress shall be in accordance with NFPA 101 section 7.4 and as permitted in 2.4.2. | Required | Required |
| 2.4.1 | REQUIRED NUMBER OF EXITS | Not less than two (2) separate exits shall be provided on every story. | Required | Required |
| 2.4.1.1 | | Not less than two separate exits shall be accessible from every part of every story. | Required | Required |
| 2.4.2 | SINGLE EXIT (STAIR) | A single exit (stairway) shall be permitted to serve all floor levels, provided that all of the following conditions for a single exit provisions are met. | Permitted | Permitted |
| 2.4.2.1 | Floor Area | Gross floor area (GFA) is equal or less than 500 m ² per floor level . | Required | Required |
| 2.4.2.2 | Common Path | Common path of travel from the entrance door of any sleeping room to an exit does not exceed 23 m. | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Small | Large |
|------------|--|---|-----------|-----------|
| 2.4.2.3 | Stair Enclosures | Exit stairway is completely enclosed or separated from the rest of the building by a minimum 2-hour fire resistance rating (1.5-hrs doors) where the exit connects four or more stories. | Required | Required |
| 2.4.2.3(1) | Exemption to Stair Enclosures | Exit stairway shall be permitted to be open or unenclosed in a two (2) story building (G+1) or in buildings with exterior corridors leading to an exterior stair, provided the common path, including the travel through the open stairway to the outside of the building at the finished ground level, is within 23 m. Also see item 3.1.2 requirements for exterior stairs. | Permitted | Permitted |
| 2.4.2.4 | Openings Protection (Doors, Windows) | All openings between the exit enclosure and the building are protected with self-closing door assemblies of 1-hour fire rating. The provisions in item 3.3.2 fire protection rated openings in exterior corridors applies. | Required | Required |
| 2.4.2.5 | Corridor Walls Protection | All corridors serving as access to exits have a minimum of 1-hour fire resistance rating. The provisions in item 3.3.2 fire resistance rated walls in exterior corridors applies. | Required | Required |
| 2.4.2.6 | Exit Discharge | Exit discharge in a single exit building shall comply with item 2.6. | Required | Required |
| 2.5 | ARRANGEMENT OF MEANS OF EGRESS | Access to all required exits shall be in accordance with NFPA 101 section 7.5, as modified by 2.5.1 and 2.5.2. | Required | Required |
| 2.5.1 | TRAVEL DISTANCE / COMMON PATH | Not more than 23 m. from each bedroom door to an enclosed primary means of escape or to the building external at the ground floor level. | Required | Required |
| 2.5.2 | DEAD-END CORRIDORS | 11 m. max. limit | Required | Required |
| 2.6 | DISCHARGE FROM EXITS | Discharge from exits shall be in accordance with NFPA 101 7.7 and in 2.6.1 through 2.6.1.1(1). | Required | Required |
| 2.6.1 | EXIST/EXIT STAIR DISCHARGE | Exits shall terminate directly outside the building, at a public way or at an exterior exit discharge | Required | Required |
| 2.6.1.1 | Exit Discharge through Interior Building Areas | Not more than one exit or 50% of the required number of exit stairs serving each floor, shall discharge through areas on any level of discharge. | Permitted | Permitted |
| 2.6.1.1(1) | | Interior exit discharge as permitted in 2.6.1 shall be within a max. 11 m. travel distance to exit termination or the building external. | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Small | Large |
|------------|-----------------------------------|---|-----------|-----------|
| 2.7 | ILLUMINATION OF MEANS OF EGRESS | Means of egress shall be illuminated in accordance with NFPA 101 section 7.8. | Required | Required |
| 2.8 | EMERGENCY LIGHTING | Emergency lighting in accordance with NFPA 101 Section 7.9. | Required | Required |
| 2.3.2 | Exemptions | The requirement for emergency lighting shall not apply where sleeping room has an exit direct to the outside of the building at street or the finished ground level. | Permitted | Permitted |
| 2.9 | MARKINGS OF MEANS OF EGRESS | Means of egress shall have signs in accordance with NFPA 101 section 7.10. | Required | Required |
| 2.1 | (Reserved). | | | |
| 3.0 | PROTECTION. | Protection shall comply with the applicable NFPA codes and standards, QCD FLS Annex and as modified in item 3.0 of this FLS Occupancy Chapter. | | |
| 3.1 | PROTECTION OF VERTICAL OPENINGS | Vertical openings shall be protected so that no primary escape route is exposed to an unprotected vertical opening. | Required | Required |
| 3.1.1 | INTERIOR STAIRS | Stair enclosures shall not be required in buildings two or fewer stories (G+1) in height where the travel distance or common path, including travel through the open stairs to the building external at the ground level, is within 23 m. | Permitted | Permitted |
| 3.1.2 | EXTERIOR (OUTSIDE) STAIRS | Exterior stairs shall be protected against blockage caused by fire within the building. Such protection shall be by separation by physical distance, arrangement of the stairs, protection of the openings exposing the stairs (1-hour fire resistance rating), or a combination thereof. Also see item 2.4.2.3(1) exemption for stair enclosures.. | Required | Required |
| 3.1.3 | VERTICAL SHAFTS/SHAFTWAYS | | | |
| 3.1.3.1 | Enclosures Fire Resistance Rating | Enclosures connecting four (4) stories – 2-hour fire resistance rated barriers | Required | Required |
| 3.1.3.1(1) | | Other enclosures below four (4) stories – 1-hour fire resistance rated barriers | Required | Required |
| 3.1.3.2 | Openings in Shaft | Windows of toilets, baths and other rooms, that opens to a common and shared vertical shafts shall be permitted, subject to the following: | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Small | Large |
|-------------------|----------------------------------|--|----------|----------|
| 3.1.3.2(1) | Openings Protection | The openings or windows shall have a fire protection rating equivalent to the fire resistance rating required for the shaft, or | Required | Required |
| 3.1.3.2(2) | | The room of the openings shall be protected within a fire resistance rated enclosures and any doors in the enclosing walls of the room shall have a fire protection rating of not less than 1-hour. | Required | Required |
| 3.1.3.2(3) | Location and Separation Distance | The openings or windows shall be located at a 3 m separation distance measured in a straight line between the nearest edge of each openings from a different unit. | Required | Required |
| 3.1.3.2(3) (a) | | The openings or windows shall not be located directly facing each other. | Required | Required |
| 3.1.3.2(3) (b) | | Any openings> sill height shall not be less than 1.2 m; and height not more than 2.10 m above the finish floor level, A concrete overhang (awning) to serve as fire block projected 0.3 m from the shaft wall directly above the openings. See figure 3.1.3.2(3)(b)(i) through (v) | Required | Required |
| 3.2 | PROTECTION FROM HAZARDS | | | |
| 3.2.1 | STORAGE ROOMS Outside Bedrooms | 1-hr fire rated enclosures and 45 mins. fire rated doors | Required | Required |
| 3.2.2 | KITCHEN/COOKING FACILITIES | 1-hr fire rated enclosures and 45 mins. fire rated doors | Required | Required |
| 3.2.2.1 | | Kitchen or cooking facilities with cooking equipment used for commercial cooking operations or with centralized kitchen involved with cooking operation that produce grease-laden vapors and that caters for 100 or more people at any given time, shall be in accordance NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations. | Required | Required |
| 3.2.3 | LOCKER ROOMS | 2-hrs fire rated enclosures and 1.5-hrs fire rated doors | Required | Required |
| 3.2.4 | LAUNDRY ROOMS | 2-hrs fire rated enclosures and 1.5-hrs fire rated doors | Required | Required |
| 3.2.5 | TRASH COLLECTION ROOM AND CHUTE | See item 5.1 requirements. | Required | Required |
| 3.3 | CORRIDOR | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Small | Large |
|---------|---|--|---------------|---------------|
| 3.3.1 | ESCAPE ROUTE CORRIDOR | Escape route or exit access corridor served by not less than 2 exits shall have not less than 1-hour fire rated walls and 30-minutes fire rated doors and windows. Also see item 3.3.2, 3.3.2.1 and 3.3.2.2 requirements. | Required | Required |
| 3.3.1.1 | | Doors shall be self-closing and self-latching. | Required | Required |
| 3.3.1.2 | | Louvers or operable transoms; transfer grilles and air passages penetrating corridor walls below the highest level of door openings. | Not Permitted | Not Permitted |
| 3.3.2 | EXTERIOR CORRIDORS (Exterior Ways of Exit Access) | Walls, doors and windows are not required to be fire rated if served by at least two remote stairs provided each stair is within 23 m. from the farthest or remotely located sleeping unit door. | Not Required | Not Required |
| 3.3.2.1 | | Walls, doors and windows are not required to be fire rated in case of access to the exit from the farthest sleeping unit door via a single path (common path/dead-end) is within 6 m. | Not Required | Not Required |
| 3.3.2.2 | Windows in External Corridor | Windows along external corridor walls shall be permitted to be unprotected (non-fire rated), provided the lowest portion of the windows (sill) are located level with the topmost part of the door (minimum 2.0 m.). See figures 3.3.2.2(1) and 3.3.2.2(2). | Permitted | Permitted |
| 3.4 | FIRE ALARM SYSTEM | | | |
| 3.4.1 | GENERAL | Complete coverage of a Fire Detection and Alarm System. | Required | Required |
| 3.4.2 | INITIATION | Complete coverage of an Automatic Detection and Manual Initiating Devices. | Required | Required |
| 3.4.3 | OCCUPANT NOTIFICATION | Complete Coverage of an Occupant Notification (audible & visible). | Required | Required |
| 3.4.4 | SUPPLEMENTARY | | | |
| 3.4.4.1 | Fire Telephone | In every required provisions of a fire command center (FCC) or emergency control center (ECC). | - | - |
| 3.4.4.2 | Graphic Annunciator (PC Panel) or Mimic Panel | In every required provisions of a fire command center (FCC) or emergency control center (ECC). | - | - |
| 3.5 | EXTINGUISHMENT REQUIREMENTS | | | |

| Item | Fire Safety Provisions | Minimum Requirements | Small | Large |
|---------|--|--|-----------------|-----------|
| 3.5.1 | AUTOMATIC SPRINKLER SYSTEM | Accommodation Buildings complying with the General Conditions and Building Limits in item 1.1 | NR-Not Required | NR |
| 3.5.2 | Fire Hose Reel | Fire hose reels are required in buildings protected by an approved supervised automatic sprinkler system. | Required | Required |
| 3.5.3 | Portable Fire Extinguisher | Applicable Portable Fire Extinguishers required in all buildings. | Required | Required |
| 3.5.4 | Rising Main (Dry or Wet Standpipe) | Refer to Annex Fire Fighting System Annex_FFS_G1 Revisions 2021 | Required | Required |
| 3.6 | SMOKE CONTROL / VENTILATION REQUIREMENTS | Legend: NR-Not Required; NA-Not Applicable; NP-Not Permitted | | |
| 3.6.1 | STAIRWELL/LOBBY | Design conditions per Annex ACMV_N1 Revisions 2021. | | |
| 3.6.1.1 | Less than 9 m habitable height | | No Reqmt | No Reqmt |
| 3.6.1.2 | 9 m to 15 m habitable height | Vent at top of stairwell | Required | NA |
| | | Stair ventilation openings at ever floor level (for stairs along external walls) | Permitted | NA |
| | | Stairwell Pressurization | NR | NA |
| 3.6.1.3 | >15 m to < 28 m habitable height | Vent at top of stairwell | NA | NP |
| | | Stair ventilation openings at ever floor level (for stairs along external walls) | NA | Required |
| | | Stairwell Pressurization | NA | Permitted |
| 3.8 | SUBDIVISION OF BUILDING SPACES | Buildings shall be subdivided in accordance with 3.8.1 | Required | Required |
| 3.8.1 | SEPARATION BETWEEN SLEEPING ROOMS | Sleeping rooms shall be separated from each other by walls and floors constructed as fire barriers of not less 1-hour fire resistance rating. | Required | Required |
| 3.9 | (Reserved). | | | |
| 4.0 | SPECIAL PROVISIONS. | Special Provisions for Firefighting and Rescue shall comply with QCD FLS Annex and as modified in item 4.0 of this FLS Occupancy Chapter. | | |



| Item | Fire Safety Provisions | Minimum Requirements | Small | Large |
|-------|---|--|-------------------|----------|
| 4.1 | FIRE (EMERGENCY) COMMAND CENTER (FCC) | QCD FLS Annex_A5 – Revisions_2021. | NR | NR |
| 4.1.1 | | A Fire Command Center shall be provided in buildings that requires Emergency Voice Communication System and/or Smoke Control System. | NA-Not Applicable | NA |
| 4.2 | FIREMAN'S ACCESS PANELS/OPENINGS | QCD FLS Annex_A3 – Revisions_2021 | Required | Required |
| 4.3 | EXTERNAL ACCESS TO SITE AND BUILDINGS | QCD FLS Annex_A3 – Revisions_2021 | Required | Required |
| 4.3.1 | SITE ACCESS/ACCESS ROAD | For gated facility development a 4.0 m wide access road and 4.5 m clear height vertical clearance entry gate or site access shall be provided. | - | - |
| 4.3.2 | FIRE ENGINE HARDSTANDING | Fire engine hardstandings with longer side parallel to the façade of the building shall be provided in buildings exceeding the habitable height of 10 m. | Required | Required |
| 4.4 | (Reserved). | | | |
| 5.0 | BUILDING SERVICES AND FIRE PROTECTION EQUIPMENT | Building Services and Fire Protection Equipment shall comply with the applicable NFPA codes and standards and QCD FLS Annex. | | |
| 5.1 | ELECTRICAL SYSTEM | Electrical wiring and equipment shall be in accordance with NFPA 70. | Required | Required |
| 5.1.1 | ELECTRICAL EQUIPMENT/PANEL ROOMS AND SIMILAR ROOMS/SPACES | QCD FLS Annex _A7 – Revisions_2021 | Required | Required |
| 5.1.2 | EMERGENCY GENERATORS AND STANDBY POWER SYSTEMS. | Emergency generators and standby power systems shall be installed, tested, and maintained in accordance with NFPA 110. | Required | Required |
| 5.1.3 | STORED ELECTRICAL ENERGY SYSTEMS | Stored electrical energy systems shall be installed, tested, and maintained in accordance with NFPA 111. | Required | Required |
| 5.2 | COMMERCIAL COOKING OPERATIONS | Where permitted, commercial cooking operations shall be protected in accordance with NFPA 96. Also see 3,2,2 requirements. | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Small | Large |
|---------|--------------------------------------|--|----------|----------|
| 5.3 | ELEVATORS, ESCALATORS, and CONVEYORS | An elevator, shall not be considered a component in a required means of egress and shall be in accordance with NFPA 101 section 9.4. | Required | Required |
| 5.3.1 | NUMBER OF CARS | The number of elevator cars permitted in a hoistway shall be not more than three (3). | Required | Required |
| 5.3.2 | OPENINGS TO EXIT ENCLOSURES | Conveyors, elevators, dumbwaiters, and pneumatic conveyors serving various stories of a building shall not open to an exit enclosure. | Required | Required |
| 5.4 | WASTE and LINEN HANDLING SYSTEM | Chutes and its associated trash collection storage rooms and service opening rooms, when provided shall comply with NFPA 101 section 9.5. | Required | Required |
| 5.4.1 | | Approved waste/linen chutes and transport systems, including gravity waste chutes, full pneumatic waste conveying systems, and gravity pneumatic waste conveying systems, shall comply with the provisions of NFPA 82. | Required | Required |
| 5.4.1.1 | Construction | Chutes, shall be separately enclosed by walls or partitions of not less than 2-hrs fire resistance rating and chute intake openings protection of 1.5-hour fire protection rating. | Required | Required |
| 5.4.1.2 | Trash/Linen Collection Storage Rooms | Chutes, shall have its associated trash collection, service opening rooms separately enclosed by walls of not less than 1-hr fire resistance rating and openings protection of 3/4-hour fire protection rating. | Required | Required |
| 5.4.1.3 | | The doors of chutes shall open only to a trash/linen collection, service opening room, laundry storage room or to a room that is designed and used exclusively for accessing the chute opening. | Required | Required |
| 5.4.2 | GRAVITY CHUTES | A waste/linen chute shall extend (full size) at least 0.90 m. above the roof of a building. | Required | Required |
| 5.4.2.1 | Chute Venting | The chute shall be open to the atmosphere, with the opening being the same cross-sectional area as the chute. | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Small | Large |
|-------|----------------------------|------------------------------------|----------|----------|
| 5.5 | FIRE PUMPS | | | |
| 5.5.1 | FIRE PUMPS ROOM | QCD FLS Annex _A6 – Revisions_2021 | NR | NR |
| 5.6 | SUBSTATION and SWITCHGEARS | QCD FLS Annex _A8 – Revisions_2021 | Required | Required |
| 5.7 | (Reserved). | | | |

VERTICAL SHAFT PLAN

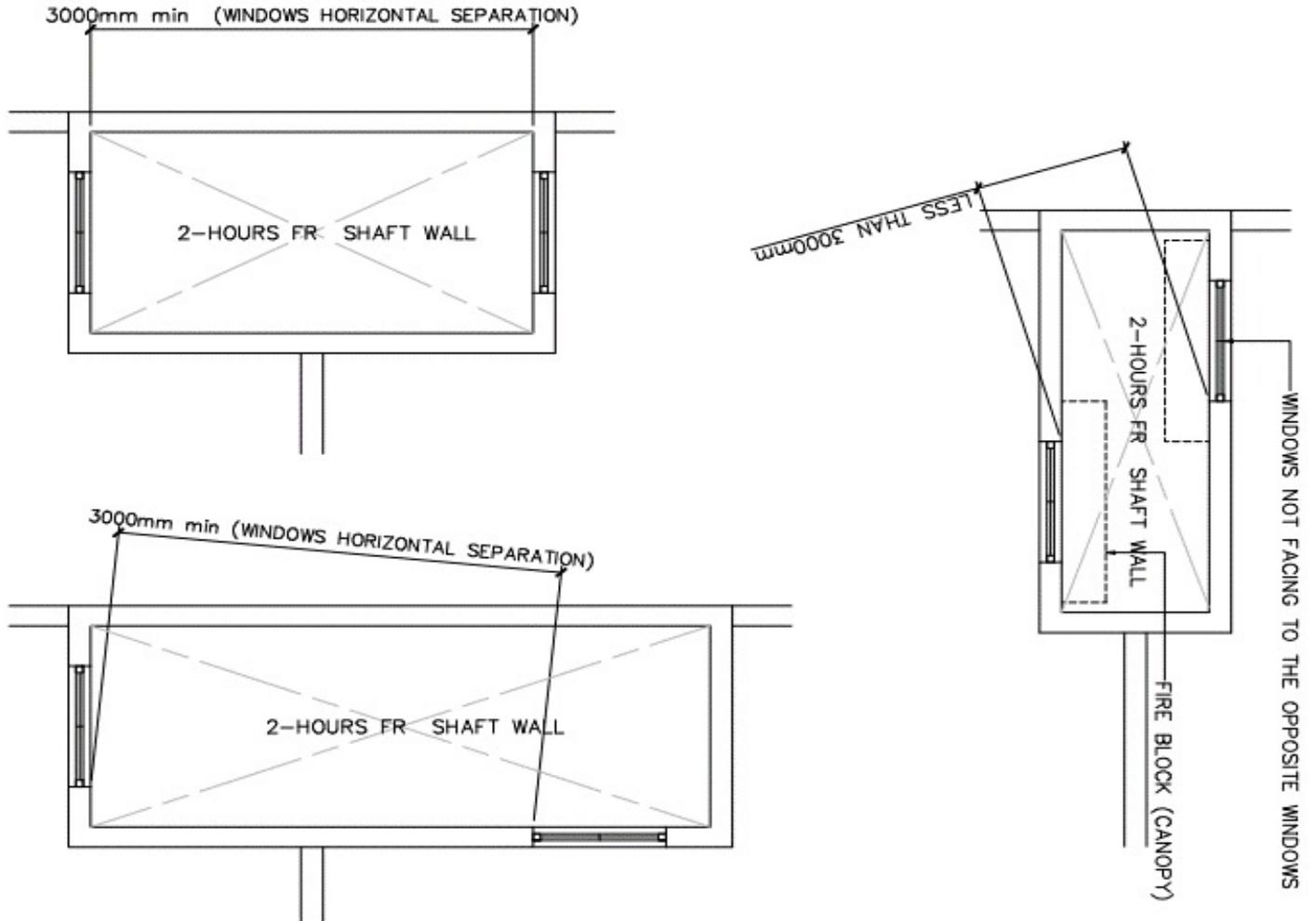
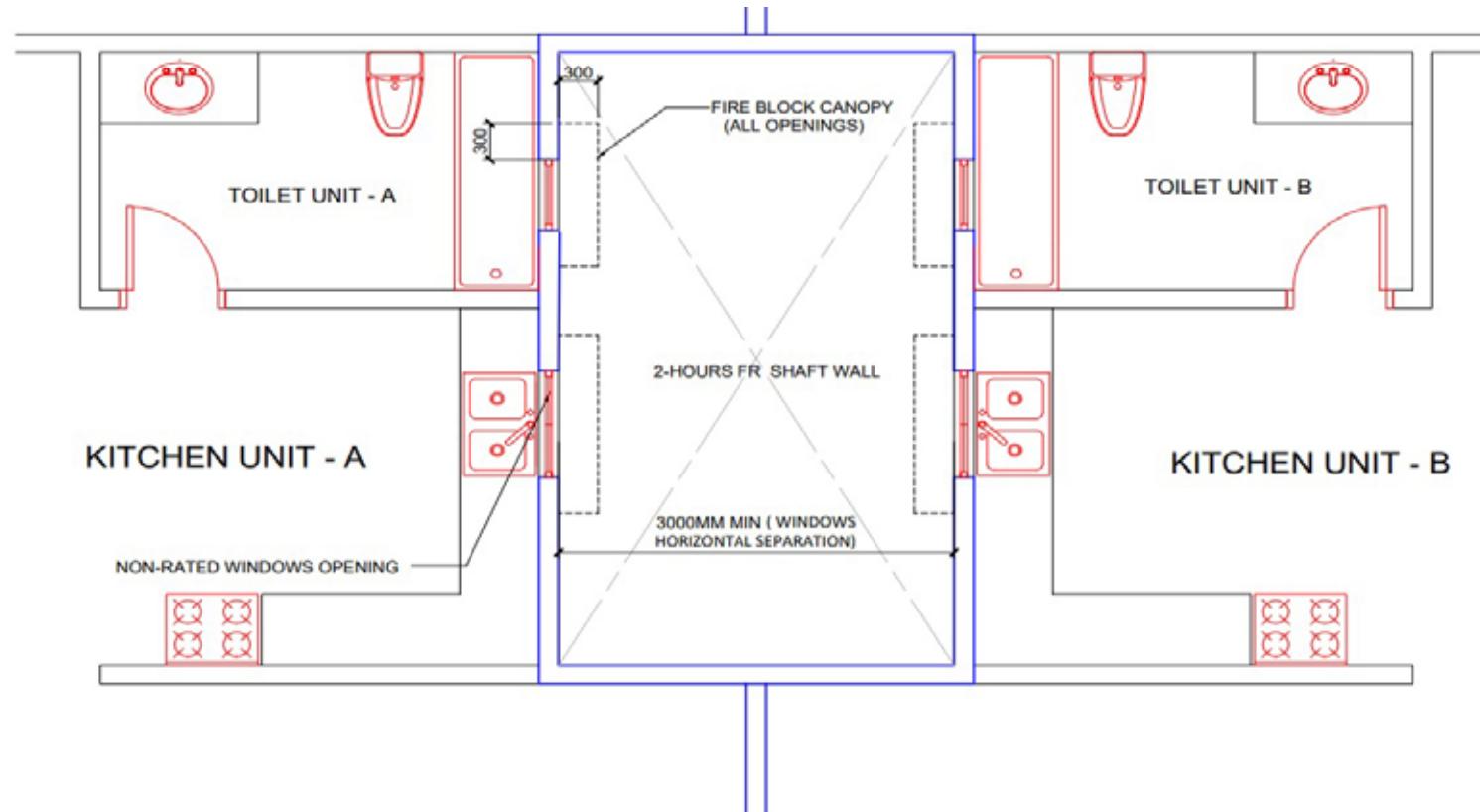


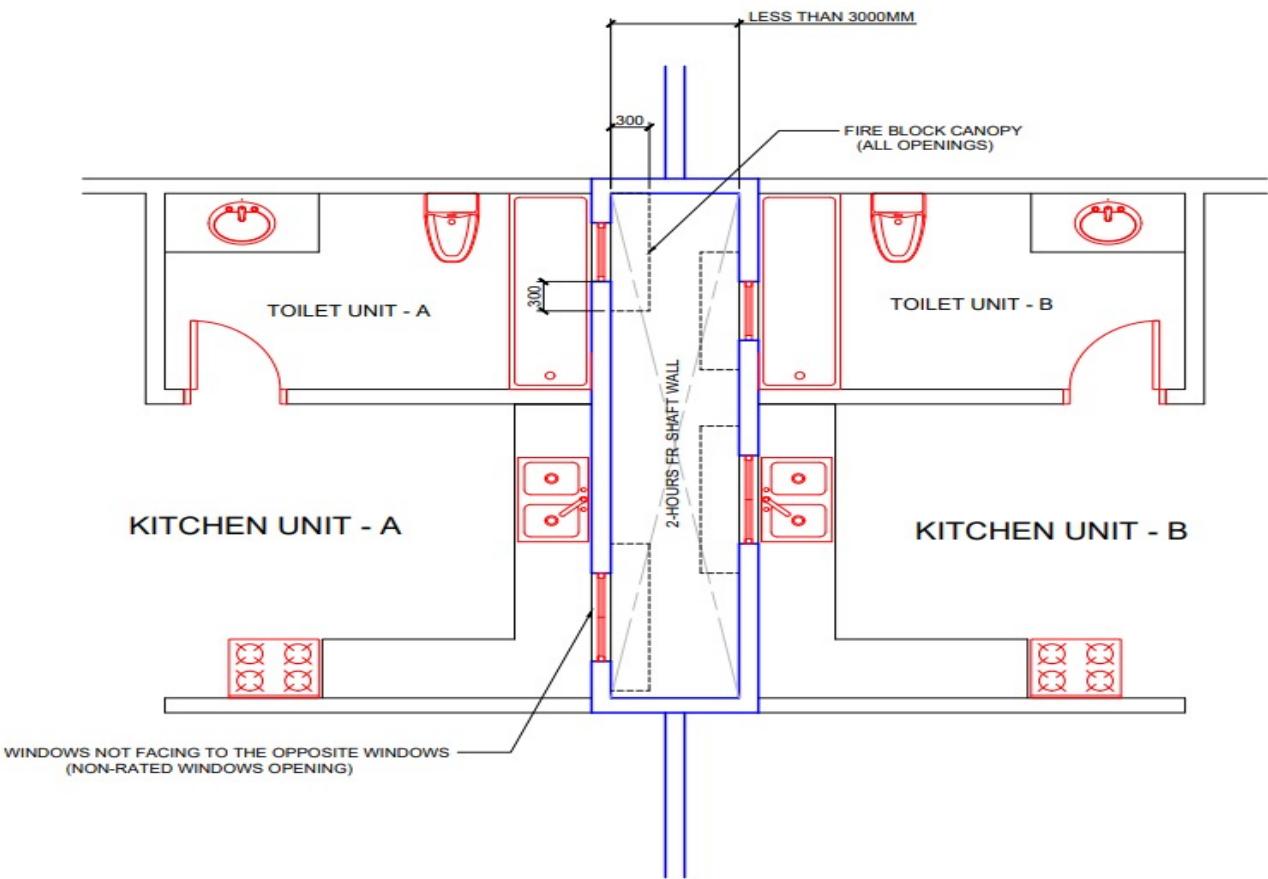
Figure 3.1.3.2(3)(b)(i).





COMMON SHAFT WITH 3000mm WINDOW SEPARATION

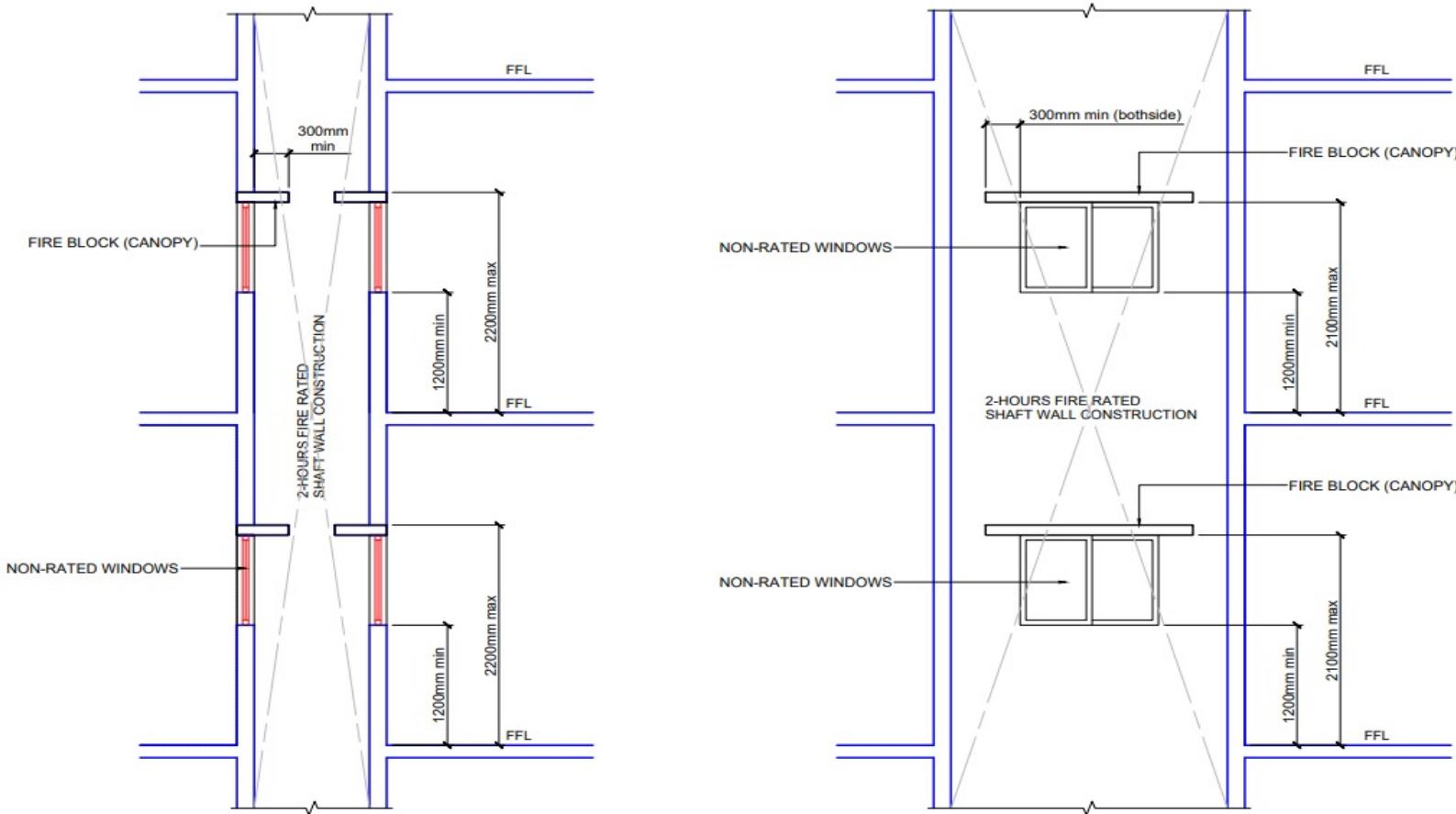
Figure 3.1.3.2(3)(b)(ii).



COMMON SHAFT WITH LESS THAN 3000mm WINDOW SEPARATION

Figure 3.1.3.2(3)(b)(iii).





VERTICAL SHAFT OPENING SECTION

Figure 3.1.3.2(3)(b)(iv).

VERTICAL SHAFT ISO SECTION

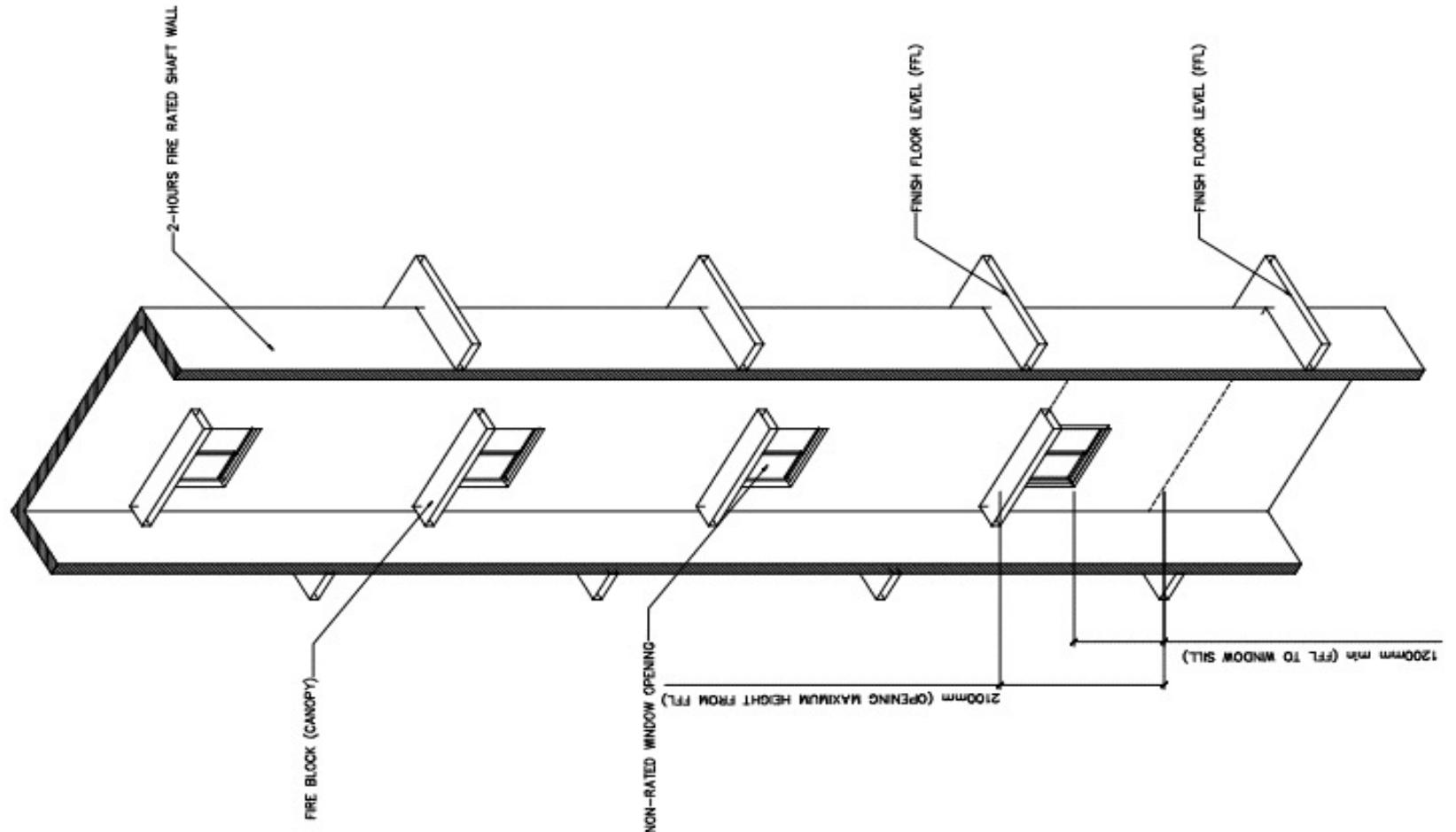
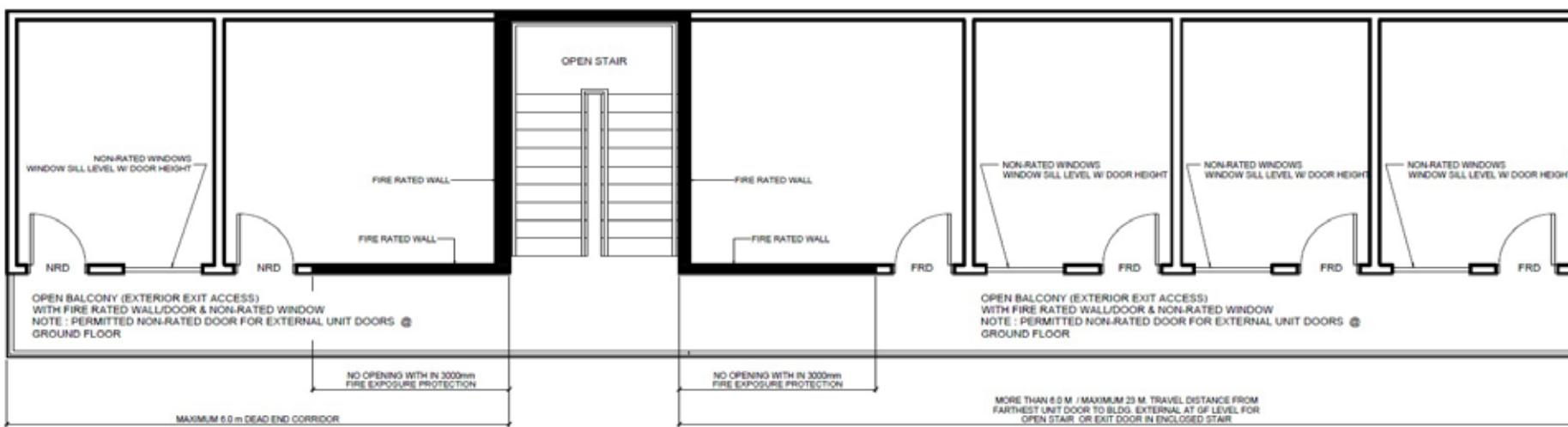


Figure 3.1.3.2(3)(b)(v).

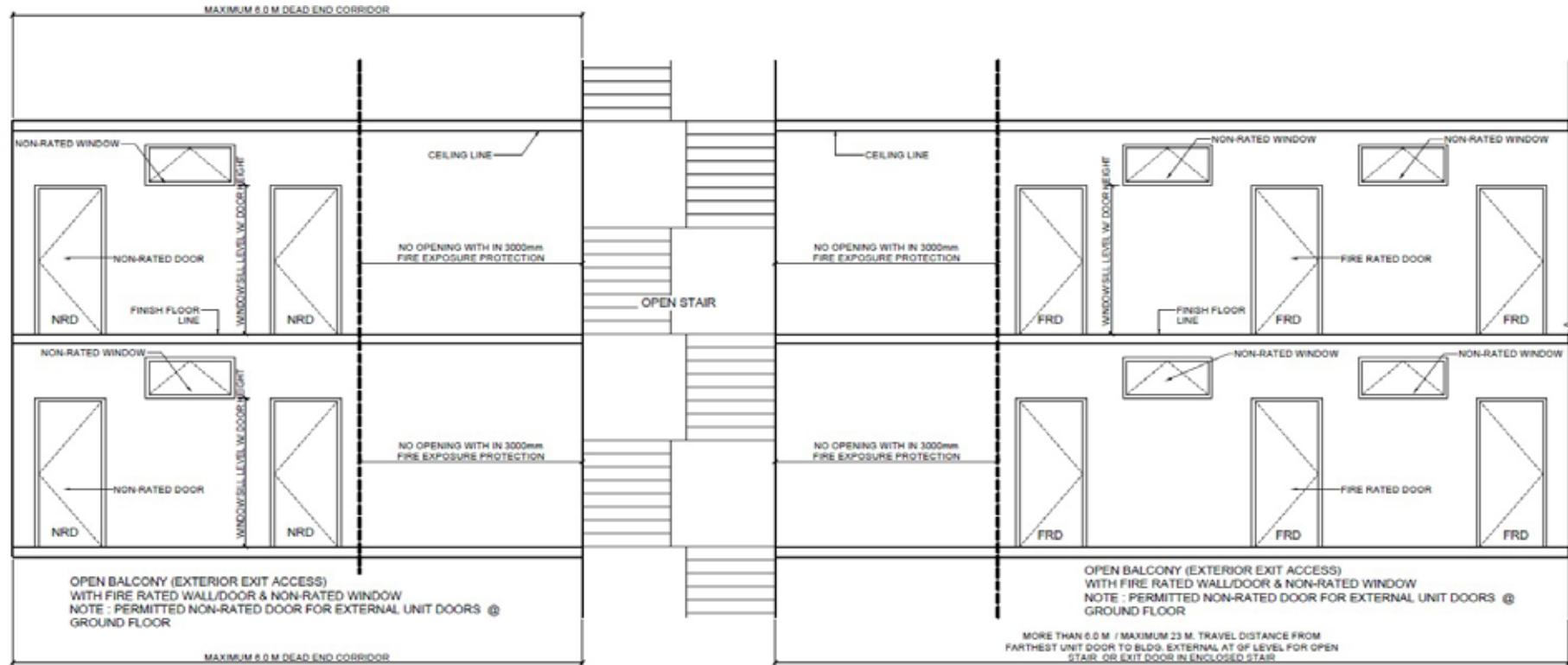




PLAN

ACCOMMODATION SINGLE EXIT WITH OPEN BALCONY (EXTERIOR EXIT ACCSESS)

Figure 3.3.2.2(1)



ELEVATION

Figure 3.3.2.2(2)





APARTMENT BUILDINGS



| APARTMENT BUILDINGS | | | | | | |
|--|---|--|--|---|-----------|-----------|
| 1.0 | GENERAL REQUIREMENTS. | The fire and life safety requirements in this chapter shall apply to buildings or portions thereof used as apartment occupancies. | | | | |
| | Residential Occupancy containing three or more dwelling units with independent bathroom and cooking facilities. | | | | | |
| | Residential Apartments / Apartment Buildings | | Residential Flats | | | |
| 1.1 GENERAL CONDITIONS & BUILDING LIMITS | | | | | | |
| | Building Category | Building Height (m) | Floor Area (m ²) | Basement Levels | | |
| 1.1.1 | LOW-RISE APARTMENT | < 15.0 m Habitable Height | No Limit [in Area or Number of Dwelling Units per story or Number of Bedrooms per dwelling unit] | No Limit [in Floor/Fire Area, Depth or Levels] | | |
| 1.1.2 | MID-RISE APARTMENT | ≥ 15 m to < 28 m Habitable Height | | | | |
| 1.1.3 | HIGH-RISE APARTMENT | ≥ 28 m Habitable Height | | | | |
| FIRE AND LIFE SAFETY REQUIREMENTS | | | | | | |
| Item | Fire Safety Provisions | | Minimum Requirements | Low-rise | Mid-rise | High-rise |
| 1.2 | CLASSIFICATION OF OCCUPANCIES | | Classification of occupancies shall be in accordance with NFPA 101 Chapter 6, and the requirements in 1.2. | Required | Required | Required |
| 1.2.1 | MULTIPLE OCCUPANCIES | | No dwelling unit of an apartment building shall have its sole means of egress pass through any nonresidential occupancy in the same building. | Required | Required | Required |
| 1.2.1.1 | In buildings that are NOT PROTECTED by an automatic sprinkler system | | The sole means of egress from the dwelling unit to the exterior shall be separated from the remainder of the building by fire barriers having a minimum 1-hour fire resistance rating. | Permitted | Permitted | Permitted |
| 1.2.1.2 | | | The sole means of egress from the dwelling unit shall not pass through a high hazard contents area. | Permitted | Permitted | Permitted |
| 1.2.1.3 | In buildings that are PROTECTED by an automatic sprinkler system | | The sole means of egress from the dwelling unit shall not pass through a high hazard contents area. | Permitted | Permitted | Permitted |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|--|-----------|-----------|-----------|
| 1.2.2 | MULTIPLE DWELLING UNITS | Multiple dwelling units shall be permitted to be located above a non residential occupancy only where one of the following conditions exists: | Permitted | Permitted | Permitted |
| 1.2.2.1 | Conditions: | Where the dwelling units of the residential occupancy and exits therefrom are separated from the non residential occupancy by construction having a minimum 1-hour fire resistance rating. | - | - | - |
| 1.2.2.2 | | Where the nonresidential occupancy is protected throughout by an approved, supervised automatic sprinkler system. | - | - | - |
| 1.2.3 | atrium | Atrium walls permitted to serve as part of the separation for creating separated occupancies on a story-by-story basis. | Permitted | Permitted | Permitted |
| 1.3 | OCCUPANT LOAD | Determined on the basis of the occupant load factors (OLF) that are characteristic of the use of the space as specified in 1.3.1 and 1.3.2. | Required | Required | Required |
| 1.3.1 | OCCUPANT LOAD FACTOR (OLF) | The occupant load shall be not less than the number of persons determined by dividing the floor area assigned to that use by the occupant load factor of 18.6 m ² per person. | Required | Required | Required |
| 1.3.2 | NON-RESIDENTIAL OCCUPANCIES in Apartment Buildings | The occupant load calculations for areas of apartment used for non-residential purposes shall be based on the occupant load factors applicable to the use of the area. | Required | Required | Required |
| 1.4 | CLASSIFICATION OF HAZARD OF CONTENTS: | The contents of residential occupancies shall be classified as Ordinary Hazard. | Required | Required | Required |
| 1.5 | MINIMUM CONSTRUCTION REQUIREMENTS. | Construction shall be in accordance with NFPA 5000 Chapters 7–8, 13–14, 31, and 35–40. | Required | Required | Required |
| 1.6 | ACCESSIBILITY. | Reserved. | | | |
| 1.7 | (Reserved). | | | | |
| 2.0 | MEANS of EGRESS REQUIREMENTS. | Means of egress shall comply with NFPA 101 Chapter 7, and as modified in item 2.0 of this FLS Occupancy Chapter. | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|----------|--|---|-----------------|-----------|-----------|
| 2.1 | MEANS OF ESCAPE (within the Dwelling or Apartment Unit) | In dwellings or dwelling units of two rooms or more, every sleeping room and every living area shall have not less than one primary means of escape and one secondary means of escape. | Required | Required | Required |
| 2.1.1 | Exemptions | A secondary means of escape shall not be required where one of the following conditions is met: | Permitted | Permitted | Permitted |
| 2.1.1(1) | | The bedroom or living area has a door leading directly to the outside of the building at or to the finished ground level. | NR-Not Required | NR | NR |
| 2.1.1(2) | | Dwelling unit is protected throughout by an automatic sprinkler system. | NR | NR | NR |
| 2.1.2 | PRIMARY MEANS OF ESCAPE | The primary means of escape shall be a door, stairway, or ramp providing a means of unobstructed travel to the outside of the dwelling unit at street or the finished ground level. | Required | Required | Required |
| 2.1.3 | SECONDARY MEANS OF ESCAPE | The secondary means of escape, shall be one of the following means: | Required | Required | Required |
| 2.1.3.1 | | A door, stairway, passage, or hall providing a way of unobstructed travel to the outside of the dwelling at street or the finished ground level that is independent of and remote from the primary means of escape. | Required | Required | Required |
| 2.1.3.2 | | A passage thru an adjacent nonlockable space, independent of and remote from the primary means of escape, to any approved means of escape. | Required | Required | Required |
| 2.1.3.3 | | An outside window or door operable from the inside without the use of tools, keys, or special effort and shall provide a clear opening of not less than 0.53 m ² . | Required | Required | Required |
| 2.1.3.4 | | The width shall be not less than 510 mm, and the height shall be not less than 610 mm. The bottom of the opening shall be not more than 1120 mm above the floor. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|---|---|-----------|-----------|-----------|
| 2.1.4 | TWO (2) PRIMARY MEANS OF ESCAPE | Any dwelling or apartment unit in excess of 185 m ² shall be provided with not less than two exit access doors remotely located from each other. | Required | Required | Required |
| 2.1.4.1 | Exemption for Two Primary Means of Escape | Buildings protected throughout by an approved, supervised automatic sprinkler system. | Permitted | Permitted | Permitted |
| 2.1.5 | ARRANGEMENT OF MEANS OF ESCAPE (within the Dwelling or Apartment Unit) | Any required path of travel in a means of escape from any room to the outside shall not pass through another room or apartment not under the immediate control of the occupant of the first room or through a bathroom or other space subject to locking. | Required | Required | Required |
| 2.1.6 | DOORS (within the Dwelling or Apartment Unit) | Doors in the path of travel of a means of escape, other than bathroom doors and doors serving a room not exceeding 6.5 m ² shall be not less than 710 mm wide. | Required | Required | Required |
| 2.1.6.1 | Bathroom Doors (Width) | Bathroom doors and doors serving a room not exceeding 6.5 m ² shall be not less than 610 mm wide. | Required | Required | Required |
| 2.1.6.2 | Doors (Height) | Doors (within dwelling or apartment unit) nominal height shall be not less than 1980 mm | Required | Required | Required |
| 2.1.7 | HALLWAYS (within the Apartment Unit) | Width of hallways shall be not less than 915 mm. | Required | Required | Required |
| 2.1.7.1 | | Nominal height of hallways (clearance below projections from the ceiling of not less than 2030 mm shall be not less than 2135 mm. | Required | Required | Required |
| 2.2 | MEANS OF EGRESS COMPONENTS | Components of means of egress shall be limited to the types described in 2.2.2 through 2.2.8. | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|------------|--|---|-----------|-----------|---------------|
| 2.2.1 | General. | In buildings protected throughout by an automatic sprinkler system, exit enclosures shall have a minimum 1-hour fire resistance rating, and doors shall have a minimum 1-hour fire protection rating. | Required | Required | Not permitted |
| 2.2.2 | DOORS | Doors shall be in accordance with NFPA 101 section 7.2.1, and the requirements in items 2.2.2.1 through 2.2.2.4. | Required | Required | Required |
| 2.2.2.1 | Installed Security Measures | No door in any means of egress shall be locked against egress when the building is occupied. Security measures, where installed, should not prevent egress. | Required | Required | Required |
| 2.2.2.1(1) | Delayed-egress Electrical Locking | Delayed-egress electrical locking system complying with NFPA 101 section 7.2.1.6.1 . | Permitted | Permitted | Permitted |
| 2.2.2.1(2) | Sensor-release of Electrical Locking Systems | Sensor-release of electrical locking systems complying with NFPA 101 section 7.2.1.6.2. | Permitted | Permitted | Permitted |
| 2.2.2.1(3) | Elevator Lobby Exit Access Door Locking | Elevator lobby exit access door locking in accordance with NFPA 101 section 7.2.1.6.3. | Permitted | Permitted | Permitted |
| 2.2.2.2 | Revolving Doors | Revolving doors complying with NFPA 101 section 7.2.1.10 | Permitted | Permitted | Permitted |
| 2.2.2.4 | Re-entry Provisions | Apartment occupancies shall be exempt from the re-entry provisions where the exit enclosure serves directly only one dwelling unit per floor, and such exit is a smokeproof enclosure. | Permitted | Permitted | Permitted |
| 2.2.3 | STAIRS | Stairs complying with NFPA 101 section 7.2.2 and as specified in 2.2.3.1 and 2.2.3.2. | Permitted | Permitted | Permitted |
| 2.2.3.1 | Spiral Stairs | Only within dwelling unit | Permitted | Permitted | Permitted |
| 2.2.3.2 | Winders | Only within dwelling unit | Permitted | Permitted | Permitted |
| 2.2.3.3 | Lifts/Elevators | Lift serving various stories of a building located within an exit stair enclosure | NP | NP | NP |
| 2.2.4 | SMOKEPROOF ENCLOSURES. | Smokeproof enclosures complying with NFPA 101 section 7.2.3. | Permitted | Permitted | Permitted |
| 2.2.5 | HORIZONTAL EXITS. | Horizontal exits complying with NFPA 101 section 7.2.4. | Permitted | Permitted | Permitted |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|-----------------------------|--|-----------|-----------|------------------|
| 2.2.6 | RAMPS | Accessible ramps and ramps used as a component in the means of egress shall conform with the general requirements for ramps in NFPA 101 7.2.5. | Required | Required | Required |
| 2.2.7 | EXIT PASSAGEWAYS. | Exit passageways complying with NFPA 101 section 7.2.6. | Permitted | Permitted | Permitted |
| 2.2.9 | AREAS OF REFUGE. | Areas of refuge complying with NFPA 101 section 7.2.12. | Permitted | Permitted | Permitted |
| 2.3 | CAPACITY OF MEANS OF EGRESS | Capacity of means of egress shall be in accordance with NFPA 101 section 7.3 and the requirements in item 2.3. | Required | Required | Required |
| 2.3.1 | STREET FLOOR EXIT | Street floor exits shall be sufficient for the occupant load of the street floor plus the required capacity of stairs and ramps discharging onto the street floor. | Required | Required | Required |
| 2.3.2 | CORRIDORS | Corridors with a required capacity of more than 50 persons, shall be of sufficient width to accommodate the required occupant load but shall have a width of not less than 1200 mm. | Required | Required | Required |
| 2.4 | NUMBER OF MEANS OF EGRESS | Number of means of egress shall be in accordance with NFPA 101 section 7.4 and as modified in item 2.4. | Required | Required | Required |
| 2.4.1 | EXITS WITHIN DWELLING UNIT | Every dwelling unit shall have access to at least two separate exits remotely located from each other as required by 2.1. | Required | Required | Required |
| 2.4.2 | SINGLE EXIT PROVISIONS | A single exit shall be permitted to serve all floor levels, provided that all of the conditions for single exit provisions in 2.4.2.1 through 2.4.2.9 are met. | Permitted | Permitted | NP-Not permitted |
| 2.4.2.1 | Floor Area | Net floor area of apartment dwellings is equal or less than 500 m ² per floor level. | Required | Required | - |
| 2.4.2.2 | Common Path | Common path of travel from the entrance door of any dwelling unit to an exit does not exceed 11 m. | Required | Required | - |
| 2.4.2.3 | Enclosures of Exit Stairway | Exit stairway is completely enclosed or separated from the rest of the building by a minimum 2-hour fire resistance rating (1.5-hrs doors) where the exit connects four or more stories. | Required | Required | - |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|------------|--|---|-----------|-----------|-----------|
| 2.4.2.4 | Number, Depth and Floor Area of Basement | Stairway serve only one (1) Basement, that is equal or less than 500 m ² fire area or fire compartment and and maximum depth of 6.0 m. | Required | Required | - |
| 2.4.2.5 | Opening Protective | All openings between the exit enclosure and the building are protected with self-closing door assemblies of 1-hour fire protection rating. | Required | Required | - |
| 2.4.2.6 | Exit Access Corridors | All corridors serving as access to exits have a minimum of 1-hour fire resistance rating. | Required | Required | - |
| 2.4.2.7 | Exit Discharge | Exits shall terminate directly, at a public way or an interior exit discharge. | Required | Required | - |
| 2.4.2.7(1) | | The interior exit discharge permitted in 2.4.2.7, shall be within 11 m. from the exit enclosure door to an exterior door leading to the public way. | Permitted | Permitted | - |
| 2.4.2.7(2) | | The interior exit discharge shall be separated from the remainder of the level of discharge by fire barriers of a min. 1-hour fire resistance rating. | Required | Required | - |
| 2.4.2.8 | Subdivisions of Building Spaces | Horizontal and vertical separation of 1.0-hr fire resistance rating is provided between dwelling units. | Required | Required | - |
| 2.4.2.9 | Smoke Control/Ventilation Requirements | | | | |
| 2.4.2.9(1) | Smoke Vents | Smoke vents (fixed-wall openings or automatic opening vents) at the top of the stairwell (9 m - 15 m habitable height). | Required | Required | - |
| 2.4.2.9(2) | Pressurization System | Positive pressure ventilation system in exit stair that traverses more than 15 m. habitable height. | NA | Required | - |
| 2.5 | ARRANGEMENT OF MEANS OF EGRESS | Arrangement of means of egress shall be in accordance with NFPA 101 section 7.5 and as modified in item 2.5. | Required | Required | Required |
| 2.5.1 | ACCESS TO EXITS | Access to all required exits shall be in accordance with Section 2.5, as modified by 2.5.1.1 and 2.5.2 | Required | Required | Required |
| 2.5.1.1 | Exit Remoteness | Remoteness shall be provided in accordance with NFPA 101 sections 7.5.1.3.1 through 7.5.1.3.7. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|---|-----------|-----------|-----------|
| 2.5.1.2 | | The distance between exits addressed by 2.5.1.1 shall not apply to non-looped exit access corridors in buildings that have corridor doors from the dwelling units that are arranged such that the exits are located in opposite directions from such doors. | Permitted | Permitted | Permitted |
| 2.5.2 | TRAVEL DISTANCE (TD) TO EXITS | The distance that a person would travel from any point within the floor area to the nearest exit shall be measured in accordance with NFPA 101 section 7.6.2.5.1 and as modified in item 2.5.2. | Required | Required | Required |
| 2.5.2.1 | Travel Distance within Dwelling Units | Travel distance within dwelling (apartment) units to a corridor door, shall not exceed 23 m. | Required | Required | Required |
| 2.5.2.2 | Buildings Protected Throughout by an Approved Automatic Sprinkler System | Travel distance within dwelling (apartment) units to a corridor door, shall not exceed 38 m. | Required | Required | Required |
| 2.5.2.3 | Travel Distance from Dwelling Unit Door to an Exit | The travel distance from a dwelling (apartment) unit entrance door to the nearest exit shall not exceed 30 m. | Required | Required | Required |
| 2.5.2.4 | Buildings Protected Throughout by an Approved Automatic Sprinkler System | The travel distance from a dwelling (apartment) unit entrance door to the nearest exit, shall not exceed 61 m. | Required | Required | Required |
| 2.5.2.5 | Travel Distance in Exterior Ways of Exit Access | The travel distance from a dwelling (apartment) unit entrance door to the nearest exit for exterior ways of exit access shall not exceed 61 m. | Required | Required | Required |
| 2.5.2.6 | Travel Distance in Other Areas | The travel distance, from areas other than those within living units, to an exit shall not exceed 61 m. | Required | Required | Required |
| 2.5.2.7 | Buildings Protected Throughout by an Approved Automatic Sprinkler System | The travel distance, from areas other than those within living units, shall not exceed 76 m. | Required | Required | Required |
| 2.5.3 | COMMON PATH (CP) OF TRAVEL | Travel within a dwelling unit shall not be included when calculating common path of travel. | Permitted | Permitted | Permitted |
| 2.5.3.1 | Common Path Limit | Common path of travel shall not exceed 11 m. | Required | Required | Required |
| 2.5.3.2 | Buildings Protected Throughout by an Approved Automatic Sprinkler System | Common path of travel shall not exceed 15 m. | Required | Required | Required |
| 2.5.4 | DEAD-END (DE) CORRIDOR | Dead-end corridors shall not exceed 11 m. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|--|------------------|-----------|-----------|
| 2.5.4.1 | Buildings Protected Throughout by an Approved Automatic Sprinkler System | Dead-end corridors shall not exceed 15 m. | Required | Required | Required |
| 2.6 | DISCHARGE FROM EXITS | Exit discharge shall comply with NFPA 101 7.7 and as permitted in 2.6.3. | Required | Required | Required |
| 2.6.1 | EXIT TERMINATION | Exits shall terminate directly, at a public way or at an exterior exit discharge. | Required | Required | Required |
| 2.6.2 | EXIT DISCHARGE THRU INTERIOR BUILDING AREAS | Discharge through interior building areas with not more than 50 percent of the required number of exits, and 50 percent of the required egress capacity. | Permitted | Permitted | Permitted |
| 2.6.3 | | Interior exit discharge as permitted in 2.6.2 shall be within a maximum 11 m. travel distance to exit termination or the building external. | Permitted | Permitted | Permitted |
| 2.7 | ILLUMINATION OF MEANS OF EGRESS | Means of egress shall be illuminated in accordance with NFPA 101 section 7.8. | Required | Required | Required |
| 2.7.1 | EMERGENCY LIGHTING | Emergency lighting in accordance with NFPA 101 Section 7.9, as modified by 2.7.1 through 2.7.3. | Required | Required | Required |
| 2.7.1.1 | | The apartment building is three (3) or more stories in height. | Required | Required | Required |
| 2.7.2 | | The occupancy is subject to 50 or more occupants above or below the level of exit discharge. | Required | Required | Required |
| 2.7.3 | | The occupancy is subject to 300 or more total occupants. | Required | Required | Required |
| 2.8 | MARKINGS OF MEANS OF EGRESS | Means of egress shall have signs in accordance with NFPA 101 Section 7.10 in all buildings requiring more than one exit. | Required | Required | Required |
| 2.9 | NORMALLY UNOCCUPIED BUILDING SERVICE EQUIPMENT SUPPORT AREAS | Provisions for normally unoccupied service support areas in accordance with NFPA 101 section 7.14. | NP-Not permitted | NP | NP |
| 2.10 | (Reserved). | | | | |
| 3.0 | PROTECTION | Protection shall comply with the applicable NFPA codes and standards, QCD FLS Annex and as modified in item 3.0 of this FLS Occupancy Chapter. | | | |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|------------|---|--|-----------|-----------|---------------|
| 3.1 | PROTECTION OF VERTICAL OPENINGS | Vertical openings shall be enclosed or protected in accordance with NFPA 101 section 8.6. | Required | Required | Required |
| 3.1.1 | COMMUNICATING SPACE | Where the provisions Communicating Spaces in accordance with NFPA 101 section 8.6.6 are used, the building shall comply with 3.5.1.2. | Required | Required | Required |
| 3.1.2 | WALLS Enclosing Vertical Openings | Walls enclosing vertical openings shall have a min. 1-hour fire resistance rating, and the doors shall have a minimum 1-hour fire protection rating. | Required | Required | Required |
| 3.1.3 | FLOOR Below the Level of Exit Discharge | No floor below the level of exit discharge used only for storage, or purposes other than residential occupancy and open to the public shall have unprotected openings to floors used for residential purposes. | Required | Required | Required |
| 3.1.4 | VERTICAL SHAFTS/SHAFTWAYS | | Permitted | Permitted | Permitted |
| 3.1.4.1 | Enclosures Fire Resistance Rating | Enclosures connecting four (4) or more stories in new construction – 2-hour fire barriers. | Required | Required | Required |
| 3.1.4.1(1) | | Other enclosures in new construction – 1-hour fire barriers | Required | Required | Required |
| 3.1.4.2 | Openings in Shaft | Windows of kitchens, toilets, baths and other rooms, that opens to a common and shared vertical shafts shall be permitted, except in high-rise buildings, subject to the following conditions: | Permitted | Permitted | Not Permitted |
| 3.1.4.2(1) | Openings Protection | The openings or windows shall have a fire protection rating equivalent to the fire resistance rating required for the shaft, or | Required | Required | - |
| 3.1.4.2(2) | | The room of the openings shall be protected within a fire resistance rated enclosures and any doors in the enclosing walls of the room shall have a fire protection rating of not less than 1-hour. | Required | Required | - |
| 3.1.4.2(3) | Location and Separation Distance | The openings or windows shall be located at a 3 m separation distance measured in a straight line between the nearest edge of each openings from a different unit. | Required | Required | - |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------------|--|---|---------------|---------------|-----------|
| 3.1.4.2(3)(a) | | The openings or windows permitted in shall not be located directly facing each other. | Required | Required | - |
| 3.1.4.2(3)(b) | | Any openings> sill height shall not be less than 1.2m ; and height not more than 2.10m above the finish floor level, A concrete overhang (awning) to serve as fire block projected 0.3m from the shaft wall directly above the openings. See figures 3.1.4.2(3)(b)(i) through (v) | Required | Required | - |
| 3.1.5 | VERTICAL OPENINGS within Dwelling Unit | Within any individual dwelling unit, vertical openings that is more than one story above or below the entrance floor level of the dwelling unit . | Not permitted | Not Permitted | Permitted |
| 3.2 | PROTECTION FROM HAZARDS | | Required | Required | Required |
| 3.2.1 | HAZARDOUS AREAS | Any hazardous area shall be protected in accordance with NFPA 101 8.7 and as specified in 3.2.1.1 through 3.2.1.9. | Required | Required | Required |
| 3.2.1.1 | Boiler and fuel-fired heater rooms | 1 hour and sprinklers or 2-hrs enclosures in non-sprinklered buildings. | Required | Required | Required |
| 3.2.1.2 | Employee locker rooms | 1 hour or sprinklers. | Required | Required | Required |
| 3.2.1.3 | Gift or retail shops | 1 hour or sprinklers. | Required | Required | Required |
| 3.2.1.4 | Bulk laundries | 1 hour and sprinklers or 2-hrs enclosures in non-sprinklered buildings. | Required | Required | Required |
| 3.2.1.5 | Laundries $\leq 9.3 \text{ m}^2$ outside of dwelling units | 1 hour or sprinklers. | Required | Required | Required |
| 3.2.1.6 | Laundries $>9.3 \text{ m}^2$ outside of dwelling units | 1 hour and sprinklers or 2-hrs enclosures in non-sprinklered buildings. | Required | Required | Required |
| 3.2.1.7 | Maintenance shops (ordinary hazard; $<1115 \text{ m}^2$) | 1 hour and sprinklers or 2-hrs enclosures in non-sprinklered buildings. | Required | Required | Required |
| 3.2.1.8 | Storage rooms outside of dwelling units | 1 hour or sprinklers. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|---|--|----------|----------|-----------|
| 3.2.1.9 | Trash collection rooms | 1 hour and sprinklers or 2-hrs enclosures in non-sprinklered buildings. | Required | Required | Required |
| 3.3 | INTERIOR FINISH | Interior finish shall be in accordance with NFPA 101 Section 10.2. | Required | Required | Required |
| 3.3.1 | INTERIOR WALL AND CEILING FINISH | Interior wall and ceiling finish materials shall be permitted as follows: | Required | Required | Required |
| 3.3.1.1 | | Exit enclosures – Class A | Required | Required | Required |
| 3.3.1.2 | | Lobbies and corridors – Class A or Class B | Required | Required | Required |
| 3.3.1.3 | | Other spaces – Class A, Class B, or Class C | Required | Required | Required |
| 3.3.2 | INTERIOR FLOOR FINISH | Interior floor finish in exit enclosures and exit access corridors and spaces not separated by walls complying with 3.7.1 shall be not less than Class II. | Required | Required | Required |
| 3.4 | DETECTION, ALARM & COMMUNICATION REQUIREMENTS | | | | |
| 3.4.1 | GENERAL | Complete coverage of Fire Detection and Alarm System. | Required | Required | Required |
| 3.4.2 | INITIATION | Complete coverage of an Automatic Detection and Manual Initiating Devices. | Required | Required | Required |
| 3.4.3 | OCCUPANT NOTIFICATION | Complete Coverage of an Occupant Notification (audible & visible). | Required | Required | Required |
| 3.4.3.1 | Emergency Voice Evacuation System | Mass Notification System | NR | NR | Required |
| 3.4.4 | SUPPLEMENTARY | | | | |
| 3.4.4.1 | Fire Telephone | In every required provisions of a fire command center (FCC) or emergency control center (ECC). | Required | Required | Required |
| 3.4.4.2 | Graphic Annunciator (PC Panel) or Mimic Panel | In every required provisions of a fire command center (FCC) or emergency control center (ECC). | Required | Required | Required |
| 3.5 | EXTINGUISHMENT REQUIREMENTS | | | | |
| 3.5.1 | AUTOMATIC SPRINKLER (AS) SYSTEM | Apartment Building shall be protected throughout by an approved, supervised automatic sprinkler system. | NR | NR | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|------------|--|--|-----------|----------|-----------|
| 3.5.1.1 | Basement Level/s | Basement level (car park/other usage) with fire area exceeding 1115 m ² . | Required | Required | Required |
| 3.5.1.1(1) | | Multiple-level Basement (car park/other usage) regardless of fire area. | Required | Required | Required |
| 3.5.1.2 | Vertical Openings: Convenience Stairways, Communicating Space & Atrium | Buildings with unprotected openings shall be protected throughout by an approved, supervised automatic sprinkler system. | Required | Required | Required |
| 3.5.1.3 | Exemption to Automatic Sprinkler System | | | | |
| 3.5.1.3(1) | Open Parking Structures | Open parking complying with the openings requirement for open parking structure, and that are contiguous with apartment buildings. | NR | NR | NR |
| 3.5.2 | Fire Hose Reel | Fire hose reels are required in buildings protected by an approved supervised automatic sprinkler system. | Required | Required | Required |
| 3.5.3 | Portable Fire Extinguisher | Applicable Portable Fire Extinguishers required in all buildings. | Required | Required | Required |
| 3.5.4 | Rising Main (Dry or Wet Standpipe) | Refer to Annex Fire Fighting System Annex_FFS_G1 Revisions 2021 | Required | Required | Required |
| 3.6 | SMOKE CONTROL / VENTILATION REQUIREMENTS | Legend: NR-Not Required; NA-Not Applicable; NP-Not Permitted | | | |
| 3.6.1 | STAIRWELL/LOBBY | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.1.1 | Less than 9 m habitable height | | No Reqmt | No Reqmt | No Reqmt |
| 3.6.1.2 | 9 m to 15 m habitable height | Vent at top of stairwell | Required | NA | NA |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | Permitted | NA | NA |
| | | Stairwell Pressurization | NR | NA | NA |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|---|---|-----------|-----------|-----------|
| 3.6.1.3 | >15 m to < 28 m habitable height | Vent at top of stairwell | NA | NP | NA |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | Required | NA |
| | | Stairwell Pressurization | NA | Permitted | NA |
| 3.6.1.4 | ≥28 m habitable height | Vent at top of stairwell | NA | NA | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | NA | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | NA | NA | Required |
| | Connecting Basement Levels | | | | |
| 3.6.1.5 | Two basement levels or ≤6 m deep, ≤2000 m ² floor area | Vent at top of stairwell : * Permitted up to five (5) connecting above floors (2B+G+4 or less) or 12 m habitable height ; whichever is less; otherwise next below provisions shall apply. | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | Permitted | Required | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Required |
| 3.6.1.6 | Three basement levels or ≤ 9.1m deep, ≤2000 m ² floor area | Vent at top of stairwell : * Permitted up to three (3) connecting above floors only (3B+G+2 or less) or 6m habitable height, whichever is less; otherwise next below provisions shall apply | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | NA | NA |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--|--|---|----------|-----------|
| 3.6.1.7 | Two basement levels or ≤ 6 m deep, >2000 m ² floor area | Vent at top of stairwell: * Permitted up to four (4) connecting floors (2B+G+3 or less) or 9 m habitable height ; whichever is less; otherwise next below provisions shall apply. | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | Required | NP | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Required | Required |
| 3.6.1.8 | Three basement levels or ≤ 9.1 m deep, >2000 m ² floor area, connecting one floor above only | Vent at top of stairwell : * Permitted up to two connecting above floors or 3 m habitable height only (3B+G+1 or less); whichever is less, otherwise next below provisions shall apply | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | NA | NA |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization. | Permitted | Required | Required |
| 3.6.1.9 | Lowest basement level >9.1 m below ground level, regardless of floor area | Vent at top of stairwell | NP | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NP | NP | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Required | Required | Required |
| 3.6.2 | ESCAPE CORRIDOR PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.2.1 | Interior Corridors | Vents (Fixed or Automatic Opening) | Required in specific type of Occupancy: Healthcare Occupancies and in Detention and Correctional Occupancies | | |
| | | Mechanical Ventilation of Corridor | | | |
| | | Pressurization of Corridor | | | |
| 3.6.2.2 | Corridor with side/s located along exterior walls | Vents (Fixed or Automatic Opening) | Required in specific type of Occupancy: Healthcare Occupancies and in Detention and Correctional Occupancies | | |
| | | Mechanical Ventilation of Corridor | | | |
| | | Pressurization of Corridor | | | |
| 3.6.3 | atrium and OTHER FLOOR OPENINGS PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-----------|--|--|----------------------------|--|---------------------------|
| 3.6.3.1 | Malls (with floor openings connecting >2 floors) | Smoke Vents (Fixed or Automatic Opening) | Required | NP | NP |
| | | Mechanical Smoke Exhaust Ventilation System/Engineered | Permitted | Required | Required |
| 3.6.3.2 | Other Occupancies (connecting >3 floor levels) | Smoke Vents (Fixed or Automatic Opening) | Required | Permitted | NP |
| | | Mechanical Smoke Exhaust Ventilation System/Engineered | Permitted | Permitted | Required |
| 3.6.4 | CAR PARKS/PARKING STRUCTURES PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.4.1 | Open Parking Structures | The open parking structure shall justify that no smoke stagnation will occur such as from a fire located somewhere in the middle of the car park; otherwise mechanical equipment that will aid in effective dispersal of smoke shall be provided | Required | Required | Required |
| 3.6.4.2 | Aboveground Enclosed Car Parks | | | | |
| 3.6.4.2.1 | Aggregate floor area of $\leq 2000 \text{ m}^2$ | Smoke Vents (Fixed or Automatic) | Required | Required | Permitted |
| | | Mechanical Smoke Purging/Clearance | Permitted | Permitted | Required |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted |
| 3.6.4.2.2 | Aggregate floor area of $> 2000 \text{ m}^2$ | Smoke Vents (Fixed or Automatic) | Required | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | NP |
| | | Engineered Smoke Control System | Required | Permitted | Required |
| 3.6.4.3 | Belowground Car Parks | | $\leq 6 \text{ m}$ Deep | $> 6 \text{ m} - \leq 9.1 \text{ m}$ Deep | $> 9.1 \text{ m}$ Deep |
| 3.6.4.3.1 | Aggregate floor area of $\leq 2000 \text{ m}^2$ | Smoke Vents (Fixed or Automatic) | Required | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | Required |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted |
| 3.6.4.3.2 | Aggregate floor area of $> 2000 \text{ m}^2$ | Smoke Vents (Fixed or Automatic) | NP | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Required | NP | NP |
| | | Engineered Smoke Control System | Permitted | Required | Required |
| 3.7 | CORRIDORS | | Low-rise | Mid-rise | High-rise |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-----------|---------------------------------------|---|------------------|-----------|-----------|
| 3.7.1 | WALLS | Exit access corridor walls shall consist of fire barriers of not less than 1-hour fire resistance rating. | Required | Required | Required |
| 3.7.2 | DOORS | Doors that open onto exit access corridors shall have not less than 30-minute fire protection rating | Required | Required | Required |
| 3.7.2.1 | | Doors that open onto exit access corridors shall be self-closing and self-latching. | Required | Required | Required |
| 3.7.3 | UNPROTECTED OPENINGS | Unprotected openings, other than those from spaces complying with 3.7.3.1, shall be prohibited in exit access corridor walls and doors. | NP-Not permitted | NP | NP |
| 3.7.3.1 | Exemption | Spaces shall be permitted to be unlimited in area and open to the corridor, provided that the following criteria are met: | Permitted | Permitted | Permitted |
| 3.7.3.1.1 | | The space is not used for guest rooms or guest suites or hazardous areas. | Permitted | Permitted | Permitted |
| 3.7.3.1.2 | | The building is protected throughout by an approved, supervised automatic sprinkler system. | Permitted | Permitted | Permitted |
| 3.7.3.1.3 | | The space does not obstruct access to required exits. | Permitted | Permitted | Permitted |
| 3.7.4 | TRANSOM, LOUVERS, OR TRANSFER GRILLES | Transoms, louvers, or transfer grilles shall be prohibited in walls or doors of exit access corridors. | NP-Not permitted | NP | NP |
| 3.8 | SUBDIVISION OF BUILDING SPACES | Buildings shall be subdivided in accordance with 3.8.1. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-------|--|--|-----------|-----------|------------------|
| 3.8.1 | SEPARATION BETWEEN DWELLING UNITS | Dwelling units shall be separated from each other by walls and floors constructed as fire barriers of not less 1-hour fire resistance rating. | Required | Required | Required |
| 3.8.2 | OPENINGS PROTECTION | Doors that open onto exit access corridors shall have not less than 1-hour fire protection rating | Required | Required | Required |
| 3.9 | (Reserved). | | | | |
| 4.0 | SPECIAL PROVISIONS. | Special Provisions for Firefighting and Rescue shall comply with QCD FLS Annex and as modified in item 4.0 of this FLS Occupancy Chapter. | | | |
| 4.1 | FIRE (EMERGENCY) COMMAND CENTER (FCC) | QCD FLS Annex_A5 – Revisions_2021. | NR | NR | Required |
| 4.1.1 | | A Fire Command Center shall be provided in buildings that requires Emergency Voice Communication System and/or Smoke Control System. | Required | Required | Required |
| 4.1.2 | Exemptions | In other than high-rise buildings, instead of a dedicated FCC; lobbies or other spaces adjacent to the main entrance/s may be permitted. | Permitted | Permitted | NP-Not Permitted |
| 4.2 | FIREMAN'S ACCESS PANELS/ OPENINGS | QCD FLS Annex_A3 – Revisions_2021 | Required | Required | Required |
| 4.3 | FIRE LIFTS (FIRE SERVICE ACCESS ELEVATORS) | QCD FLS Annex_A4 – Revisions_2021 | NR | NR | Required |
| 4.3.1 | | The building basement/s is more than nine (9) meters below the average ground level (grade plane). | Required | Required | Required |
| 4.3.2 | FIREFIGHTING LOBBY | QCD FLS Annex_A2 – Revisions_2021 | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|-------|---|--|-------------------|----------|-----------|
| 4.3.3 | SMOKE-STOP LOBBY | QCD FLS Annex_A2 – Revisions_2021 | Required | Required | Required |
| 4.4 | AMBULANCE STRETCHER ACCOMMODATION | QCD FLS Annex_A4 – Revisions_2021 | NR-Not Required | Required | Required |
| 4.5 | EXTERNAL ACCESS TO SITE AND BUILDINGS | QCD FLS Annex_A3 – Revisions_2021 | Required | Required | Required |
| 4.5.1 | SITE ACCESS/ACCESS ROAD | For gated facility development a 4.0 m wide access road and 4.5 m clear height vertical clearance entry gate or site access shall be provided. | Required | Required | Required |
| 4.5.2 | FIRE ENGINE HARDSTANDING (FEH) | FEH with longer side parallel to the façade of the building shall be provided in buildings exceeding the habitable height of 10 m. | Required | Required | Required |
| 4.6 | REFUGE FLOORS | QCD FLS Annex_A1 – Revisions_2021 | NA-Not Applicable | NA | Required |
| 4.7 | (Reserved). | | | | |
| 5.0 | BUILDING SERVICES and FIRE PROTECTION EQUIPMENT | Building Services and Fire Protection Equipment shall comply with the applicable NFPA codes and standards and QCD FLS Annex. | | | |
| 5.1 | ELECTRICAL SYSTEM | Electrical wiring and equipment shall be in accordance with NFPA 70. | Required | Required | Required |
| 5.1.1 | ELECTRICAL EQUIPMENT/PANEL ROOMS AND SIMILAR ROOMS/SPACES | QCD FLS Annex _A7 – Revisions_2021 | Required | Required | Required |
| 5.1.2 | EMERGENCY GENERATORS AND STANDBY POWER SYSTEMS. | Emergency generators and standby power systems shall be installed, tested, and maintained in accordance with NFPA 110. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|--------------------------------------|---|----------|----------|-----------|
| 5.1.3 | STORED ELECTRICAL ENERGY SYSTEMS | Stored electrical energy systems shall be installed, tested, and maintained in accordance with NFPA 111. | Required | Required | Required |
| 5.2 | COMMERCIAL COOKING OPERATIONS | Where permitted, commercial cooking operations shall be protected in accordance with NFPA 96. | Required | Required | Required |
| 5.3 | ELEVATORS, ESCALATORS, and CONVEYORS | An elevator, shall not be considered a component in a required means of egress and shall be in accordance with NFPA 101 section 9.4. | Required | Required | Required |
| 5.3.1 | NUMBER OF CARS | The number of elevator cars permitted in a hoistway shall be not more than three (3). | Required | Required | Required |
| 5.3.2 | OPENINGS TO EXIT ENCLOSURES | Conveyors, elevators, dumbwaiters, and pneumatic conveyors serving various stories of a building shall not open to an exit enclosure. | Required | Required | Required |
| 5.4 | WASTE HANDLING SYSTEM | Waste chutes and its associated trash collection storage rooms and service opening rooms, when provided shall comply with NFPA 101 section 9.5. | Required | Required | Required |
| 5.4.1 | | Approved waste chutes and transport systems, including gravity waste chutes, full pneumatic waste conveying systems, and gravity pneumatic waste conveying systems, shall comply with the provisions of NFPA 82. | Required | Required | Required |
| 5.4.1.1 | Construction | Waste chutes, shall be separately enclosed by walls or partitions of not less than 2-hrs fire resistance rating and chute intake openings protection of 1.5-hour fire protection rating. | Required | Required | Required |
| 5.4.1.2 | Trash Collection Storage Rooms | Waste chutes, shall have its associated trash collection, service opening rooms separately enclosed by walls of not less than 1-hr fire resistance rating and openings protection of 3/4-hour fire protection rating. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
|---------|----------------------------|---|----------|----------|-----------|
| 5.4.1.3 | | The doors of chutes shall open only to a trash collection, service opening room, laundry storage room or to a room that is designed and used exclusively for accessing the chute opening. | Required | Required | Required |
| 5.4.2 | GRAVITY CHUTES | A waste chute shall extend (full size) at least 0.92 m. above the roof of a building. | Required | Required | Required |
| 5.4.2.1 | Chute Venting | The chute shall be open to the atmosphere, with the opening being the same cross-sectional area as the chute. | Required | Required | Required |
| 5.5 | FIRE PUMPS | | | | |
| 5.5.1 | FIRE PUMPS ROOM | QCD FLS Annex _A6 – Revisions_2021 | Required | Required | Required |
| 5.6 | SUBSTATION and SWITCHGEARS | QCD FLS Annex _A8 – Revisions_2021 | Required | Required | Required |
| 5.7 | (Reserved). | | | | |

VERTICAL SHAFT PLAN

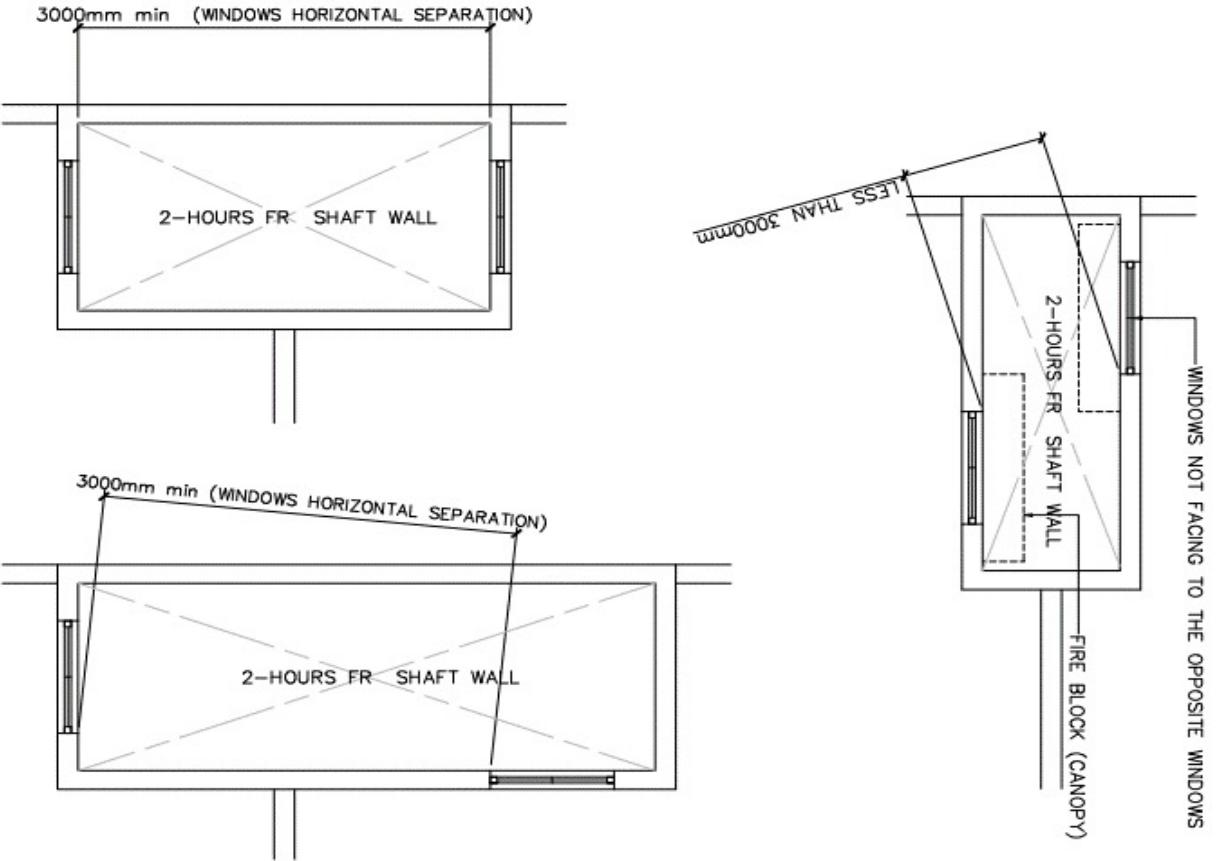
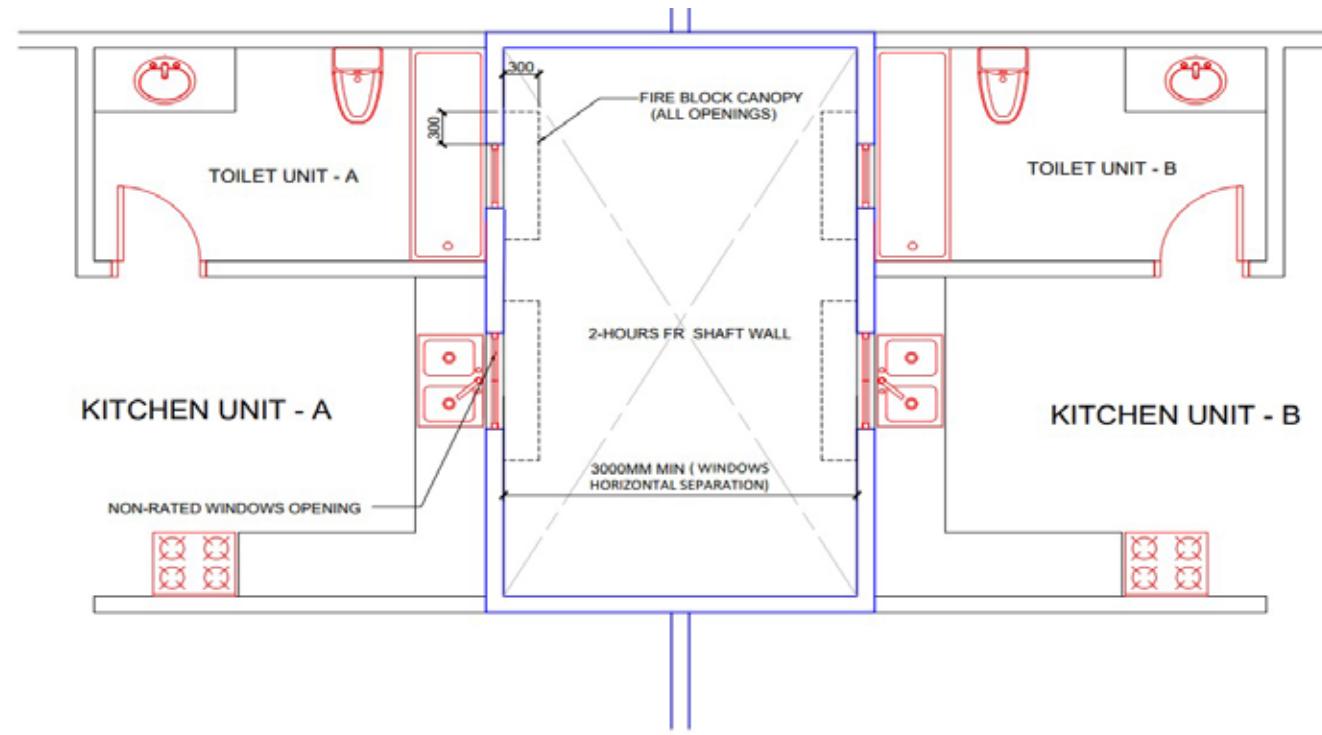


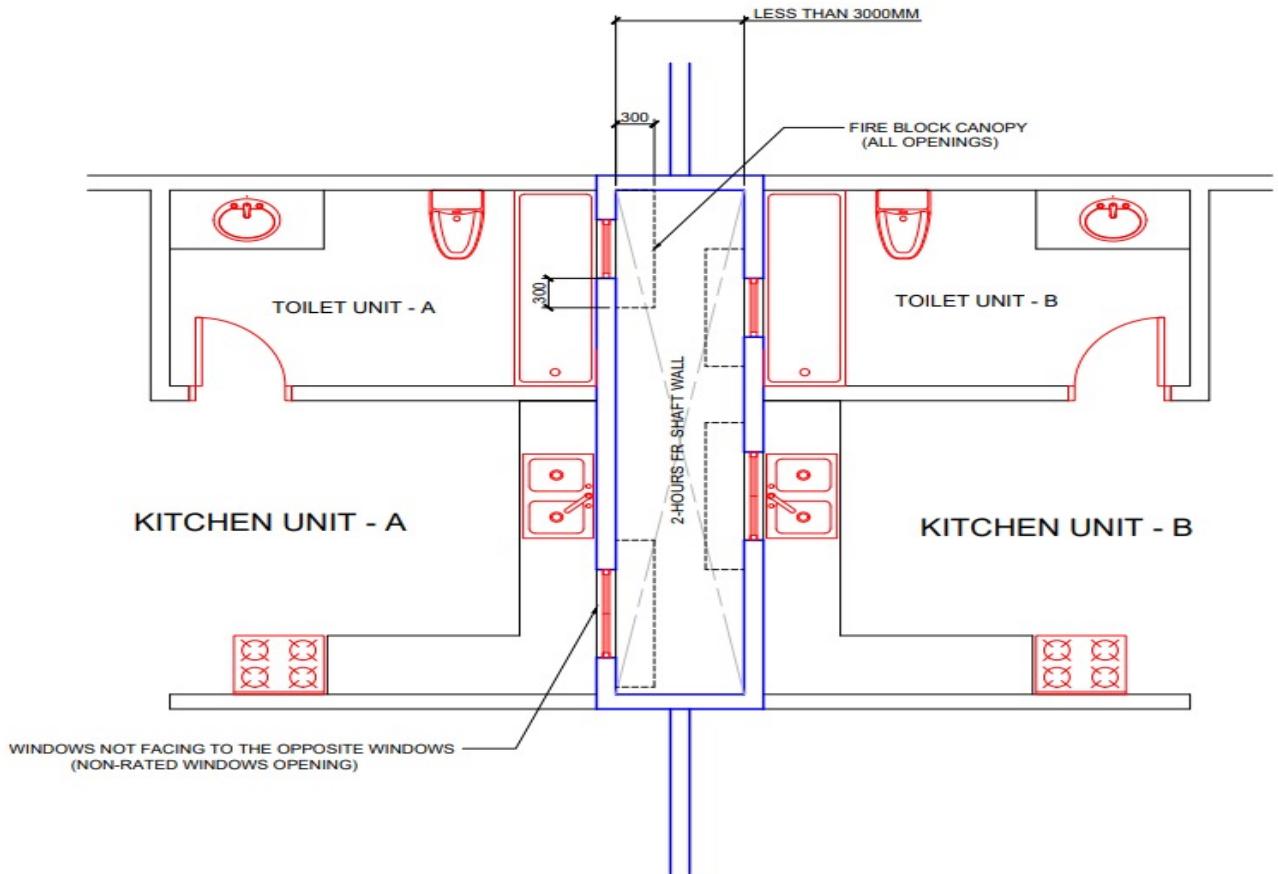
Figure 3.3.2.2(2)





COMMON SHAFT WITH 3000mm WINDOW SEPARATION

Figure 3.1.4.2(3)(b)(ii).



COMMON SHAFT WITH LESS THAN 3000mm WINDOW SEPARATION

Figure 3.1.4.2(3)(b)(iii).



VERTICAL SHAFT ISO SECTION

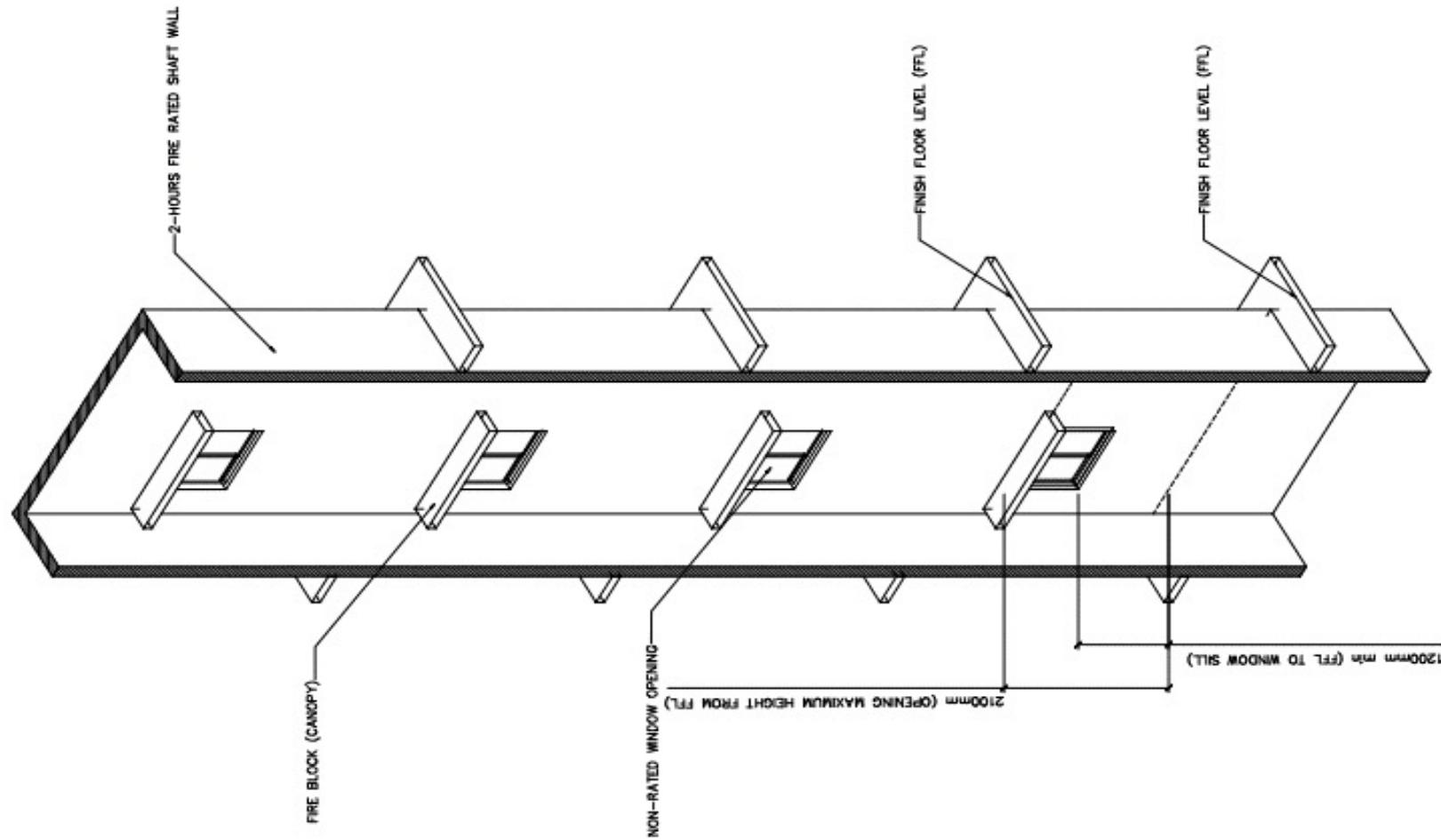


Figure 3.1.4.2(3)(b)(v).

MERCANTILE OCCUPANCIES



MERCANTILE OCCUPANCIES

| | | | | | | | | | |
|---|--|---|---|---|---|----------|--|--|--|
| 1.0 | GENERAL REQUIREMENTS. | The requirements of this chapter shall apply to buildings or portions thereof used as mercantile occupancies. | | | | | | | |
| Mercantile occupancies include stores, markets, and other rooms, buildings, or structures used for the display and sale of merchandise. | | | | | | | | | |
| This occupancy classification includes, but is not limited to, the following: | | | | | | | | | |
| | Supermarkets Convenience stores Department stores Hardware stores | Sales/Rental Stores Pharmacies Rental Equipment Centers Automobile Sales Showrooms | Fle Markets and Craft Centers Building Materials/Supplies Centers Shopping Centers/Malls | Office Supply/Bookstores Computer and Electronics Stores Sporting Goods Stores Warehouse Club Stores | | | | | |
| 1.1 | GENERAL CONDITIONS AND BUILDING LIMITS | | | | | | | | |
| | Sub-Classification (Class) | Building Height (m) | Aggregate Gross Area (m ²) | Basement Levels | | | | | |
| | 1.1.1 TYPE A MERCANTILE Occupancies | > 3 Stories Stories not used for sales above or below sales floor are not counted in the height classification | > 2800 m ² Sections of floors not used for sales purposes are not counted in the area classification | | No Limit in Floor Area/Fire Area, Depth or Levels | | | | |
| | 1.1.2 TYPE B MERCANTILE Occupancies | ≤ 3 Stories Stories not used for sales above or below sales floor are not counted in the height classification | > 280 m ² and ≤ 2800 m ² Sections of floors not used for sales purposes are not counted in the area classification | | No Limit in Floor Area/Fire Area, Depth or Levels | | | | |
| | 1.1.3 TYPE C MERCANTILE Occupancies | One (1) Story or G+M only A mezzanine less than or equal to one-third the area of the floor below is permitted | ≤280 m ² Sections of floors not used for sales purposes are not counted in the area classification | | Not Permitted | | | | |
| FIRE AND LIFE SAFETY (FLS) REQUIREMENT | | | | | | | | | |
| Item | Fire Safety Provisions | Minimum Requirements | | Type A | Type B | Type C | | | |
| | 1.2 CLASSIFICATION OF OCCUPANCIES | Mercantile occupancies shall include all buildings and structures or parts thereof with occupancy as defined in NFPA 101 6.1.10 and in item 1.0 | | Required | Required | Required | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|------------|--|---|-----------|-----------|-----------|
| 1.2.1 | SUBCLASSIFICATION OF OCCUPANCY. | Mercantile occupancies shall be subclassified as follows: | | | |
| 1.2.1.1 | Class A Mercantile Occupancies | All mercantile occupancies having an aggregate gross area of more than 2800 m ² or occupying more than three (3) stories for sales purposes. | Required | - | - |
| 1.2.1.2 | Class B Mercantile Occupancies | | | | |
| 1.2.1.2(1) | Class B | All mercantile occupancies of more than 280 m ² , but not more than 2800 m ² , aggregate gross area and occupying not more than three (3) stories for sales purposes. | - | Required | - |
| 1.2.1.2(2) | Class B | All mercantile occupancies of not more than 280 m ² gross area and occupying two (2) or three (3) stories for sales purposes | - | Required | - |
| 1.2.1.3 | Class C Mercantile Occupancies | All mercantile occupancies of not more than 280 m ² gross area and used for sales purposes occupying one story only | - | - | Required |
| 1.2.2 | CLASSIFICATION REQUIREMENTS | The aggregate gross area shall be the total gross area of all floors used for mercantile purposes. | Required | Required | Required |
| 1.2.2.1 | | Where a mercantile occupancy is divided into sections, regardless of fire separation, the aggregate gross area shall include the area of all sections used for sales purposes. | Required | Required | Required |
| 1.2.2.2 | | Areas of floors not used for sales purposes, such as an area used only for storage and not open to the public, shall not be counted for the purposes of the classifications in 1.2.1. | Permitted | Permitted | Permitted |
| 1.2.3 | MEZZANINES | Mezzanines shall comply with NFPA 101 section 8.6.10 and in 1.2.3.1. | Required | Required | Required |
| 1.2.3.1 | Area Limitations | The aggregate area of mezzanines located within a room, other than normally unoccupied equipment platforms, shall not exceed one-third the open area of the room in which the mezzanines are located. | Required | Required | Required |
| 1.2.3.1(1) | | Enclosed space shall not be included in a determination of the size of the room in which the mezzanine is located. | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|------------|---|---|-----------|-----------|-----------|
| 1.2.3.1(2) | | No limit on the number of mezzanines in a room shall be required. | Permitted | Permitted | Permitted |
| 1.2.3.1(3) | | For purposes of determining the allowable mezzanine area, the aggregate area of the mezzanines shall not be included in the area of the room. | Permitted | Permitted | Permitted |
| 1.2.3.2 | Openness. | All portions of a mezzanine, other than walls not more than 1065 mm high, columns, and posts, shall be open to and unobstructed from the room in which the mezzanine is located, unless the occupant load of the aggregate area of the enclosed space does not exceed 10. | Required | Required | Required |
| 1.2.3.2(1) | | A mezzanine having two or more means of egress shall not be required to open into the room in which it is located if not less than one of the means of egress provides direct access from the enclosed area to an exit at the mezzanine level. | Permitted | Permitted | Permitted |
| 1.2.4 | MULTI-TENANT Mercantile Occupancies | Where a number of tenant spaces under different management are located in the same building, the aggregate gross area for subclassification shall be one of the following: | | | |
| 1.2.4.1 | Tenant Spaces not Separated | Where tenant spaces are not separated, the aggregate gross floor area of all such tenant spaces shall be used in determining classification per 1.2.1. | Required | Required | Required |
| 1.2.4.2 | Tenants Spaces with 2-hours Separation | Where individual tenant spaces are separated by fire barriers with a 2-hour fire resistance rating, each tenant space shall be individually classified. | Permitted | Permitted | Permitted |
| 1.2.4.3 | Tenants Spaces with 1-hour Separation and Protected with Automatic Sprinkler System | Where tenant spaces are separated by fire barriers with a 1-hour fire resistance rating, and the building is protected throughout by an approved, supervised automatic sprinkler system, each tenant space shall be individually classified. | Permitted | Permitted | Permitted |
| 1.2.4.4 | Tenant Spaces in Malls | The tenant spaces in a mall structure shall be classified individually. | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|-----------------|---|---|-----------|-----------|-----------|
| 1.2.5 | MULTIPLE OCCUPANCIES | All multiple occupancies shall be in accordance with NFPA 101 section 6.1.14 and as specified in 1.2. | Required | Required | Required |
| 1.2.5.1 | Combined Mercantile Occupancies and Parking Structures. | The fire barrier separating parking structures from a building classified as a mercantile occupancy shall be a fire barrier having a minimum 2-hour fire resistance rating. | Required | Required | Required |
| 1.2.5.1(1) | | Openings in the fire barrier shall not be required to be protected with fire protection-rated opening protectives in enclosed parking structures that are protected throughout by an automatic sprinkler system, or | Permitted | Permitted | Permitted |
| 1.2.5.2(2) | | In open parking structures, provided that all of the following conditions are met: | | | |
| 1.2.5.2 (2) (a) | Area of Openings | The openings do not exceed 25 percent of the area of the fire barrier in which they are located. | Required | Required | Required |
| 1.2.5.2 (2) (b) | Use of the Openings | The openings are used as a public entrance and for associated sidelight functions. | Required | Required | Required |
| 1.2.5.2 (2) (c) | Extinguishing System | The building containing the mercantile occupancy is protected throughout by an approved, supervised automatic sprinkler system. | Required | Required | Required |
| 1.2.5.2 (2) (d) | Fuel Spill Protection | Means are provided to prevent spilled fuel from accumulating adjacent to the openings and entering the building. | Required | Required | Required |
| 1.2.5.2 (2) (e) | Barriers | Physical means are provided to prevent vehicles from being parked or driven within 3050 mm of the openings. | Required | Required | Required |
| 1.2.5.2 (2) (f) | Smoke Partition | The openings are protected as a smoke partition in accordance with NFPA 101 section 8.4, with no minimum fire protection rating required. | Required | Required | Required |
| 1.3 | OCCUPANT LOAD (OL) | Determined on the basis of the occupant load factors (OLF) in NFPA 101 Table 7.3.1.2 and as specified in item 1.3. | Required | Required | Required |
| 1.3.1 | Sales area on street floor | Occupant load shall not exceed one person per 2.8 m ² in gross area | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|---|---|----------|----------|----------|
| 1.3.2 | Sales area on two or more street floors | Occupant load shall not exceed one person per 3.7 m ² in gross area | Required | Required | Required |
| 1.3.3 | Sales area on floor below street floor | Occupant load shall not exceed one person per 2.8 m ² in gross area | Required | Required | Required |
| 1.3.4 | Sales area on floors above street floor | Occupant load shall not exceed one person per 5.6 m ² in gross area | Required | Required | Required |
| 1.3.5 | Floors or portions of floors used only for offices | Occupant load shall not exceed one person per 9.3 m ² in gross area | Required | Required | Required |
| 1.3.6 | Storage, Receiving, and Shipping, and not open to general public. | Occupant load shall not exceed one person per 27.9 m ² in gross area | Required | Required | Required |
| 1.3.7 | Mall structures | Per factors applicable to use of space | Required | Required | Required |
| 1.4 | CLASSIFICATION OF HAZARD OF CONTENTS | Hazard of contents shall be classified in accordance with NFPA 101 6.3.2. | Required | Required | Required |
| 1.4.1 | HIGH HAZARD Mercantile Occupancies | Mercantile occupancies classified as high hazard in accordance with NFPA section 6.2 shall meet all of the following additional requirements: | Required | Required | Required |
| 1.4.1.1 | | Exits shall be located so that not more than 23 m of travel from any point is needed to reach the nearest exit. | Required | Required | Required |
| 1.4.1.2 | | From every point, there shall be not less than two exits accessible by travel in different directions (no common path of travel). | Required | Required | Required |
| 1.4.1.3 | | All vertical openings shall be enclosed. | Required | Required | Required |
| 1.5 | MINIMUM CONSTRUCTION REQUIREMENTS. | Construction shall be in accordance with NFPA 5000 Chapters 7–8, 13–14, 31, and 35–40. | Required | Required | Required |
| 1.6 | ACCESSIBILITY. | Accessibility shall be in accordance with NFPA 5000 Chapter 12. | Required | Required | Required |
| 1.7 | (Reserved). | | | | |
| 2.0 | MEANS of EGRESS REQUIREMENTS | Means of egress shall comply with NFPA 101 Chapter 7, and as modified in item 2.0 of this FLS Occupancy Chapter. | | | |

| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|--|---|-----------|-----------|-----------|
| 2.1 | GENERAL | No inside open stairway or inside open ramp shall be permitted to serve as a component of the required means of egress system for more than one floor. | Required | Required | Required |
| 2.1.1 | | Where there are two or more floors below the street floor, the same stairway or other exit shall be permitted to serve all floors, but all required exits from such areas shall be independent of any open stairways between the street floor and the floor below it. | Permitted | Permitted | Permitted |
| 2.1.2 | | Where exits from the upper floor also serve as an entrance from a principal street, the upper floor shall be classified as a street floor in accordance with NFPA 101 3.3.281 and shall be subject to the requirements of this FLS chapter for street floors. | Required | Required | Required |
| 2.1.3 | | High hazard mercantile occupancies shall be arranged in accordance with item 1.4.1 | Required | Required | Required |
| 2.2 | MEANS OF EGRESS COMPONENTS | Means of egress components shall be limited to the types described in 2.2.1 through 2.2.7. | Required | Required | Required |
| 2.2.1 | DOORS | Doors shall be in accordance with NFPA 101 section 7.2.1, and the requirements in items 2.2.1. | Required | Required | Required |
| 2.2.1.2 | Locks | Locks complying with NFPA 101 section 7.2.1.5.5 shall be permitted only on principal entrance/exit doors. | Permitted | Permitted | Permitted |
| 2.2.1.3 | Elevator Lobby Exit Access Door Assemblies Locking | Electrically locked door assemblies separating the elevator lobby from the exit access, in accordance with NFPA 101 section 7.2.1.6.3. | Permitted | Permitted | Permitted |
| 2.2.1.4 | Delayed-Egress Electrical Locking Systems | Delayed-egress electrical locking systems complying with NFPA 101 7.2.1.6.1. | Permitted | Permitted | Permitted |
| 2.2.1.5 | Sensor-Release of Electrical Locking Systems | Sensor-release of electrical locking systems complying with NFPA 101 7.2.1.6.2 in buildings protected throughout by an approved automatic sprinkler system. | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|------------|--|--|-----------|-----------|--------------|
| 2.2.1.6 | Horizontal or Vertical Security Grilles or Doors | Horizontal or vertical security grilles or doors complying with NFPA 101 7.2.1.4.1(3), used as a part of the required means of egress from a tenant space. | Permitted | Permitted | Permitted |
| 2.2.1.7 | | All doors at the foot of stairs from upper floors or at the head of stairs leading to floors below the street floor shall swing in the direction of egress travel. | Permitted | Permitted | Permitted |
| 2.2.1.8 | Revolving Doors | Revolving doors complying with NFPA 101 section 7.2.1.10. | Permitted | Permitted | Permitted |
| 2.2.2 | STAIRS | Stairs complying with NFPA 101 section 7.2.2. | Permitted | Permitted | Permitted |
| 2.2.2.1 | Spiral Stairs | Spiral stairs complying with NFPA 101 section 7.2.2.2.3. | Permitted | Permitted | Permitted |
| 2.2.3 | SMOKEPROOF ENCLOSURES | Smokeproof enclosures complying with NFPA 101 section 7.2.3. | Permitted | Permitted | Permitted |
| 2.2.4 | HORIZONTAL EXITS | Horizontal exit complying with NFPA 101 section 7.2.4. | Permitted | Permitted | Permitted |
| 2.2.5 | RAMPS | Ramps complying with NFPA 101 section 7.2.5. | Permitted | Permitted | Permitted |
| 2.2.6 | EXIT PASSAGEWAY | Exit passageways complying with NFPA 101 section 7.2.6. | Permitted | Permitted | Permitted |
| 2.2.6.1 | | Exit passageways in a mall structure shall be permitted to accommodate the following occupant loads independently: | Permitted | Permitted | Permitted |
| 2.2.6.1(1) | | Portion of the occupant load assigned to the exit passageway from only the mall/pedestrian way | Required | Required | Required |
| 2.2.6.1(2) | | Largest occupant load assigned to the exit passageway from a single tenant space | Required | Required | Required |
| 2.2.7 | AREA OF REFUGE | Areas of refuge complying with NFPA 101 section 7.2.12. | Required | Required | Required |
| 2.3 | CAPACITY OF MEANS OF EGRESS | The capacity of means of egress shall be in accordance with NFPA 101 section 7.3 and as modified in 2.3.1. | Required | Required | Required |
| 2.3.1 | CORRIDOR OR PASSAGEWAY | Corridors or passageways, shall be of sufficient width to accommodate the required occupant load but shall have a width of not less than 1200 mm. | Required | Required | Required |
| 2.3.2 | STREET FLOOR EGRESS CAPACITY | In Class A and Class B mercantile occupancies street floor exits shall be sufficient for the occupant load of the street floor plus the required capacity of open stairs and ramps discharging through the street floor. | Required | Required | Not Required |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|------------|---|---|-----------|-----------|-----------|
| 2.4 | NUMBER OF MEANS OF EGRESS | The number of means of egress shall be in accordance with NFPA 101 7.4. | Required | Required | Required |
| 2.4.1 | GENERAL | Means of egress shall comply with all of the following, except as otherwise permitted by 2.4.3 | Required | Required | Required |
| 2.4.1.1 | | Not less than two separate exits shall be provided on every story. | Required | Required | Required |
| 2.4.1.2 | | Not less than two separate exits shall be accessible from every part of every story. | Required | Required | Required |
| 2.4.2 | SINGLE EXIT ACCESS PATH | Exit access, as required by 2.4.1.2, shall be permitted to include a single exit access path for the distances permitted as common paths of travel. | Permitted | Permitted | Permitted |
| 2.4.3 | SINGLE EXIT PROVISION | | | | |
| 2.4.3.1 | Class C Mercantile Occupancies | A single means of egress shall be permitted in a Class C mercantile occupancy subject to the following conditions: | Permitted | Permitted | Permitted |
| 2.4.3.1(1) | | Travel distance to the exit or to a mall pedestrian way does not exceed 23 m. | Required | Required | Required |
| 2.4.3.1(2) | | Travel distance to the exit or to a mall concourse does not exceed 30 m, and the story on which the occupancy is located, and all communicating levels that are traversed to reach the exit or mall concourse, are protected throughout by an automatic sprinkler system. | Required | Required | Required |
| 2.4.3.2 | Class A, Class B, or Class C Mercantile Occupancy | A single means of egress to an exit or to a mall concourse shall be permitted from a mezzanine, subject to conditions in 2.4.3.2(1). | Permitted | Permitted | Permitted |
| 2.4.3.2(1) | | The common path of travel does not exceed 23 m, or does not exceed 30 m if protected throughout by an automatic sprinkler system. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|---|---|----------|----------|----------|
| 2.5 | ARRANGEMENT OF MEANS OF EGRESS | Means of egress shall be arranged in accordance with NFPA 101 7.5. | Required | Required | Required |
| 2.5.1 | TRAVEL DISTANCE | | | | |
| 2.5.1.1 | Ordinary Hazard Mercantile Occupancies | Travel distance shall not exceed 46 m. | Required | Required | Required |
| 2.5.1.2 | | Travel distance shall not exceed 76 m (sprinkler protected throughout). | Required | Required | Required |
| 2.5.1.3 | High Hazard Mercantile Occupancies | Travel distance shall not exceed 23 m. | Required | Required | Required |
| 2.5.2 | DEAD-END | | | | |
| 2.5.2.1 | | Dead-end corridors in buildings shall not exceed 6 m. | Required | Required | Required |
| 2.5.2.2 | | Dead-end shall not exceed 15 m (sprinkler protected throughout). | Required | Required | Required |
| 2.5.3 | COMMON PATH | | | | |
| 2.5.3.1 | Low/Ordinary Hazard Mercantile Occupancies | Common paths of travel shall not exceed 23 m. | Required | Required | Required |
| 2.5.3.2 | | Common paths shall not exceed 30 m (sprinkler protected throughout). | Required | Required | Required |
| 2.5.3.3 | High Hazard Mercantile Occupancies | Common paths of travel shall not be permitted. | NP | NP | NP |
| 2.5.4 | AISLES | Aisles leading to each exit shall be required, and the aggregate width of such aisles shall be not less than the required width of the exit. | Required | Required | Required |
| 2.5.4.1 | | Required aisles shall be not less than 915 mm in clear width. | Required | Required | Required |
| 2.5.4.2 | Class A Mercantile Occupancies, | Not less than one aisle of a 1525 mm minimum clear width shall lead directly to an exit. | Required | Required | Required |
| 2.5.5 | Mercantile Occupancies other than Bulk Merchandising Retail Buildings | If the only means of customer entrance is through one exterior wall of the building, one-half of the required egress width from the street floor shall be located in such wall. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|------------|---|--|-----------|-----------|-----------|
| 2.5.5.1 | | Means of egress from floors above or below the street floor shall be arranged in accordance with NFPA 101 section 7.5. | Required | Required | Required |
| 2.5.6 | | Not less than one-half of the required exits shall be located so as to be reached without passing through checkout stands. | Required | Required | Required |
| 2.5.7 | CHECKOUT STANDS | Checkout stands or associated railings or barriers shall not obstruct exits, required aisles, or approaches thereto. | Required | Required | Required |
| 2.5.8 | WHEELED CART AND BUGGIES | Adequate provision shall be made for the transit and parking of such carts to minimize the possibility that they might obstruct means of egress. | Required | Required | Required |
| 2.5.9 | EXIT ACCESS | | | | |
| 2.5.9.1 | Class A and Class B Mercantile Occupancies (Sprinkler Protected Throughout) | Exit access shall be permitted to pass through storerooms, provided that all of the following conditions are met: | Permitted | Permitted | Permitted |
| | Class C Mercantile Occupancies, | | | | |
| 2.5.9.1(1) | | Not more than 50 percent of exit access shall be provided through the storeroom. | Required | Required | Required |
| 2.5.9.1(2) | | The storeroom shall not be subject to locking. | Required | Required | Required |
| 2.5.9.1(3) | | The main aisle through the storeroom shall be not less than 1200 m wide. | Required | Required | Required |
| 2.5.9.1(4) | | The path of travel through the storeroom shall be defined, direct, and continuously maintained in an unobstructed condition. | Required | Required | Required |
| 2.6 | DISCHARGE FROM EXITS | Exit discharge shall comply with NFPA 101 section 7.7 and item 2.6.1. | Required | Required | Required |
| 2.6.1 | Building Protected Throughout (Automatic Sprinkler System) | Fifty percent of the exits shall be permitted to discharge through the level of exit discharge in accordance with NFPA 101 7.7.2. | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|-------------|--|--|-----------------|----------|----------|
| 2.7 | ILLUMINATION OF MEANS OF EGRESS | Means of egress shall be illuminated in accordance with NFPA 101 7.8. | Required | Required | Required |
| 2.8 | EMERGENCY LIGHTING | Class A and Class B mercantile occupancies and mall structures shall have emergency lighting facilities in accordance with NFPA 101 section 7.9. | Required | Required | Required |
| 2.8.1 | | Emergency lighting shall be provided in any building where any one of the conditions in 2.8.1.1 through 2.8.1.3 exists: | Required | Required | Required |
| 2.8.1.1 | Number of Stories | The building is three (3) or more stories in height. | Required | Required | Required |
| 2.8.1.2 | Number of Occupants | The occupancy is subject to 50 or more occupants above or below the level of exit discharge. | Required | Required | Required |
| 2.8.1.3 | Total Number of Occupants | The occupancy is subject to 300 or more total occupants. | Required | Required | Required |
| 2.8.2 | Additional Locations | Any areas accessible to the public. | Required | Required | Required |
| 2.8.3 | | Emergency lighting shall not be required in Shops with glass façade fronting the streets. | NR-Not Required | NR | NR |
| 2.9 | MARKINGS OF MEANS OF EGRESS | Where an exit is not immediately apparent from all portions of the sales area, means of egress shall have signs in accordance with NFPA 101 7.10. | Required | Required | Required |
| 2.10 | SPECIAL MEANS OF EGRESS FEATURES | | | | |
| 2.10.1 | HAZARDOUS MATERIALS | Where hazardous materials are present, the provisions of 2.10.1.1 and 2.10.1.2 shall apply. | Required | Required | Required |
| 2.10.1.1 | Hazardous materials classified as high-hazard contents | Hazardous materials that are stored, used, or handled, and that are also classified as high-hazard contents shall comply with the Special Provisions for Occupancies with High Hazard Contents in NFPA 101 section 7.12.2. | Required | Required | Required |
| 2.10.1.2 | Hazardous Materials | Hazardous materials shall comply with both 2.10.1.2(1) and 2.10.1.2(2) | Required | Required | Required |
| 2.10.1.2(1) | | Means of egress requirements of this Code | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|-------------|---|--|-----------|-----------|-----------|
| 2.10.1.2(2) | | Applicable means of egress requirements of NFPA 30, NFPA 45, NFPA 55, NFPA 58, NFPA 400, and NFPA 495 that are stricter than NFPA 101 Chapter 7 requirements for Means of Egress and this FLS occupancy chapter. | Required | Required | Required |
| 2.11 | (Reserved). | | | | |
| 3.0 | PROTECTION | Protection shall comply with the applicable NFPA codes and standards, QCD FLS Annex and as modified in item 3.0 of this FLS Occupancy Chapter. | | | |
| 3.1 | PROTECTION OF VERTICAL OPENINGS | Vertical openings shall be enclosed or protected in accordance with NFPA 101 section 8.6, except under any of the following conditions: | Required | Required | Required |
| 3.1.1 | CLASS A and CLASS B Mercantile Occupancies (Sprinkler Protected Throughout) | Unprotected vertical openings shall be permitted at one of the following locations: | | | |
| 3.1.1.1 | | Between any two floors. | Permitted | Permitted | Permitted |
| 3.1.1.2 | | Among the street floor, the first adjacent floor below, and the adjacent floor (or mezzanine) above. | Permitted | Permitted | Permitted |
| 3.1.2 | CLASS C Mercantile Occupancies | Unprotected openings between the street floor and the mezzanine. | Permitted | Permitted | Permitted |
| 3.1.3 | CONVENIENCE STAIRWAYS | Unenclosed vertical openings created by convenience stairways complying with the conditions in NFPA 101 section 8.6.9.2 (1) through (4). | Permitted | Permitted | Permitted |
| 3.1.4 | ESCALATORS AND MOVING WALKS not constituting an exit | Unenclosed vertical openings in accordance with NFPA 101 section 8.6.9.7, shall be permitted and the number of contiguous stories shall not be limited. | Permitted | Permitted | Permitted |
| 3.2 | PROTECTION FROM HAZARDS | Hazardous areas including, but not limited to, areas used for general storage, boiler rooms, and maintenance shops that include woodworking and painting areas shall be protected in accordance with NFPA 101 section 8.7. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|--|---|------------------|-----------|-----------|
| 3.2.1 | GENERAL STORAGE/STOCK AREAS (Sprinkler Protected Throughout) | An enclosure shall be exempt from the provisions of NFPA 101 section 8.7.1.2. | NR- Not required | NR | NR |
| 3.2.2 | HIGH HAZARD CONTENTS AREAS | High hazard contents areas, shall meet all of the following criteria: | Required | Required | Required |
| 3.2.2.1 | Enclosures/Separation from Other Areas | The area shall be separated from other parts of the building by fire barriers having a min. 1-hour FR rating, with all openings therein protected by self-closing fire door assemblies having a min. 3/4-hour fire protection rating. | Required | Required | Required |
| 3.2.2.2 | Extinguishing Requirements | The area shall be protected by an automatic extinguishing system. | Required | Required | Required |
| 3.2.2.3 | | In high hazard areas, all vertical openings shall be enclosed. | Required | Required | Required |
| 3.2.3 | HAZARDOUS MATERIALS | Mercantile occupancies with storage, use, handling of hazardous materials and in areas where hazardous materials are present in excess of the maximum allowable quantities shall comply with the following codes: NFPA 30, NFPA 54, NFPA 55, NFPA 58, NFPA 400, and NFPA 495. | Required | Required | Required |
| 3.2.4 | COMMERCIAL COOKING OPERATIONS | Commercial cooking operations shall be protected in accordance with NFPA 96, unless the cooking equipment in 3.2.5.1 and 3.2.5.2 are permitted. | Required | Required | Required |
| 3.2.4.1 | Types of Cooking Equipment | Outdoor equipment | Permitted | Permitted | Permitted |
| 3.2.4.2 | | Equipment used only for food warming | Permitted | Permitted | Permitted |
| 3.3 | INTERIOR FINISH | Interior finish shall be in accordance with NFPA 101 section 10.2. | Required | Required | Required |
| 3.3.1 | INTERIOR WALL AND CEILING FINISH | Interior wall and ceiling finish materials shall be Class A, Class B, or Class C. | Required | Required | Required |
| 3.3.2 | INTERIOR FLOOR FINISH | Interior floor finish in exit enclosures shall be Class I or Class II. | Required | Required | Required |
| 3.3.2.1 | | Interior floor finish shall comply with NFPA 101 10.2.7.1 or 10.2.7.2, as applicable. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|--|--|----------|-----------------|----------|
| 3.4 | DETECTION, ALARM & COMMUNICATION REQUIREMENTS | | | | |
| 3.4.1 | GENERAL | Complete coverage of Fire Detection and Alarm System. | Required | Required | Required |
| 3.4.2 | INITIATION | Complete coverage of an Automatic Detection and Manual Initiating Devices. | Required | Required | Required |
| 3.4.3 | OCCUPANT NOTIFICATION | Complete Coverage of an Occupant Notification (audible & visible). | Required | Required | Required |
| 3.4.3.1 | Emergency Voice Evacuation System | Mass Notification System | Required | Required | NR |
| 3.4.4 | SUPPLEMENTARY | | | | |
| 3.4.4.1 | Fire Telephone | In every required provisions of a fire command center (FCC) or emergency control center (ECC). | Required | NR-Not Required | NR |
| 3.4.4.2 | Graphic Annunciator (PC Panel) or Mimic Panel | In every required provisions of a fire command center (FCC) or emergency control center (ECC). | Required | Required | NR |
| 3.5 | EXTINGUISHMENT REQUIREMENTS | | | | |
| 3.5.1 | AUTOMATIC SPRINKLER (AS) SYSTEM | Mercantile occupancies shall be protected by an approved automatic sprinkler system in any of the following specified locations: | | | |
| 3.5.1.1 | Number of Stories | Throughout all mercantile occupancies three or more stories in height. | Required | Required | NR |
| 3.5.1.2 | Gross Floor Area | Throughout all mercantile occupancies exceeding 1115 m ² in gross area. | Required | Required | NR |
| 3.5.1.3 | Basement used for the sale, storage or handling of combustible goods and merchandise | Throughout stories below the level of exit discharge where such stories have an area exceeding 232 m ² . | Required | Required | NR |
| 3.5.1.4 | Mixed Occupancies | Throughout multiple occupancies (mixed occupancies) where the conditions of 3.5.1.1 through 3.5.1.3 apply to the mercantile occupancy. | Required | Required | NR |
| 3.5.2 | Fire Hose Reel | Fire hose reels are required in buildings protected by an approved supervised automatic sprinkler system. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|--|---|-------------|----------------|-------------|
| 3.5.3 | Portable Fire Extinguisher | Applicable Portable Fire Extinguishers required in all buildings. | Required | Required | Required |
| 3.5.4 | Rising Main (Dry or Wet Standpipe) | Refer to Annex Fire Fighting System Annex_FFS_G1 Revisions 2021 | Required | Required | Required |
| 3.6 | SMOKE CONTROL / VENTILATION REQUIREMENTS | Legend: NR-Not Required; NA-Not Applicable; NP-Not Permitted | | | |
| 3.6.1 | STAIRWELL/LOBBY PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | <15m | ≥15m - <28m | ≥28m |
| 3.6.1.1 | Less than 9 m habitable height | | No Reqmt | No Reqmt | No Reqmt |
| 3.6.1.2 | 9 m to 15 m habitable height | Vent at top of stairwell | Required | NA | NA |
| | | Stair ventilation openings at every floor level (stairs along external walls) | Permitted | NA | NA |
| | | Stairwell Pressurization | NR | NA | NA |
| | STAIRWELL/LOBBY PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | <15m | ≥15m - <28m | ≥28m |
| 3.6.1.3 | >15 m to < 28 m habitable height | Vent at top of stairwell | NA | NP | NA |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | Required | NA |
| | | Stairwell Pressurization | NA | Permitted | NA |
| 3.6.1.4 | ≥28 m habitable height | Vent at top of stairwell | NA | NA | NP |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | NA | NA | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | NA | NA | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|---|---|-----------|-----------------------|-------------|
| | Connecting Basement Levels | | | | |
| 3.6.1.5 | Two basement levels or ≤ 6 m deep, ≤ 2000 m ² floor area | Vent at top of stairwell : * Permitted up to five (5) connecting above floors (2B+G+4 or less) or 12 m habitable height ; whichever is less; otherwise next below provisions shall apply. | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | Permitted | Required | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Required |
| 3.6.1.6 | Three basement levels or ≤ 9.1 m deep, ≤ 2000 m ² floor area | Vent at top of stairwell : * Permitted up to three (3) connecting above floors only (3B+G+2 or less) or 6m habitable height, whichever is less; otherwise next below provisions shall apply | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | NA | NA | NA |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Permitted |
| 3.6.1.7 | Two basement levels or ≤ 6 m deep, >2000 m ² floor area | Vent at top of stairwell: * Permitted up to four (4) connecting floors (2B+G+3 or less) or 9 m habitable height ; whichever is less; otherwise next below provisions shall apply. | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | Required | NP | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Required | Required |
| | STAIRWELL/LOBBY PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | <15m | ≥ 15 m - <28 m | ≥ 28 m |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|--|--|---|-----------------------|-------------|
| 3.6.1.8 | Three basement levels or ≤ 9.1 m deep, >2000 m ² floor area, connecting one floor above only | Vent at top of stairwell : * Permitted up to two connecting above floors or 3 m habitable height only (3B+G+1 or less); whichever is less, otherwise next below provisions shall apply | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | NA | NA | NA |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization. | Permitted | Required | Required |
| 3.6.1.9 | Lowest basement level >9.1 m below ground level, regardless of floor area | Vent at top of stairwell | NP | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NP | NP | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Required | Required | Required |
| 3.6.2 | ESCAPE CORRIDOR PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | Type A | Type B | Type C |
| 3.6.2.1 | Interior Corridors | Vents (Fixed or Automatic Opening) | Required in specific type of Occupancy: Healthcare Occupancies and in Detention and Correctional Occupancies | | |
| | | Mechanical Ventilation of Corridor | | | |
| | | Pressurization of Corridor | | | |
| 3.6.2.2 | Corridor with side/s located along exterior walls | Vents (Fixed or Automatic Opening) | Required in specific type of Occupancy: Healthcare Occupancies and in Detention and Correctional Occupancies | | |
| | | Mechanical Ventilation of Corridor | | | |
| | | Pressurization of Corridor | | | |
| 3.6.3 | atrium and OTHER FLOOR OPENINGS | Design conditions per Annex ACMV_N1 Revisions 2021. | <15 m | ≥ 15 m - <28 m | ≥ 28 m |
| 3.6.3.1 | Malls (with floor openings connecting >2 floors) | Smoke Vents (Fixed or Automatic Opening) | Required | NP | NP |
| | | Mechanical Smoke Exhaust Ventilation System/Engineered | Permitted | Required | Required |
| 3.6.3.2 | Other Occupancies (connecting >3 floor levels) | Smoke Vents (Fixed or Automatic Opening) | Required | Permitted | NP |
| | | Mechanical Smoke Exhaust Ventilation System/Engineered | Permitted | Permitted | Required |
| 3.6.4 | CAR PARKS/PARKING STRUCTURES | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|-----------|---|--|-----------|-------------------|-------------|
| 3.6.4.1 | Open Parking Structures | The open parking structure shall justify that no smoke stagnation will occur such as from a fire located somewhere in the middle of the car park; otherwise mechanical equipment that will aid in effective dispersal of smoke shall be provided | Required | Required | Required |
| 3.6.4.2 | Aboveground Enclosed Car Parks | | <15m | ≥15m - <28m | ≥28m |
| 3.6.4.2.1 | Aggregate floor area of ≤2000 m ² | Smoke Vents (Fixed or Automatic) | Required | Required | Permitted |
| | | Mechanical Smoke Purging/Clearance | Permitted | Permitted | Required |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted |
| 3.6.4.2.2 | Aggregate floor area of >2000 m ² | Smoke Vents (Fixed or Automatic) | Required | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | NP |
| | | Engineered Smoke Control System | Required | Permitted | Required |
| 3.6.4.3 | Belowground Car Parks | | ≤6m Deep | ≥6m - ≤9.1 m Deep | >9.1 m Deep |
| 3.6.4.3.1 | Aggregate floor area of ≤2000 m ² | Smoke Vents (Fixed or Automatic) | Required | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | Required |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted |
| 3.6.4.3.2 | Aggregate floor area of >2000 m ² | Smoke Vents (Fixed or Automatic) | NP | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Required | NP | NP |
| | | Engineered Smoke Control System | Permitted | Required | Required |
| 3.6.5 | COMPARTMENT SMOKE CONTROL | | Type A | Type B | Type C |
| 3.6.5.1 | CLASS A Mercantile Occupancies Single Fire Compartment ≤ 2800 m ² | Mercantile occupancies with a single fire compartment on a floor of an area >2800 m ² , shall have provisions for smoke management system. | Required | NA | NA |
| 3.7 | CORRIDORS | | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|---------------------------------------|--|-----------|-----------|----------|
| 3.7.1 | EXIT ACCESS CORRIDORS | Exit access corridors shall be separated from use areas by fire barriers in accordance with NFPA 101 section 8.3 having a minimum 1-hour fire resistance rating, except under any of the following conditions: | Required | Required | NA |
| 3.7.1.1 | | Where exits are available from an open floor area. | Permitted | Permitted | NA |
| 3.7.1.2 | | Within a space occupied by a single tenant. | Permitted | Permitted | NA |
| 3.7.1.3 | | Within buildings protected throughout by an automatic sprinkler system. | Permitted | Permitted | NA |
| 3.7.2 | OPENINGS | Openings in corridor walls required to be protected in 3.7.1, shall have not less than 30 minutes a fire resistance rating. | Required | Required | Required |
| 3.8 | SUBDIVISION OF BUILDING SPACES | Buildings shall be subdivided in accordance with 3.8.1. | Required | Required | Required |
| 3.8.1 | TENANTS SEPARATION | Each tenant space shall be separated from other tenant spaces by partitions having a fire resistance rating of not less than 1 hour. | Required | Required | Required |
| 3.8.1.1 | | The partition wall shall extend to the underside of the roof or floor above. | Required | Required | Required |
| 3.8.1.2 | | No separation shall be required between the tenant space and the common areas fronting the tenant space or the concourse. | Required | Required | Required |
| 3.9 | (Reserved). | | | | |
| 4.0 | SPECIAL PROVISIONS. | Special Provisions for Firefighting and Rescue shall comply with QCD FLS Annex and as modified in item 4.0 of this FLS Occupancy Chapter. | | | |
| 4.1 | FIRE (EMERGENCY) COMMAND CENTER (FCC) | QCD FLS Annex_A5 – Revisions_2021. | Required | Required | NA |
| 4.1.1 | | A Fire Command Center shall be provided in buildings that requires Emergency Voice Communication System and/or Smoke Control System. | Required | Required | NA |
| 4.2 | FIREMAN'S ACCESS PANELS/ OPENINGS | QCD FLS Annex_A3 – Revisions_2021 | Required | Required | NA |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|-------|---|--|----------|----------|----------|
| 4.3 | FIRE LIFTS (FIRE SERVICE ACCESS ELEVATORS) | QCD FLS Annex_A4 – Revisions_2021 | Required | Required | NA |
| 4.3.1 | | In any building where the basements is more than nine (9) meters below the average ground level. | Required | Required | NA |
| 4.3.2 | FIREFIGHTING LOBBY | QCD FLS Annex_A2 – Revisions_2021 | Required | Required | NA |
| 4.3.3 | SMOKE-STOP LOBBY | QCD FLS Annex_A2 – Revisions_2021 | Required | Required | NA |
| 4.4 | AMBULANCE STRETCHER ACCOMMODATION | QCD FLS Annex_A4 – Revisions_2021 | Required | NA | NA |
| 4.6 | EXTERNAL ACCESS TO SITE AND BUILDINGS | QCD FLS Annex_A3 – Revisions_2021 | Required | Required | Required |
| 4.6.1 | SITE ACCESS/ACCESS ROAD | For gated facility development a 4.0 m wide access road and 4.5 m clear height vertical clearance entry gate or site access shall be provided. | Required | Required | Required |
| 4.6.2 | FIRE ENGINE HARDSTANDING | Fire engine hardstandings with longer side parallel to the façade of the building shall be provided in buildings with habitable height exceeding 10 m. | Required | Required | NA |
| 4.7 | (Reserved). | | | | |
| 5.0 | BUILDING SERVICES and FIRE PROTECTION EQUIPMENT | Building Services and Fire Protection Equipment shall comply with the applicable NFPA codes and standards and QCD FLS Annex. | | | |
| 5.1 | ELECTRICAL SYSTEM | Electrical wiring and equipment shall be in accordance with NFPA 70. | Required | Required | Required |
| 5.1.1 | ELECTRICAL EQUIPMENT/PANEL ROOMS AND SIMILAR ROOMS/SPACES | QCD FLS Annex _A7 – Revisions_2021 | Required | Required | Required |
| 5.1.2 | EMERGENCY GENERATORS AND STANDBY POWER SYSTEMS. | Emergency generators and standby power systems shall be installed, tested, and maintained in accordance with NFPA 110. | Required | Required | Required |
| 5.1.3 | STORED ELECTRICAL ENERGY SYSTEMS | Stored electrical energy systems shall be installed, tested, and maintained in accordance with NFPA 111. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|--------------------------------------|---|----------|----------|----------|
| 5.2 | COMMERCIAL COOKING OPERATIONS | Where permitted, commercial cooking operations shall be protected in accordance with NFPA 96. | Required | Required | Required |
| 5.3 | ELEVATORS, ESCALATORS, and CONVEYORS | An elevator, shall not be considered a component in a required means of egress and shall be in accordance with NFPA 101 section 9.4. | Required | Required | Required |
| 5.3.1 | NUMBER OF CARS | The number of elevator cars permitted in a hoistway shall be not more than three (3). | Required | Required | Required |
| 5.3.2 | OPENINGS TO EXIT ENCLOSURES | Conveyors, elevators, dumbwaiters, and pneumatic conveyors serving various stories of a building shall not open to an exit enclosure. | Required | Required | Required |
| 5.4 | WASTE HANDLING SYSTEM | Waste chutes and its associated trash collection storage rooms and service opening rooms, when provided shall comply with NFPA 101 section 9.5. | Required | Required | Required |
| 5.4.1 | | Approved waste chutes and transport systems, including gravity waste chutes, full pneumatic waste conveying systems, and gravity pneumatic waste conveying systems, shall comply with the provisions of NFPA 82. | Required | Required | Required |
| 5.4.1.1 | Construction | Waste chutes, shall be separately enclosed by walls or partitions of not less than 2-hrs fire resistance rating and chute intake openings protection of 1.5-hour fire protection rating. | Required | Required | Required |
| 5.4.1.2 | Trash Collection Storage Rooms | Waste chutes, shall have its associated trash collection, service opening rooms separately enclosed by walls of not less than 1-hr fire resistance rating and openings protection of 3/4-hour fire protection rating. | Required | Required | Required |
| 5.4.1.3 | | The doors of chutes shall open only to a trash collection, service opening room, laundry storage room or to a room that is designed and used exclusively for accessing the chute opening. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|----------------------------|---|----------|----------|----------|
| 5.4.2 | GRAVITY CHUTES | A waste chute shall extend (full size) at least 0.92 m. above the roof of a building. | Required | Required | Required |
| 5.4.2.1 | Chute Venting | The chute shall be open to the atmosphere, with the opening being the same cross-sectional area as the chute. | Required | Required | Required |
| 5.5 | FIRE PUMPS | | | | |
| 5.5.1 | FIRE PUMPS ROOM | QCD FLS Annex _A6 – Revisions_2021 | Required | Required | Required |
| 5.6 | SUBSTATION and SWITCHGEARS | QCD FLS Annex _A8 – Revisions_2021 | Required | Required | Required |





BUSINESS OCCUPANCIES



BUSINESS OCCUPANCIES

| | | | | | |
|---|--|--|---|---|------------------|
| 1.0 | GENERAL REQUIREMENTS. | The requirements of this chapter shall apply to buildings or portions thereof used as business occupancies. | | | |
| | An occupancy used for the transaction of business other than mercantile. | | | | |
| | Government Halls / Courthouses (Transaction of Public Business and the keeping of books and records) | College / University Buildings, Instructional Laboratories, Classrooms (< 50 persons) | Dentists / Doctors Offices and Outpatient Clinics (Ambulatory to ≤ 3 patients) | General Offices and Service Facilities (News Stands, Lunch Counters serving < 50 persons, Barber Shops, and Beauty Parlors) | |
| 1.1 | GENERAL CONDITIONS AND BUILDING LIMITS | | | | |
| | Building Category | Building Height (m) | Floor Area (m ²) | Basement Levels | |
| 1.1.1 | LOW-RISE Buisness Occupancies | < 15.0 m Habitable Height | No Limit | No Limit [in Floor Area/Fire Area, Depth or Levels] | |
| 1.1.2 | MID-RISE Business Occupancies | ≥ 15 m to < 28 m Habitable Height | | | |
| 1.1.3 | HIGH-RISE Business Occupancies | ≥ 28 m Habitable Height | | | |
| FIRE AND LIFE SAFETY (FLS) REQUIREMENT | | | | | |
| Item | Fire Safety Provisions | Minimum Requirements | Low-rise | Mid-rise | High-rise |
| 1.2 | CLASSIFICATION OF OCCUPANCIES | | | | |
| 1.2.1 | MULTIPLE OCCUPANCIES | All multiple occupancies shall be in accordance with NFPA 101 section 6.1.14 and the requirements of either 1.2.1.1 or 1.2.1.2. | Required | Required | Required |
| 1.2.1.1 | Mixed Occupancies | Each portion of the building shall be classified as to its use and shall comply with the most restrictive requirements of the occupancies involved, unless separate safeguards are approved. | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|-----------------|---|---|-----------|-----------|-----------|
| 1.2.1.2 | Separated occupancies | Each part of the building comprising a distinct occupancy, shall be completely separated from other occupancies by the required separation, as specified in NFPA 101 Table 6.1.14.4.1(a) and Table 6.1.14.4.1(b). | Permitted | Permitted | Permitted |
| 1.2.1.3 | Combined Business Occupancies and Parking Structures. | The fire barrier separating parking structures from a building classified as a business occupancy shall be a fire barrier having a minimum 2-hour fire resistance rating. | Required | Required | Required |
| 1.2.1.3(1) | Exemptions | Openings in the fire barrier shall not be required to be protected with fire protection-rated opening protectives in enclosed parking structures that are protected throughout by an approved, automatic sprinkler system, or in open parking structures, provided that all of the conditions in 1.2.1.3(1)(a) through 1.2.1.3(1)(f) are met: | Permitted | Permitted | Permitted |
| 1.2.1.3 (1) (a) | Area of Openings | The openings do not exceed 25 percent of the area of the fire barrier in which they are located. | Required | Required | Required |
| 1.2.1.3 (1) (b) | Use of the Openings | The openings are used as a public entrance and for associated sidelight functions | Required | Required | Required |
| 1.2.1.3 (1) (c) | Extinguishing System | The building containing the business occupancy is protected throughout by an approved, automatic sprinkler system | Required | Required | Required |
| 1.2.1.3 (1) (d) | Fuel Spill Protection | Means are provided to prevent spilled fuel from accumulating adjacent to the openings and entering the building. | Required | Required | Required |
| 1.2.1.3 (1) (e) | Barriers | Physical means are provided to prevent vehicles from being parked or driven within 3050 mm of the openings. | Required | Required | Required |
| 1.2.1.3 (1) (f) | Smoke Partition | The openings are protected as a smoke partition, with no minimum fire protection rating required. | Required | Required | Required |
| 1.2.1.4 | Atrium walls | Atrium walls shall be permitted to serve as part of the separation for creating separated occupancies on a story-by-story basis from non-hazardous spaces in assembly, educational, day care, health care, ambulatory health care, residential, and mercantile occupancies other than bulk merchandise buildings. | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|--|--|-----------|-----------|-----------|
| 1.3 | OCCUPANT LOAD (OL) | Determined on the basis of the occupant load factors (OLF) that are characteristic of the use of the space as specified in 1.3.1. | Required | Required | Required |
| 1.3.1 | OCCUPANT LOAD FACTOR (OLF) General Business Use Areas | The occupant load shall be not less than the number of persons determined by dividing the floor area assigned to that use by the occupant load factor of 9.3 m ² per person. | Required | Required | Required |
| 1.4 | CLASSIFICATION OF HAZARD OF CONTENTS | Contents of business occupancies shall be classified as Ordinary Hazard. | Required | Required | Required |
| 1.5 | MINIMUM CONSTRUCTION REQUIREMENTS. | Construction shall be in accordance with NFPA 5000 Chapters 7–8, 13–14, 31, and 35–40. | Required | Required | Required |
| 1.6 | ACCESSIBILITY. | Accessibility shall be in accordance with NFPA 5000 Chapter 12. | | | |
| 1.7 | (Reserved). | | | | |
| 2.0 | MEANS of EGRESS REQUIREMENTS | Means of egress shall comply with NFPA 101 Chapter 7, and as modified in item 2.0 of this FLS Occupancy Chapter. | | | |
| 2.1 | GENERAL | | | | |
| 2.1.1 | STAIRS and RAMPS serving two or more floors below a street floor occupied for business use | Where two or more floors below the street floor are occupied for business use, the same stairs or ramps shall be permitted to serve each floor. | Permitted | Permitted | Permitted |
| 2.1.1.1 | | An inside open stairway or inside open ramp shall be permitted to serve as a component of the required means of egress system from not more than one floor level below the street floor. | Permitted | Permitted | Permitted |
| 2.2 | MEANS OF EGRESS COMPONENTS | Means of egress components shall be limited to the types described in 2.2.1 through 2.2.7. | Required | Required | Required |
| 2.2.1 | DOORS | Doors shall be in accordance with NFPA 101 section 7.2.1, and the requirements in items 2.2.1. | Required | Required | Required |
| 2.2.1.1 | Door Locking to Prevent Unwanted Entry | Only where specialized security measures are needed to prevent unwanted entry in college and university classrooms, areas of office spaces open to the public, laboratories, or instructional rooms or spaces. | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|--|---|-----------|-----------|-----------|
| 2.2.1.2 | Locks | Locks complying with NFPA 101 section 7.2.1.5.5 shall be permitted only on principal entrance/exit doors that is expected to be unlocked in order for the facility to do business. | Permitted | Permitted | Permitted |
| 2.2.1.3 | Elevator Lobby Exit Access Door Assemblies Locking | Electrically locked door assemblies separating the elevator lobby from the exit access, in accordance with NFPA 101 section 7.2.1.6.3. | Permitted | Permitted | Permitted |
| 2.2.1.4 | Delayed-Egress Electrical Locking Systems | Approved, delayed-egress electrical locking systems installed on door assemblies serving low- and ordinary-hazard contents in buildings protected throughout by an automatic fire detection system or an automatic sprinkler system, complying with NFPA 101 section 7.2.1.6.1. | Permitted | Permitted | Permitted |
| 2.2.1.5 | Sensor-Release of Electrical Locking Systems | Door assemblies in the means of egress equipped with sensor-release electrical locking system hardware complying with NFPA 101 7.2.1.6.2. | Permitted | Permitted | Permitted |
| 2.2.1.6 | Horizontal or Vertical Security Grilles or Doors | As part of the required means of egress from a tenant space complying with NFPA 101 section 7.2.1.4.1(3) | Permitted | Permitted | Permitted |
| 2.2.1.7 | Revolving Doors | Revolving door assemblies, used or not used in the means of egress, complying with NFPA 101 section 7.2.1.10. | Permitted | Permitted | Permitted |
| 2.2.2 | STAIRS | Stairs complying with NFPA 101 section 7.2.2 and as specified in 2.2.2.1. | Permitted | Permitted | Permitted |
| 2.2.2.1 | Spiral Stairs | Spiral stairs as a component in a means of egress complying with NFPA 101 section 7.2.2.2.3. | Permitted | Permitted | Permitted |
| 2.2.3 | SMOKEPROOF ENCLOSURES | Smokeproof enclosures complying with NFPA 101 section 7.2.3. | Permitted | Permitted | Permitted |
| 2.2.4 | HORIZONTAL EXITS | Horizontal exit as a component in a means of egress or used as substitute for other exits complying with NFPA 101 section 7.2.4. | Permitted | Permitted | Permitted |
| 2.2.5 | RAMPS | Every ramp used as a component in a means of egress complying with NFPA 101 section 7.2.5. | Permitted | Permitted | Permitted |
| 2.2.6 | EXIT PASSAGEWAY | Exit passageways used as exit components complying with NFPA 101 section 7.2.6. | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|------------------------------|---|-----------|------------------|-----------|
| 2.2.6.1 | | An exit passageway serving as a horizontal means of exit travel that is protected from fire in a manner similar to an enclosed interior exit stair. | Required | Required | Required |
| 2.2.7 | AREA OF REFUGE | Areas of refuge complying with NFPA 101 section 7.2.12. | Required | Required | Required |
| 2.3 | CAPACITY OF MEANS OF EGRESS | The capacity of means of egress shall be in accordance with NFPA 101 section 7.3 and as modified in 2.3.1. | Required | Required | Required |
| 2.3.1 | CORRIDOR OR PASSAGEWAY | The clear width of any corridor or passageway serving an occupant load of 50 or more shall not be less than 1200mm. | Required | Required | Required |
| 2.3.2 | STREET FLOOR EGRESS CAPACITY | Street floor exits shall be sufficient for the occupant load of the street floor plus the required capacity of open stairs and ramps discharging through the street floor. | Required | Required | Required |
| 2.4 | NUMBER OF MEANS OF EGRESS | The number of means of egress shall be in accordance with NFPA 101 7.4. | Required | Required | Required |
| 2.4.1 | GENERAL | Means of egress shall comply with all of the following, except as otherwise permitted by 2.4.3 | Required | Required | Required |
| 2.4.1.1 | | Not less than two separate exits shall be provided on every story. | Required | Required | Required |
| 2.4.1.2 | | Not less than two separate exits shall be accessible from every part of every story. | Required | Required | Required |
| 2.4.2 | SINGLE EXIT ACCESS PATH | Exit access, as required by 2.4.1.2, shall be permitted to include a single exit access path for the distances permitted as common paths of travel. | Permitted | Permitted | Permitted |
| 2.4.3 | SINGLE EXIT PROVISION | Any building of not more than 15 m habitable height, shall be permitted a single separate exit to each story, provided that all of the conditions in 2.4.3.1 through 2.4.3.7 are met: | Permitted | NP-Not Permitted | NP |
| 2.4.3.1 | Floor Area Limit | Gross floor area is equal or less than 500 m ² per floor level | Required | - | - |
| 2.4.3.2 | Exit Discharge | The exit shall discharge directly to the building external at the level of exit discharge. | Required | - | - |
| 2.4.3.3 | Common Path of Travel | The total distance of travel from any point, to an exit, shall not exceed 23 m. or 30 m. in a single tenant business occupancy. | Required | - | - |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|--|---|-----------|-----------|-----------|
| 2.4.3.4 | Corridor Wall Protection | All corridors serving as access to exits in a multiple tenant business occupancy shall have a minimum of 1-hour fire resistance rating. Single tenant occupancy shall not require corridor wall protection. | Required | - | - |
| 2.4.3.5 | Openings in Corridor Walls | All doors openings onto the exit access corridors (multi-tenant) are protected with self-closing door assemblies of 1-hour fire protection rating. | Required | - | - |
| 2.4.3.6 | Exit Stair Enclosures | Exit stairway is completely enclosed or separated from the rest of the building by a minimum 2-hour fire resistance rating (1.5-hrs doors) where the exit connects four or more stories. | Required | - | - |
| 2.4.3.7 | Exit Stair Ventilation | Provisions of smoke vents at the top of the stairwell, for buildings exceeding 9m (to not more than 15 m) habitable height. | Required | - | - |
| 2.4.5 | SINGLE EXIT PROVISIONS in Mezzanine | A single means of egress shall be permitted from a mezzanine, provided that the common path of travel does not exceed 23 m, or 30 m if protected throughout by an automatic sprinkler system. | Permitted | Permitted | Permitted |
| 2.5 | ARRANGEMENT OF MEANS OF EGRESS | Access to all required exits shall be arranged in accordance with NFPA 101 section 7.5. and as modified by 2.5. | Required | Required | Required |
| 2.5.1 | TRAVEL DISTANCE (TD) TO EXITS | Travel distance shall comply with 2.5.1.1 and 2.5.1.2. | Required | Required | Required |
| 2.5.1.1 | | Travel distance to an exit shall from any point shall not exceed 61 m. | Required | Required | Required |
| 2.5.1.2 | Buildings Protected Throughout by an Approved Automatic Sprinkler System | Travel distance in business occupancies shall not exceed 91 m. | Required | Required | Required |
| 2.5.2 | COMMON PATH (CP) OF TRAVEL | Limits on common path of travel shall comply with 2.5.2.1 thru 2.5.2.3. | Permitted | Permitted | Permitted |
| 2.5.2.1 | Common Path Limit | Common path of travel shall not exceed 23 m. | Required | Required | Required |
| 2.5.2.2 | Buildings Protected Throughout by an Approved Automatic Sprinkler System | Common path of travel shall not exceed 30 m. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|--|---|-----------|-----------|-----------|
| 2.5.2.3 | | Common path of travel within a single tenant space having an occupant load not exceeding 30 persons shall not exceed 30 m. | Required | Required | Required |
| 2.5.3 | DEAD-END (DE) CORRIDOR | Dead-end corridors in accordance with 2.5.3.1 and 2.5.3.2. | Permitted | Permitted | Permitted |
| 2.5.3.1 | | Dead-end corridors in buildings shall not exceed 6.0 m. | Required | Required | Required |
| 2.5.3.2 | Buildings Protected Throughout by an Approved Automatic Sprinkler System | Dead-end corridors shall not exceed 15 m. | Required | Required | Required |
| 2.6 | DISCHARGE FROM EXITS | Exit discharge shall comply with NFPA 101 section 7.7. | Required | Required | Required |
| 2.6.1 | EXIT TERMINATION | Exits shall terminate directly, at a public way or an exterior exit discharge. | Required | Required | Required |
| 2.6.2 | EXIT DISCHARGE THROUGH INTERIOR BUILDING AREAS | Exits shall be permitted to discharge through interior building areas, provided that all of the criteria in NFPA 101 section 7.7.2 are met. | Permitted | Permitted | Permitted |
| 2.7 | ILLUMINATION OF MEANS OF EGRESS | Means of egress shall be illuminated in accordance with NFPA 101 7.8. | Required | Required | Required |
| 2.8 | EMERGENCY LIGHTING | Emergency lighting shall be provided in accordance with NFPA 101 section 7.9 and as specified in 2.8.1 through 2.8.3. | Required | Required | Required |
| 2.8.1 | | Emergency lighting shall be provided in any building where any one of the conditions in 2.8.1.1 through 2.8.1.3 exists: | Required | Required | Required |
| 2.8.1.1 | Number of Stories | The building is three (3) or more stories in height. | Required | Required | Required |
| 2.8.1.2 | Number of Occupants | The occupancy is subject to 50 or more occupants above or below the level of exit discharge. | Required | Required | Required |
| 2.8.1.3 | Total Number of Occupants | The occupancy is subject to 300 or more total occupants. | Required | Required | Required |
| 2.8.2 | UNDERGROUND AND LIMITED ACCESS STRUCTURES | Emergency lighting in accordance with Section 2.8 shall be provided for all underground and limited access structures. | Required | Required | Required |
| 2.8.3 | OFFICE AREAS | Emergency lighting shall be provided in corridors leading to multiple-closed offices and in open work area. | Required | Required | Required |
| 2.9 | MARKINGS OF MEANS OF EGRESS | Means of egress shall have signs in accordance with NFPA 101 section 7.10. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|-------------|--|--|-----------|-----------|-----------|
| 2.10 | SPECIAL MEANS OF EGRESS FEATURES | | | | |
| 2.10.1 | HAZARDOUS MATERIALS | Where hazardous materials are stored, used, or handled, the provisions of 2.10.1.1 and 2.10.1.2 shall apply. | Required | Required | Required |
| 2.10.1.1 | Hazardous materials classified as high-hazard contents | Hazardous materials that are stored, used, or handled, and that are also classified as high-hazard contents shall comply with the Special Provisions for Occupancies with High Hazard Contents in NFPA 101 section 7.12.2. | Required | Required | Required |
| 2.10.1.2 | Hazardous Materials | Hazardous materials shall comply with both 2.10.1.2(1) and 2.10.1.2(2) | Required | Required | Required |
| 2.10.1.2(1) | | Means of egress requirements of this Code | Required | Required | Required |
| 2.10.1.2(2) | | Applicable means of egress requirements of NFPA 30, NFPA 45, NFPA 55, NFPA 58, NFPA 400, and NFPA 495 that are stricter than NFPA 101 Chapter 7 requirements for Means of Egress and this occupancy chapter. | Required | Required | Required |
| 3.0 | PROTECTION | Protection shall comply with the applicable NFPA codes and standards, QCD FLS Annex and as modified in item 3.0 of this FLS Occupancy Chapter. | | | |
| 3.1 | PROTECTION OF VERTICAL OPENINGS | Vertical openings shall be enclosed or protected in accordance with NFPA 101 section 8.6. | Required | Required | Required |
| 3.1.1 | CONVENIENCE OPENINGS | Convenience openings in accordance with NFPA 101 section 8.6.9. | Permitted | Permitted | Permitted |
| 3.1.1.1 | | Unenclosed vertical openings not concealed within the building construction in accordance with NFPA 101 section 8.6.9.1. | Permitted | Permitted | Permitted |
| 3.1.2 | CONVENIENCE STAIRWAYS | Unenclosed vertical openings created by convenience stairways complying with the conditions in NFPA 101 section 8.6.9.2. | Permitted | Permitted | Permitted |
| 3.1.3 | ESCALATORS AND MOVING WALKS not constituting an exit | Unenclosed vertical openings in accordance with NFPA 101 8.6.9.7, shall be permitted and the number of contiguous stories shall not be limited. | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|--|---|------------------|-----------|-----------|
| 3.1.4 | EXIT ACCESS STAIR | Unenclosed exit access stairs traversing a maximum two-story, single-tenant space complying with 3.1.4.1, 3.1.4.2 and 3.1.4.3. | Permitted | Permitted | Permitted |
| 3.1.4.1 | | The building is protected throughout by an automatic sprinkler system, or | Required | Required | Required |
| 3.1.4.2 | | Not less than two separate exits shall be provided on every story. | Required | Required | Required |
| 3.1.4.3 | | The total travel to the outside does not exceed 30 m. | Required | Required | Required |
| 3.1.5 | FLOORS BELOW STREET FLOOR | Floors that are below the street floor and are used for storage or other than a business occupancy shall have no unprotected openings to business occupancy floors | Required | Required | Required |
| 3.2 | PROTECTION FROM HAZARDS | Hazardous areas including, but not limited to, areas used for general storage, boiler rooms, and maintenance shops that include woodworking and painting areas shall be protected in accordance with NFPA 101 section 8.7. | Required | Required | Required |
| 3.2.1 | GENERAL STORAGE/ARCHIVE | Protection of rooms inside individual tenant spaces that are used to store routine office supplies for that tenant. | NR- Not required | NR | NR |
| 3.2.2 | HIGH HAZARD CONTENTS AREAS | High hazard contents areas, shall meet all of the following criteria: | Required | Required | Required |
| 3.2.2.1 | Enclosures/Separation from Other Areas | The area shall be separated from other parts of the building by fire barriers having a min. 1-hour FR rating, and all openings therein protected by self-closing door assemblies having a min. 3/4-hour FP rating. | Required | Required | Required |
| 3.2.2.2 | Extinguishing Requirements | The area shall be protected by an automatic extinguishing system. | Required | Required | Required |
| 3.2.3 | HAZARDOUS MATERIALS | Business occupancies with storage, use, handling of hazardous materials and in areas where hazardous materials are present in excess of the maximum allowable quantities shall comply with the following codes: NFPA 30, NFPA 54, NFPA 55, NFPA 58, NFPA 400, and NFPA 495. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|---|--|-----------|-----------|-----------|
| 3.2.4 | MEDICAL GAS | Medical gas storage areas and the operation, management, and maintenance of medical gases shall be in accordance with NFPA 99. | Required | Required | Required |
| 3.2.5 | COMMERCIAL COOKING OPERATIONS | Commercial cooking operations shall be protected in accordance with NFPA 96, unless the cooking equipment in 3.2.5.1 and 3.2.5.2 are used. | Required | Required | Required |
| 3.2.5.1 | Types of Cooking Equipment | Outdoor equipment | Permitted | Permitted | Permitted |
| 3.2.5.2 | | Equipment used only for food warming | Permitted | Permitted | Permitted |
| 3.3 | INTERIOR FINISH | Interior finish shall be in accordance with NFPA 101 section 10.2. | Required | Required | Required |
| 3.3.1 | INTERIOR WALL AND CEILING FINISH | Interior wall and ceiling finish material shall be Class A or Class B in exits and in exit access corridors | Required | Required | Required |
| 3.3.1.1 | | Interior wall and ceiling finishes shall be Class A, Class B, or Class C in areas other than those specified in 3.3.1 | Required | Required | Required |
| 3.3.2 | INTERIOR FLOOR FINISH | Interior floor finish in exit enclosures shall be Class I or Class II. | Required | Required | Required |
| 3.4 | DETECTION, ALARM & COMMUNICATION REQUIREMENTS | | | | |
| 3.4.1 | GENERAL | Complete coverage of Fire Detection and Alarm System. | Required | Required | Required |
| 3.4.2 | INITIATION | Complete coverage of an Automatic Detection and Manual Initiating Devices. | Required | Required | Required |
| 3.4.3 | OCCUPANT NOTIFICATION | Complete Coverage of an Occupant Notification (audible & visible). | Required | Required | Required |
| 3.4.3.1 | Emergency Voice Evacuation System | Mass Notification System | NR | NR | Required |
| 3.4.4 | SUPPLEMENTARY | | | | |
| 3.4.4.1 | Fire Telephone | In every required provisions of a fire command center (FCC) or emergency control center (ECC). | Required | Required | Required |
| 3.4.4.2 | Graphic Annunciator (PC Panel) or Mimic Panel | In every required provisions of a fire command center (FCC) or emergency control center (ECC). | Required | Required | Required |
| 3.5 | EXTINGUISHMENT REQUIREMENTS | | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|---|--|-----------|-----------|-----------|
| 3.5.1 | AUTOMATIC SPRINKLER (AS) SYSTEM | Business occupancies shall be protected throughout by an approved, supervised automatic sprinkler system. | NR | NR | Required |
| 3.5.1.1 | Basement Level/s | Basement level (car park and other usage) with fire area or fire compartment exceeding 1115 m ² . | Required | Required | Required |
| 3.5.1.2 | | Multiple-level Basement (car park and other usage) regardless of fire area or fire compartment. | Required | Required | Required |
| 3.5.1.3 | Vertical Openings: Convenience Stairways & Atrium | Buildings with unprotected openings shall be protected throughout by an approved, supervised automatic sprinkler system. | Required | Required | Required |
| 3.5.2 | OTHER AUTOMATIC SUPPRESSION SYSTEM | Where an automatic sprinkler system is required in Section 3.5.1 and 3.5.1.1 through 3.5.1.3, the appropriate type of automatic suppression system shall be permitted. | Permitted | Permitted | Permitted |
| 3.5.3 | Fire Hose Reel | Fire hose reels are required in buildings protected by an approved supervised automatic sprinkler system. | Required | Required | Required |
| 3.5.4 | Portable Fire Extinguisher | Applicable Portable Fire Extinguishers required in all buildings. | Required | Required | Required |
| 3.5.5 | Rising Main (Dry or Wet Standpipe) | Refer to Annex Fire Fighting System Annex_FFS_G1 Revisions 2021 | Required | Required | Required |
| 3.6 | SMOKE CONTROL / VENTILATION REQUIREMENTS | Legend: NR-Not Required; NA-Not Applicable; NP-Not Permitted | | | |
| 3.6.1 | STAIRWELL/LOBBY | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.1.1 | Less than 9 m habitable height | | No Reqmt | No Reqmt | No Reqmt |
| 3.6.1.2 | 9 m to 15 m habitable height | Vent at top of stairwell | Required | NA | NA |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | Permitted | NA | NA |
| | | Stairwell Pressurization | NR | NA | NA |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|---|---|-----------|-----------|-----------|
| 3.6.1.3 | >15 m to < 28 m habitable height | Vent at top of stairwell | NA | NP | NA |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | NA | Required | NA |
| | | Stairwell Pressurization | NA | Permitted | NA |
| 3.6.1.4 | ≥28 m habitable height | Vent at top of stairwell | NA | NA | NP |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | NA | NA | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | NA | NA | Required |
| | Connecting Basement Levels | | | | |
| 3.6.1.5 | Two basement levels or ≤6 m deep, ≤2000 m ² floor area | Vent at top of stairwell : * Permitted up to five (5) connecting above floors (2B+G+4 or less) or 12 m habitable height ; whichever is less; otherwise next below provisions shall apply. | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | Permitted | Required | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Required |
| 3.6.1.6 | Three basement levels or ≤ 9.1m deep, ≤2000 m ² floor area | Vent at top of stairwell : * Permitted up to three (3) connecting above floors only (3B+G+2 or less) or 6m habitable height, whichever is less; otherwise next below provisions shall apply | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | NA | NA | NA |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|--|--|---|----------|----------|
| 3.6.1.7 | Two basement levels or ≤ 6 m deep, >2000 m ² floor area | Vent at top of stairwell: * Permitted up to four (4) connecting floors (2B+G+3 or less) or 9 m habitable height ; whichever is less; otherwise next below provisions shall apply. | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | Required | NP | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Required | Required |
| 3.6.1.8 | Three basement levels or ≤ 9.1 m deep, >2000 m ² floor area, connecting one floor above only | Vent at top of stairwell : * Permitted up to two connecting above floors or 3 m habitable height only (3B+G+1 or less); whichever is less, otherwise next below provisions shall apply | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | NA | NA | NA |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization. | Permitted | Required | Required |
| 3.6.1.9 | Lowest basement level >9.1 m below ground level, regardless of floor area | Vent at top of stairwell | NP | NP | NP |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | NP | NP | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Required | Required | Required |
| 3.6.2 | ESCAPE CORRIDOR PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.2.1 | Interior Corridors | Vents (Fixed or Automatic Opening) | Required in specific type of Occupancy: Healthcare Occupancies and in Detention and Correctional Occupancies | | |
| | | Mechanical Ventilation of Corridor | | | |
| | | Pressurization of Corridor | | | |
| 3.6.2.2 | Corridor with side/s located along exterior walls | Vents (Fixed or Automatic Opening) | | | |
| | | Mechanical Ventilation of Corridor | | | |
| | | Pressurization of Corridor | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|-----------|--|--|-----------|-------------------|-------------|
| 3.6.3 | atrium and OTHER FLOOR OPENINGS PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.3.1 | Malls (with floor openings connecting >2 floors) | Smoke Vents (Fixed or Automatic Opening) | Required | NP | NP |
| | | Mechanical Smoke Exhaust Ventilation System/Engineered | Permitted | Required | Required |
| 3.6.3.2 | Other Occupancies (connecting >3 floor levels) | Smoke Vents (Fixed or Automatic Opening) | Required | Permitted | NP |
| | | Mechanical Smoke Exhaust Ventilation System/Engineered | Permitted | Permitted | Required |
| 3.6.4 | CAR PARKS/PARKING STRUCTURES PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | | | |
| 3.6.4.1 | Open Parking Structures | The open parking structure shall justify that no smoke stagnation will occur such as from a fire located somewhere in the middle of the car park; otherwise mechanical equipment that will aid in effective dispersal of smoke shall be provided | Required | Required | Required |
| 3.6.4.2 | Aboveground Enclosed Car Parks | | | | |
| 3.6.4.2.1 | Aggregate floor area of ≤2000 m ² | Smoke Vents (Fixed or Automatic) | Required | Required | Permitted |
| | | Mechanical Smoke Purging/Clearance | Permitted | Permitted | Required |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted |
| 3.6.4.2.2 | Aggregate floor area of >2000 m ² | Smoke Vents (Fixed or Automatic) | Required | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | NP |
| | | Engineered Smoke Control System | Required | Permitted | Required |
| 3.6.4.3 | Belowground Car Parks | | ≤6m Deep | >6m - ≤9.1 m Deep | >9.1 m Deep |
| 3.6.4.3.1 | Aggregate floor area of ≤2000 m ² | Smoke Vents (Fixed or Automatic) | Required | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | Required |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|-----------|--|---|-----------------|-----------|----------------------|
| 3.6.4.3.2 | Aggregate floor area of >2000 m ² | Smoke Vents (Fixed or Automatic) | NP | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Required | NP | NP |
| | | Engineered Smoke Control System | Permitted | Required | Required |
| 3.7 | CORRIDORS | | Low-rise | Mid-rise | High-rise |
| 3.7.1 | WALLS | Where access to exits is provided by corridors, such corridors shall be separated from use areas by fire barriers having a minimum 1-hour fire resistance rating, unless one of the conditions in 3.7.1.1, 3.7.1.2 or 3.7.1.3 exists: | Required | Required | N/A - Not Applicable |
| 3.7.1.1 | | Where exits are available from an open floor area, such as open plan buildings, corridors are not required to be separated. | Permitted | Permitted | Permitted |
| 3.7.1.2 | | Within a space occupied by a single tenant limited to an area occupied under a single management and work the same hours. | Permitted | Permitted | Permitted |
| 3.7.1.3 | | Within buildings protected throughout by an automatic sprinkler system | Permitted | Permitted | Permitted |
| 3.7.2 | Openings in Corridor Walls | All doors and other openings onto the exit access corridors shall have not less than 30 minutes fire protection rating unless the corridor serves spaces occupied by a single tenant. | Required | Required | Required |
| 3.7.2.1 | Self-closing Devices | Doors required to be protected in accordance with 3.7.2, shall be self-closing and self-latching. | Required | Required | Required |
| 3.8 | (Reserved). | | | | |
| 4.0 | SPECIAL PROVISIONS. | Special Provisions for Firefighting and Rescue shall comply with QCD FLS Annex and as modified in item 4.0 of this FLS Occupancy Chapter. | | | |
| 4.1 | FIRE (EMERGENCY) COMMAND CENTER (FCC) | QCD FLS Annex_A5 – Revisions_2021. | NR-Not Required | NR | Required |
| 4.1.1 | | A Fire Command Center shall be provided in buildings that requires Emergency Voice Communication System and/or Smoke Control System. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|-------|--|--|-----------------|-----------|------------------|
| 4.1.2 | Exemptions | In other than high-rise buildings, instead of a dedicated FCC, lobbies or other spaces adjacent to the main entrance/s may be permitted. | Permitted | Permitted | NP-Not Permitted |
| 4.2 | FIREMAN'S ACCESS PANELS/OPENINGS | QCD FLS Annex_A3 – Revisions_2021 | Required | Required | Required |
| 4.3 | FIRE LIFTS (FIRE SERVICE ACCESS ELEVATORS) | QCD FLS Annex_A4 – Revisions_2021 | NR-Not Required | NR | Required |
| 4.3.1 | | The building basements is more than nine (9) meters below the average ground level. | Required | Required | Required |
| 4.3.2 | FIREFIGHTING LOBBY | QCD FLS Annex_A2 – Revisions_2021 | Required | Required | Required |
| 4.3.3 | SMOKE-STOP LOBBY | QCD FLS Annex_A2 – Revisions_2021 | Required | Required | Required |
| 4.4 | AMBULANCE STRETCHER ACCOMMODATION | QCD FLS Annex_A4 – Revisions_2021 | NR | Required | Required |
| 4.5 | EXTERNAL ACCESS TO SITE AND BUILDINGS | QCD FLS Annex_A3 – Revisions_2021 | Required | Required | Required |
| 4.5.1 | SITE ACCESS/ACCESS ROAD | For gated facility development a 4.0 m wide access road and 4.5 m clear height vertical clearance entry gate or site access shall be provided. | Required | Required | Required |
| 4.5.2 | FIRE ENGINE HARDSTANDING (FEH) | FEH with longer side parallel to the façade of the building shall be provided in buildings exceeding the habitable height of 10 m. | Required | Required | Required |
| 4.6 | REFUGE FLOORS | QCD FLS Annex_A1 – Revisions_2021 | NA | NA | Required |
| 4.7 | (Reserved). | | | | |
| 5.0 | BUILDING SERVICES and FIRE PROTECTION EQUIPMENT | Building Services and Fire Protection Equipment shall comply with the applicable NFPA codes and standards and QCD FLS Annex. | | | |
| 5.1 | ELECTRICAL SYSTEM | Electrical wiring and equipment shall be in accordance with NFPA 70. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|---|--|----------|----------|----------|
| 5.1.1 | ELECTRICAL EQUIPMENT/PANEL ROOMS AND SIMILAR ROOMS/SPACES | QCD FLS Annex _A7 – Revisions_2021 | Required | Required | Required |
| 5.1.2 | EMERGENCY GENERATORS AND STANDBY POWER SYSTEMS. | Emergency generators and standby power systems shall be installed, tested, and maintained in accordance with NFPA 110. | Required | Required | Required |
| 5.1.3 | STORED ELECTRICAL ENERGY SYSTEMS | Stored electrical energy systems shall be installed, tested, and maintained in accordance with NFPA 111. | Required | Required | Required |
| 5.2 | COMMERCIAL COOKING OPERATIONS | Where permitted, commercial cooking operations shall be protected in accordance with NFPA 96. | Required | Required | Required |
| 5.3 | ELEVATORS, ESCALATORS, and CONVEYORS | An elevator, shall not be considered a component in a required means of egress and shall be in accordance with NFPA 101 section 9.4. | Required | Required | Required |
| 5.3.1 | NUMBER OF CARS | The number of elevator cars permitted in a hoistway shall be not more than three (3). | Required | Required | Required |
| 5.3.2 | OPENINGS TO EXIT ENCLOSURES | Conveyors, elevators, dumbwaiters, and pneumatic conveyors serving various stories of a building shall not open to an exit enclosure. | Required | Required | Required |
| 5.4 | WASTE HANDLING SYSTEM | Waste chutes and its associated trash collection storage rooms and service opening rooms, when provided shall comply with NFPA 101 section 9.5. | Required | Required | Required |
| 5.4.1 | | Approved waste chutes and transport systems, including gravity waste chutes, full pneumatic waste conveying systems, and gravity pneumatic waste conveying systems, shall comply with the provisions of NFPA 82. | Required | Required | Required |
| 5.4.1.1 | Construction | Waste chutes, shall be separately enclosed by walls or partitions of not less than 2-hrs fire resistance rating and chute intake openings protection of 1.5-hour fire protection rating. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Type A | Type B | Type C |
|---------|--------------------------------|--|----------|----------|----------|
| 5.4.1.2 | Trash Collection Storage Rooms | Waste chutes shall have its associated trash collection, service opening rooms separately enclosed by walls of not less than 1-hr fire resistance rating and openings protection of 3/4-hour fire protection rating. | Required | Required | Required |
| 5.4.1.3 | | The doors of chutes shall open only to a trash collection, service opening room, laundry storage room or to a room that is designed and used exclusively for accessing the chute opening. | Required | Required | Required |
| 5.4.2 | GRAVITY CHUTES | A waste chute shall extend (full size) at least 0.92 m. above the roof of a building. | Required | Required | Required |
| 5.4.2.1 | | The chute shall be open to the atmosphere, with the opening being the same cross-sectional area as the chute. | Required | Required | Required |
| 5.5 | FIRE PUMPS | | | | |
| 5.5.1 | FIRE PUMPS ROOM | QCD FLS Annex _A6 – Revisions_2021 | Required | Required | Required |
| 5.6 | SUBSTATION and SWITCHGEARS | QCD FLS Annex _A8 – Revisions_2021 | Required | Required | Required |
| 5.7 | (Reserved). | | | | |





INDUSTRIAL OCCUPANCIES



| INDUSTRIAL OCCUPANCIES | | | | | | |
|--|---|---|---|--|-------------|--|
| 1.0 | GENERAL REQUIREMENTS. | The fire and life safety requirements in this chapter shall apply to buildings or portions thereof used as industrial occupancies. | | | | |
| | An occupancy in which products are manufactured or in which processing, assembling, mixing, packaging, finishing, decorating, or repair operations are conducted. | | | | | |
| | Factories of All Kinds Pumping Stations / Telephone Exchanges GasPlants / Laundries | | Auto-body and Repair Shops / Laboratories Recycling plants / Refineries Food processing plants / Drycleaning plants | Hangars (for Servicing Aircraft) Post Office Central Sorting/Maintenance Facilities / Power Plants / Sawmills | | |
| 1.1 | GENERAL CONDITIONS AND BUILDING LIMITS | | | | | |
| | Sub-Classification (Hazards) | Building Height (m) | Floor Area (m ²) | Basement Levels | | |
| 1.1.1 | LOW HAZARD Industrial Occupancy | Height Limit based on Type of Construction and Fire Resistance of Building Elements in NFPA 5000 Table 7.4.1 | Area Limit based on Type of Construction and Fire Resistance of Building Elements in NFPA 5000 Table 7.4.1 | No Limit in Floor/Fire Area, Depth or Number of Levels | | |
| 1.1.2 | ORDINARY HAZARD Industrial Occupancy | | | | | |
| 1.1.3 | HIGH HAZARD Industrial Occupancy | | | | | |
| FIRE AND LIFE SAFETY REQUIREMENTS | | | | | | |
| Item | Fire Safety Provisions | | Minimum Requirements | | Low Hazard | |
| 1.2 | CLASSIFICATION OF OCCUPANCIES | | Industrial occupancies shall include all buildings and structures or parts thereof with occupancy as described in item 1.0. | | Ordinary | |
| 1.2.1 | INDUSTRIAL OCCUPANCY | | Industrial occupancy classification shall comply with 1.2.1.1 and 1.2.1.2 | | High Hazard | |
| 1.2.1.1 | Applications | | Industrial occupancies shall include factories making products of all kinds and properties used for operations such as processing, assembling, mixing, packaging, finishing or decorating, repairing, and similar operations. | | Required | |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|------------|--|---|------------|-----------|-------------|
| 1.2.1.2 | Incidental High Hazard Operations | Incidental high hazard operations protected in accordance with special hazard protection in NFPA 101 section 8.7 and in 3.2 of this occupancy guideline, in industrial occupancies containing low or ordinary hazard contents shall not be the basis for high hazard industrial occupancy classification. | Permitted | Permitted | Permitted |
| 1.2.2 | SUBCLASSIFICATION OF OCCUPANCY | Each industrial occupancy shall be subclassified according to its use as described in 1.2.2.1, 1.2.2.2, and 1.2.2.3. | Required | Required | Required |
| 1.2.2.1 | General Industrial Occupancy | General industrial occupancies shall include all of the following: | Required | Required | Required |
| 1.2.2.1(1) | Ordinary / Low Hazard Industrial Operations for Various Types of Industrial Processes. | Industrial occupancies that conduct ordinary and low hazard industrial operations in buildings of conventional design that are usable for various types of industrial processes. | Required | Required | Required |
| 1.2.2.1(2) | Multistory and Multi Tenant Buildings / High Density of Employee Population | Industrial occupancies that include multistory buildings where floors are occupied by different tenants, or buildings that are usable for such occupancy and, therefore, are subject to possible use for types of industrial processes with a high density of employee population. | Required | Required | Required |
| 1.2.2.2 | Special-Purpose Industrial Occupancy | Special-purpose industrial occupancies shall include all of the following: | Required | Required | Required |
| 1.2.2.2(1) | Ordinary / Low Hazard Industrial Operations for Specific Type of Operations | Industrial occupancies that conduct ordinary and low hazard industrial operations in buildings designed for, and that are usable only for, particular types of operations. | Required | Required | Required |
| 1.2.2.2(2) | Area Occupied by Machinery or Equipment / Low Density of Employee Population | Industrial occupancies that are characterized by a relatively low density of employee population, with much of the area occupied by machinery or equipment | Required | Required | Required |
| 1.2.2.2(3) | Application of Special-Purpose Industrial Occupancy | The special-purpose industrial occupancy classification shall not be applied to a building to reduce the life safety features; the full number and arrangement of exits required for a general industrial occupancy shall be provided. | Required | Required | Required |
| 1.2.2.3 | High-Hazard Industrial Occupancy | High-hazard industrial occupancies shall include all of the following: | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|-----------------|--|---|------------|-----------|-------------|
| 1.2.2.3(1) | High-Hazard Industrial Operations | Industrial occupancies in which industrial operations that include high hazard materials, processes, or contents are conducted. | Required | Required | Required |
| 1.2.2.3 (1) (a) | | Where gasoline and other flammable liquids are handled, used, or stored under such conditions that involve possible release of flammable vapors; | Required | Required | Required |
| 1.2.2.3 (1) (b) | | Where grain dust, wood flour or plastic dust, aluminum or magnesium dust, or other explosive dusts are produced; | Required | Required | Required |
| 1.2.2.3 (1) (c) | | Where hazardous chemicals or explosives are manufactured, stored, or handled; | Required | Required | Required |
| 1.2.2.3 (1) (d) | | Where materials are processed or handled under conditions that might produce flammable flyings; and where other situations of similar hazard exist. | Required | Required | Required |
| 1.2.3 | CHANGE OF INDUSTRIAL OCCUPANCY SUBCLASSIFICATION | A change from one subclassification of industrial occupancy to another are permitted only where the building complied with requirements for the new subclassification. | Required | Required | Required |
| 1.2.4 | MULTIPLE OCCUPANCIES | Multiple occupancies shall comply with the requirements of either 1.2.4.1 or 1.2.4.2. | Required | Required | Required |
| 1.2.4.1 | Mixed Occupancies | Each portion of the building shall be classified as to its use and shall comply with the most restrictive requirements of the occupancies involved, unless separate safeguards are approved. | Permitted | Permitted | Permitted |
| 1.2.4.2 | Separated occupancies | Each part of the building comprising a distinct occupancy, shall be completely separated from other occupancies by the required separation, as specified in NFPA 101 Table 6.1.14.4.1(a) and Table 6.1.14.4.1(b). | Permitted | Permitted | Permitted |
| 1.3 | OCCUPANT LOAD (OL) | Occupant load in industrial occupancies shall be determined on the basis of the occupant load factor in 1.3.1 or in 1.3.2. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|--|---|------------|----------|-------------|
| 1.3.1 | GENERAL and HIGH-HAZARD Industrial Occupancy | The occupant load in general and high-hazard industrial occupancies shall be based on an average of 9.3 m ² of gross floor area per occupant. | Required | Required | Required |
| 1.3.2 | SPECIAL-PURPOSE Industrial Occupancy | The occupant load in a special-purpose industrial occupancy shall be determined as the maximum probable population of the space under consideration. | Required | Required | Required |
| 1.4 | CLASSIFICATION OF HAZARD OF CONTENTS | Classification of hazard of contents shall be in accordance with NFPA 101 section 6.2. | Required | Required | Required |
| 1.4.1 | | Industrial occupancies shall be classified as low hazard, ordinary hazard, or high hazard depending on the nature of industrial operation, manufacturing processes, equipment, and hazard of materials, processes, or contents. | Required | Required | Required |
| 1.4.1 | LOW HAZARD INDUSTRIAL OCCUPANCIES | Industrial uses that can be considered as LOW Hazard Industrial Occupancies include the following: | | | |
| 1.4.1.1 | Beverages (Non-alcoholic) / Brick and Masonry / Ceramic / Foundries / Glass products / Gypsum / Ice / Metal Products (Fabrication and Assembly) / Telecommunications Signal Processing / Telephone Exchanges | | | | |
| 1.4.2 | OTHER THAN LOW HAZARD INDUSTRIAL OCCUPANCIES | Industrial uses that can be considered as ORDINARY or HIGH Hazard Industrial Occupancies, include the following: | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|---|--|------------|-----------|-------------|
| 1.4.2.1 | Aircraft / Appliances / Athletic equipment / Automobiles and other motor vehicles / Bakeries / Beverages (alcoholic) / Bicycles / Boat building / Brooms or Brushes / Business Machines / Cameras and Photo Equipment / Canvas or similar Fabric / Clothing / Construction / Carpets and Rugs (includes cleaning) / Disinfectants / Drycleaning and Dyeing / Electric Light Plants and Power Houses / Electronics / Engines (including rebuilding) / Food Processing / Furniture / Hemp Products / Jute Products / Laundries / Leather Products / Machinery / Metals / Millwork (sash and door) / Motion Pictures and Television Filming / Motor Vehicle Repair Garages / Musical Instruments / Optical Goods / Paper Mills or Products / Photographic Film / Plastic Products / Printing or Publishing / Recreational Vehicles / Refuse Incineration / Shoes / Soaps and Detergents / Textiles / Tobacco / Trailers / Upholstering / Wood (Distillation) / Woodworking (Cabinet Making) or Carpentry | | | | |
| 1.5 | MINIMUM CONSTRUCTION REQUIREMENTS. | Construction shall be in accordance with NFPA 5000 Chapters 7-8, 13-14, 31, and 35-40. | Required | Required | Required |
| 1.6 | ACCESSIBILITY. | Accessibility shall be in accordance with NFPA 5000 Chapter 12. | Required | Required | Required |
| 2.0 | MEANS of EGRESS REQUIREMENTS. | Means of egress shall comply with NFPA 101 Chapter 7, and as modified in item 2.0 of this FLS Occupancy Chapter. | | | |
| 2.1 | MEANS OF EGRESS COMPONENTS | Components of means of egress shall be limited to the types describe in this occupancy guideline | Required | Required | Required |
| 2.1.1 | DOORS | Door assembly in a means of egress in industrial occupancy shall be in accordance with NFPA 101 section 7.2.1 and to the special requirements of 2.1.1. | Required | Required | Required |
| 2.1.1.1 | Side-hinged, swinging type Door Assemblies | Approved, side-hinged, swinging type door assemblies shall be provided as primary means of egress in industrial occupancies. | Required | Required | Required |
| 2.1.1.2 | Delayed-Egress Electrical Locking Systems | Approved, delayed-egress electrical locking systems complying with NFPA 101 section 7.2.1.6.1, on any door in industrial occupancies with security needs. | Permitted | Permitted | Permitted |
| 2.1.1.3 | Sensor-Release of Electrical Locking Systems | Sensor-release electrical locking system complying with NFPA 101 section 7.2.1.6.2. and installed on egress doors as a security measure that does not compromise the use of the means of egress. | Permitted | Permitted | Permitted |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|------------------------------------|---|------------|-----------|-------------|
| 2.1.2 | STAIRS | Stairs complying with NFPA 101 section 7.2.2, shall be permitted to be modified by any of the conditions in 2.1.2.1 and 2.1.2.2. | Permitted | Permitted | Permitted |
| 2.1.2.1 | Stair Treads and Landings | Noncombustible grated or expanded metal stair treads and landing floors. | Permitted | Permitted | Permitted |
| 2.1.2.2 | Industrial Equipment Access Stairs | Industrial equipment access stairs in accordance with NFPA 101 40.2.5.3. | Permitted | Permitted | Permitted |
| 2.1.2.1 | Spiral Stairs | Spiral stairs as a component in a means of egress complying with NFPA 101 section 7.2.2.2.3. | Permitted | Permitted | Permitted |
| 2.1.3 | SMOKEPROOF ENCLOSURES | Smokeproof enclosures complying with NFPA 101 section 7.2.3. | Permitted | Permitted | Permitted |
| 2.1.4 | HORIZONTAL EXITS | Horizontal exit used as substitute for other exits shall comply with all the criteria for horizontal exits in NFPA 101 section 7.2.4. | Permitted | Permitted | Permitted |
| 2.1.4.1 | | In horizontal exits where the opening is protected by a fire door assembly on each side of the wall in which it is located, one fire door shall be of the swinging type, and the other shall be permitted to be an automatic-sliding fire door that shall be kept open whenever the building is occupied. | Permitted | Permitted | Permitted |
| 2.1.5 | RAMPS | Every ramp used as a component in a means of egress shall be in accordance with NFPA 101 section 7.2.5. | Permitted | Permitted | Permitted |
| 2.1.5.1 | Industrial Equipment Access Ramps | Industrial equipment access ramps used as a component in a means of egress in accordance with NFPA 101 section 40.2.5.2. | Permitted | Permitted | Permitted |
| 2.1.6 | EXIT PASSAGEWAY | Exit passageways used as a component in a means of egress complying with NFPA 101 section 7.2.6. | Permitted | Permitted | Permitted |
| 2.1.7 | FIRE ESCAPE STAIRS | Fire escape stairs used as a component in a means of egress complying with NFPA 101 section 7.2.8. | Permitted | Permitted | Permitted |
| 2.1.8 | FIRE ESCAPE LADDERS | Fire escape ladders used as a component in a means of egress complying with NFPA 101 section 7.2.9. | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|-----------------------------|---|-------------------|-----------|-------------|
| 2.1.8.1 | Fixed Industrial Stairs | Fixed industrial stairs in accordance with the minimum requirements for fixed stairs and stair railing systems in ANSI A1264.1, Safety Requirements for Workplace Walking / Working Surfaces and Their Access; Workplace Floor, Wall and Roof Openings; Stairs and Guardrail Systems. | Permitted | Permitted | Permitted |
| 2.1.9 | AREA OF REFUGE | Areas of refuge complying with NFPA 101 section 7.2.12. | Permitted | Permitted | Permitted |
| 2.2 | CAPACITY OF MEANS OF EGRESS | The capacity of means of egress shall be in accordance with NFPA 101 section 7.3. | Required | Required | Required |
| 2.2.1 | CORRIDOR OR PASSAGEWAY | In industrial occupancies, means of egress shall be sized to accommodate the occupant load as determined in accordance with item 1.3. | Required | Required | Required |
| 2.2.1.1 | | Spaces not subject to human occupancy because of the presence of machinery or equipment shall not be included in the computation. | Permitted | Permitted | Permitted |
| 2.3 | NUMBER OF MEANS OF EGRESS | The number of means of egress shall comply with NFPA 101 section 7.4 and as modified in 2.3.1 and 2.3.2. | Required | Required | Required |
| 2.3.1 | MINIMUM REQUIRED | Not less than two means of egress shall be provided from every story or section, and not less than one exit shall be reached without traversing another story. | Required | Required | Required |
| 2.3.1.1 | | Not less than 2 exits shall be provided in any floor level, including mezzanine with an occupant load exceeding 50. | Not Required | Required | Required |
| 2.3.1.2 | | Floors or portions thereof with an occupant load of more than 500 - <1000, shall have the minimum 3 number of separate and remote means of egress. | Required | Required | Required |
| 2.3.2 | HIGH HAZARD CONTENT AREAS | Not less than two means of egress shall be provided, unless all of the following criteria in 2.3.2.1 through 2.3.2.3 are met: | NA-Not Applicable | NA | Required |
| 2.3.2.1 | | Rooms or spaces do not exceed 18.6 m ² . | NA | NA | Permitted |
| 2.3.2.2 | | Rooms or spaces have an occupant load not exceeding three persons. | NA | NA | Permitted |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|------------|---|---|-------------------|-----------|-------------|
| 2.3.2.3 | | Rooms or spaces have a travel distance to the room door not exceeding 7620 mm | NA | NA | Permitted |
| 2.3.1.3 | Low Hazard Occupancy | In low hazard industrial occupancies, a single means of egress shall be permitted from any story or section. | Permitted | NA | NA |
| 2.3.1.4 | Ordinary Hazard Occupancy | In ordinary hazard industrial occupancies, a single means of egress shall be permitted from any story or section, provided that the exit can be reached within the distance permitted as a common path of travel. | NA | Permitted | NA |
| 2.4 | ARRANGEMENT OF MEANS OF EGRESS | Access to all required exits shall be in accordance with NFPA 101 section 7.5, and as modified by 2.4. | Required | Required | Required |
| 2.4.1 | TRAVEL DISTANCE (TD) | Travel distance measured in accordance with NFPA 101 section 7.6, shall not exceed that provided in 2.4.1.1 through 2.4.1.5. | Required | Required | Required |
| 2.4.1.1 | General Industrial Occupancy | Travel distance in general industrial occupancies with low or ordinary hazards, shall not exceed 61 m. | Required | Required | NA |
| 2.4.1.1(1) | Protected with an approved automatic spinkler system | Travel distance in general industrial occupancies with low or ordinary hazards, shall not exceed 76 m. | Required | Required | NA |
| 2.4.1.2 | Special-Purpose Industrial Occupancy | Travel distance in special-purpose industrial occupancies with low or ordinary hazards, shall not exceed 91 m. | Required | Required | NA |
| 2.4.1.2(1) | Protected with an approved automatic spinkler system | Travel distance in special-purpose industrial occupancies with low or ordinary hazards, shall not exceed 122 m. | Required | Required | NA |
| 2.4.1.3 | High Hazard Industrial Occupancy | Travel distance in high hazard industrial occupancies and high-hazard contents areas shall not exceed 23 m. | NA-Not Applicable | NA | Required |
| 2.4.2 | COMMON PATH (CP) OF TRAVEL | Common path of travel shall comply with 2.4.2.1 through 2.4.2.3. | Required | Required | NA |
| 2.4.2.1 | General Industrial and Special-Purpose Industrial Occupancy | Common path of travel in general industrial and in special-purpose industrial occupancies with low or ordinary hazards, shall not exceed 15 m. | Required | Required | NA |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|------------|--|---|------------|-----------|------------------|
| 2.4.2.1(1) | Protected with an approved automatic sprinkler system | Common path of travel in general industrial and in special-purpose industrial occupancies with low or ordinary hazards, shall not exceed 30 m. | Required | Required | NA |
| 2.4.2.2 | High Hazard Industrial Occupancy | Common path of travel in high hazard storage occupancy is prohibited, unless permitted in item 2.3.2 | NA | NA | NP-Not Permitted |
| 2.4.3 | DEAD-END (DE) CORRIDOR | Dead-end corridors shall comply with 2.4.3.1 through 2.4.3.3. | NA | Required | NA |
| 2.4.3.1 | General Industrial and Special-Purpose Industrial Occupancy | Dead-end corridors in general industrial and in special-purpose industrial occupancies with low or ordinary hazards, shall not exceed 15 m. | Required | Required | NA |
| 2.4.3.3 | High Hazard Industrial Occupancy | Dead-end corridors in high hazard storage occupancy is prohibited, unless permitted in 2.3.2 | NA | NA | NP |
| 2.4.4 | Ancillary Facilities | Ancillary facilities located within industrial occupancies include administrative office, laboratory, control, and employee service facilities incidental to the predominant industrial function. | Permitted | Permitted | Permitted |
| 2.4.4.1 | | Ancillary facilities shall be arranged to allow travel in independent directions after leaving the ancillary facility so that both means of egress paths do not become compromised by the same fire or similar emergency. | Required | Required | Required |
| 2.4.4.2 | Ancillary Facilities in Special-Purpose Industrial Occupancy | Ancillary facilities in special-purpose industrial occupancies shall have not less than a 2-hour fire resistance-rated separation from the predominant industrial occupancy, and shall have one means of egress that is separated from the predominant industrial occupancy by 2-hour fire resistance - rated construction. | Required | Required | Required |
| 2.4.5 | Industrial Equipment Access | Industrial equipment access doors, walkways, platforms, ramps, and stairs that serve as a component of the means of egress from the involved equipment. | Permitted | Permitted | Permitted |
| 2.4.5.1 | Industrial Equipment Access Dimensional Criteria | Minimum horizontal dimension of any walkway, landing, or platform (clear). | 560 mm | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|---------------------------------|--|------------|-----------|-------------|
| | | Minimum stair or ramp width (clear between landings) | 560 mm | Required | Required |
| | | Minimum tread width (clear) | 560 mm | Required | Required |
| | | Minimum tread depth | 255 mm | Required | Required |
| | | Maximum riser height | 230 mm | Required | Required |
| | | Handrails are permitted to terminate, at the required height, at a point directly above the top and bottom risers. | | Permitted | Permitted |
| | | Maximum height between landings | 3660 mm | Required | Required |
| | | Minimum headroom | 2030 mm | Required | Required |
| | | Minimum width of door openings (clear) | 560 mm | Required | Required |
| 2.4.5.2 | | Any means of egress component permitted by 2.4.5, shall serve not more than 20 people. | | Required | Required |
| 2.5 | DISCHARGE FROM EXITS | Exit discharge shall be in accordance with NFPA 101 section 7.7. | | Required | Required |
| 2.5.1 | EXIT TERMINATION | Exits shall terminate directly, at a public way or at an exterior exit discharge. | | Required | Required |
| 2.6 | ILLUMINATION OF MEANS OF EGRESS | Means of egress shall be illuminated in accordance with NFPA 101 section 7.8 | | Required | Required |
| 2.6.1 | ILLUMINATION BY NATURAL SOURCES | Means of egress shall be illuminated with natural lighting that provides the required level of illumination in structures occupied only during daylight hours. | | Permitted | Permitted |
| 2.7 | EMERGENCY LIGHTING | Emergency lighting shall be provided in accordance with NFPA 101 section 7.9. and in 2.7.1 through 2.7.3 unless permitted in 2.7.4 and 2.7.5. | | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|--|--|------------|-----------|-------------|
| 2.7.1 | | Emergency lighting shall be provided in stairs, major aisles, corridors, ramps, and passageways leading to large locker rooms or laboratories using hazardous chemicals. | Required | Required | Required |
| 2.7.2 | High Risk Task Areas | Emergency lighting shall be provided in high risk task areas as described in 2.7.2.1 and 2.7.2.2 | Required | Required | Required |
| 2.7.2.1 | | High risk task areas such as in local risk and control rooms for dangerous industrial buildings. | Required | Required | Required |
| 2.7.2.2 | | High risk task area such as in motor generator, control or industrial rooms. | Required | Required | Required |
| 2.7.3 | | Emergency lighting shall be considered where operations require lighting to perform orderly manual emergency operation or shutdown, maintain critical services, or provide safe start-up after a power failure. | Required | Required | Required |
| 2.7.4 | Exemptions | Special-purpose industrial occupancies without routine human habitation. | Permitted | Permitted | NA |
| 2.7.5 | | Structures occupied only during daylight hours, with skylights or windows arranged to provide the required level of illumination on all portions of the means of egress during such hours. | Permitted | Permitted | Permitted |
| 2.8 | MARKINGS OF MEANS OF EGRESS | Means of egress shall have signs in accordance with NFPA 101 section 7.10. | Required | Required | Required |
| 2.9 | SPECIAL MEANS OF EGRESS FEATURES | | | | |
| 2.9.1 | HAZARDOUS MATERIALS | Where hazardous materials are stored, used, or handled, the provisions of 2.9.1.1 and 2.9.1.2 shall apply. | Required | Required | Required |
| 2.9.1.1 | Hazardous materials classified as high-hazard contents | Hazardous materials that are stored, used, or handled, and that are also classified as high-hazard contents shall comply with the Special Provisions for Occupancies with High Hazard Contents in the provisions of NFPA section 7.11. | Required | Required | Required |
| 2.9.1.2 | Hazardous Materials | Hazardous materials shall comply with both 2.9.1.2(1) and 2.9.1.2(2) | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|------------|--|--|------------|-----------|-------------|
| 2.9.1.2(1) | | Means of egress requirements of this Fire and Life Safety Requirements. | Required | Required | Required |
| 2.9.1.2(2) | | Applicable means of egress requirements of NFPA 30, NFPA 45, NFPA 55, NFPA 58, NFPA 400, and NFPA 495 that are stricter than the general requirements for means of egress and this industrial occupancy chapter. | Required | Required | Required |
| 2.10 | (Reserved). | | | | |
| 3.0 | PROTECTION. | Protection shall comply with the applicable NFPA codes and standards, QCD FLS Annex and as modified in item 3.0 of this FLS Occupancy Chapter. | | | |
| 3.1 | PROTECTION OF VERTICAL OPENINGS | Any vertical opening shall be protected in accordance with NFPA 101 section 8.6, unless otherwise permitted by one of the following in 3.1.1 through 3.1.4. | Required | Required | Required |
| 3.1.1 | SPECIAL-PURPOSE and HIGH-HAZARD Industrial Occupancy | Where unprotected vertical openings exist and are necessary to manufacturing operations, such openings shall be permitted beyond the specified limits provided the condition in 3.1.1.1 is met. | Permitted | Permitted | Permitted |
| 3.1.1.1 | Conditions | Every floor level shall have direct access to one or more enclosed stairs or other exits protected against obstruction by any fire or smoke in the open areas connected by the unprotected vertical openings. | Required | Required | Required |
| 3.1.2 | OPEN STAIRS, Open Ramps and Escalators | Open stairs, open ramps, and escalators shall be permitted where connecting only two adjacent stories (one floor pierced only). | Permitted | Permitted | Permitted |
| 3.1.3 | CONVENIENCE OPENINGS | Unenclosed vertical openings in accordance with NFPA 101 section 8.6.9.1. | Permitted | Permitted | Permitted |
| 3.1.4 | CONVENIENCE STAIRWAYS | Unenclosed vertical openings created by convenience stairways in accordance with NFPA 101 section 8.6.9.2. | Permitted | Permitted | Permitted |
| 3.2 | PROTECTION FROM HAZARDS | | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|-------------------------------------|--|-------------------|-----------|-------------|
| 3.2.1 | HIGH-HAZARD INDUSTRIAL OCCUPANCIES | All high hazard industrial occupancies, operations, or processes shall have an automatic extinguishing systems or other protection appropriate to the particular hazard, such as explosion venting or suppression. | NA-Not Applicable | NA | Required |
| 3.2.1.1 | Areas Subject to Explosion Hazard | Protection required in 3.2.1 shall be provided for any area subject to an explosion hazard in order to minimize danger to occupants in case of fire or other emergency before they have time to use exits to escape. | Required | Required | Required |
| 3.2.1.2 | | Hazardous areas in industrial occupancies protected by automatic extinguishing systems shall be exempt from the smoke-resisting enclosure requirement of NFPA 101 section 8.7.1.2. | Permitted | Permitted | Permitted |
| 3.2.2 | COMMERCIAL COOKING FACILITIES | Commercial cooking equipment shall be protected in accordance with NFPA 96 . | Required | Required | Required |
| 3.2.3 | HAZARDOUS MATERIALS | Industrial occupancies occupancies with the storage, use, and handling of hazardous materials shall comply with the applicable NFPA hazardous materials document.: NFPA 30, NFPA 54, NFPA 55, NFPA 58, NFPA 400, and NFPA 495. | Required | Required | Required |
| 3.3 | INTERIOR FINISH | Interior finish shall be in accordance with NFPA 101 section 10.2. | Required | Required | Required |
| 3.3.1 | INTERIOR WALL AND CEILING FINISH | Interior wall and ceiling finish materials shall be Class A, Class B, or Class C in operating areas. | Required | Required | Required |
| 3.3.1.1 | | In exit enclosures, interior wall and ceiling finish materials shall be Class A or Class B. | Required | Required | Required |
| 3.3.2 | INTERIOR FLOOR FINISH | Interior floor finish in exit enclosures and in exit access corridors shall be Class I or Class II. | Required | Required | Required |
| 3.4 | DETECTION, ALARM AND COMMUNICATIONS | | | | |
| 3.4.1 | GENERAL | Complete coverage of Fire Detection and Alarm System shall be provided. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|--|---|-----------------|----------|-------------------|
| 3.4.2 | INITIATION | Complete coverage of an Automatic Detection and Manual Initiating Devices. | Required | Required | Required |
| 3.4.3 | OCCUPANT NOTIFICATION | Complete Coverage of an Occupant Notification (audible & visible). | Required | Required | Required |
| 3.4.3.1 | Emergency Voice Evacuation System | Mass Notification System | NR | NR | Required |
| 3.4.4 | SUPPLEMENTARY | | Required | Required | Required |
| 3.4.4.1 | Fire Telephone / 2-way Communication | In every required provisions of a fire command center (FCC) or emergency control center(ECC). | Required | Required | Required |
| 3.4.4.2 | Graphic Annunciator (PC Panel) or Mimic Panel | In every required provisions of a fire command center (FCC) or emergency control center(ECC). | Required | Required | Required |
| 3.5 | EXTINGUISHMENT REQUIREMENTS | | | | |
| 3.5.1 | AUTOMATIC FIRE SPRINKLER (AFS) SYSTEM | Industrial occupancies, other than low hazard storage occupancies, shall be protected by an approved, supervised automatic sprinkler system, in any of the following locations and conditions in 3.5.1.1 through 3.5.1.6. | NR-Not Required | Required | Required |
| 3.5.1.1 | G+2 Floors and Above (Ordinary Hazard) | An automatic sprinkler system shall be provided throughout all industrial occupancies three or more stories in height. | NR | Required | NA-Not Applicable |
| 3.5.1.2 | Fire Area Exceeds 1115 m ² (Ordinary Hazard) | An automatic sprinkler system shall be provided throughout all industrial occupancies exceeding 1115 m ² in fire area or fire compartment. | NR | Required | NA |
| 3.5.1.3 | Total Area of All Floors Exceeds 2230 m ² (Ordinary Hazard) | An automatic sprinkler system shall be provided throughout industrial occupancies, where the total area of all floors, including mezzanines (when provided), exceeds 2230 m ² . | NR | Required | NA |
| 3.5.1.4 | High Hazard Industrial Occupancy | High hazard industrial occupancy shall be protected throughout with an approved automatic sprinkler system. | NA | NA | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|------------|--|---|-------------------|-----------|------------------|
| 3.5.1.5 | Woodworking Operations | Buildings containing woodworking operations exceeding 232 m ² that use equipment, machinery, or appliances; that generate finely divided, combustible waste; or that use finely divided combustible materials, shall be installed with an approved automatic fire sprinkler system. | NA | Required | Required |
| 3.5.1.5(1) | | Areas within building involved in woodworking operations in accordance with 3.5.1.5, shall be clearly identified and area marked on the floor surface. | NA | Required | Required |
| 3.5.1.6 | Power-Generation Buildings. | Buildings of Type I or Type II construction used exclusively for the enclosure of steam generators, steam turbines, gas turbines, heat recovery generators, and flue gas treatment equipment shall not be required to be sprinklered throughout, provided that the special hazards are protected by approved automatic suppression systems in accordance with NFPA 11, NFPA 12, NFPA 13, NFPA 15, NFPA 16, NFPA 17, NFPA 750, or NFPA 2001. | NA | Required | Required |
| 3.5.1.7 | Spray Areas (Rooms/Booths) in Repair Garage and Other Industrial Occupancies | Spray application operations shall be located only in buildings that are completely protected by an approved system of automatic sprinklers. | NA | Required | Required |
| 3.5.1.7(1) | Spray Areas and Mixing Rooms | Spray areas (both manual and automated spray application processes) used for liquid spray operations and mixing rooms shall be protected with an approved automatic fire protection system in accordance with 3.5.1 or 3.5.2. | NA | Required | Required |
| 3.5.1.7(2) | | In unsprinklered buildings, an automatic fire protection system complying with 3.5.1 or 3.5.2 shall be installed to protect spray application processes. | NA | Required | Required |
| 3.5.1.8 | Exemption to Automatic Fire Sprinkler System Requirements | Exemption to the automatic fire sprinkler system required in 3.5.1.1 through 3.5.1.3 shall be permitted with the following conditions: | NA-Not Applicable | Permitted | NP-Not Permitted |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|-----------------|------------------------------------|---|------------|-----------|-------------|
| 3.5.1.8(1) | Create Separate Buildings | Create separate buildings via 2-hour or greater vertically aligned fire barrier, for purposes of limiting the fire area to not more than 1115 m ² , and complying with conditions in 3.5.1.8(1) (a) through 3.5.1.8(2)(b). | NA | Permitted | NP |
| 3.5.1.8 (1) (a) | Vertical Continuity | The 2-hour or greater vertically aligned fire barrier wall shall be extended 760mm above roof surface. | NA | Required | NP |
| 3.5.1.8 (1) (b) | Horizontal Continuity | Connections between the 2-hour or greater fire barrier wall and the exterior walls shall form an end wall exposure protection (T-shaped). | NA | Required | NP |
| 3.5.1.8 (1) (c) | | Length of the end wall protection shall be not less than 1830 mm, where the height of the exposing area is equal or less than 12 m or not less than 3050 mm if the height of the exposing area is more than 12 m. | NA | Required | NP |
| 3.5.1.8(2) | Doorways and Openings | Openings in fire barriers shall be protected with the following: | NA | Required | NP |
| 3.5.1.8 (2) (a) | | Doors shall be normally closed and shall be automatic-closing or self-closing fire doors. | NA | Required | NP |
| 3.5.1.8 (2)(b) | | The aggregate width of all openings at any level shall not exceed 25 percent of the length of the wall. | NA | Required | NP |
| 3.5.2 | OTHER AUTOMATIC SUPPRESSION SYSTEM | Where an automatic sprinkler system is required in Section 3.5.1, the appropriate type of automatic suppression system shall be permitted in areas where likely water damage may occur, or the sprinkler system may damage the contents or equipment. | Permitted | Permitted | Permitted |
| 3.5.3 | Fire Hose Reel | Fire hose reels are required in buildings protected by an approved supervised automatic sprinkler system. | Required | Required | Required |
| 3.5.4 | Portable Fire Extinguisher | Applicable Portable Fire Extinguishers required in all buildings. | Required | Required | Required |
| 3.5.5 | Rising Main (Dry or Wet Standpipe) | Refer to Annex Fire Fighting System Annex_FFS_G1 Revisions 2021 | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|------------|--|--|------------|-------------|-------------|
| 3.6 | SMOKE CONTROL/VENTILATION REQUIREMENTS | Design conditions per Annex ACMV_N1 Revisions 2021. (AS-Sprinklered / NS-Not Sprinklered) | | | |
| 3.6.1 | INDUSTRIAL OCCUPANCY BUILDING | | | | |
| 3.6.1.1 | Aboveground Industrial Occupancy | Fire area or fire compartment exceeds 100 m ² . | Required | Required | Required |
| 3.6.1.1(1) | ≤ 100 m ² (AS or NS) | | NR | NR | NR |
| 3.6.1.1(2) | 100 m ² ≤ 500 m ² (AS) | | NR | NR | NR |
| 3.6.1.1(3) | 100 m ² ≤ 500 m ² (NS) | Smoke Vent of minimum % Openings according to Annex ACMV_N1 Revisions 2021. | NR | NR | Required |
| 3.6.1.1(4) | 500 to ≤ 1115 m ² (NS) | Smoke Vent of minimum % Openings according to Annex ACMV_N1 Revisions 2021. | NR | Required | Required |
| 3.6.1.1(5) | 500 to ≤ 1115 m ² (AS) | Smoke Vent of minimum % Openings according to Annex ACMV_N1 Revisions 2021. | NR | NR | NR |
| 3.6.1.1(6) | 1115 m ² ≤ 2500 m ² (AS) | Smoke Vent of minimum % Openings according to Annex ACMV_N1 Revisions 2021. | Required | Required | NP |
| 3.6.1.1(7) | | Purging System | Permitted | Permitted | Required |
| 3.6.1.1(8) | 2500 m ² ≤ 4000 m ² (AS) | Purging System | Required | Required | Required |
| 3.6.1.1(9) | 4000 m ² (AS) | Engineered Smoke Control System | Required | Required | Required |
| 3.6.1.2 | Belowground Industrial Occupancy | Fire area or fire compartment exceeds 100 m ² . | Required | Required | Required |
| 3.6.1.2(1) | 100 m ² ≤ 1115 m ² (NS) | Smoke Vent of minimum % Openings according to Annex ACMV_N1 Revisions 2021. | Required | Required | NP |
| 3.6.1.2(2) | | Purging System | Permitted | Permitted | Required |
| 3.6.1.2(3) | ≤ 1115 m ² (AS) | Smoke Vent of minimum % Openings according to Annex ACMV_N1 Revisions 2021. | Permitted | Permitted | Required |
| 3.6.1.2(4) | | Purging System | Permitted | Permitted | Required |
| 3.6.1.2(5) | 1115 m ² (AS) | Engineered Smoke Control System | Required | Required | Required |
| 3.6.2 | STAIRWELL/LOBBY | Design conditions per Annex ACMV_N1 Revisions 2021. | <15m | ≥15m - <28m | ≥28m |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|---|---|------------|-------------|-------------|
| 3.6.2.1 | Less than 9 m habitable height | | No Reqmt | No Reqmt | No Reqmt |
| 3.6.2.2 | 9 m to 15 m habitable height | Vent at top of stairwell | Required | NA | NA |
| | | Stair ventilation openings at every floor level (stairs along external walls) | Permitted | NA | NA |
| | | Stairwell Pressurization | NR | NA | NA |
| 3.6.2.3 | >15 m to < 28 m habitable height | Vent at top of stairwell | NA | NP | NA |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | Required | NA |
| | | Stairwell Pressurization | NA | Permitted | NA |
| 3.6.2.4 | ≥28 m habitable height | Vent at top of stairwell | NA | NA | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | NA | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | NA | NA | Required |
| | Connecting Basement Levels | | | | |
| 3.6.2.5 | Two basement levels or ≤6 m deep, ≤2000 m ² floor area | Vent at top of stairwell : * Permitted up to five (5) connecting above floors (2B+G+4 or less) or 12 m habitable height ; whichever is less; otherwise next below provisions shall apply. | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | Permitted | Required | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Required |
| | STAIRWELL/LOBBY | Design conditions per Annex ACMV_N1 Revisions 2021. | <15m | ≥15m - <28m | ≥28m |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|--|---|------------|-----------|-------------|
| 3.6.2.6 | Three basement levels or ≤ 9.1 m deep, ≤ 2000 m ² floor area | Vent at top of stairwell : * Permitted up to three (3) connecting above floors only (3B+G+2 or less) or 6m habitable height, whichever is less; otherwise next below provisions shall apply | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | NA | NA |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Permitted |
| 3.6.2.7 | Two basement levels or ≤ 6 m deep, >2000 m ² floor area | Vent at top of stairwell: * Permitted up to four (4) connecting floors (2B+G+3 or less) or 9 m habitable height ; whichever is less; otherwise next below provisions shall apply. | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | Required | NP | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Required | Required |
| 3.6.2.8 | Three basement levels or ≤ 9.1 m deep, >2000 m ² floor area, connecting one floor above only | Vent at top of stairwell : * Permitted up to two connecting above floors or 3 m habitable height only (3B+G+1 or less); whichever is less, otherwise next below provisions shall apply | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | NA | NA |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization. | Permitted | Required | Required |
| 3.6.2.9 | Lowest basement level >9.1 m below ground level, regardless of floor area | Vent at top of stairwell | NP | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NP | NP | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|-----------|---|--|---|-------------|-------------|
| 3.6.3 | ESCAPE CORRIDOR PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | Low Hazard | Ordinary | High Hazard |
| 3.6.3.1 | Interior Corridors | Vents (Fixed or Automatic Opening) | Required in specific type of Occupancy: Healthcare Occupancies and in Detention and Correctional Occupancies | | |
| | | Mechanical Ventilation of Corridor | | | |
| | | Pressurization of Corridor | | | |
| 3.6.3.2 | Corridor with side/s located along exterior walls | Vents (Fixed or Automatic Opening) | | | |
| | | Mechanical Ventilation of Corridor | | | |
| | | Pressurization of Corridor | | | |
| 3.6.4 | atrium and OTHER FLOOR OPENINGS PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | <15m | ≥15m - <28m | ≥28m |
| 3.6.4.1 | Malls (with floor openings connecting >2 floors) | Smoke Vents (Fixed or Automatic Opening) | NA | NA | NA |
| | | Mechanical Smoke Exhaust Ventilation System/Engineered | NA | NA | NA |
| 3.6.4.2 | Other Occupancies (connecting >3 floor levels) | Smoke Vents (Fixed or Automatic Opening) | Required | Permitted | NP |
| | | Mechanical Smoke Exhaust Ventilation System/Engineered | Permitted | Permitted | Required |
| 3.6.5 | CAR PARKS/PARKING STRUCTURES PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | <15m | ≥15m - <28m | ≥28m |
| 3.6.5.1 | Open Parking Structures | The open parking structure shall justify that no smoke stagnation will occur such as from a fire located somewhere in the middle of the car park; otherwise mechanical equipment that will aid in effective dispersal of smoke shall be provided | Required | Required | Required |
| 3.6.5.2 | Aboveground Enclosed Car Parks | | | | |
| 3.6.5.2.1 | Aggregate floor area of ≤2000 m ² | Smoke Vents (Fixed or Automatic) | Required | Required | Permitted |
| | | Mechanical Smoke Purging/Clearance | Permitted | Permitted | Required |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted |
| 3.6.5.2.2 | Aggregate floor area of >2000 m ² | Smoke Vents (Fixed or Automatic) | Required | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | NP |
| | | Engineered Smoke Control System | Required | Permitted | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|-----------|---|---|-----------------|-------------------|---------------|
| 3.6.5.3 | Belowground Car Parks | | ≤6m Deep | >6m - ≤9.1 m Deep | >9.1 m Deep |
| 3.6.5.3.1 | Aggregate floor area of ≤2000 m ² | Smoke Vents (Fixed or Automatic) | Required | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | Required |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted |
| 3.6.5.3.2 | Aggregate floor area of >2000 m ² | Smoke Vents (Fixed or Automatic) | NP | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Required | NP | NP |
| | | Engineered Smoke Control System | Permitted | Required | Required |
| 3.7 | CORRIDORS | Exit access corridors protection. | NR | NR | NR |
| 3.7.1 | WALLS | Corridors shall be separated from use areas by fire barriers having a minimum 1-hour fire resistance rating. | NR-Not Required | NR | NR |
| 3.8 | SUBDIVISIONS OF BUILDING SPACES | Internal subdivisions. | NR | Required | Required |
| 3.8.1 | Incidental Spaces | Incidental spaces shall be permitted without fire rated separation from other areas, as long as the space function is in support of the predominant occupancy. | Permitted | NA-Not Applicable | NA |
| 3.8.2 | Salesrooms, Showrooms, Offices, or Similar Spaces | Any single area or spaces of equal or more than 140 m ² in area, shall be separated from the main industrial occupancy by walls or partitions and floor or floor-ceiling assemblies of not less than 2-hrs fire resistance rating. | NR | Required | Required |
| 3.8.2.1 | | The separation required in 3.8.2, shall be permitted to be reduced to not less than 1-hour fire resistance rating in buildings protected throughout by an approved, supervised automatic sprinkler system. | Permitted | Permitted | Not Permitted |
| 3.8.3 | Parts Storage and Other Storage Areas | Parts storage and other storage areas of equal or more than 140 m ² in area, shall be separated from all other portions of the building by walls or partitions and floor or floor-ceiling assemblies having a fire resistance rating of not less than 2 hours. | NR | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|-----------|--|--|------------|----------|-------------|
| 3.8.4 | Repair Garage | Garage occupancies shall be separated from other portions of a multi-tenanted building by walls or partitions and floor or floor-ceiling assemblies of not less than 2-hrs fire resistance rating. | NR | Required | Required |
| 3.8.4.1 | Spray Areas and Spray Booths in Repair Garage | Wall, floors and assemblies that intersect or enclose a spray area shall be constructed of non-combustible or limited combustible materials or assemblies and shall be rigidly mounted or fastened. | NR | Required | Required |
| 3.8.4.1.1 | | Spray booths shall be separated from other operations by a minimum distance of 900 mm or by a partition, wall, or floor/ceiling assembly having a minimum fire resistance rating of 1-hour. | NR | Required | Required |
| 3.8.4.1.2 | | A clear space of not less than 900 mm shall be maintained on all sides and above the spray booth. This clear space shall be kept free of any storage or combustible construction. | NR | Required | Required |
| 3.8.4.2 | Spray Rooms in Repair Garage | In addition to 3.8.4.1 requirements, spray rooms shall be constructed of, and separated vertically and horizontally from all surrounding areas by construction assemblies of not less than 2-hrs fire resistance ratings. | NR | Required | Required |
| 3.8.5 | Fire and Smoke Barrier Walls/Partitions, Floor or Floor Ceiling Assemblies | The 2-hrs fire barrier walls or partitions and floor or floor-ceiling assemblies required in 3.8.2 thru 3.8.4 shall be constructed in such a manner as to restrict the passage of smoke, vehicle exhaust gases, and odors from the repair or parking area (in case of repair garages) to these spaces. | NR | Required | Required |
| 3.90 | (Reserved). | | | | |
| 4.0 | SPECIAL PROVISIONS. | Special Provisions for Firefighting and Rescue shall comply with QCD FLS Annex and as modified in item 4.0 of this FLS Occupancy Chapter. | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|-------|---|--|-----------------|----------|-------------|
| 4.1 | FIRE (EMERGENCY) COMMAND CENTER (FCC) | QCD FLS Annex_A5 – Revisions_2021. | NR-Not Required | NR | Required |
| 4.1.1 | | A fire command center shall be provided in any building that requires an Emergency Voice Communication System and/or Smoke Control System. | Required | Required | Required |
| 4.2 | FIREMAN'S ACCESS PANELS/OPENINGS | QCD FLS Annex_A3 – Revisions_2021 | Required | Required | Required |
| 4.2.1 | | Fireman's access panels shall be provided in industrial occupancy buildings regardless of habitable height. | Required | Required | Required |
| 4.3 | EXTERNAL ACCESS TO SITE AND BUILDINGS | QCD FLS Annex_A3 – Revisions_2021 | NR | NR | NR |
| 4.3.1 | SITE ACCESS | For gated facility development a 4.0 m wide and 4.5 m clear height vertical clearance entry gate or site access shall be provided. | NR | NR | NR |
| 4.3.3 | FIRE ENGINE HARDSTANDING | Industrial occupancies shall be provided with fire engine hardstanding regardless of habitable height. | Required | Required | Required |
| 4.4 | (Reserved). | | | | |
| 5.0 | BUILDING SERVICES and FIRE PROTECTION EQUIPMENT | Building Services and Fire Protection Equipment shall comply with the applicable NFPA codes and standards and QCD FLS Annex. | | | |
| 5.1 | ELECTRICAL SYSTEM | Electrical wiring and equipment shall be in accordance with NFPA 70. | Required | Required | Required |
| 5.1.1 | ELECTRICAL EQUIPMENT/PANEL ROOMS AND SIMILAR ROOMS/SPACES | QCD FLS Annex _A7 – Revisions_2021 | Required | Required | Required |
| 5.1.2 | EMERGENCY GENERATORS AND STANDBY POWER SYSTEMS. | Emergency generators and standby power systems shall be installed, tested, and maintained in accordance with NFPA 110. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|---|---|-------------------|----------|-------------|
| 5.1.3 | STORED ELECTRICAL ENERGY SYSTEMS | Stored electrical energy systems shall be installed, tested, and maintained in accordance with NFPA 111. | Required | Required | Required |
| 5.2 | COMMERCIAL COOKING OPERATIONS | Where permitted, commercial cooking operations shall be protected in accordance with NFPA 96. | Required | Required | Required |
| 5.3 | ELEVATORS, ESCALATORS, and CONVEYORS | An elevator, shall not be considered a component in a required means of egress and shall be in accordance with NFPA 101 section 9.4. | Required | Required | Required |
| 5.3.1 | NUMBER OF CARS | The number of elevator cars permitted in a hoistway shall be not more than three (3). | Required | Required | Required |
| 5.3.2 | OPENINGS TO EXIT ENCLOSURES | Conveyors, elevators, dumbwaiters, and pneumatic conveyors serving various stories of a building shall not open to an exit enclosure. | Required | Required | Required |
| 5.4 | FIRE PUMPS | | | | |
| 5.5.1 | FIRE PUMPS ROOM | QCD FLS Annex _A6 – Revisions_2021 | Required | Required | Required |
| 5.5 | SUBSTATION and SWITCHGEARS | QCD FLS Annex _A8 – Revisions_2021 | Required | Required | Required |
| 5.6 | (Reserved). | | | | |
| 6.0 | SPECIAL PROVISIONS for AIRCRAFT - SERVICING HANGARS. | Aircraft Servicing Hangars shall comply with the applicable NFPA codes and standards and this FLS Occupancy Chapter. | | | |
| 6.1 | GENERAL | For further information on, and provisions for aircraft hangars, see NFPA 409 Standard on Aircraft Hangars. | NA-Not Applicable | Required | Required |
| 6.1.1 | Applications | The requirements of Industrial Occupancy sections 1.0 through 4.0 shall be met, except as modified by 6.1.1.1 through 6.1.1.6 | NA | Required | Required |
| 6.1.1.1 | Number of Exits | There shall be not less than two means of egress from each aircraft servicing area. | NA | Required | Required |
| 6.1.1.2 | | Exits from aircraft storage areas shall be provided at intervals not exceeding 46 m. on all exterior walls. | NA | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|---|---|------------|----------|------------------|
| 6.1.1.3 | Egress Components | Where horizontal exits are provided, doors shall be provided in the horizontal exit fire barrier at intervals not exceeding 30 m. | NA | Required | Required |
| 6.1.1.4 | | Where dwarf, or "smash," doors are provided in doors that accommodate aircraft, such doors shall be permitted for compliance with 6.1.1.1 through 6.1.1.3. | NA | Required | Required |
| 6.1.1.5 | Arrangement of Means of Egress and Discharge from Exits | Means of egress from mezzanine floors in aircraft servicing areas shall be arranged so that the travel distance to the nearest exit from any point on the mezzanine does not exceed 23 m., and such means of egress shall lead directly to a properly enclosed stair discharging directly to the exterior, to a suitable cutoff area, or to outside stairs. | NA | Required | Required |
| 6.1.1.6 | Dead-Ends | Dead ends shall not exceed 15 m. for other than high hazard contents areas and shall not be permitted for high hazard contents areas. | NA | Required | NP-Not Permitted |
| 6.2 | (Reserved). | | | | |

STORAGE OCCUPANCIES



STORAGE OCCUPANCIES

| | | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|---|--|--|---|-----------------|------------------------|--|--|--|--|--|--|--|--|--|
| 1.0 | GENERAL REQUIREMENTS | | The fire and life safety requirements in this chapter shall apply to buildings or portions thereof used as storage occupancies. | | | | | | | | | | | | | | | | | |
| | Buildings or structures used primarily for the storage or sheltering of goods, merchandise, products, or vehicles. | | | | | | | | | | | | | | | | | | | |
| | Warehouses Hangars (for Aircraft Storage only) Freight Terminals | | | Barns Bulk Oil Storage Truck and Marine Terminals | | | | Parking Garages Cold Storage Grain Elevators | | | | | | | | | | | | |
| 1.1 | GENERAL CONDITIONS AND BUILDING LIMITS | | | | | | | | | | | | | | | | | | | |
| | Sub-Classification (Hazards) | | Building Height (m) | | | Floor Area (m ²) | | | Basement Levels | | | | | | | | | | | |
| 1.1.1 | LOW HAZARD Storage Occupancy | | Height Limit based on Type of Construction and Fire Resistance of Building Elements in NFPA 5000 Table 7.4.1 | | | Area Limit based on Type of Construction and Fire Resistance of Building Elements in NFPA 5000 Table 7.4.1 | | | No Limit in Floor/Fire Area, Depth or Number of Levels | | | | | | | | | | | |
| 1.1.2 | ORDINARY HAZARD Storage Occupancy | | | | | | | | | | | | | | | | | | | |
| 1.1.3 | HIGH HAZARD Storage Occupancy | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| FIRE AND LIFE SAFETY REQUIREMENTS | | | | | | | | | | | | | | | | | | | | |
| Item | Fire Safety Provisions | | | Minimum Requirements | | | | | Low Hazard | Ordinary | High Hazard | | | | | | | | | |
| 1.2 | CLASSIFICATION OF OCCUPANCIES | | | Storage occupancies shall include all buildings and structures or parts thereof with occupancy as described in item 1.0. | | | | | | | | | | | | | | | | |
| 1.2.1 | STORAGE OCCUPANCY | | | Storage occupancy classification shall comply with 1.2.1.1 and 1.2.1.2 | | | | | Required | Required | Required | | | | | | | | | |
| 1.2.1.1 | Applications | | | Storage occupancies shall include all buildings and structures or parts thereof, used to shelter a wide variety of commodities having a wide range of hazards. | | | | | Required | Required | Required | | | | | | | | | |
| 1.2.1.2 | Incidental Storage | | | Incidental storage in another occupancy shall not be the basis for overall occupancy classification. | | | | | Required | Required | Required | | | | | | | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|---------------------------------------|--|------------|-----------|-------------|
| 1.2.2 | INDUSTRIAL TYPE OPERATION | Storage occupancies or areas of storage occupancies that are used for the purpose of packaging, labeling, sorting, special handling, or other operations requiring an occupant load greater than that normally contemplated for storage shall be classified as industrial occupancies. | Required | Required | Required |
| 1.2.3 | MULTIPLE OCCUPANCIES | Multiple occupancies shall comply with either 1.2.3.1 or 1.2.3.2. | Required | Required | Required |
| 1.2.3.1 | Mixed Occupancies | Each portion of the building shall be classified as to its use and shall comply with the most restrictive requirements of the occupancies involved, unless separate safeguards are approved. | Permitted | Permitted | Permitted |
| 1.2.3.2 | Separated occupancies | Each part of the building comprising a distinct occupancy, shall be completely separated from other occupancies by the required separation, as specified in NFPA 101 Table 6.1.14.4.1(a) and Table 6.1.14.4.1(b). | Permitted | Permitted | Permitted |
| 1.3 | OCCUPANT LOAD (OL) | The occupant load, shall be determined on the basis of the maximum probable population of the space under consideration. | Required | Required | Required |
| 1.3.1 | OCCUPANT LOAD FACTOR (OLF) | No occupant load factor (OLF) specified; the occupant load shall be determined on the basis of the maximum number of persons expected to occupy the storage occupancy under any anticipated facility operation. | Required | Required | Required |
| 1.4 | CLASSIFICATION OF HAZARD OF CONTENTS. | Hazard of contents shall be classified in accordance with NFPA 101 6.2. | Required | Required | Required |
| 1.4.1 | CONTENTS OF STORAGE OCCUPANCIES | Contents of storage occupancies shall be classified as low hazard, ordinary hazard, or high hazard depending on the quantity and character of the materials stored, their packaging, and other factors. | Required | Required | Required |
| 1.4.1.1 | High Hazard Contents | Storage buildings with hazardous materials shall be classified as storage occupancies with high-hazard contents. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|---|---|------------|----------|-------------|
| 1.4.1.2 | High Hazard Storage Occupancies | Buildings or areas in which high-hazard contents are stored, used, or handled shall comply with NFPA 5000 chapter 34 High Hazard Contents. | Required | Required | Required |
| 1.4.2 | LOW HAZARD STORAGE OCCUPANCIES | Storage uses that can be considered as LOW hazard storage occupancies include the following: | | | |
| 1.4.2.1 | | Asbestos / Beer or wine up to 12 percent alcohol in metal, glass, or ceramic containers / Cement in bags / Chalk and crayons / Dairy products in nonwax-coated paper containers / Dry cell batteries / Electrical coils / Electrical motors / Empty cans / Food products / Foods in noncombustible containers / Fresh fruits and vegetables in nonplastic trays or containers / Frozen foods / Glass / Glass bottles, empty or filled with noncombustible liquids / Gypsum board / Inert pigments / Ivory / Meats / Metal cabinets / Metal desks with plastic tops and trim / Metal parts / Metals / Mirrors / Oil-filled and other types of distribution transformers / Porcelain and pottery / Sheds / Stoves / Talc and soapstones / Tanks / Towers / Washers and dryers. | | | |
| 1.4.3 | OTHER THAN LOW HAZARD STORAGE OCCUPANCIES | Storage uses that can be considered as ORDINARY or HIGH hazard storage occupancies, include the following: | | | |
| 1.4.3.1 | | Aerosols Level 2 and Level 3 / Aircraft hangars / Automobiles and Transport Vehicles /Parking Garages or Parking Structures, Open or Enclosed / Bags, cloth, burlap, & paper / Bamboo and rattan / Baskets / Belting, canvas and leather / Books and paper in rolls or packs / Boots and shoes / Buttons, includes cloth covered, pearl, or bone / Cardboard & cardboard boxes / Clothing, woolen wearing apparel / Cordage / Furniture / Furs / Glues, mucilage, pastes, and size / Grains / Horns and combs, other than celluloid / Leather / Linoleum / Lumber / Petroleum warehouses for storage of lubricating oils with flash point of 200° F (93° C) or higher / Photo engravings / Resilient flooring / Silks / Soaps / Sugar / Tires, bulk storage / Tobacco, cigars, cigarettes, and snuff / Upholstery and mattresses / Wax candles. | | | |
| 1.5 | MINIMUM CONSTRUCTION REQUIREMENTS | Construction shall be in accordance with NFPA 500 Chapters 7–8, 13–14, 31, and 35–40. | Required | Required | Required |
| 1.6 | ACCESSIBILITY. | Accessibility shall be in accordance with NFPA 5000 Chapter 12. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|------------|--|---|------------|-----------|-------------|
| 1.7 | (Reserved). | | | | |
| 2.0 | MEANS OF EGRESS REQUIREMENTS | Means of egress shall comply with NFPA 101 Chapter 7, and as modified in item 2.0 of this FLS Occupancy Chapter. | | | |
| 2.1 | MEANS OF EGRESS COMPONENTS | Components of means of egress shall be limited to the types describe in this occupancy guideline | Required | Required | Required |
| 2.1.1 | DOORS | Doors shall be in accordance with NFPA 101 section 7.2.1, and to the special requirements of 2.1.1. | Required | Required | Required |
| 2.1.1.1 | Side-hinged, swinging type Door Assemblies | Approved, side-hinged, swinging type door assemblies shall be provided as primary means of egress in storage occupancies. | Required | Required | Required |
| 2.1.1.2 | Delayed-Egress Electrical Locking Systems | Approved, delayed-egress electrical locking systems is permitted on any door in storage occupancies with security needs. | Permitted | Permitted | Permitted |
| 2.1.1.3 | Sensor-Release of Electrical Locking Systems | Sensor-release electrical locking system installed on egress doors as a security measure that does not compromise the use of the means of egress. | Permitted | Permitted | Permitted |
| 2.1.2 | STAIRS | Stairs shall comply with NFPA 101 section 7.2.2 and shall be permitted to be modified by any of the conditions in 2.1.2 (1) and 2.1.2 (2). | Permitted | Permitted | Permitted |
| 2.1.2 (1) | Stair Treads and Landings | Noncombustible grated or expanded metal stair treads and landing floors. | Permitted | Permitted | Permitted |
| 2.1.2. (2) | Industrial Equipment Access Stairs | Industrial equipment access stairs in accordance with NFPA 101 40.2.5.3. | Permitted | Permitted | Permitted |
| 2.1.2.1 | Spiral Stairs | Spiral stairs complying with NFPA 101 section 7.2.2.2.3 . | Permitted | Permitted | Permitted |
| 2.1.3 | SMOKEPROOF ENCLOSURES | Smokeproof enclosures complying with NFPA 101 section 7.2.3. | Permitted | Permitted | Permitted |
| 2.1.4 | HORIZONTAL EXITS | Horizontal exits complying with NFPA 101 section 7.2.4. | Permitted | Permitted | Permitted |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|-----------------------------------|---|------------|-----------|-------------|
| 2.1.4.1 | | In horizontal exits where the opening is protected by a fire door assembly on each side of the wall in which it is located, one fire door shall be of the swinging type, and the other shall be permitted to be an automatic-sliding fire door that shall be kept open whenever the building is occupied. | Required | Required | Required |
| 2.1.5 | RAMPS | Ramps complying with NFPA 101 section 7.2.5. | Permitted | Permitted | Permitted |
| 2.1.5.1 | Industrial Equipment Access Ramps | Industrial equipment access ramps used as a component in a means of egress in accordance with NFPA 101 section 40.2.5.2. | Permitted | Permitted | Permitted |
| 2.1.6 | EXIT PASSAGEWAY | Exit passageways complying with NFPA 101 section 7.2.6. | Permitted | Permitted | Permitted |
| 2.1.7 | FIRE ESCAPE STAIRS | Existing fire escape stairs complying with NFPA 101 section 7.2.8. | Permitted | Permitted | Permitted |
| 2.1.8 | FIRE ESCAPE LADDERS | Fire escape ladders complying with NFPA 101 section 7.2.9. | Permitted | Permitted | Permitted |
| 2.1.8.1 | Fixed Industrial Stairs | Fixed industrial stairs in accordance with the minimum requirements for fixed stairs in ANSI A1264.1, Safety Requirements for Workplace Walking /Working Surfaces and Their Access; Workplace Floor, Wall and Roof Openings; Stairs and Guardrail Systems. | Permitted | Permitted | Permitted |
| 2.1.9 | AREA OF REFUGE | Areas of refuge complying with NFPA 101 7.2.12 | Permitted | Permitted | Permitted |
| 2.2 | CAPACITY OF MEANS OF EGRESS | The capacity of means of egress shall be in accordance with NFPA 101 Section 7.3 and the requirements in item 2.2 | Required | Required | Required |
| 2.2.1 | CORRIDOR OR PASSAGEWAY | The minimum width of any corridor, passageway or any exit access serving not more than 180 persons within storage occupancies, shall not be less than 915 mm. | Required | Required | Required |
| 2.3 | NUMBER OF MEANS OF EGRESS | The number of means of egress shall comply with 2.3.1 and 2.3.2. | Required | Required | Required |
| 2.3.1 | MINIMUM REQUIRED | All buildings or structures used for storage, and every section thereof considered separately, shall have not less than two separate means of egress as remotely located from each other as practicable. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|-----------|---|--|-------------------|-----------|-------------|
| 2.3.1.1 | | Not less than 2 exits shall be provided in any floor level, including mezzanine with an occupant load exceeding 50. | NR-Not Required | Required | Required |
| 2.3.1.2 | | Floors or portions thereof with an occupant load of more than 500 - <1000, shall have the minimum 3 number of separate and remote means of egress. | Required | Required | Required |
| 2.3.2 | HIGH HAZARD CONTENT AREAS | Not less than two means of egress shall be provided, unless all of the following criteria in 2.3.2.1 through 2.3.2.3 are met: | NA-Not Applicable | NA | Required |
| 2.3.2.1 | | Rooms or spaces do not exceed 18.6 m ² . | NA | NA | Permitted |
| 2.3.2.2 | | Rooms or spaces have an occupant load not exceeding three persons. | NA | NA | Permitted |
| 2.3.2.3 | | Rooms or spaces have a travel distance to the room door not exceeding 7620 mm. | NA | NA | Permitted |
| 2.3.3 | Low Hazard Occupancy | In low hazard storage occupancies, a single means of egress shall be permitted from any story or section. | Permitted | NA | NA |
| 2.3.4 | Ordinary Hazard Occupancy | In ordinary hazard storage occupancies, a single means of egress shall be permitted from any story or section, provided that the exit can be reached within the distance permitted as a common path of travel. | NA-Not Applicable | Permitted | NA |
| 2.4 | ARRANGEMENT OF MEANS OF EGRESS | Means of egress, arranged in accordance with NFPA 101 Section 7.5, shall not exceed that provided by 2.4. | Required | Required | Required |
| 2.4.1 | TRAVEL DISTANCE (TD) | Travel distance, measured in accordance with NFPA 101 section 7.6, shall not exceed that provided in 2.4.1.1 through 2.4.1.3. | NA | Required | Required |
| 2.4.1.1 | Low Hazard Storage Occupancy | Travel distance to exits in low hazard storage occupancies shall not be limited. | NR-Not Required | NA | NA |
| 2.4.1.2 | Ordinary Hazard Storage Occupancy | Travel distance in ordinary hazard storage occupancy shall not exceed 61 m. | NA | Required | NA |
| 2.4.1.2.1 | Protected with an approved automatic sprinkler system | Travel distance in ordinary hazard storage occupancy shall not exceed 122 m. | NA | Required | NA |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|-----------|---|--|-------------------|----------|-------------|
| 2.4.1.3 | High Hazard Storage Occupancy | Travel distance in high hazard storage occupancy, including storage buildings with flammable and combustible liquid products stored and protected in accordance with NFPA 30, Flammable and Combustible Liquids Code, shall not exceed 30 m. | NA | NA | Required |
| 2.4.2 | COMMON PATH (CP) OF TRAVEL | Common path of travel shall comply with 2.4.2.1 thru 2.4.2.3. | NA | Required | NA |
| 2.4.2.1 | Low Hazard Storage Occupancy | Common path of travel in low hazard storage occupancies shall not be limited. | NR | NA | NA |
| 2.4.2.2 | Ordinary Hazard Storage Occupancy | Common path of travel in ordinary hazard storage occupancy shall not exceed 15 m. | NA | Required | NA |
| 2.4.2.2.1 | Protected with an approved automatic sprinkler system | Common path of travel in ordinary hazard storage occupancy shall not exceed 30 m. | NA | Required | NA |
| 2.4.2.3 | High Hazard Storage Occupancy | Common path of travel in high hazard storage occupancy is prohibited. | NA | NA | NP |
| 2.4.3 | DEAD-END (DE) CORRIDOR | Dead-end corridors shall comply with 2.4.3.1 thruough 2.4.3.3. | NA | Required | NA |
| 2.4.3.1 | Low Hazard Storage Occupancy | Dead-end corridor in low hazard storage occupancies shall not be limited. | NR | NA | NA |
| 2.4.3.2 | Ordinary Hazard Storage Occupancy | Dead-end corridor in ordinary hazard occupancy shall not exceed 15 m. | NA | Required | NA |
| 2.4.3.2.1 | Protected with an approved automatic sprinkler system | Dead-end corridor in ordinary hazard storage occupancy shall not exceed 30 m. | NA-Not Applicable | Required | NA |
| 2.4.3.3 | High Hazard Storage Occupancy | Dead-end corridor in high hazard storage occupancy is prohibited. | NA | NA | NA |
| 2.5 | DISCHARGE FROM EXITS | Discharge from exits shall be in accordance with NFPA 101 section 7.7. | Required | Required | Required |
| 2.5.1 | EXIT TERMINATION | Exits shall terminate directly, at a public way or at an exterior exit discharge. | Required | Required | Required |
| 2.6 | ILLUMINATION OF MEANS OF EGRESS | Means of egress shall be illuminated in accordance with NFPA 101 section 7.8 and as specified in 2.6.1. | Required | Required | Required |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|------------|--|--|------------|-----------|-------------|
| 2.6.1 | ILLUMINATION BY NATURAL SOURCES | In structures occupied only during daylight hours, means of egress shall be permitted to be illuminated with windows, skylights, open wall sections, and similar means of illumination by natural sources arranged to provide the required level of illumination on all portions of the means of egress during such hours. | Permitted | Permitted | Permitted |
| 2.7 | EMERGENCY LIGHTING | Emergency lighting shall be provided in normally occupied storage occupancies in accordance with NFPA 101 section 7.9, except for spaces occupied only during daylight hours with natural illumination in accordance with 2.6.1 | Required | Required | Required |
| 2.7.1 | | Emergency lighting shall be provided in covered car parks along the normal pedestrian routes | Required | Required | Required |
| 2.8 | MARKINGS OF MEANS OF EGRESS | Means of egress shall have signs in accordance with NFPA 101 section 7.10. | Required | Required | Required |
| 2.9 | SPECIAL MEANS OF EGRESS FEATURES | | | | |
| 2.9.1 | HAZARDOUS MATERIALS | Where hazardous materials are stored, used, or handled, the provisions of 2.9.1.1 and 2.9.1.2 shall apply. | Required | Required | Required |
| 2.9.1.1 | Hazardous materials classified as high-hazard contents | Hazardous materials that are stored, used, or handled, and that are also classified as high-hazard contents shall comply with the Special Provisions for Occupancies with High Hazard Contents in NFPA 101 Section 7.11. | Required | Required | Required |
| 2.9.1.2 | Hazardous Materials | Hazardous materials shall comply with both 2.9.1.2(1) and 2.9.1.2(2) | Required | Required | Required |
| 2.9.1.2(1) | | Means of egress requirements in NFPA 101 chapter 7 and item 2.0 of this Fire and Life Safety (FLS) Requirements. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|------------|----------------------------------|---|------------|-----------|-------------|
| 2.9.1.2(2) | | Applicable means of egress requirements of NFPA 30, NFPA 45, NFPA 55, NFPA 58, NFPA 400, and NFPA 495 that are stricter than the general requirements for means of egress and this storage occupancy chapter. | Required | Required | Required |
| 2.10 | (Reserved) | | | | |
| 3.0 | PROTECTION. | Protection shall comply with the applicable NFPA codes and standards, QCD FLS Annex and as modified in item 3.0 of this FLS Occupancy Chapter. | | | |
| 3.1 | PROTECTION OF VERTICAL OPENINGS | Any vertical opening shall be protected in accordance with NFPA 101 section 8.6, unless otherwise permitted by 3.1.1 and 3.1.2. | Required | Required | Required |
| 3.1.1 | CONVENIENCE OPENINGS | Unenclosed vertical openings created by convenience openings complying with NFPA 101 section 8.6.9.1. | Permitted | Permitted | Permitted |
| 3.1.2 | CONVENIENCE STAIRWAYS | Unenclosed vertical openings created by convenience stairways complying with NFPA 101 section 8.6.9.2. | Permitted | Permitted | Permitted |
| 3.2 | PROTECTION FROM HAZARDS | Where hazardous materials are stored, used, or handled, the provisions of NFPA 101 section 8.7.3.1 and 3.2 of this occupancy chapter shall apply. | Required | Required | Required |
| 3.2.1 | HAZARDOUS MATERIALS | Storage occupancies with the storage, use, and handling of hazardous materials shall comply with the applicable NFPA hazardous materials document.: NFPA 30, NFPA 54, NFPA 55, NFPA 58, NFPA 400, NFPA 495. | Required | Required | Required |
| 3.2.1.1 | | No storage, use, or handling of hazardous materials shall be permitted in any location where such storage, use, or handling would jeopardize egress from the structure, unless otherwise permitted by a document listed in 3.2.1. | Required | Required | Required |
| 3.2.2 | MSDS-Material Safety Data Sheets | Provide MSDS and chemical information documents for the hazardous storage chemical warehouse and facility that shall be properly placed/ situated at the warehouse and chemical store entrance. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|------------|---|--|------------|----------|-------------|
| 3.2.2.1 | Warehouse and Chemical Stores - Laboratory Scale Chemical Reagents. | Implement strict chemical compatibility storage arrangement as per approved Chemical Compatibility Matrix for Laboratories. See Matrix in Table 3.2.2.1. | Required | Required | Required |
| 3.2.2.2 | | Storage of Class 5.1, 5.2 chemicals and Class 4.3 chemicals shall be separated or placed in approved hazardous material storage cabinets. See 3.2.2.2(1) | Required | Required | Required |
| 3.2.2.2(1) | Chemicals Class | Class 4.3 - Water Reactive Materials | | | |
| | | Class 5.1 - Oxidizers Materials | | | |
| | | Class 5.2- Organic Peroxides Materials | | | |
| 3.2.2.3 | | Individual containers less than 5gal (19L) or less than 25lb (11kg) shall be stored or displayed on pallets, racks, or shelves. Containers shall be listed or approved for the intended use. | Required | Required | Required |
| 3.2.3 | (Reserved) | | | | |



| Item | Fire Safety Provisions | Minimum Requirements | | | | | | | Low Hazard | Ordinary | High Hazard | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|------------------------|------------------------|------------------------|----------------------|------------------------|--------------------------|------------------------|----------------------------|------------------------|----------------------------|---------------------|---|---|---|---|---|---|---|---|---|---------------------|---|---|---|---|---|---|---|---|---|-------------------|---|---|---|---|---|---|---|---|---|-------------------|---|---|---|---|---|---|---|---|---|-------------|---|---|---|---|---|---|---|---|---|---------------------|---|---|---|---|---|---|---|---|---|-----------------------|---|---|---|---|---|---|---|---|---|---------------------|---|---|---|---|---|---|---|---|---|-------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|---|--|--|---|---|---|
| Table 3.2.2.1 | <p style="text-align: center;">CHEMICAL COMPATIBILITY MATRIX FOR LABORATORIES</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Category</th><th>1 FLAMMABLE LIQUIDS</th><th>2a ACIDS, INORGANIC</th><th>2b ACIDS, ORGANIC</th><th>3 ALKALIS (BASES)</th><th>4 OXIDIZERS</th><th>5 ORGANIC PEROXIDES</th><th>6a POISONS, INORGANIC</th><th>6b POISONS, ORGANIC</th><th>7 AIR / WATER REACTIVES</th></tr> </thead> <tbody> <tr> <td>1 FLAMMABLE LIQUIDS</td><td>✓</td><td>✗</td><td>✓</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✓</td><td>✗</td></tr> <tr> <td>2a ACIDS, INORGANIC</td><td>✗</td><td>✓</td><td>✗</td><td>✗</td><td>✓</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td></tr> <tr> <td>2b ACIDS, ORGANIC</td><td>✓</td><td>✗</td><td>✓</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td></tr> <tr> <td>3 ALKALIS (BASES)</td><td>✗</td><td>✗</td><td>✗</td><td>✓</td><td>✓</td><td>✗</td><td>✓</td><td>✗</td><td>✗</td></tr> <tr> <td>4 OXIDIZERS</td><td>✗</td><td>✓</td><td>✗</td><td>✓</td><td>✓</td><td>✗</td><td>✓</td><td>✗</td><td>✗</td></tr> <tr> <td>5 ORGANIC PEROXIDES</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✓</td><td>✗</td><td>✗</td><td>✗</td></tr> <tr> <td>6a POISONS, INORGANIC</td><td>✗</td><td>✗</td><td>✗</td><td>✓</td><td>✓</td><td>✗</td><td>✓</td><td>✗</td><td>✗</td></tr> <tr> <td>6b POISONS, ORGANIC</td><td>✓</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✓</td><td>✗</td></tr> <tr> <td>7 AIR / WATER REACTIVES</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✗</td><td>✓</td></tr> </tbody> </table> <p>NOTES AND GUIDANCE:</p> <p>A. KEY:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">✓</td><td>MAYBE Compatible (Consult Material Safety Data Sheets-MSDS / Safety Data Sheets-SDS)</td></tr> <tr> <td style="text-align: center;">✗</td><td>NOT Compatible (do NOT store TOGETHER in the same cabinet)</td></tr> </table> <p>B. QUANTITY LIMITATIONS:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Storage in Laboratory work areas / per room SHALL not exceed 50liters (13.2gallons) for flammable liquids.</td></tr> </table> <p>C. INSTRUCTIONS FOR STORAGE AND HANDLING:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">The air extraction outlet shall be at least 3m away from any building opening.</td></tr> <tr> <td>The minimum Ventilation of a laboratory containing chemicals shall be 5 air changes per hour.</td></tr> <tr> <td>All chemical bottles and containers shall be sealed and airtight and placed inside the designated cabinet.</td></tr> <tr> <td>All chemical bottles and containers/cabinets shall be properly labeled addressing the hazard group/severity.</td></tr> <tr> <td>Drip pans/trays shall be used for liquid chemicals.</td></tr> <tr> <td>Drip pans/trays material shall not react with the contained chemical.</td></tr> <tr> <td>Storage cabinets in laboratory work areas / per room shall be at least 30minutes (0.5-hr) fire resistive construction material and shall be manufactured as per BS 476.</td></tr> </table> | Category | 1 FLAMMABLE LIQUIDS | 2a ACIDS, INORGANIC | 2b ACIDS, ORGANIC | 3 ALKALIS (BASES) | 4 OXIDIZERS | 5 ORGANIC PEROXIDES | 6a POISONS, INORGANIC | 6b POISONS, ORGANIC | 7 AIR / WATER REACTIVES | 1 FLAMMABLE LIQUIDS | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | 2a ACIDS, INORGANIC | ✗ | ✓ | ✗ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | 2b ACIDS, ORGANIC | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | 3 ALKALIS (BASES) | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | 4 OXIDIZERS | ✗ | ✓ | ✗ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | 5 ORGANIC PEROXIDES | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | ✗ | ✗ | 6a POISONS, INORGANIC | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | 6b POISONS, ORGANIC | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | 7 AIR / WATER REACTIVES | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | MAYBE Compatible (Consult Material Safety Data Sheets-MSDS / Safety Data Sheets-SDS) | ✗ | NOT Compatible (do NOT store TOGETHER in the same cabinet) | Storage in Laboratory work areas / per room SHALL not exceed 50liters (13.2gallons) for flammable liquids. | The air extraction outlet shall be at least 3m away from any building opening. | The minimum Ventilation of a laboratory containing chemicals shall be 5 air changes per hour. | All chemical bottles and containers shall be sealed and airtight and placed inside the designated cabinet. | All chemical bottles and containers/cabinets shall be properly labeled addressing the hazard group/severity. | Drip pans/trays shall be used for liquid chemicals. | Drip pans/trays material shall not react with the contained chemical. | Storage cabinets in laboratory work areas / per room shall be at least 30minutes (0.5-hr) fire resistive construction material and shall be manufactured as per BS 476. |
| Category | 1 FLAMMABLE LIQUIDS | 2a ACIDS, INORGANIC | 2b ACIDS, ORGANIC | 3 ALKALIS (BASES) | 4 OXIDIZERS | 5 ORGANIC PEROXIDES | 6a POISONS, INORGANIC | 6b POISONS, ORGANIC | 7 AIR / WATER REACTIVES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 FLAMMABLE LIQUIDS | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2a ACIDS, INORGANIC | ✗ | ✓ | ✗ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2b ACIDS, ORGANIC | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 ALKALIS (BASES) | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 OXIDIZERS | ✗ | ✓ | ✗ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 ORGANIC PEROXIDES | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | ✗ | ✗ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6a POISONS, INORGANIC | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6b POISONS, ORGANIC | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 AIR / WATER REACTIVES | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ✓ | MAYBE Compatible (Consult Material Safety Data Sheets-MSDS / Safety Data Sheets-SDS) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ✗ | NOT Compatible (do NOT store TOGETHER in the same cabinet) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Storage in Laboratory work areas / per room SHALL not exceed 50liters (13.2gallons) for flammable liquids. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| The air extraction outlet shall be at least 3m away from any building opening. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| The minimum Ventilation of a laboratory containing chemicals shall be 5 air changes per hour. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| All chemical bottles and containers shall be sealed and airtight and placed inside the designated cabinet. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| All chemical bottles and containers/cabinets shall be properly labeled addressing the hazard group/severity. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Drip pans/trays shall be used for liquid chemicals. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Drip pans/trays material shall not react with the contained chemical. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Storage cabinets in laboratory work areas / per room shall be at least 30minutes (0.5-hr) fire resistive construction material and shall be manufactured as per BS 476. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|---|--|-----------------|----------|-------------|
| 3.3 | INTERIOR FINISH | Interior finish shall be in accordance with NFPA 101 Section 10.2 and as specified in 3.3.1 and 3.3.2. | Required | Required | Required |
| 3.3.1 | INTERIOR WALL AND CEILING FINISH | Interior wall and ceiling finish materials shall be Class A, Class B, or Class C in accordance with Section NFPA 101 10.2 in storage areas and shall be as required by NFPA 101 7.1.4 in exit enclosures. | Required | Required | Required |
| 3.3.1.1 | | Interior wall and ceiling finishes shall be Class A, Class B, or Class C in areas other than those specified in 3.3.1 | Required | Required | Required |
| 3.3.2 | INTERIOR FLOOR FINISH | Interior floor finish in exit enclosures shall be Class I or Class II. | Required | Required | Required |
| 3.4 | DETECTION, ALARM AND COMMUNICATIONS | | | | |
| 3.4.1 | GENERAL | Complete coverage of Fire Detection and Alarm System. | Required | Required | Required |
| 3.4.2 | INITIATION | Complete coverage of an Automatic Detection and Manual Initiating Devices. | Required | Required | Required |
| 3.4.3 | OCCUPANT NOTIFICATION | Complete Coverage of an Occupant Notification (audible & visible). | Required | Required | Required |
| 3.4.3.1 | Emergency Voice Evacuation System | Mass Notification System | NR | NR | Required |
| 3.4.4 | SUPPLEMENTARY | | Required | Required | Required |
| 3.4.4.1 | Fire Telephone / 2-way Communication | In every required provisions of a fire command center (FCC) or emergency control center(ECC). | Required | Required | Required |
| 3.4.4.2 | Graphic Annunciator (PC Panel) or Mimic Panel | In every required provisions of a fire command center (FCC) or emergency control center(ECC). | Required | Required | Required |
| 3.5 | EXTINGUISHMENT REQUIREMENTS | | | | |
| 3.5.1 | AUTOMATIC FIRE SPRINKLER (AFS) SYSTEM | Storage occupancies, other than low hazard storage occupancies, shall be protected by an approved, supervised automatic sprinkler system, in any of the following locations and conditions in 3.5.1.1 through 3.5.1.6. | NR-Not Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|----------------|--|--|-------------------|-----------|------------------|
| 3.5.1.1 | G+2 Floors and Above (Ordinary Hazard) | An automatic sprinkler system shall be provided throughout all storage occupancies three or more stories in height. | NR | Required | NA |
| 3.5.1.2 | Fire Area Exceeds 1115 m ² (Ordinary Hazard) | An automatic sprinkler system shall be provided throughout all storage occupancies exceeding 1115 m ² in fire area or fire compartment. | NR | Required | NA |
| 3.5.1.3 | Total Area of All Floors Exceeds 2230 m ² (Ordinary Hazard) | An automatic sprinkler system shall be provided throughout storage occupancies, where the total area of all floor levels, including mezzanines (when provided) exceeds 2230 m ² . | NR | Required | NA |
| 3.5.1.4 | High Hazard Storage Occupancy | High hazard storage occupancy shall be protected throughout with an approved automatic sprinkler system. | NA | NA | Required |
| 3.5.1.5 | Bulk Storage of Tires | Buildings and structures where the volume for the storage of tires exceeds 566 m ³ shall be equipped throughout with an approved automatic fire sprinkler system. | NA-Not Applicable | Required | NA |
| 3.5.1.6 | Mini-Storage Building | An automatic sprinkler system shall be installed throughout all mini-storage buildings greater than 232 m ² and where any of the individual storage units are separated by a 1-hour fire resistance-rated barrier. | NA | Required | NA |
| 3.5.1.7 | Exemption to Automatic Fire Sprinkler System Requirements | Exemption to the automatic fire sprinkler system required in 3.5.1.1 through 3.5.1.3 shall be permitted with the following conditions: | NA-Not Applicable | Permitted | NP-Not Permitted |
| 3.5.1.7(1) | Create Separate Buildings | Create separate buildings via 2-hour or greater vertically aligned fire barrier, for purposes of limiting the fire area to not more than 1115 m ² , and complying with conditions in 3.5.1.7(1) (a) through 3.5.1.7(2)(b) | NA | Permitted | NP |
| 3.5.1.7 (1)(a) | Vertical Continuity | The 2-hour or greater vertically aligned fire barrier wall shall be extended 760mm above roof surface. | NA | Required | NP |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|----------------|------------------------------------|---|------------|-----------|------------------|
| 3.5.1.7 (1)(b) | Horizontal Continuity | Connections between the 2-hour or greater fire barrier wall and the exterior walls shall form an end wall exposure protection (T-shaped). | NA | Required | NP |
| 3.5.1.7 (1)(c) | | Length of the end wall protection shall be not less than 1830 mm, where the height of the exposing area is equal or less than 12 m or not less than 3050 mm if the height of the exposing area is more than 12 m. | NA | Required | NP-Not Permitted |
| 3.5.1.7(2) | Doorways and Openings | Doorways and openings in fire walls and fire barriers shall be protected with the following: | NA | Required | NP |
| 3.5.1.7 (2)(a) | | Doors shall be normally closed and shall be automatic-closing or self-closing fire doors. | NA | Required | NP |
| 3.5.1.7 (2)(b) | | The aggregate width of all openings at any level shall not exceed 25 percent of the length of the wall. | NA | Required | NP |
| 3.5.2 | OTHER AUTOMATIC SUPPRESSION SYSTEM | Where an automatic sprinkler system is required in Section 3.5.1, the appropriate type of automatic suppression system shall be permitted in areas where likely water damage may occur, or the sprinkler system may damage the contents or equipment. | Permitted | Permitted | Permitted |
| 3.5.3 | Fire Hose Reel | Fire hose reels are required in buildings protected by an approved supervised automatic sprinkler system. | Required | Required | Required |
| 3.5.4 | Portable Fire Extinguisher | Applicable Portable Fire Extinguishers required in all buildings. | Required | Required | Required |
| 3.5.5 | Rising Main (Dry or Wet Standpipe) | Refer to Annex Fire Fighting System Annex_FFS_G1 Revisions 2021 | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|------------|--|---|------------|-------------|------------------|
| 3.6 | SMOKE CONTROL/VENTILATION REQUIREMENTS | Design conditions per Annex ACMV_N1 Revisions 2021. (AS-Sprinklered / NS-Not Sprinklered) | | | |
| 3.6.1 | STORAGE OCCUPANCY BUILDING | | | | |
| 3.6.1.1 | Aboveground Storage Occupancy | Fire area or fire compartment exceeds 100 m ² . | Required | Required | Required |
| 3.6.1.1(1) | ≤ 100 m ² (AS or NS) | | NR | NR | NR |
| 3.6.1.1(2) | 100 m ² ≤ 500 m ² (AS) | | NR | NR | NR |
| 3.6.1.1(3) | 100 m ² ≤ 500 m ² (NS) | Smoke Vent of minimum % Openings according to Annex ACMV_N1 Revisions 2021. | NR | NR | Required |
| 3.6.1.1(4) | 500 to ≤ 1115 m ² (NS) | Smoke Vent of minimum % Openings according to Annex ACMV_N1 Revisions 2021. | NR | Required | Required |
| 3.6.1.1(5) | 500 to ≤ 1115 m ² (AS) | Smoke Vent of minimum % Openings according to Annex ACMV_N1 Revisions 2021. | NR | NR | NR |
| 3.6.1.1(6) | 1115 m ² ≤ 2500 m ² (AS) | Smoke Vent of minimum % Openings according to Annex ACMV_N1 Revisions 2021. | Required | Required | NP |
| 3.6.1.1(7) | | Purging System | Permitted | Permitted | Required |
| 3.6.1.1(8) | 2500 m ² ≤ 4000 m ² (AS) | Purging System | Required | Required | Required |
| 3.6.1.1(9) | 4000 m ² (AS) | Engineered Smoke Control System | Required | Required | Required |
| 3.6.1.2 | Belowground Storage Occupancy | Fire area or fire compartment exceeds 100 m ² . | Required | Required | Required |
| 3.6.1.2(1) | 100 m ² ≤ 1115 m ² (NS) | Smoke Vent of minimum % Openings according to Annex ACMV_N1 Revisions 2021. | Required | Required | NP-Not Permitted |
| 3.6.1.2(2) | | Purging System | Permitted | Permitted | Required |
| 3.6.1.2(3) | ≤ 1115 m ² (AS) | Smoke Vent of minimum % Openings according to Annex ACMV_N1 Revisions 2021. | Permitted | Permitted | Required |
| 3.6.1.2(4) | | Purging System | Permitted | Permitted | Required |
| 3.6.1.2(5) | 1115 m ² (AS) | Engineered Smoke Control System | Required | Required | Required |
| 3.6.2 | STAIRWELL/LOBBY | Design conditions per Annex ACMV_N1 Revisions 2021. | <15m | ≥15m - <28m | ≥28m |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|---|---|------------|-------------|-------------|
| 3.6.2.1 | Less than 9 m habitable height | | No Reqmt | No Reqmt | No Reqmt |
| 3.6.2.2 | 9 m to 15 m habitable height | Vent at top of stairwell | Required | NA | NA |
| | | Stair ventilation openings at every floor level (for stairs along external walls) | Permitted | NA | NA |
| | | Stairwell Pressurization | NR | NA | NA |
| 3.6.2.3 | >15 m to < 28 m habitable height | Vent at top of stairwell | NA | NP | NA |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | Required | NA |
| | | Stairwell Pressurization | NA | Permitted | NA |
| 3.6.2.4 | ≥28 m habitable height | Vent at top of stairwell | NA | NA | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | NA | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | NA | NA | Required |
| | Connecting Basement Levels | | | | |
| 3.6.2.5 | Two basement levels or ≤6 m deep, ≤2000 m ² floor area | Vent at top of stairwell : * Permitted up to five (5) connecting above floors (2B+G+4 or less) or 12 m habitable height ; whichever is less; otherwise next below provisions shall apply. | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | Permitted | Required | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Required |
| 3.6.2 | STAIRWELL/LOBBY | Design conditions per Annex ACMV_N1 Revisions 2021. | <15m | ≥15m - <28m | ≥28m |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|--|---|------------|-----------|-------------|
| 3.6.2.6 | Three basement levels or ≤ 9.1 m deep, ≤ 2000 m ² floor area | Vent at top of stairwell : * Permitted up to three (3) connecting above floors only (3B+G+2 or less) or 6m habitable height, whichever is less; otherwise next below provisions shall apply | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | NA | NA |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Permitted | Permitted |
| 3.6.2.7 | Two basement levels or ≤ 6 m deep, >2000 m ² floor area | Vent at top of stairwell: * Permitted up to four (4) connecting floors (2B+G+3 or less) or 9 m habitable height ; whichever is less; otherwise next below provisions shall apply. | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | Required | NP | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Permitted | Required | Required |
| 3.6.2.8 | Three basement levels or ≤ 9.1 m deep, >2000 m ² floor area, connecting one floor above only | Vent at top of stairwell : * Permitted up to two connecting above floors or 3 m habitable height only (3B+G+1 or less); whichever is less, otherwise next below provisions shall apply | *Required | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NA | NA | NA |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization. | Permitted | Required | Required |
| 3.6.2.9 | Lowest basement level >9.1 m below ground level, regardless of floor area | Vent at top of stairwell | NP | NP | NP |
| | | Stair ventilation openings at every floor level (stairs along external walls) | NP | NP | NP |
| | | Stairwell pressurization, smoke stop/fire fighting lobby pressurization | Required | Required | Required |
| 3.6.3 | ESCAPE CORRIDOR PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | Low Hazard | Ordinary | High Hazard |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|-----------|---|--|---|-------------|-------------|
| 3.6.3.1 | Interior Corridors | Vents (Fixed or Automatic Opening) | Required in specific type of Occupancy: Healthcare Occupancies and in Detention and Correctional Occupancies | | |
| | | Mechanical Ventilation of Corridor | | | |
| | | Pressurization of Corridor | | | |
| 3.6.3.2 | Corridor with side/s located along exterior walls | Vents (Fixed or Automatic Opening) | | | |
| | | Mechanical Ventilation of Corridor | | | |
| | | Pressurization of Corridor | | | |
| 3.6.4 | atrium and OTHER FLOOR OPENINGS PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | <15m | ≥15m - <28m | ≥28m |
| 3.6.4.1 | Malls (with floor openings connecting >2 floors) | Smoke Vents (Fixed or Automatic Opening) | NA | NA | NA |
| | | Mechanical Smoke Exhaust Ventilation System/Engineered | NA | NA | NA |
| 3.6.4.2 | Other Occupancies (connecting >3 floor levels) | Smoke Vents (Fixed or Automatic Opening) | Required | Permitted | NP |
| | | Mechanical Smoke Exhaust Ventilation System/Engineered | Permitted | Permitted | Required |
| 3.6.5 | CAR PARKS/PARKING STRUCTURES PROTECTION | Design conditions per Annex ACMV_N1 Revisions 2021. | <15m | ≥15m - <28m | ≥28m |
| 3.6.5.1 | Open Parking Structures | The open parking structure shall justify that no smoke stagnation will occur such as from a fire located somewhere in the middle of the car park; otherwise mechanical equipment that will aid in effective dispersal of smoke shall be provided | Required | Required | Required |
| 3.6.5.2 | Aboveground Enclosed Car Parks | | | | |
| 3.6.5.2.1 | Aggregate floor area of ≤2000 m ² | Smoke Vents (Fixed or Automatic) | Required | Required | Permitted |
| | | Mechanical Smoke Purging/Clearance | Permitted | Permitted | Required |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted |
| 3.6.5.2.2 | Aggregate floor area of >2000 m ² | Smoke Vents (Fixed or Automatic) | Required | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | NP |
| | | Engineered Smoke Control System | Required | Permitted | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|-----------|---|---|-----------------|-------------------|---------------|
| 3.6.5.3 | Belowground Car Parks | | ≤6m Deep | >6m - ≤9.1 m Deep | >9.1 m Deep |
| 3.6.5.3.1 | Aggregate floor area of ≤2000 m ² | Smoke Vents (Fixed or Automatic) | Required | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Permitted | Required | Required |
| | | Engineered Smoke Control System | Permitted | Permitted | Permitted |
| 3.6.5.3.2 | Aggregate floor area of >2000 m ² | Smoke Vents (Fixed or Automatic) | NP | NP | NP |
| | | Mechanical Smoke Purging/Clearance | Required | NP | NP |
| | | Engineered Smoke Control System | Permitted | Required | Required |
| 3.7 | CORRIDORS | Exit access corridors protection | NR | NR | Required |
| 3.7.1 | WALLS | Corridors shall be separated from use areas by fire barriers having a minimum 1-hour fire resistance rating. | NR-Not Required | NR | NR |
| 3.8 | SUBDIVISIONS OF BUILDING SPACES | Internal subdivisions. | NR | Required | Required |
| 3.8.1 | INCIDENTAL SPACES | Incidental spaces shall be permitted without fire rated separation from other areas, as long as the space function is in support of the predominant occupancy. | Permitted | NA-Not Applicable | NA |
| 3.8.2 | Salesrooms, Showrooms, Offices, or Similar Spaces | Any single area or spaces of equal or more than 140 m ² in area, shall be separated from the main industrial occupancy by walls or partitions and floor or floor-ceiling assemblies of not less than 2-hrs fire resistance rating. | Required | Required | Required |
| 3.8.2.1 | | The separation required in 3.8.2, shall be permitted to be reduced to not less than 1-hour fire resistance rating in buildings protected throughout by an approved, supervised automatic sprinkler system. | Permitted | Permitted | Not Permitted |
| 3.9 | (Reserved). | | | | |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|-------|---|--|-----------------|----------|-------------|
| 4.0 | SPECIAL PROVISIONS. | Special Provisions for Firefighting and Rescue shall comply with QCD FLS Annex and as modified in item 4.0 of this FLS Occupancy Chapter. | | | |
| 4.1 | FIRE (EMERGENCY) COMMAND CENTER (FCC) | QCD FLS Annex_A5 – Revisions_2021. | NR-Not Required | NR | Required |
| 4.1.1 | | A fire command center shall be provided in any building that requires an Emergency Voice Communication System and/or Smoke Control System. | Required | Required | Required |
| 4.2 | FIREMAN>S ACCESS PANELS/OPENINGS | QCD FLS Annex_A3 – Revisions_2021 | Required | Required | Required |
| 4.2.1 | | Fireman>s access panels shall be provided in storage occupancy buildings regardless of habitable height. | Required | Required | Required |
| 4.3 | EXTERNAL ACCESS TO SITE AND BUILDINGS | QCD FLS Annex_A3 – Revisions_2021 | NR | NR | NR |
| 4.3.1 | SITE ACCESS | For gated facility development a 4.0 m wide and 4.5 m clear height vertical clearance entry gate or site access shall be provided. | NR | NR | NR |
| 4.3.3 | FIRE ENGINE HARDSTANDING | Storage occupancies shall be provided with fire engine hardstanding regardless of habitable height. | Required | Required | Required |
| 4.4 | (Reserved). | | | | |
| 5.0 | BUILDING SERVICES and FIRE PROTECTION EQUIPMENT | Building Services and Fire Protection Equipment shall comply with the applicable NFPA codes and standards and QCD FLS Annex. | | | |
| 5..1 | ELECTRICAL SYSTEM | Electrical wiring and equipment shall be in accordance with NFPA 70. | Required | Required | Required |
| 5.1.1 | ELECTRICAL EQUIPMENT/PANEL ROOMS AND SIMILAR ROOMS/SPACES | QCD FLS Annex _A7 – Revisions_2021 | Required | Required | Required |
| 5.1.2 | EMERGENCY GENERATORS AND STANDBY POWER SYSTEMS. | Emergency generators and standby power systems shall be installed, tested, and maintained in accordance with NFPA 110. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|-------|--|---|------------|----------|-------------|
| 5.1.3 | STORED ELECTRICAL ENERGY SYSTEMS | Stored electrical energy systems shall be installed, tested, and maintained in accordance with NFPA 111. | Required | Required | Required |
| 5.2 | COMMERCIAL COOKING OPERATIONS | Where permitted, commercial cooking operations shall be protected in accordance with NFPA 96. | Required | Required | Required |
| 5.3 | ELEVATORS, ESCALATORS, and CONVEYORS | An elevator, shall not be considered a component in a required means of egress and shall be in accordance with NFPA 101 section 9.4. | Required | Required | Required |
| 5.3.1 | NUMBER OF CARS | The number of elevator cars permitted in a hoistway shall be not more than three (3). | Required | Required | Required |
| 5.3.2 | OPENINGS TO EXIT ENCLOSURES | Conveyors, elevators, dumbwaiters, and pneumatic conveyors serving various stories of a building shall not open to an exit enclosure. | Required | Required | Required |
| 5.4 | FIRE PUMPS | | | | |
| 5.5.1 | FIRE PUMPS ROOM | QCD FLS Annex _A6 – Revisions_2021 | Required | Required | Required |
| 5.5 | SUBSTATION and SWITCHGEARS | QCD FLS Annex _A8 – Revisions_2021 | Required | Required | Required |
| 5.6 | (Reserved). | | | | |
| 6.0 | SPECIAL PROVISIONS for OPEN-SIDES STORAGE BUILDINGS | Open-sides Storage Buildings shall comply with the applicable NFPA codes and standards and this FLS Occupancy Chapter. | | | |
| 6.1 | APPLICATIONS | The requirements of Storage Occupancies sections 1.0 through 4.0 shall be met, except as modified by 6.1.1 through 6.1.4. | Required | Required | NA |
| 6.1.1 | OPENINGS REQUIREMENT | All sides of the storage building shall be open and without walls to be considered as an open-side or sheds storage building. | Required | Required | NA |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|---------------------------------------|---|-----------------|-----------|-------------|
| 6.1.1.1 | External Walls | External walls along the perimeter of the building shall be permitted, provided the wall does not exceed 1 m. height from the finished floor line. | Permitted | Permitted | NA |
| 6.1.2 | HAZARD CLASSIFICATION | Provisions in 6.1 through 6.1.9 shall only be limited to storage contents classified as low and ordinary hazards. | Required | Required | NA |
| 6.1.3 | BUILDING AREA | Gross area of one compartment or fire area shall not exceed 4000 m ² . | Required | Required | NA |
| 6.1.4 | BUILDING HEIGHT | Building height from the finished floor level up to the level of the junction between the supporting column and the beam or roof assembly, shall be not less than 4 m. | Required | Required | NA |
| 6.1.4.1 | Contents Storage Height | Storage of commodities shall be arranged so as not to exceed a maximum height of 3 m., when stored in racks, piled or stacked atop each other. | Required | Required | NA |
| 6.1.4.2 | Spacing between Storage Racks/Shelves | When aisles are created within a storage piles or areas, aisle shall have a minimum clear width of 1.2 m. | Required | Required | NA |
| 6.1.5 | EXPOSURE PROTECTION | Open-sides or shed storage building shall be separated from the property line and other buildings located on the same lot. | Required | Required | NA |
| 6.1.5.1 | Horizontal Separation | A minimum horizontal separation of 6 m. shall be provided between the open-side/shed storage building and the property line or other buildings located on the same lot. | Required | Required | NA |
| 6.1.5.2 | | The horizontal separation shall be measured at a 90-degree angle to the exterior surface of the building. | Required | Required | NA |
| 6.1.6 | AUTOMATIC SPRINKLER SYSTEM | An automatic sprinkler system shall not be required in open-side or shed storage building complying with the conditions in 6.1.1 through 6.1.5.2. | NR-Not Required | NR | NA |
| 6.1.7 | FIRE DETECTION | A fire detection system shall not be required in open-sides storage buildings complying with the conditions in 6.1.1 through 6.1.5.2. | NR | NR | NA |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|------------|---|---|-------------------|----------|-------------|
| 6.1.8.1 | Initiation | Initiation of the fire alarm system shall be in accordance with the requirements for storage occupancies in 3.4. | Required | Required | NA |
| 6.1.8.2 | Notification | Notification of the fire alarm system shall be in accordance with the requirements for storage occupancies in 3.4. | Required | Required | NA |
| 6.1.9 | SMOKE CONTROL SYSTEM | Smoke control system shall not be required in open-wall storage buildings complying with the conditions in 6.1.1 through 6.1.5.2. | NR | NR | NA |
| 6.2 | (Reserved). | | | | |
| 7.0 | SPECIAL PROVISIONS for AIRCRAFT STORAGE HANGARS. | Aircraft Storage Hangars shall comply with the applicable NFPA codes and standards and this FLS Occupancy Chapter. | | | |
| 7.1 | GENERAL | For further information on, and provisions for aircraft hangars, see NFPA 409 Standard on Aircraft Hangars. | | | |
| 7.1.1 | APPLICATIONS | The requirements of Storage Occupancy sections 1.0 through 4.0 shall be met, except as modified by 7.1.1.1 through 7.1.3 | NA-Not Applicable | Required | NA |
| 7.1.1.1 | Number of Exits | There shall be not less than two (2) means of egress from each aircraft storage area. | NA | Required | NA |
| 7.1.1.2 | | Exits from aircraft storage areas shall be provided at intervals not exceeding 46 m on all exterior walls. | NA | Required | NA |
| 7.1.1.3 | Egress Components | Where horizontal exits are provided, doors shall be provided in the horizontal exit fire barrier at intervals not exceeding 30 m. | NA | Required | NA |
| 7.1.1.4 | | Where dwarf or "smash" doors are provided in doors that accommodate aircraft, such doors shall be permitted for compliance with 7.1.1.1 through 7.1.1.3. | NA | Required | NA |
| 7.1.2 | ARRANGEMENT OF MEANS OF EGRESS AND DISCHARGE FROM EXITS | Means of egress from mezzanine floors in aircraft storage areas shall be arranged so that the travel distance to the nearest exit from any point on the mezzanine does not exceed 23 m. | NA | Required | NA |
| 7.1.2.1 | | The means of egress required in 7.1.2, shall lead directly to a properly enclosed stair discharging directly to the exterior, to a suitable cutoff area, or to outside stairs. | NA | Required | NA |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|------------|---|--|------------|----------|-------------|
| 7.1.3 | DEAD-ENDS | Dead ends shall not exceed 15 m. for other than high hazard contents areas and shall not be permitted for high hazard contents areas. | NA | Required | NA |
| 8.0 | GRAIN HANDLING, PROCESSING, MILLING, or OTHER BULK STORAGE FACILITIES. | Bulk Storage Facilities shall comply with the applicable NFPA codes and standards and this FLS Occupancy Chapter. | | | |
| 8.1 | GENERAL | For further information, see NFPA 61 Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities. | | | |
| 8.1.1 | APPLICATIONS | The requirements of Storage Occupancy sections 1.0 through 4.0 shall be met, except as modified by 8.1.2 through 8.1.5.2 | Required | Required | Required |
| 8.1.2 | NUMBER OF MEANS OF EGRESS | There shall be not less than two means of egress from all working levels of the head house, as modified by 8.1.2.1, 8.1.2.2, and 8.1.2.3. | Required | Required | Required |
| 8.1.2.1 | Egress Components | One of the two means of egress shall be a stair to the level of exit discharge, and, if this means of egress is interior to the structure, it shall be enclosed by a dust-resistant, 1-hour fire resistance-rated enclosure. | Required | Required | Required |
| 8.1.2.1(1) | | Exterior exit stair shall be protected from the structure by a 1-hour fire resistance-rated wall that extends at least 3050 mm beyond the stair. | Required | Required | Required |
| 8.1.2.2 | Second Means of Egress | The second means of egress shall be one of the following: | Required | Required | Required |
| 8.1.2.2(1) | Exterior Stair or Basket Ladder-Type Fire Escape | Exterior stair or basket ladder-type fire escape that is accessible from all working levels of the structure and provides a passage to the finished ground level. | Required | Required | Required |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|------------|---|--|------------|-----------|------------------|
| 8.1.2.2(2) | | Exterior stair or basket ladder-type fire escape that is accessible from all working levels of the structure, provides access to adjoining structures, and provides a continuous path to the means of egress described in 8.1.3. | Required | Required | Required |
| 8.1.2.3 | Stair Enclosures | Stair enclosures in existing structures shall be permitted to have non-fire-rated dust-resistant enclosures. | Required | Required | Required |
| 8.1.3 | MEANS OF EGRESS TO FINISHED GROUND LEVEL | An exterior stair or basket ladder-type fire escape shall provide passage to the finished ground level from the top of the end of an adjoining structure, such as a silo, conveyor, gallery, or gantry. | Required | Required | Required |
| 8.1.4 | UNDERGROUND SPACES | | | | |
| 8.1.4.1 | Number of Means of Egress | Underground spaces shall have not less than two means of egress, except as permitted in 8.1.4.2 | Required | Required | Required |
| 8.1.4.2 | | Where the horizontal travel distance to the means of egress is less than 15 m in normally unoccupied spaces, a single means of egress shall be permitted. | Required | Permitted | NP-Not Permitted |
| 8.1.5 | TRAVEL DISTANCE (TD) TO EXITS | Travel distance shall not exceed that provided by 8.1.5.1 and 8.1.5.2. | Required | Required | NA |
| 8.1.5.1 | | Travel distance in bulk storage facilities shall not exceed 61 m. | Required | Required | NA |
| 8.1.5.2 | | Travel distance in bulk storage facilities protected throughout by an approved, supervised automatic sprinkler system, shall not exceed 122 m. | Required | Required | NA |
| 8.2 | (Reserved). | | | | |
| 9.0 | SPECIAL PROVISIONS for PARKING STRUCTURES. | Parking Structures shall comply with the applicable NFPA codes and standards and this FLS Occupancy Chapter. | | | |
| 9.1 | APPLICATIONS | The provisions of item 9.0 shall apply to parking structures of the closed or open type, above or below grade plane. | | | |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|-------|-------------------------|--|-------------------|----------|-------------|
| 9.1.1 | | The provisions of item 9.0 shall not apply to assisted mechanical-type or automated-type parking facilities that are not occupied by customers. | NA-Not Applicable | Required | NA |
| 9.1.2 | | For further information and other provisions on parking structures, see the latest NFPA 88A Standard for Parking Structures. | NA | Required | NA |
| 9.2 | MULTIPLE OCCUPANCIES | | | | |
| 9.2.1 | | Where both parking and repair operations are conducted in the same building, the entire building shall comply with the provisions for Industrial Occupancies except as modified by item 9.2.1.1. | NA | Required | NA |
| 9.2.2 | SEPARATED OCCUPANCIES | Where the parking and repair sections are separated by not less than 1-hour fire-rated construction, the parking and repair sections shall be treated separately. | NA | Required | NA |
| 9.2.3 | | In areas where repair operations are conducted, the means of egress shall comply with the means of egress provisions of industrial occupancies. | NA | Required | NA |
| 9.3 | OPEN PARKING STRUCTURES | | | | |
| 9.3.1 | AREA OF WALL OPENING | For natural ventilation purposes, the exterior sides of the structure shall have uniformly distributed openings on two or more sides. | NA | Required | NA |
| 9.3.2 | | The area of such openings in exterior walls on a level shall be not less than 20 percent of the total perimeter wall area of each level. | NA | Required | NA |
| 9.3.3 | | The aggregate length of the openings considered to be providing natural ventilation shall be not less than 40 percent of the perimeter of the level. | NA | Required | NA |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|-------|--------------------------------------|---|-------------------|-----------|-------------|
| 9.3.4 | | Where the required openings are uniformly distributed over two opposing sides of the building, item 9.3.3 shall not apply. | NA | Required | NA |
| 9.3.5 | | Interior wall lines and column lines shall be at least 20 percent open, with openings uniformly distributed to provide ventilation. | NA-Not Applicable | Required | NA |
| 9.4 | CLASSIFICATION OF OCCUPANCIES | | | | |
| 9.4.1 | | Incidental vehicle parking in another occupancy shall not be the basis for overall occupancy classification. | NA | Required | NA |
| 9.5 | CLASSIFICATION OF HAZARD OF CONTENTS | | | | |
| 9.5.1 | | Parking structures used only for the storage of vehicles shall be classified as ordinary hazard in accordance with item 1.4 | NA | Required | NA |
| 9.5.2 | | The presence of gasoline, diesel fuel, and alternative fuels such as compressed natural gas in closed automobile fuel tanks or gas cylinders does not warrant a high hazard classification. | NA | Permitted | NA |
| 9.6 | MINIMUM CONSTRUCTION REQUIREMENTS | | | | |
| 9.6.1 | | Those parts of parking structures located within, immediately below, attached to, or less than 3000 mm from a building used for any other purpose shall be separated by walls, partitions, floors, or floor-ceiling assemblies having fire resistance ratings of not less than 2 hours. | NA | Required | NA |
| 9.6.2 | | No fire-rated separation shall be required when parts of a parking structure and a building used for any other purpose are separated by 3000 mm or more, and are attached only via open pedestrian balconies or bridges or open vehicle bridges. | NA | Permitted | NA |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|------------|-----------------------------|--|------------|-----------|-------------|
| 9.6.3 | | Those portions of an open parking structure located within or immediately below a building used for another purpose shall have the principal supporting members and bearing walls in all levels of the parking structure protected to provide a fire-resistive rating equivalent to that required for the other occupancy. | NA | Required | NA |
| 9.6.4 | | Offices or other similar spaces that are related to the operation of the parking structure and are less than 300 m ² in area, other than cashier or attendant booths, shall be separated from parking areas by walls or partitions that resist the passage of smoke. | NA | Required | NA |
| 9.6.5 | | Floor surfaces shall be of noncombustible material. | NA | Required | NA |
| 9.6.6 | | Combustible construction is not permitted. | NA | NP | NA |
| 9.6.7 | | Asphalt shall be permitted on grade. | NA | Permitted | NA |
| 9.6.8 | ENCLOSED PARKING STRUCTURES | The maximum building height, number of stories, and area limitations for enclosed parking structures shall be in accordance with NFPA 5000 chap. 7. | NA | Required | NA |
| 9.6.9 | OPEN PARKING STRUCTURES | Open parking structures shall be of Type I or Type II construction in accordance with NFPA 5000 chapter 7 and as defined in NFPA 220. | NA | Required | NA |
| 9.6.9.1 | | Heights and floor areas of open parking structures of Type I, Type II (222), or Type II (111) construction shall be permitted to be unlimited. | NA | Required | NA |
| 9.6.9.2 | | Open parking structures of Type II (000) construction shall be permitted to be of unlimited area where both of the following conditions are met: | NA | Required | NA |
| 9.6.9.2(2) | | The height does not exceed 25 m. | NA | Required | NA |
| 9.6.9.2(2) | | The horizontal distance from any point on any parking level to an exterior wall opening on a street, an alley, a courtyard, or other similar permanent open space does not exceed 60 m. | NA | Required | NA |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|------------|---------------------------------|---|-------------------|-----------|-------------|
| 9.7 | MEANS OF EGRESS REQUIREMENTS | | | | |
| 9.7.1 | MEANS OF EGRESS COMPONENTS | Components of means of egress shall be limited to the types described in items 9.7.1.1 through 9.7.1.2 | NA | Required | NA |
| 9.7.1.1 | Doors | Doors in accordance with item 2.1.1. | NA | Permitted | NA |
| 9.7.1.1(1) | | Special locking arrangements complying with NFPA 101 section 7.2.1.6. | NA | Permitted | NA |
| 9.7.1.1(2) | | An opening for the passage of automobiles shall be permitted to serve as an exit from a street floor, provided that no door or shutter is installed therein. | NA | Permitted | NA |
| 9.7.1.2 | Stairs | Stairs in accordance with 2.1.2 shall be permitted, unless otherwise permitted by item 9.7.1.2.1. | NA | Required | NA |
| 9.7.1.2(1) | Stair Enclosures | In open parking structures, stairs are not required to be enclosed. | NA | Permitted | NA |
| 9.7.1.2(2) | Winders | Winders shall be not be permitted. | NA | NP | NA |
| 9.7.1.3 | Smokeproof Enclosures | Smokeproof enclosures complying with item 2.1.3. | NA | Permitted | NA |
| 9.7.1.4 | Horizontal Exits | Horizontal exits complying with item 2.1.4. | NA | Permitted | NA |
| 9.7.1.5 | Ramps | Ramps shall be permitted in accordance with any of the following conditions: | NA | Permitted | NA |
| 9.7.1.5(1) | Ramps Usage | Ramps complying with item 2.1.5 shall be permitted and shall not be subject to normal vehicular traffic where used as an exit. | NA | Permitted | NA |
| 9.7.1.5(2) | Ramps as Second Means of Egress | In a ramp-type open parking structure with open vehicle ramps not subject to closure, the ramp shall be permitted to serve in lieu of the second means of egress from floors above the level of exit discharge, provided that the ramp discharges directly outside at the street level. | NA-Not Applicable | Permitted | NA |
| 9.7.1.5(3) | | For parking structures extending only one floor level below the level of exit discharge, a vehicle ramp leading directly to the outside shall be permitted to serve in lieu of the second means of egress, provided that no door or shutter is installed therein. | NA | Permitted | NA |

| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------------|---|---|-------------------|-----------|-------------|
| 9.7.1.6 | Exit Passageways | Exit passageways complying with item 2.1.6. | NA | Permitted | NA |
| 9.7.1.7 | Fire Escape Stairs | Fire escape stairs complying with item 2.1.7. | NA | Permitted | NA |
| 9.7.1.8 | Areas of Refuge | Areas of refuge complying with item 2.1.9. | NA | Permitted | NA |
| 9.7.1.8(1) | | In open-air parking structures, the area of refuge requirements shall not apply. | NA | Permitted | NA |
| 9.7.2 | NUMBER OF MEANS OF EGRESS | The number of means of egress shall comply with items 9.7.2.1 and 9.7.2.2. | NA | Required | NA |
| 9.7.2.1 | | Not less than two means of egress shall be provided from every floor or section of every parking structure. | NA | Required | NA |
| 9.7.2.2 | | Floors or portions thereof with an occupant load of more than 500 - <1000 shall have the minimum 3 number of separate and remote means of egress. | NA | Required | NA |
| 9.7.3 | ARRANGEMENT OF MEANS OF EGRESS | | | | |
| 9.7.3.1 | Common Path of Travel | A common path of travel shall be permitted for the first 15 m from any point in the parking structure. | NA | Required | NA |
| 9.7.3.2 | Dead-Ends | Dead ends shall not exceed 15 m. | NA | Required | NA |
| 9.7.3.3 | Fuel Dispensing Devices within Parking Structures | Where fuel-dispensing devices are located within a parking structure, items 9.7.3.3(1) and 9.7.3.3(2) shall apply. | NA | Required | NA |
| 9.7.3.3(1) | | Travel away from the fuel-dispensing device in any direction shall lead to an exit with no dead end in which occupants might be trapped by fire. | NA | Required | NA |
| 9.7.3.3(2) | | Within closed parking structures containing fuel-dispensing devices, exits shall be arranged and located to meet all of the following additional requirements: | NA | Required | NA |
| 9.7.3.3(2)(a) | | Exits shall lead to the outside of the building on the same level or to stairs, with no upward travel permitted, unless direct outside exits are available from that floor. | NA-Not Applicable | Required | NA |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------------|---|--|-------------------|----------|-------------|
| 9.7.3.3(2)(b) | | Any story below the story at which fuel is being dispensed shall have exits leading directly to the outside via outside stairs or doors at the finished ground level. | NA | Required | NA |
| 9.7.4 | TRAVEL DISTANCE (TD) TO EXITS | Travel distance shall not exceed that provided by items 9.7.4.1 and 9.7.4.2, except as otherwise permitted in item 9.7.4.5. | NA | Required | NA |
| 9.7.4.1 | Enclosed Parking Structures | Travel distance in enclosed parking structures shall not exceed 46 m. | NA | Required | NA |
| 9.7.4.2 | | Travel distance in enclosed parking structures protected with an approved automatic sprinkler system shall not exceed 61 m. | NA | Required | NA |
| 9.7.4.3 | Open Parking Structures | Travel distance in open parking structures shall not exceed 91 m. | NA | Required | NA |
| 9.7.4.4 | | Travel distance in open parking structures protected with an approved automatic sprinkler system shall not exceed 122 m. | NA | Required | NA |
| 9.7.4.5 | Parking Structure Open Not Less than 50% on All Sides | Travel distance in parking structure open not less than 50% on all sides shall not exceed 122 m. | NA | Required | NA |
| 9.7.4.6 | Open Parking Structures | In open parking structures, travel distance shall comply with one of the following: | NA | Required | NA |
| 9.7.4.6(1) | | The travel distance to an exit shall not exceed the travel distance specified in items 9.7.4.1 through 9.7.4.2. | NA | Required | NA |
| 9.7.4.6(2) | | The travel distance to a stair that does not meet the provisions for an exit enclosure shall not exceed the travel distance specified in items 9.7.4.1 and 9.7.4.2, and travel along the stair shall not be limited. | NA | Required | NA |
| 9.7.5 | DISCHARGE FROM EXITS | Exit discharge shall comply with item 2.5. | NA | Required | NA |
| 9.7.6 | ILLUMINATION OF MEANS OF EGRESS | Means of egress shall be illuminated in accordance with item 2.6 or with natural lighting that provides the required level of illumination in structures occupied only during daylight hours. | NA | Required | NA |
| 9.7.7 | EMERGENCY LIGHTING | Parking structures shall be provided with emergency lighting in accordance item 2.7, except for structures occupied only during daylight hours and arranged to provide the required level of illumination of all portions of the means of egress by natural means. | NA-Not Applicable | Required | NA |



| Item | Fire Safety Provisions | Minimum Requirements | Low Hazard | Ordinary | High Hazard |
|---------|--|--|-------------------|-----------|-------------|
| 9.7.8 | MARKINGS OF MEANS OF EGRESS | Means of egress shall have signs in accordance with item 2.8. | NA | Required | NA |
| 9.8 | PROTECTION | | | | |
| 9.8.1 | PROTECTION OF VERTICAL OPENINGS | | | | |
| 9.8.1.1 | Vertical Openings in Enclosed Parking Structures | Vertical openings through floors in enclosed parking structures four stories or more in height shall be enclosed with walls or partitions having a fire resistance rating of not less than 2 hours. | NA | Required | NA |
| 9.8.1.2 | | Vertical openings through floors in enclosed parking structures less than four stories in height shall be enclosed with walls or partitions having a fire resistance rating of not less than 1 hour. | NA | Required | NA |
| 9.8.1.3 | Ramps | Ramps in enclosed parking structures shall not be required to be enclosed where the parking structure is protected throughout by an approved, automatic sprinkler system. | NA | Permitted | NA |
| 9.8.1.4 | | Ramps in enclosed parking structures shall not be required to be enclosed where the parking structure is protected throughout by an approved, supervised, automatic fire detection system and a mechanical ventilation system in accordance with item 9.8.5. | NA | Permitted | NA |
| 9.8.1.5 | Openings in Floor Assembly between Enclosed Parking Structure and Open Parking Structure | Openings in the floor assembly between an enclosed parking structure and an open parking structure, except exit openings, shall not be required to be enclosed where the enclosed parking structure is protected in accordance with item 9.8.1.3 or 9.8.1.4. | NA | Permitted | NA |
| 9.8.1.6 | Vertical Openings in Open Parking Structures | Unprotected vertical openings through floors in open parking structures shall be permitted. | NA | Permitted | NA |
| 9.8.2 | INTERIOR FINISH | | | | |
| 9.8.2.1 | Interior Wall and Ceiling Finish | Interior wall and ceiling finish materials shall be Class A, Class B, or Class C in parking structures and shall be as required by item 3.3.1 in exit enclosures. | NA | Required | NA |
| 9.8.2.2 | Interior Floor Finish | Interior floor finish in exit enclosures and exit access corridors shall be Class I or Class II. | NA-Not Applicable | Required | NA |



| | | | | | |
|------------|-------------------------------------|--|----|----------|----|
| 9.8.3 | DETECTION, ALARM AND COMMUNICATIONS | A fire alarm system shall be required for parking structures, except as modified by 9.8.3.1 and 9.8.3.2. | NA | Required | NA |
| 9.8.3.1 | | Open parking structures shall not be required to have a fire detection system. | NA | NR | NA |
| 9.8.3.2 | | Parking structures protected throughout by an approved automatic sprinkler system shall not be required to have a fire detection system. | NA | Required | NA |
| 9.8.3.3 | Initiation | Initiation of the fire alarm system required in item 9.8.3, shall be in accordance with the requirements for storage occupancies in item 3.4. | NA | Required | NA |
| 9.8.3.4 | Notification (Sounder and Flasher) | The required fire alarm system in item 9.8.3 shall activate an audible and visible alarm in a continuously attended location for purposes of initiating emergency action. | NA | Required | NA |
| 9.8.4 | AUTOMATIC SPRINKLER SYSTEM | | | | |
| 9.8.4.1 | Enclosed Parking Structures | Enclosed parking structures located at or above grade plane, within or immediately below a building used for another occupancy, shall have an automatic sprinkler system throughout the parking structure. | NA | Required | NA |
| 9.8.4.1(1) | Open Parking Structures | Automatic sprinkler system shall not be required in open parking structures. | NA | NR | NA |
| 9.8.4.1.2 | High-rise, Open Parking Structures | Open parking structures located under other occupancies within a high-rise building, shall be protected throughout by an approved, supervised automatic sprinkler system. | NA | Required | NA |
| 9.8.5 | SMOKE CONTROL SYSTEM | See 3.6.5 for requirements. | | | |
| 9.9 | (Reserved). | | | | |

General Directorate of Civil Defence (QCD) – Fire and Life Safety Requirement (ANNEX)

This document provides the minimum fire and life safety requirements for buildings and structures of various occupancies prescribed by the General Directorate of Civil Defence (GDCD). It establishes the guidelines in determining the minimum design and construction requirements, firefighting, fire alarm and detection, smoke control provisions, as well as other valuable life safety concerns necessary in the protection of precious lives and properties.

This document also adopts the National Fire Protection Association (NFPA) codes and standards as principal reference for provisions or requirements not specifically addressed in this document. In the event of any conflict concerning requirements under this document and requirements under NFPA, the requirements under this document shall be upheld.

Adoption of requirements from other fire and engineering codes and standards should have the prior concurrence of GDCD before its application.

This document is an updated version of the Fire Safety Guidelines and Annex published in 2015 (FSG_2015), and further supersedes and replaces that previous FSG_2015 documents.





REFUGE FLOORS



| FLS | REFUGE FLOORS | |
|------------|---|----------------|
| A1 | Fire and Life Safety (FLS) Requirements Annex_1 | Revisions_2021 |
| Item | Provisions | Notes |
| 1.0 | High-rise Buildings. | |
| 1.1 | High-rise building of more than 30 stories shall be provided with at least one refuge floor at an interval of not more than 20 stories. | |
| 2.0 | Refuge Floors. | |
| | The refuge floor shall comply with the following requirements: | |
| 2.1 | It shall be of masonry construction having fire resistance rating not less than 2 hours. | |
| 2.2 | At least 50% of the gross floor area of the refuge floor shall be designated as holding area. | |
| 2.3 | There shall be no commercial activities in the holding area. | |
| 2.4 | The size of the holding area shall be adequate to accommodate at least half the total occupant load of all stories above and below the refuge floor, basing on 0.3m^2 per person. | |
| 2.5 | The holding area shall be separated from other areas of the refuge floor by compartment wall having fire resistance rating not less than 2 hours. Link of the holding area with other occupied rooms/areas shall be via an external corridor, or a smoke-stop lobby. | |
| 2.6 | The holding area shall be naturally ventilated with permanent openings on at least 2 sides of external walls. Height of opening shall not be less than 1200mm high and the total area of ventilation openings shall not be less than 25% of the floor area of the holding area. | |
| 2.6.1 | All parts of the holding area shall be within 9m of any ventilation opening. Ventilation opening shall be located at least 1.5m horizontally and 3m vertically above adjoining unprotected opening. | |

| Item | Provisions | Notes |
|------|--|-------|
| 2.7 | The holding area can also be mechanically ventilated or air-conditioned in the event of emergency. | |
| 2.8 | The ventilation equipment shall be connected to secondary power supply via 2 hour fire resistance cable. The ventilation system shall be indicated and shall not share with other areas. | |
| 2.9 | Automatic sprinkler system shall be provided for the refuge floor. | |
| 2.10 | Escape routes leading to the holding area shall be thru smoke-stop/fire lobby or external corridor. | |
| 2.11 | A sign depicting "REFUGE FLOOR" shall be displayed inside the staircase and on wall immediately outside the staircase at the refuge floor. The sign of lettering size not less 50mm shall be displayed at a height of 1500mm above the landing/finished floor level. | |
| 2.12 | Emergency lighting shall be provided to cover all areas of the holding area. Such lighting shall be connected to secondary power supply, i.e. generator, battery, etc. | |
| 2.13 | Two-way voice communication system shall be provided at the firefighting lift lobby serving the refuge floor. | |





SMOKE-STOP AND FIREFIGHTING LOBBIES



| FLS | SMOKE-STOP AND FIREFIGHTING LOBBIES | |
|------------|--|----------------|
| A2 | Fire and Life Safety (FLS) Requirements Annex_2 | Revisions_2021 |
| Item | Provisions | Notes |
| 1.0 | Smoke-stop Lobby. | |
| 1.1 | Entry at every floor level to a smoke proof enclosures (exit staircase) of any building or part of a building with any of the following conditions: | |
| 1.1.1 | The building has a habitable height of 28m or higher, above ground level (High-rise). | |
| 1.1.2 | The building basement/s is more than nine (9) meters below the average ground level (grade plane). | |
| 1.1.3 | Where the smoke proof enclosures (exit staircase) traverses more than five (5) floor levels including basements and belongs to a place of public resort (Assembly & Healthcare Occupancy) regardless of the habitable height or basement depth. | |
| 2.0 | Fire Fighting Lobby. | |
| 2.1 | All Fire Lifts shall be provided with a Fire Fighting Lobby. It shall be adjacent and accessible to an exit staircase and provided with a firefighting lobby at each floor level. The floor shall be graded away from the lift door towards the lobby entrance door with a minimum slope of 1 in 200. | |
| 3.0 | Purpose. | |
| 3.1 | Smoke Stop lobbies, including Fire Fighting Lobbies act as buffer spaces for entry into the protected staircases to ensure smoke and toxic gasses do not enter the staircase shaft (smoke proof enclosure) and spread vertically, are used by fire fighters during emergencies and shall be maintained as common property. | |
| 4.0 | Enclosures and Openings Protective | |

| Item | Provisions | Notes |
|------------|--|-------|
| 4.1 | Access to the smoke proof enclosures must be through a lobby that is separated from the adjoining areas of the building by barriers having a 2-hours fire resistance rating. | |
| 4.2 | Door/s opening into the lobby shall be protected with an approved fire door assembly having a minimum of 1-1/2 fire protection rating and the fire door assembly from the required lobby to the smoke proof enclosure shall have a minimum of 20-minute fire protection rating - | |
| | Item 4.2 Only applies to smoke stop lobbies were the lobby only have door openings to the stair and the entry door to the protected space/lobby. | |
| 4.3 | Door leaves shall be designed to minimize air leakage and shall be self-closing devices or shall be automatic-closing by actuation of a smoke detector within 3050mm of the required lobby door opening. | |
| 5.0 | Lobby Dimensions | |
| 5.1 | Smoke-stop lobbies shall have no dimensions smaller than 1.8 meter in clear width. | |
| 5.2 | Firefighting Lobby floor area shall not be smaller than 6.0m ² and its least side dimension of not less than 2.0 meter clear width. | |





EXTERNAL ACCESS TO SITE AND BUILDING

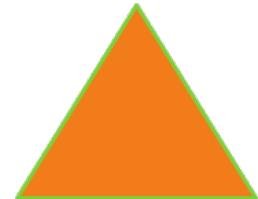


| EXTERNAL ACCESS TO SITE AND BUILDING | | |
|--------------------------------------|---|----------------|
| A3 | Fire and Life Safety (FLS) Requirements Annex_3 | Revisions_2021 |
| Item | Provisions | Notes |
| 1.0 | Access Road/Fire Engine Hardstanding (FEH) | |
| 1.1 | 4m-width firefighting appliance access or access road to the building shall be provided and the gradient shall not exceed 1: 8.3. The angle of approach and departure for any means of access road shall not exceed 1 m drop in 20 m. | |
| | No curve on any portion of the access road shall have an inside radius of less than 7 m and an outside radius of less than 12 m. No portion of the access road shall be built with any wall, fence or any structure to prevent obstruction to the maneuvering of the fire appliance. | |
| | The access road shall able to sustain the stationary load of a 24-ton fire appliance. | |
| 1.2 | In addition to access road, fire engine hardstanding of 6 m x 15 m (minimum), with longer side parallel to the façade of the building shall be provided in buildings with habitable height exceeding 10 m. The hardstanding shall be able to withstand the stationary load of a 60-ton fire appliance. | |
| 1.2.1 | Access opening shall be provided along the external wall of building fronting the fire engine hardstanding to provide access to the building for firefighting and rescue operations. | |
| 1.3 | Hardstanding is not required for residential building such as bungalow, semi-detach and terrace houses regardless of building height. | |
| 1.4 | For landed residential development with shared communal facilities, there is a need of firefighting appliance access road. The maximum travel distance from the fire engine pump appliance to every point on the project plan area of any building shall be 60 m. | |
| 1.5 | For residential building that exceed the habitable height of 10 m, the required fire engine hardstanding shall be within 18 m of the breeching inlet. The breeching inlets shall be located on the external wall above ground level nearest to the vertical run of the riser stack. | |
| 1.6 | For building of institution, office, shop and places of public resort with habitable height not exceeding 10 m, fire engine hardstanding shall not be required provided, the fire engine access road shall be within a travel distance of 45 m from every point on projected plan area of any building. | |



| Item | Provisions | Notes |
|------|---|-------|
| 1.7 | Length of fire engine hardstanding shall be provided based on the gross floor area (including toilets, stores, circulation areas, etc.) of the largest floor in the building for institution, office, shop and places of public resort with habitable height exceeding 10m. | |
| | Please refer to Figure A-Table A1.7, for required length which is in term of the building perimeter length. Different building types have different requirements. | |
| 1.8 | Factory (industrial) and storage (warehouse) shall not require firefighting appliance access or access road within the site. And regardless of habitable height, fire engine hardstanding shall be provided. Length of fire engine hardstanding shall be provided based on the gross cubic volume (including toilets, stores, circulation areas, etc.) of the largest floor in the building. | |
| 1.9 | Every part of the fire engine hardstanding and/or access road shall be within an unobstructed distance of 50 m away from a fire hydrant. | |
| 1.10 | Fire engine hardstanding shall be positioned so that the nearer edge shall not less than 2 m or not more than 10 m from the centre position of the access opening, measured horizontally. | |
| 1.11 | Fire engine hardstanding shall be laid on the level and paved platform or if on an incline, the gradient shall not exceed 1:15. | |
| 1.12 | Fire engine hardstanding and access roads shall have an unobstructed vertical clearance of not less than 4.5 m. | |
| 1.13 | Public road can serve as fire engine hardstanding provided the location of such public roads is in compliance with the requirements of distance from the fireman's access opening. | |
| 1.14 | Fire engine hardstanding and access road shall be kept clear of obstructions and other parts of the building, plants, trees or other fixtures shall not obstruct the path between the fire engine hardstanding and access opening. | |
| 1.15 | The inner radius of turning facility for the fire engine hardstanding and access road shall be minimum 7.0 m. | |
| 1.16 | Dead-end fire department access roads shall be within 46 m in length; otherwise, provisions for another site access (gate or entrance/exit) remotely located from the main site entrance in villa compound, or approved provisions for the fire apparatus to turn around (turning facility) in all other landed development, will be required. | |
| 1.17 | All corners of fire engine hardstanding shall be marked. | |
| 1.18 | Marking of corners shall be in contrasting color to the ground surfaces or finishes. | |



| Item | Provisions | Notes |
|------------|--|---|
| 1.19 | Fire engine hardstanding provided on turfed area must be marked with contrasting object (preferably reflective) that is visible at night. The markings are to be at an interval not more than 2 m apart and shall be provided on both sides of the fire engine hardstanding | |
| 1.20 | Side post displaying the wordings 'Fire Engine Access – Keep Clear' shall be provided at the entrance of the fire engine hardstanding. Size of wordings shall not be less than 50 mm. | |
| 2.0 | Access Opening/Fireman's Access Panels (FAP). | |
| 2.1 | Access opening shall be spaced not more than 20m apart measured along the external wall from centre to centre of all access openings. | <p>Firefighting Access Do Not Obstruct</p>  |
| 2.2 | <p>Access shall include unobstructed external wall openings, windows, balcony doors, glazed wall panels or access panels.</p> <p>Windows, doors, wall panels or access panels must be readily operable from the inside and outside, unless fitted with breakable glazing. Inside and outside of access openings shall be unobstructed at all times during the occupancy of the building.</p> | |
| 2.3 | An external wall which face the fire engine hardstanding and is windowless or a blank wall shall be provided with access opening at each storey. | |
| 2.4 | Access opening shall be not less than 850 mm wide by 1000 mm high with sill height of not more than 1100 mm and height not less than 1800 mm above the inside floor level. | |
| 2.5 | Panels to access openings shall be posted with either a red or orange triangle of equal sides (minimum 150 mm on each side), which can be upright or inverted, on the external side of the wall and with wordings "Fire Fighting Access – Do Not Obstruct" of at least 25 mm height on the internal side. | |
| 2.6 | Buildings and construction regardless of occupancy except factories (industrial occupancy) and warhouses (storage occupancies), having a habitable height of 10m or less, shall be exempted from the requirement to provide access opening. | |

***Building Type - Institutional, Office, Shop and Place of Public
Resort***

Gross floor area of largest floor

| <i>Minimum</i> | <i>1/6 perimeter (min 15m)</i> |
|--|--------------------------------|
| <i>2000m² to 4000m²</i> | <i>¼ perimeter</i> |
| <i>>4000m² to 8000m²</i> | <i>½ perimeter</i> |
| <i>>8000m² to 16000m²</i> | <i>¾ perimeter</i> |
| <i>>16000m²</i> | <i>Island site access</i> |

Building Type - Factory and Storage

Gross cubicle extend of the building

| <i>Minimum</i> | <i>1/6 perimeter (min 15m)</i> |
|--------------------------------|--------------------------------|
| <i>>28400m³</i> | <i>¼ perimeter</i> |
| <i>>56800m³</i> | <i>½ perimeter</i> |
| <i>>85200m³</i> | <i>¾ perimeter</i> |
| <i>>113600m³</i> | <i>Island site access</i> |

Building protected throughout by automatic sprinkler system

| <i>Minimum</i> | <i>1/6 perimeter (min 15m)</i> |
|---|--------------------------------|
| <i>4000m² to 8000m²</i> | <i>¼ perimeter</i> |
| <i>>8000m² to 16000m²</i> | <i>½ perimeter</i> |
| <i>>16000m² to 32000m²</i> | <i>¾ perimeter</i> |
| <i>>32000m²</i> | <i>Island site access</i> |

Building protected throughout by automatic sprinkler system

| <i>Minimum</i> | <i>1/6 perimeter (min 15m)</i> |
|--------------------------------|--------------------------------|
| <i>>56800m³</i> | <i>¼ perimeter</i> |
| <i>>113600m³</i> | <i>½ perimeter</i> |
| <i>>170400m³</i> | <i>¾ perimeter</i> |
| <i>>227200m³</i> | <i>Island site access</i> |

Figure A-Table A1.7



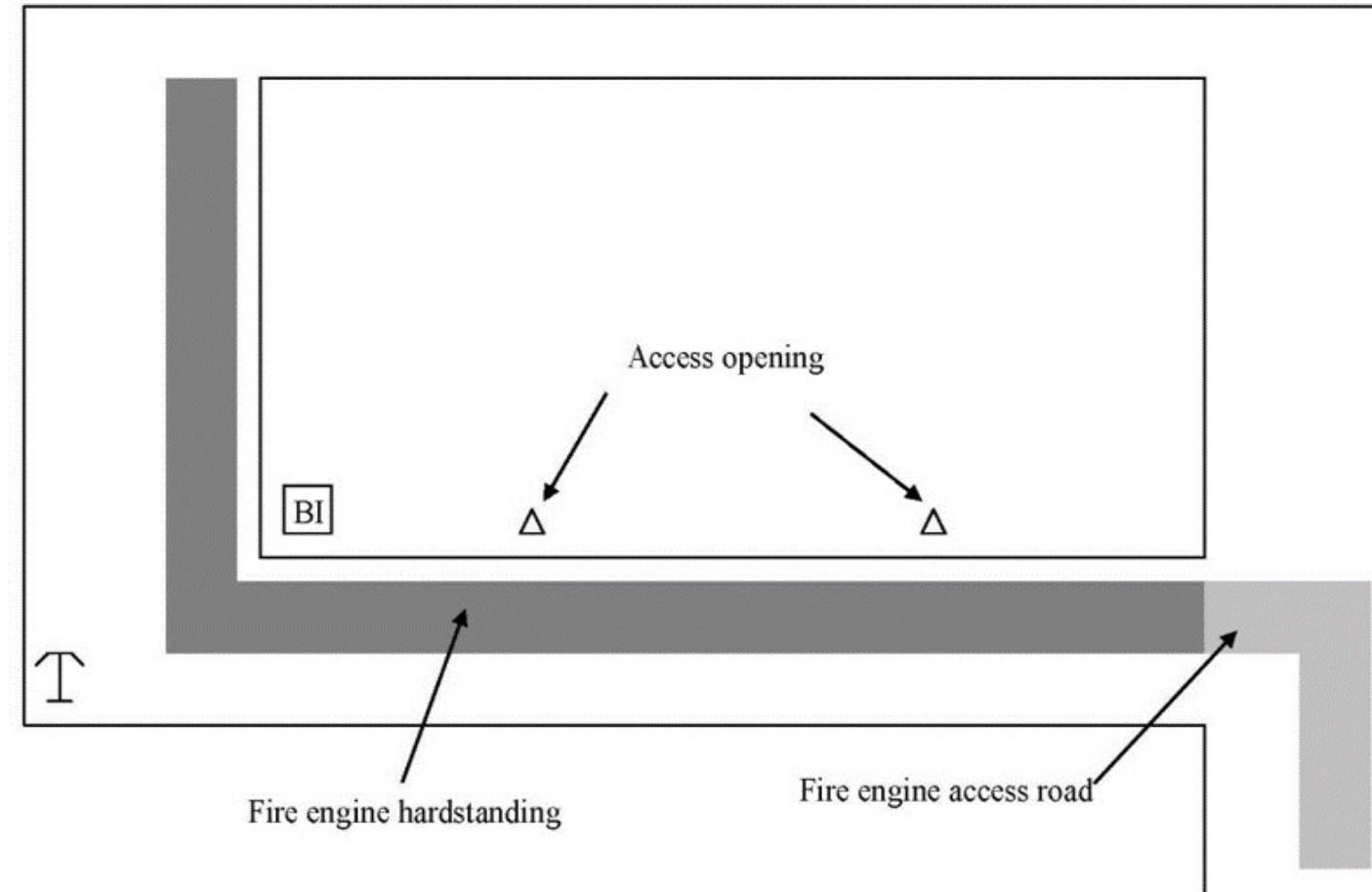


Figure B

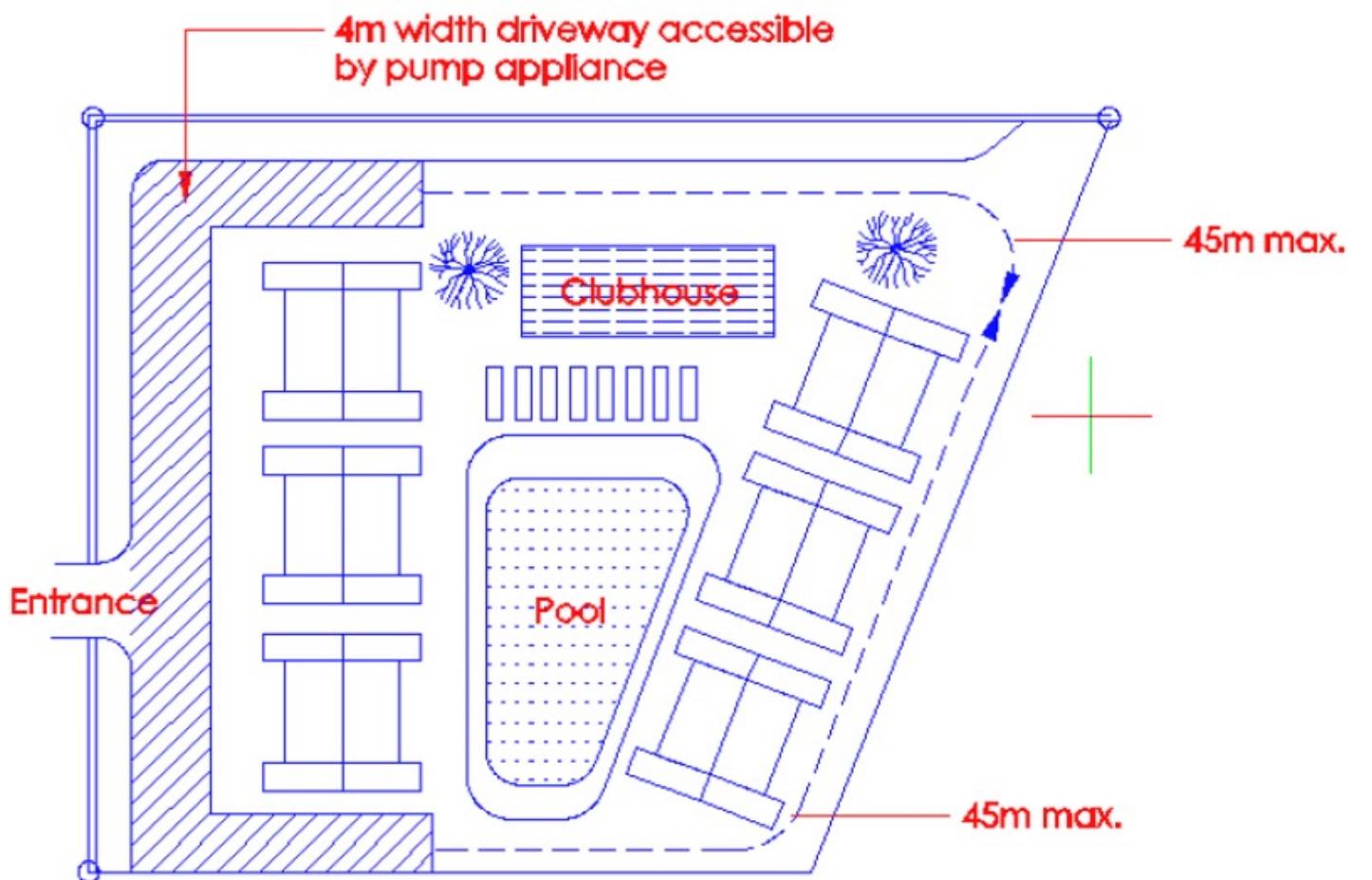


Figure C



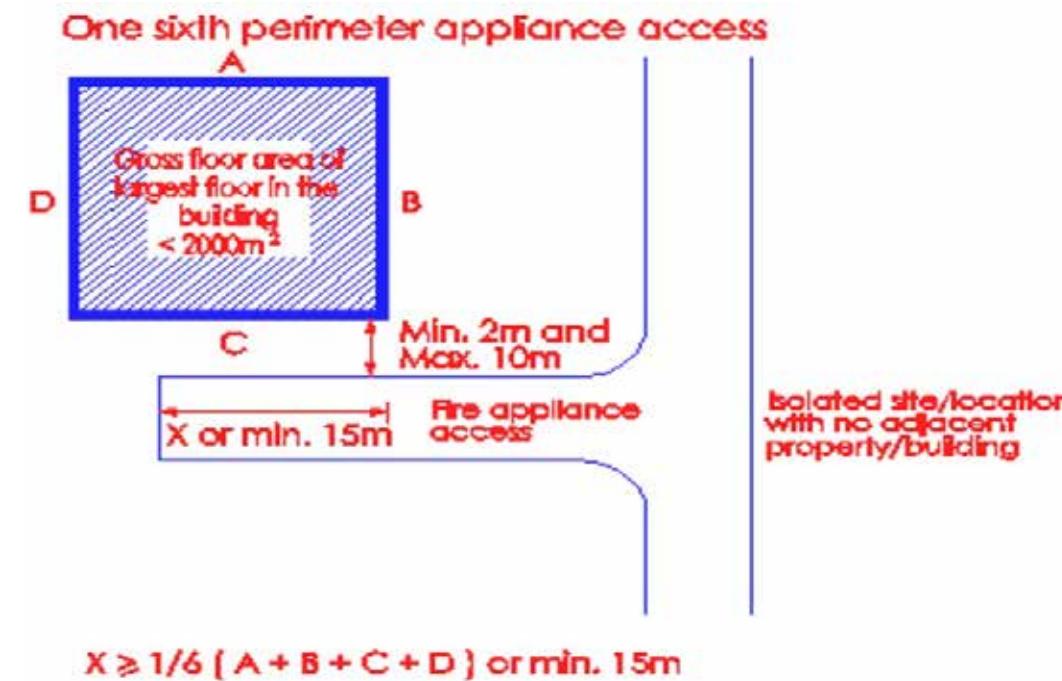


Figure D

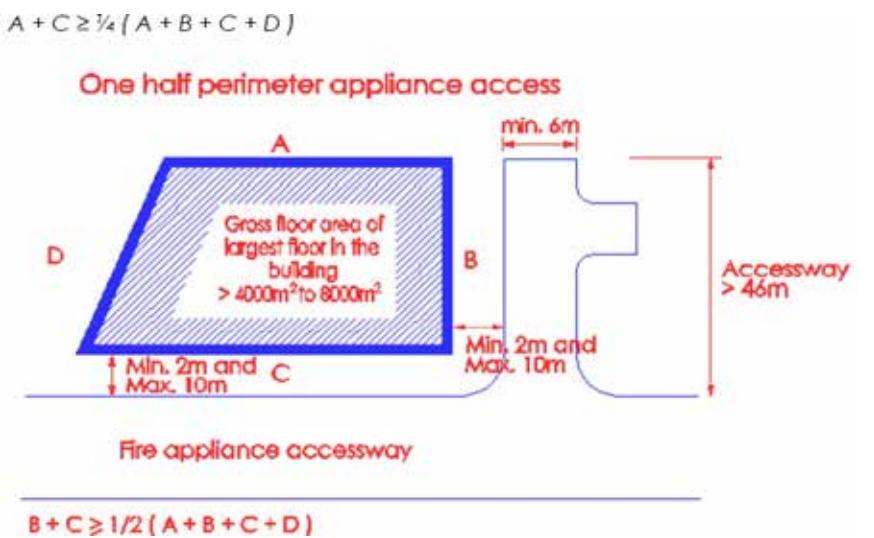
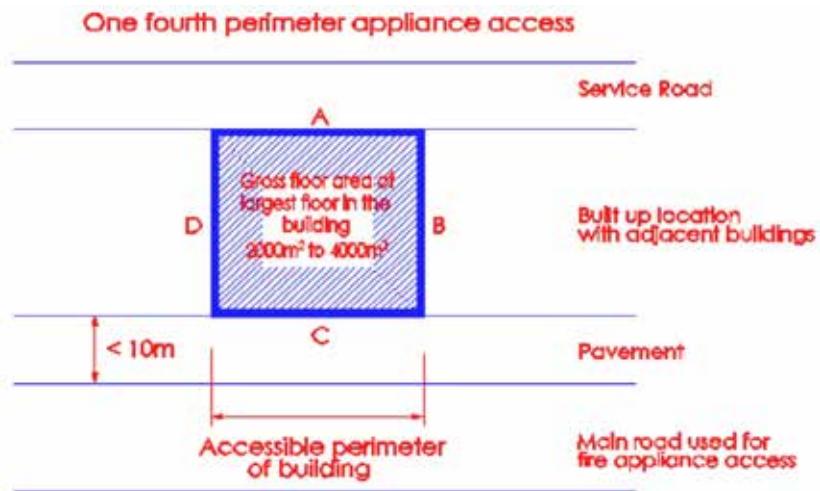


Figure E



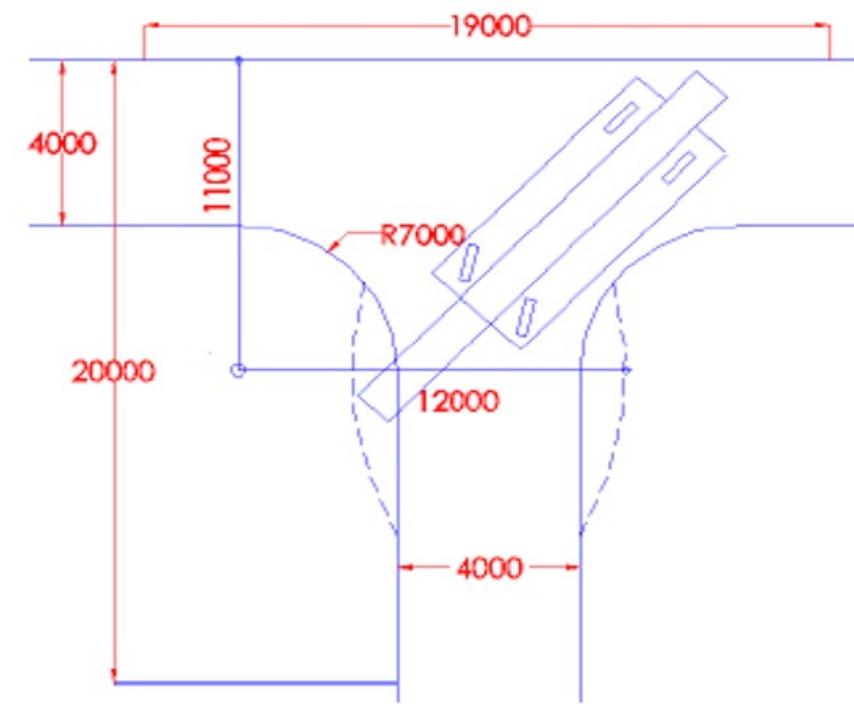


Figure G

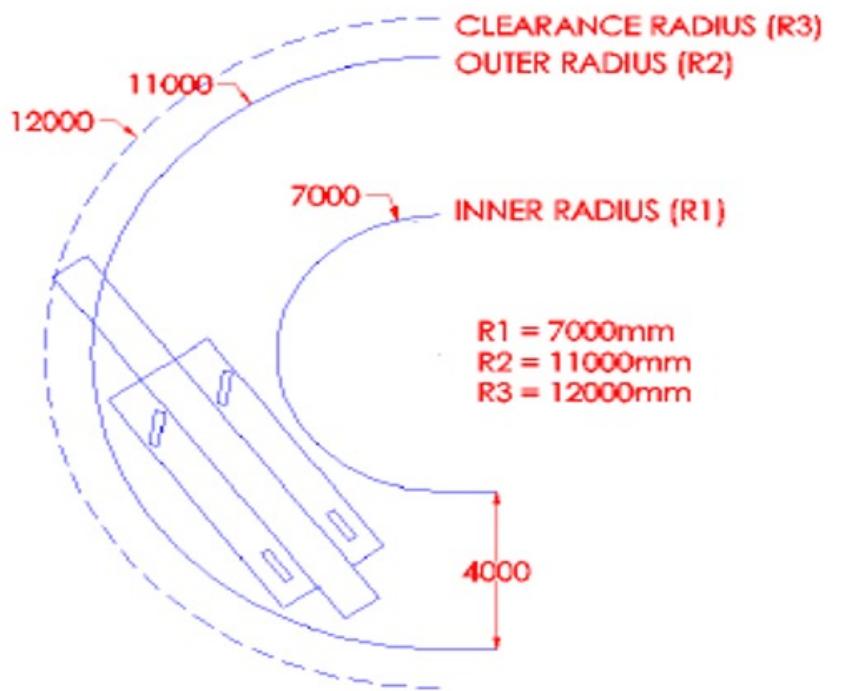


Figure H



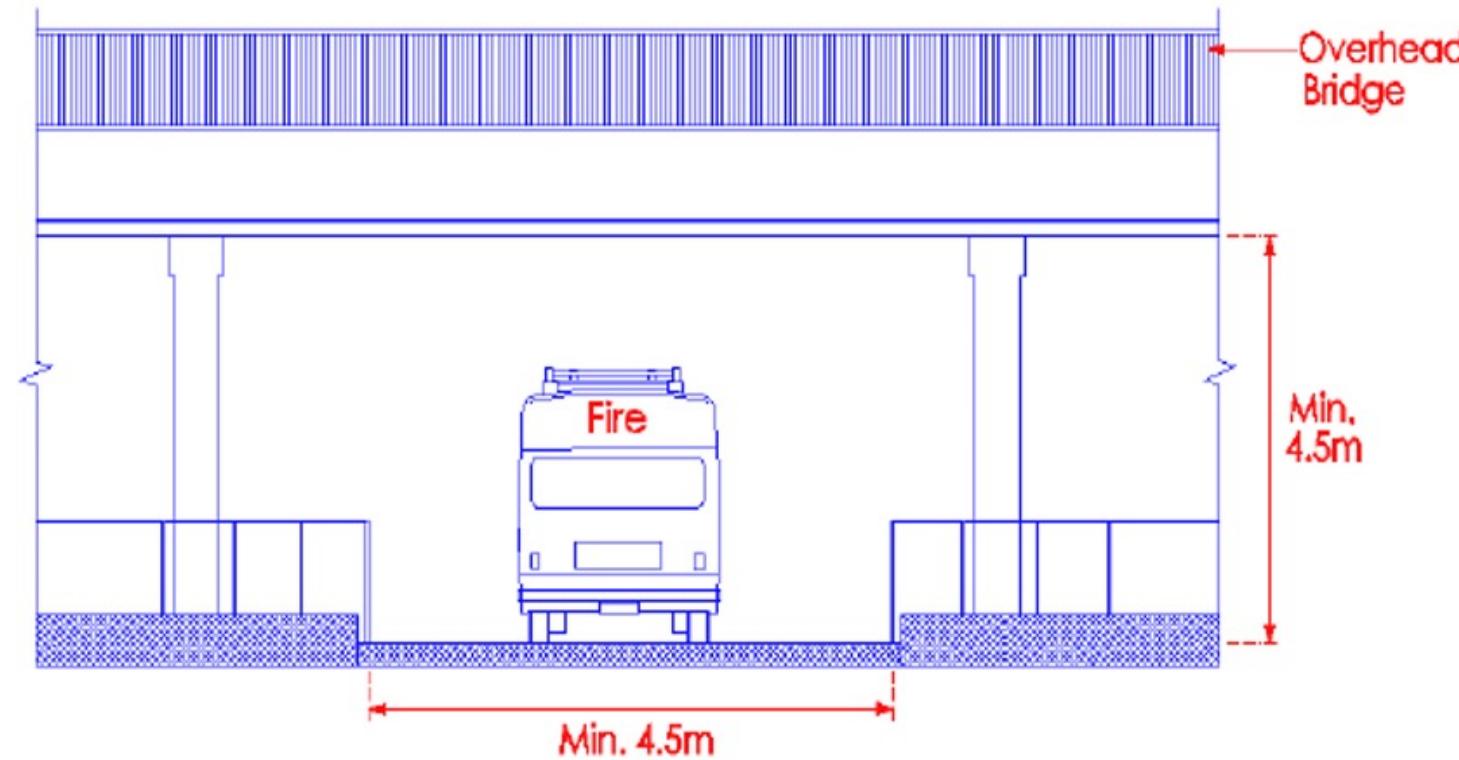


Figure I

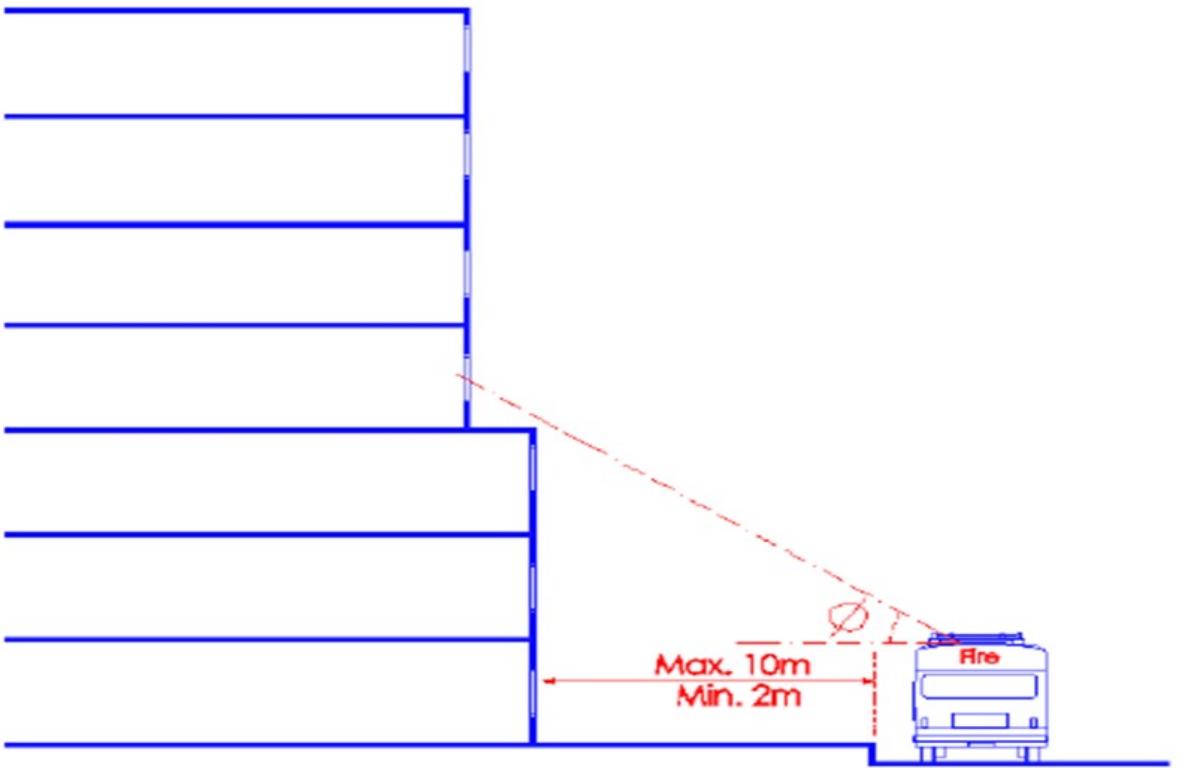


Figure J



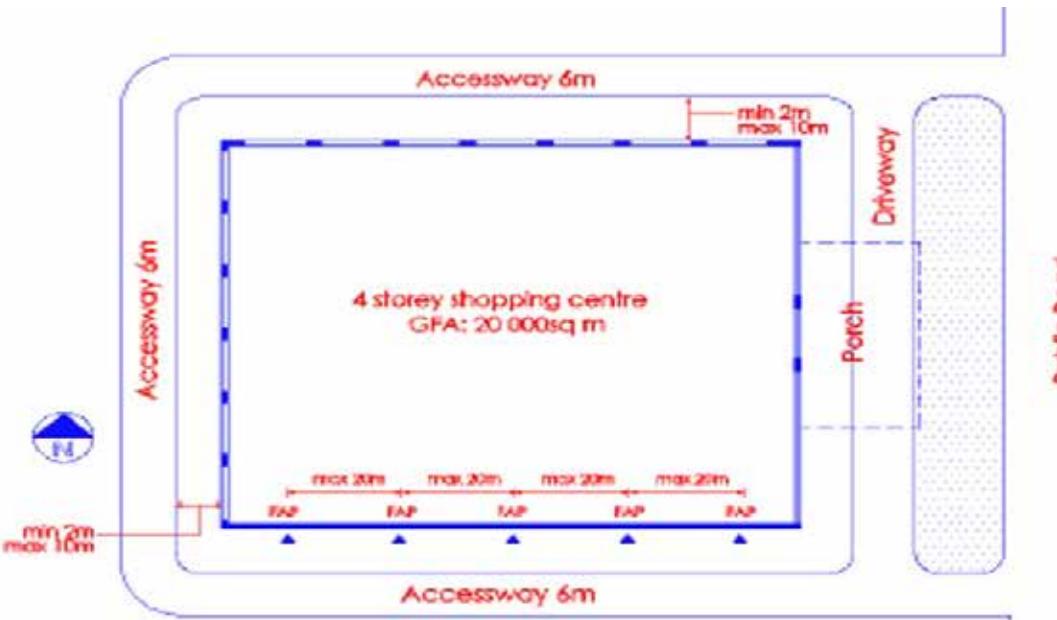


Figure K



▲ FAP - Fireman's Access Panel
AO - Access Opening (eg. Window)

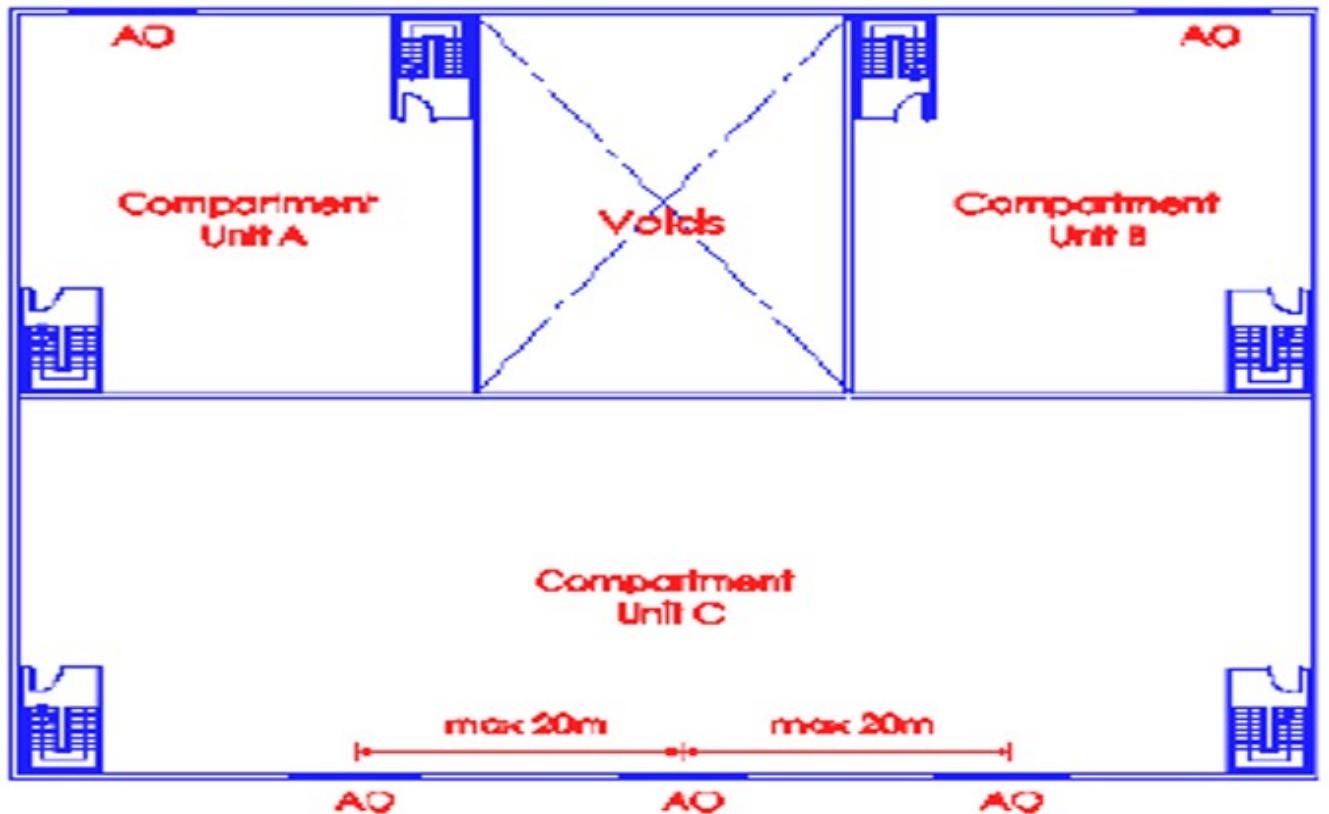


Figure L





FIRE LIFTS / FIRE SERVICE ACCESS ELEVATORS



| FLS FIRE LIFTS / FIRE SERVICE ACCESS ELEVATORS | | |
|--|--|---|
| A4 | Fire and Life Safety (FLS) Requirements Annex_4 | Revisions_2021 |
| Item | Provisions | Notes |
| 1.0 | General. | |
| 1.1 | Every floor of any building shall be served by the required minimum number of fire lifts (FL)/fire service access elevators (FSAE): | |
| 1.1.1 | In any building, in which the habitable height is 28.0 meters or above the lowest level of fire department vehicle access*, and/or | In High-rise Buildings |
| 1.1.2 | The building basement/s is more than 9.0 meters below the lowest level of fire department vehicle access*. | Basement depth >9 m. |
| | * Reference level to measure the basement depth and habitable height. | |
| 1.2 | Fire lifts/fire service access elevators shall be contained within a separate protected shaft. | |
| 1.3 | A lift/elevator mainly intended for the transport of goods shall not be designated as a fire lifts/fire service access elevators. | |
| 2.0 | Minimum Number of Fire Lifts. | |
| 2.1 | In buildings of equal or more than 28.0 m habitable height and/or with basement/s exceeding 9.0 m. below the lowest level of fire department vehicle access, at least one (1) fire lifts/fire service access elevator with minimum 1590 kg and serving the lowest level of fire department vehicle access and all floors above, shall be provided. | One (1) FL in equal or over 28 m. and/or more than 9 m depth basement/s |
| 2.2 | In buildings with an occupied floor over 36.0 m in height above the lowest level of fire department vehicle access, a minimum of two (2) fire lift/fire service access elevators, each having a minimum 1590 kg capacity and serving the lowest level of fire department vehicle access and all floors above, shall be provided to serve as fire service access elevators. | Two (2) FL in 36 m. or more (super high-rise) |
| 2.3 | The fire lifts/fire service access elevator shall be sized and arranged in accordance with the requirements in item 8.0 Ambulance Stretcher Accommodation (ASA) Elevator. | All FL shall be sized as Ambulance Stretcher Accommodation Lift |
| 2.4 | When a minimum of two (2) fire lifts/fire service access elevators are required in 2.2, a minimum of one (1) fire lifts/fire service access elevator shall be provided for every 900 m ² floor area. | When two (2) FL are required provide one (1) FL in every 900 m ² |
| 3.0 | Firefighting Lobby. | |

| Item | Provisions | Notes |
|------------|--|-------|
| 3.1 | Each fire lifts/fire service access elevators shall open into or served at each story by a firefighting lobby. | |
| 3.2 | Where a fire lift/fire service access elevator has two entrances onto a floor, the second entrance shall not be required to open into a firefighting lobby. As a compensatory measure, pressurization shall be provided to the lift/elevator shaft. | |
| 3.3 | The firefighting lobby, considered as part of the smoke proof enclosure (exit stair), shall be enclosed by barrier having 2-hours fire resistance rating with door assemblies of not less than a 1.5 hour fire protection rating and shall be self-closing or automatic closing. | |
| 3.4 | The firefighting lobby shall be pressurized to minimum 10 air changes per hour. | |
| 3.5 | Enclosed firefighting lobby shall not be required at the street floor or level of exit discharge. | |
| 3.6 | Firefighting Lobby floor area shall not be smaller than 6.0m ² and its least side dimension of not less than 2.0 meter clear width. | |
| 4.0 | Access. | |
| 4.1 | Fire lifts/fire service access elevators shall have access to every habitable floor above or below the designated floor. | |
| 4.2 | Fire lifts/fire service access elevators shall be adjacent and have direct access to an exit stair enclosure and be approached by a firefighting lobby at each story. | |
| 5.0 | Operational Features. | |
| 5.1 | Fire lifts/fire service access elevators shall be provided with an operational feature that would enable firemen to cancel first or earlier call which has been inadvertently made to the fire lift during an emergency. For instance, in a fire emergency when any one of the fire detection devices or fire alarm systems is activated, all the passenger lifts shall be brought to the designated floor (usually ground story) and park there with the lift landing doors remaining opened. | |
| 5.2 | Fire lifts/fire service access elevators shall also be provided with an operational feature at the ground story to recall the lift back to the ground floor after fire fighter uses it. | |
| 6.0 | Power Supply. | |
| 6.1 | The power supply to the lift shall be connected to a sub-main circuit exclusive to the lift and independent of any other main or sub-main circuit. The power cables serving the lift installation shall be routed through an area of negligible fire risk. | |



| Item | Provisions | Notes |
|------------|--|---------------|
| 6.2 | The following buildings require the provision of standby generating plant for special emergency operations of fire lift/fire service elevators: | |
| 6.2.1 | Assembly, business, day-care educational, health care, hotel industrial, mercantile and industrial buildings; Residential buildings; | |
| 6.2.2 | Mixed developments where the passenger lifts serve both the residential and non-residential floors. | |
| 7.0 | Fire Lift/Fire Service Access Elevators Symbols. | |
| 7.1 | A pictorial symbol of the standardized design designating which lift/elevator are fire lifts/fire service access elevators shall be installed on each side of the hoist way door frame on the portion of the frame at right angles to the fire fighting lobby. | See Figure A. |
| | Figure A. Fire Lift/Fire Service Access Elevators Symbols. | |
| 7.2 | The fire lifts/fire service access elevators shall comply with the following: | |
| 7.3 | The symbol shall be minimum of 3in. (76 mm) in height. | |
| 7.4 | The vertical centerline of the symbol shall be centered on the hoistway door frame. Each symbol shall be not less than 78 in. (1981 mm) and not more than 84 in. (2134 mm) above the finish floor at the threshold | |
| 8.0 | Ambulance Stretcher Accommodation (ASA) | |
| 8.1 | In buildings with a habitable height of 18m and above, a minimum of one lift/elevator shall be provided for fire fighter emergency operation to all floors. | |
| 8.2 | When fire lifts/fire service access elevators are required, one shall be designated as an Ambulance Stretcher Accommodation. | |
| 8.3 | The elevator car shall be sized and arranged to accommodate a 610 mm × 2130 mm ambulance stretcher with minimum 125-mm radius corners in the horizontal, open position. | |
| 8.4 | The lift/elevator car shall be identified by the international symbol for emergency medical services (star of life). The symbol shall be minimum 3 in. (75 mm) in height and shall be located inside the car on both sides of the door frame. | |



Figure A



Figure B. Star of Life

FIRE (EMERGENCY) COMMAND CENTER



| FIRE (EMERGENCY) COMMAND CENTER | | |
|--|--|-----------------------|
| FLS | Fire and Life Safety (FLS) Requirements Annex_5 | Revisions_2021 |
| Item | Provisions | Notes |
| 1.0 | Application. | |
| 1.1 | A Fire Command Center shall be provided in any High-rise Buildings or buildings that requires any of the following installations: | |
| 1.1.1 | Emergency Voice Communication System; and | |
| 1.1.2 | Smoke Control System. | |
| 1.2 | In other than high-rise Residential Buildings, instead of a dedicated fire rated fire (emergency) command center; lobbies or other spaces adjacent to the main entrance/s may be permitted. | |
| 2.0 | Location. | |
| 2.1 | Fire Command Center shall be located: | |
| 2.1.1 | Adjacent to the fire lift lobby at the designated storey of the building (i.e. the lobby of the building on the ground floor or immediately adjacent thereto) and | |
| 2.1.2 | With safe access from outside and provided with prominently marked exterior entrances. | |
| 2.1.3 | Alternatively at the logical main entrance where the fire response team will report if there is no fire lift in the building. | |
| 3.0 | Equipment. | |
| 3.1 | Fire command centre shall contain control and supervisory equipment/panel in accordance with NFPA 101 and he following: | |
| 3.1.1 | Main Fire Alarm Panel (MFAP) | |
| 3.1.2 | Emergency voice communication control panel. | |
| 3.1.3 | Firefighters' smoke-control station (NFPA 92A). | |
| 4.0 | Size | |
| 4.1 | Fire Command Center shall be adequately size to house all above-mentioned equipment and a free working space of at least 9 m ² minimum area (least dimension 2.5 m) with at least with 1 m unobstructed clearance from all equipment. | |
| 5.0 | Compartment. | |

| Item | Provisions | Notes |
|------|--|---------------------|
| 5.1 | Fire Command Center shall have not less than 2 hours fire resistance separation from other parts of the building. | |
| 6.0 | Emergency Lighting and Power. | |
| 6.1 | Fire Command Centre shall be provided with emergency lighting in accordance with NFPA 101 and 70. All lighting and equipment essential for emergency operation in the centre shall also be connected to secondary power supply by fire resistant cables complying with NFPA 70. | |
| 7.0 | Ventilation Systems. | |
| 7.1 | Air-conditioning or Mechanical Ventilation (ACMV) where required for the Fire Command Centre shall be provided with secondary power supply and shall have ductwork independent of any other ductwork serving other parts of the building. Any part of the supply duct running outside the Fire Command Centre which it serves shall either be enclosed or constructed to give a fire resistance rating of at least 2-hours. The minimum outdoor air supply in non-air-conditioned Fire Command Centre shall be 6 air-changes per hour. | |
| 8.0 | Services. | Star of Life |
| 8.1 | Services and equipment not serving the Fire Command Centre shall not pass through the center. | |





FIRE PUMPS



| FLS_A6 | | FIRE PUMPS | |
|------------|---|--|----------------|
| | | Fire and Life Safety (FLS) Requirements Annex_A6 | Revisions_2021 |
| Item | Provisions | | Notes |
| 1.0 | Certifications and QCD Approvals | | |
| 1.1 | Fire pump equipment must be listed and certified by a 3rd party. The certification must be based on a scheme which includes continual surveillance of the manufacturing plant where the fire pumps are manufactured and assembled. Where fire pumps are assembled at a different plant to where they are manufactured then the assembly plant must also be included within the certification and surveillance scheme. | | |
| 1.2 | Fire pump equipment relied upon for satisfaction of fire safety requirements and regulations must be submitted to the QCD for review and approval. On approval a QCD certificate for the fire pump will be issued to the submitting party. | | |
| 2.0 | Applications Fire pumps must be provided for all buildings and structures where firefighting systems are required and installed to ensure adequate flows of water at the minimum required pressures are maintained for the duration of the firefighting operations. | | |
| 3.0 | Installations | | |
| 3.1 | All fire pumps installations must be designed to operate under the conditions of loss of primary power source and mechanical failure. | | |
| 3.2 | A fire pump installation comprising a duty electric motor driven pump with a standby diesel engine driven pump is deemed to satisfy this requirement. | | |
| 3.3 | All fire pump configurations are subject to review and specific approval from the QCD is required. | | |
| 4.0 | All equipment associated with pump installations must be approved by QCD. | | |
| 5.0 | All fire pumps must be capable of providing at least 150% of the required minimum firefighting water flow at not less than 65% of the minimum pressure required. | | |
| 6.0 | Flow meter | | |
| 6.1 | A listed approved flow meter must be provided for each fire pump installation. The flow meter must be installed in accordance with the manufacturer's recommendations and within the listing limitations. | | |
| 6.2 | The measurable flow range of the meter must be at least 200% of the minimum required flow. | | |

| Item | Provisions | Notes |
|------|--|-------|
| 6.3 | The flow meter must be installed such that its indicator/dial/gauge can be easily seen and read without the aid of step ladders, scaffolding or other lifting equipment. | |
| 6.4 | The flow meter must be a permanent installation and must not be removed after initial testing and setting into operation of the system. | |
| 7.0 | <p>Pump Performance Curves</p> <p>A performance curve showing the pumps delivery flows and pressure together with the system demand curve must be provided for each installation. The intersection must be the design delivery of the pump system.</p> | |
| | | |
| 8.0 | Fire Pump Room | |
| 8.1 | Fire pumps must be enclosed in their own dedicated pump room. | |
| 8.2 | Maintain 0.8 meter working spaces inside the fire pump room. | |
| 8.3 | Least side dimension shall be 3 meters (4 meters in basement). | |
| 8.4 | Minimum vertical clearance shall be 2.6 meters. | |
| 8.5 | Add note in life safety plan stating that it's necessity to submit the modification plan in case of increase the size of the pump | |
| 8.6 | In high rise buildings, the fire pumps' room enclosure must have a 2-hours fire resistance rating and 1.5-hour openings protection (doors, windows and penetrations). | |
| 8.7 | Indoor fire pump room enclosures must have not less than 2-hours fire resistance rating and 1.5-hour openings protection (doors, windows and penetrations). | |
| 8.8 | In other than high-rise buildings, the fire pumps' room enclosure must have a 1 hour fire resistance rating for throughout sprinkler protected both building and the fire pump room | |
| 8.9 | A separate fire pump building that is physically separated of at least 15.3 m away from any buildings or fire exposures and complying with the required protection for outdoor installations, shall not be required to be within a fire resistance rated enclosures. | |
| 8.10 | Sprinkler required in fire pump buildings or rooms enclosing diesel engine pump drivers and day tanks. | |
| 9.0 | Ventilation | |
| 9.1 | Where located within a building, a separate and dedicated ventilation system must be provided for the fire pump room. | |
| 9.2 | The ventilation system must draw fresh air directly from outside the building. | |



| Item | Provisions | Notes |
|-------------|---|-------|
| 9.3 | Exhaust fans must be rated for hot gasses at 250°C for 2 hours. | |
| 9.4 | Power supplies for the exhaust fans must be from the Class 1 central emergency generator through fire rated cables having a minimum 2 hour fire resistance rating. | |
| 10.0 | Access and Location. | |
| 10.1 | Safe direct access from outside the building must be provided for the fire pump room. | |
| 10.2 | Exhaust fans must be rated for hot gasses at 250°C for 2 hours. | |
| 10.3 | Designated access within 3m from the fire pump room door, provided the access (stair) is protected and discharge directly to the building external. | |
| 10.4 | Add a marker indicating the location of the pump in the building and how to access to it. | |
| 10.5 | Fire pump room shall be located where safe and direct access from the building external can be achieved. When in basement, the fire pump room shall be located not lower than one (1) basement depth. | |

ELECTRICAL ROOMS



| FLS_A7 ELECTRICAL ROOMS | | |
|--|--|---|
| Revisions_2021 | | Notes |
| Item | Provisions | |
| 1.0 | The minimum requirements shall apply to the following: (Electrical Equipment/Panel and Similar rooms/spaces not limited to the following:) | |
| 1.1 | Communications Rooms | |
| 1.2 | Extra-Low Voltage – ELV Rooms | |
| 1.3 | Computer / IT Rooms | |
| 1.4 | Server Rooms | |
| 1.5 | Electrical/EE Rooms | |
| 1.6 | Closed-Circuit Television – CCTV Rooms | |
| 1.7 | Electrical Meter Rooms | |
| 2.0 | Electrical Equipment/Panel and Similar Rooms/Spaces: | |
| 2.1 | FOR BUILDINGS OR PORTIONS OF BUILDING NOT REQUIRED WITH SPRINKLER PROTECTION: Electrical equipment/panel and similar rooms shall be protected with automatic fire extinguishing system (wet or other type) if: | |
| 2.1.1 | 1-hr fire resistance rated enclosures regardless of room size. | |
| 2.1.2 | 2-hrs fire resistance rated enclosures and not compliant with the conditions below item no. 2.2 (exemption for automatic fire extinguishing provision), regardless of room size. | |

| Item | Provisions | Notes |
|-------|--|-------|
| 2.2 | <p>Exemption for Automatic Fire Extinguishing Provision: Automatic Fire Extinguishing System (Wet or other type) shall not be required in electrical equipment/ panel and similar rooms/spaces where all of the following conditions are met:</p> | |
| 2.2.1 | The room is dedicated to electrical equipment only. | |
| 2.2.2 | Only dry-type electrical equipment is used. | |
| 2.2.3 | Equipment is installed in a 2-hour fire-rated enclosure including protection for penetrations. 1.5-hr fire protection rated openings shall be provided. | |
| 2.2.4 | Storage is not permitted within the room. | |
| 2.3 | <p>FOR BUILDING/S REQUIRED WITH THROUGHOUT SPRINKLER PROTECTION: Electrical equipment/panel and similar rooms shall be protected with automatic fire extinguishing system (wet or other type) and shall be enclosed within a minimum of 1-hr fire resistance rating.</p> | |
| 2.4 | Other Requirements: | |
| 2.4.1 | Electrical panel/s including exposed cable conduits located along exit access, shall be within a fire rated assemblies (closet/cabinet) of 1-hour fire resistance rating and 3/4-hr openings protection. | |
| 2.4.2 | Electrical Meters including exposed cable conduits located along exit access, shall be within a fire rated assemblies (closet/cabinet) of 1-hour fire resistance rating and 3/4-hr openings protection. | |





QCD-QATAR CIVIL DEFENCE AND KAHRAMAA LOSS PREVENTION SYSTEM: SUBSTATIONS - ELECTRICITY AND DISTRIBUTION NETWORKS



| FLS | QCD-QATAR CIVIL DEFENCE AND KAHRAMAA LOSS PREVENTION SYSTEM: SUBSTATIONS - ELECTRICITY AND DISTRIBUTION NETWORKS | | | | | | |
|------|--|--|--------------------------------|--|---|---|--|
| A8 | Fire and Life Safety (FLS) Requirements Annex_8 | | | | | | Revisions_2021 |
| Item | Type of Sub-station and Equipment | Location on Site or Property | Room / Space | Fire and Loss Prevention (LP) Requirements | | | Other Loss Prevention Requirements |
| | | | | Fire Protection System | Wall Enclosures (hrs/ mins) | Opening Protectives (hrs/mins) | |
| 1.0 | PUBLIC Distribution Substation | | | | | | |
| 1.1 | INDOOR Distribution Substation: VCB-OCB + TX (Oil Type + Dry Type for future use) + FP | Located in Open Area; Separated or Attached with Neighbors, subject to Site condition | MV/HV SWITCHGEAR / PANEL ROOMS | PFE-Portable Fire Extinguishers: 2-nos Clean Agent or CO, 10lbs | 2-hrs (120mins) FRR fire rated enclosures and separation (wall) from adjacent rooms or spaces. | 1.5-hrs (90mins) FPR (Doors, Windows and Penetrations) No requirement if openings are fronting a public open space or street and separated by not less than 6 m from other buildings. G.I. Steel Door, with Sand Trap Ventilator shall be provided. | (1) Exit/Safety Signs (Arabic & English format); (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials. (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated. Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall. |

| Item | Type of Sub-station and Equipment | Location on Site or Property | Room / Space | Fire and Loss Prevention (LP) Requirements | | | |
|------|---|--|-----------------------|---|---|--|---|
| | | | | Fire Protection System | Wall Enclosures (hrs/ mins) | Opening Protectives (hrs/mins) | Other Loss Prevention Requirements |
| | PUBLIC Distribution Substation | | | | | | |
| 1.1 | INDOOR Distribution Substation: VCB-OCB + TX (Oil Type + Dry Type for future use) + FP | Located in Open Area; Separated or Attached with Neighbors, subject to Site condition | TRANSFORMER (TX) ROOM | PFE-Portable Fire Extinguishers: 2-nos Dry Chemical, 10lbs | 2-hrs (120mins) FRR fire rated & blast proof enclosures and separation (wall) from adjacent rooms or spaces. No requirement, if external walls are fronting a public open space or street. No requirement, if located 15 m away from any building or structures. | 1.5-hrs (90mins) FPR fire rated & blast proof Doors, Windows and fire rated penetrations. No requirement if openings are fronting a public open space or street and separated by not less than 6 m from other buildings. G.I. Steel Door, with Sand Trap Ventilator shall be provided. No requirement, if located 15 m away from any building or structures. | (1) Exit/Safety Signs (Arabic & English format); (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials. (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated. Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall. |



| Item | Type of Sub-station and Equipment | Location on Site or Property | Room / Space | Fire and Loss Prevention (LP) Requirements | | | |
|------|---|--|--------------------------------|--|---|--|---|
| | | | | Fire Protection System | Wall Enclosures (hrs/ mins) | Opening Protectives (hrs/mins) | Other Loss Prevention Requirements |
| | PUBLIC Distribution Substation | | | | | | |
| 1.2 | OUTDOOR Distribution Substation: Outdoor Switchgears (RMU [Oil or SF6] - F Swt - TX Swt.] + TX [Oil Type + Dry Type for future use] + FP | Located in Open Area; Separated or Attached with Neighbors, subject to Site condition | MV/HV SWITCHGEAR / PANEL ROOMS | PFE-Portable Fire Extinguishers: 2-nos Clean Agent or CO ₂ , 10lbs | 2-hrs (120mins) FRR fire rated enclosures and separation (wall) from adjacent rooms or spaces. No requirement, if external walls are fronting a public open space or street. No requirement, if located 15 m away from any building or structures. | 1.5-hrs (90mins) FPR (Doors, Windows and Penetrations) No requirement if openings are fronting a public open space or street and separated by not less than 6 m from other buildings. G.I. Steel Door, with Sand Trap Ventilator shall be provided. No requirement, if located 15 m away from any building or structures. | (1) Exit/Safety Signs (Arabic & English format); (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials. (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated. Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall. |

| Item | Type of Sub-station and Equipment | Location on Site or Property | Room / Space | Fire and Loss Prevention (LP) Requirements | | | |
|------|---|--|-----------------------|---|---|--|---|
| | | | | Fire Protection System | Wall Enclosures (hrs/ mins) | Opening Protectives (hrs/mins) | Other Loss Prevention Requirements |
| | PUBLIC Distribution Substation | | | | | | |
| 1.2 | OUTDOOR Distribution Substation: Outdoor Switchgears (RMU [Oil or SF6] - F Swt - TX Swt.] + TX [Oil Type + Dry Type for future use] + FP | Located in Open Area; Separated or Attached with Neighbors, subject to Site condition | TRANSFORMER (TX) ROOM | PFE-Portable Fire Extinguishers: 2-nos Dry Chemical, 10lbs | 2-hrs (120mins) FRR fire rated & blast proof enclosures and separation (wall) from adjacent rooms or spaces. No requirement, if external walls are fronting a public open space or street. No requirement, if located 15 m away from any building or structures. | 1.5-hrs (90mins) FPR fire rated & blast proof Doors, Windows and fire rated penetrations. No requirement if openings are fronting a public open space or street and separated by not less than 6 m from other buildings. G.I. Steel Door, with Sand Trap Ventilator shall be provided. No requirement, if located 15 m away from any building or structures. | (1) Exit/Safety Signs (Arabic & English format); (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials. (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated. Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall. |



| Item | Type of Sub-station and Equipment | Location on Site or Property | Room / Space | Fire and Loss Prevention (LP) Requirements | | | |
|------|--|---|----------------------|--|-----------------------------|--------------------------------|------------------------------------|
| | | | | Fire Protection System | Wall Enclosures (hrs/ mins) | Opening Protectives (hrs/mins) | Other Loss Prevention Requirements |
| | PUBLIC Distribution Substation | | | | | | |
| 1.3 | PACKAGE Substation: RMU (Oil or SF6) + TX (Oil Type) + FSFP | No Civil Building (Steel Enclosures only) | N/A - Not applicable | N/A - Not applicable | N/A - Not applicable | N/A - Not applicable | N/A - Not applicable |

| Item | Type of Sub-station and Equipment | Location on Site or Property | Room / Space | Fire and Loss Prevention (LP) Requirements | | | |
|------|---|--|--------------------------------|--|---|---|--|
| | | | | Fire Protection System | Wall Enclosures (hrs/ mins) | Opening Protectives (hrs/mins) | Other Loss Prevention Requirements |
| | PUBLIC Distribution Substation | | | | | | |
| 1.4 | SWITCHING Stations: Indoor Switchgears (VCB-OCB) or Outdoor Switchgears (RMU) (Oil or SF6) | Located in Open Area; Separated or Attached with Neighbors, subject to Site condition | MV/HV SWITCHGEAR / PANEL ROOMS | PFE-Portable Fire Extinguishers: 2-nos Clean Agent or CO ₂ , 10lbs | 2-hrs (120mins) FRR fire rated enclosures and separation (wall) from adjacent rooms or spaces. No requirement, if external walls are fronting a public open space or street. No requirement, if located 15 m away from any building or structures. | 1.5-hrs (90mins) FPR Doors, Windows and Penetrations. No requirement if openings are fronting a public open space or street and separated by not less than 6 m from other buildings. G.I. Steel Door, with Sand Trap Ventilator shall be provided. No requirement, if located 15 m away from any building or structures. | (1) Exit/Safety Signs (Arabic & English format); (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials. (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated. Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall. |



| Item | Type of Sub-station and Equipment | Location on Site or Property | Room / Space | Fire and Loss Prevention (LP) Requirements | | | |
|------|---|--|-----------------------|---|---|--|--|
| | | | | Fire Protection System | Wall Enclosures (hrs/ mins) | Opening Protectives (hrs/mins) | Other Loss Prevention Requirements |
| | PUBLIC Distribution Substation | | | | | | |
| 1.5 | REMOTE Stations (GMT): Ground Mounted TX (Oil Type + Dry Type for future use) + FP | Located in Open Area; Separated or Attached with Neighbors, subject to Site condition | TRANSFORMER (TX) ROOM | PFE-Portable Fire Extinguishers: 1-no. Dry Chemical, 10lbs | 2-hrs (120mins) FRR fire rated & blast proof enclosures and separation (wall) from adjacent rooms or spaces. No requirement, if external walls are fronting a public open space or street. No requirement, if located 15 m away from any building or structures. | 1.5-hrs (90mins) FPR fire rated & blast proof Doors, Windows and fire rated penetrations. No requirement if openings are fronting a public open space or street and separated by not less than 6 m from other buildings. G.I. Steel Door, with Sand Trap Ventilator shall be provided. No requirement, if located 15 m away from any building or structures. | (1) Exit/Safety Signs (Arabic & English format); (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials. (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated. Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall. |

| Item | Type of Sub-station and Equipment | Location on Site or Property | Room / Space | Fire and Loss Prevention (LP) Requirements | | | |
|------|--|---|----------------------|--|-----------------------------|--------------------------------|------------------------------------|
| | | | | Fire Protection System | Wall Enclosures (hrs/ mins) | Opening Protectives (hrs/mins) | Other Loss Prevention Requirements |
| | PUBLIC Distribution Substation | | | | | | |
| 1.6 | REMOTE Stations (PMT): Pole Mounted Tx. (Oil Type) 200 KVa | No Civil Building (Steel Enclosures only) | N/A - Not applicable | N/A - Not applicable | N/A - Not applicable | N/A - Not applicable | N/A - Not applicable |



| Item | Type of Sub-station and Equipment | Location on Site or Property | Room / Space | Fire and Loss Prevention (LP) Requirements | | | |
|------------|---|---|---|---|---|---|---|
| | | | | Fire Protection System | Wall Enclosures (hrs/ mins) | Opening Protectives (hrs/mins) | Other Loss Prevention Requirements |
| 2.0 | CONSUMER DISTRIBUTION SUBSTATION | | | | | | |
| 2.1 | INDOOR Distribution Substation: VCB-OCB + TX (Oil Type + Dry Type) + FP + MV Panel | Located outside (detached) or within or attached to consumer building, in either Ground (GF) or Basement Level, subject to the Project type | A/G (Aboveground) MV/HV SWITCHGEAR / PANEL ROOMS | PFE-Portable Fire Extinguishers, 1-no. Clean Agent or CO ₂ , 10lbs | 3-hrs (180mins) FRR fire rated enclosures. | 3-hrs (180mins) FPR: Doors, Windows & Penetrations. No requirement, if located 15 m away from any building or structures. | (1) Exit/Safety Signs (Arabic & English format); (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials. (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated. Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall. |

| Item | Type of Sub-station and Equipment | Location on Site or Property | Room / Space | Fire and Loss Prevention (LP) Requirements | | | |
|----------------------------------|---|---|---|--|---|---|---|
| | | | | Fire Protection System | Wall Enclosures (hrs/ mins) | Opening Protectives (hrs/mins) | Other Loss Prevention Requirements |
| CONSUMER Distribution Substation | | | | | | | |
| 2.1 | INDOOR Distribution Substation: VCB-OCB + TX (Oil Type + Dry Type) + FP + MV Panel | Located outside (detached) or within or attached to consumer building, in either Ground (GF) or Basement Level, subject to the Project type | A/G (Aboveground) TRANSFORMER (TX) ROOM | PFE-Portable Fire Extinguishers, 2-nos Dry Chemical, 10lbs | 3-hrs (180mins) FRR fire rated & blast proof enclosures and separation (wall) from adjacent rooms or spaces. No requirement, if external walls are fronting a public open space or street. No requirement, if located 15 m away from any building or structures. | 3-hrs (180mins) FPR fire rated & blast proof Doors, Windows and fire rated Penetrations. No requirement if openings are fronting a public open space or street and separated by not less than 6 m from other buildings. G.I. Steel Door, with Sand Trap Ventilator shall be provided. No requirement, if located 15 m away from any building or structures. | (1) Exit/Safety Signs (Arabic & English format); (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials. (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated. Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall. |



| Item | Type of Sub-station and Equipment | Location on Site or Property | Room / Space | Fire and Loss Prevention (LP) Requirements | | | |
|------|---|---|---|---|---|---|---|
| | | | | Fire Protection System | Wall Enclosures (hrs/ mins) | Opening Protectives (hrs/mins) | Other Loss Prevention Requirements |
| | CONSUMER Distribution Substation | | | | | | |
| 2.1 | INDOOR Distribution Substation: VCB-OCB + TX (Oil Type + Dry Type) + FP + MV Panel | Located outside (detached) or within or attached to consumer building, in either Ground (GF) or Basement Level, subject to the Project type | U/G (Underground) MV/HV SWITCHGEAR / PANEL ROOMS | FM200 or Inert Gas Fire Suppression System PFE-Portable Fire Extinguishers, 1-no. Clean Agent or CO ₂ , 10lbs | 2-hrs (120mins) FRR fire rated enclosures. | 1.5-hrs (90mins) FPR: Doors, Windows & Penetrations. | (1) Exit/Safety Signs (Arabic & English format); (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials. (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated. |
| | CONSUMER Distribution Substation | | | | | | |
| 2.1 | INDOOR Distribution Substation: VCB-OCB + TX (Oil Type + Dry Type) + FP + MV Panel | | U/G (Underground) TRANSFORMER (TX) ROOM | FM200 or Inert Gas Fire Suppression System PFE-Portable Fire Extinguishers, 1-no. Clean Agent or CO ₂ , 10lbs | 2-hrs (120mins) FRR fire rated enclosures. | 1.5-hrs (90mins) FPR: Doors, Windows & Penetrations. | (1) Exit/Safety Signs (Arabic & English format); (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials. (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated. |

| Item | Type of Sub-station and Equipment | Location on Site or Property | Room / Space | Fire and Loss Prevention (LP) Requirements | | | |
|------|---|--|--|---|--|---|--|
| | | | | Fire Protection System | Wall Enclosures (hrs/ mins) | Opening Protectives (hrs/mins) | Other Loss Prevention Requirements |
| | CONSUMER Distribution Substation | | | | | | |
| 2.2 | OUTDOOR Distribution Substation: Outdoor Switchgears (RMU [Oil or SF6] - F Swt - TX Swt.] + TX [Oil Type + Dry Type] + FP + MV Panel | Located outside (detached) or within or attached to consumer building, at Ground Level (GF), | A/G (Aboveground) MV/HV SWITCHGEAR / PANEL ROOMS | PFE-Portable Fire Extinguishers, 1-no. Clean Agent or CO ₂ , 10lbs | 3-hrs (180mins) FRR fire rated enclosures. No requirement, if located 15 m away from any building or structures. | 3-hrs (180mins) FPR: Doors, Windows & Penetrations. No requirement, if located 15 m away from any building or structures. | (1) Exit/Safety Signs (Arabic & English format); (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials. (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated. Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall. |



| Item | Type of Sub-station and Equipment | Location on Site or Property | Room / Space | Fire and Loss Prevention (LP) Requirements | | | |
|----------------------------------|---|--|---|--|---|---|---|
| | | | | Fire Protection System | Wall Enclosures (hrs/ mins) | Opening Protectives (hrs/mins) | Other Loss Prevention Requirements |
| CONSUMER Distribution Substation | | | | | | | |
| 2.2 | OUTDOOR Distribution Substation: Outdoor Switchgears (RMU [Oil or SF6] - F Swt - TX Swt.] + TX [Oil Type + Dry Type] + FP + MV Panel | Located outside (detached) or within or attached to consumer building, at Ground Level (GF), | A/G (Aboveground) TRANSFORMER (TX) ROOM | PFE-Portable Fire Extinguishers, 2-nos Dry Chemical, 10lbs | 3-hrs (180mins) FRR fire rated & blast proof enclosures and separation (wall) from adjacent rooms or spaces. No requirement, if external walls are fronting a public open space or street. No requirement, if located 15 m away from any building or structures. | 3-hrs (180mins) FPR fire rated & blast proof Doors, Windows and fire rated Penetrations. No requirement if openings are fronting a public open space or street and separated by not less than 6 m from other buildings. G.I. Steel Door, with Sand Trap Ventilator shall be provided. No requirement, if located 15 m away from any building or structures. | (1) Exit/Safety Signs (Arabic & English format); (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials. (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated. Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall. |

| Item | Type of Sub-station and Equipment | Location on Site or Property | Room / Space | Fire and Loss Prevention (LP) Requirements | | | |
|------|--|--|----------------------|--|-----------------------------|--------------------------------|------------------------------------|
| | | | | Fire Protection System | Wall Enclosures (hrs/ mins) | Opening Protectives (hrs/mins) | Other Loss Prevention Requirements |
| | CONSUMER Distribution Substation | | | | | | |
| 2.3 | PACKAGE Substation: RMU (Oil or SF6) + TX (Oil Type) + FSFP | Steel Enclosures only. Located outside, sometimes within consumer building (GF) in very limited cases where suitable height available 5-6 m. | N/A - Not applicable | N/A - Not applicable | N/A - Not applicable | N/A - Not applicable | N/A - Not applicable |



| Item | Type of Sub-station and Equipment | Location on Site or Property | Room / Space | Fire and Loss Prevention (LP) Requirements | | | |
|----------------------------------|---|--|--------------------------------|---|---|---|---|
| | | | | Fire Protection System | Wall Enclosures (hrs/ mins) | Opening Protective (hrs/mins) | Other Loss Prevention Requirements |
| CONSUMER Distribution Substation | | | | | | | |
| 2.4 | SWITCHING Stations: Indoor Switchgears (VCB-OCB) or Outdoor Switchgears (RMU) (Oil or SF6) | Located outside (detached) or within or attached to consumer building, at Ground Level (GF), subject to the Project type | MV/HV SWITCHGEAR / PANEL ROOMS | PFE-Portable Fire Extinguishers: 2-nos Clean Agent or CO ₂ , 10lbs | 3-hrs (180mins) FRR fire rated enclosures and separation (wall) from adjacent rooms or spaces. No requirement, if located 15 m away from any building or structures. | 3-hrs (180mins) FPR Doors, Windows and Penetrations. No requirement, if located 15 m away from any building or structures. | (1) Exit/Safety Signs (Arabic & English format); (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials. (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated. Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall. |

| Item | Type of Sub-station and Equipment | Location on Site or Property | Room / Space | Fire and Loss Prevention (LP) Requirements | | | |
|------|--|--|---|--|--|--|---|
| | | | | Fire Protection System | Wall Enclosures (hrs/ mins) | Opening Protectives (hrs/mins) | Other Loss Prevention Requirements |
| | CONSUMER Distribution Substation | | | | | | |
| 2.5 | REMOTE Stations (GMT): Ground Mounted TX (Oil Type + Dry Type) + FP + MV Panel TX capacity: 500-800-1000-1250-1600 Kva | Located outside (detached) or within or attached consumer building, at Ground Level (GF) or Basement or High Floor, subject to the project type. | A/G (Aboveground) TRANSFORMER (TX) ROOM | Fire Alarm System + PFE, 2-nos Dry Chemical, 10lbs | 3-hrs (180mins) FRR fire rated & blast proof enclosures and separation (wall) from adjacent rooms or spaces. No requirement, if external walls are fronting a public open space or street. No requirement, if located 15 m away from any building or structures. | 3-hrs (180mins) FPR fire rated & blast proof Doors, Windows and fire rated Penetrations. No requirements if openings are fronting a public open space or street and separated by not less than 6 m from other buildings. G.I. Steel Door, with Sand Trap Ventilator shall be provided. No requirement, if located 15 m away from any building or structures. | (1) Exit/Safety Signs (Arabic & English format); (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials. (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated. Above Point 2 & 3 shall not be applicable in case the substation is located 15 m away from any building or structure as there is no requirement of fire rated enclosure and separation wall. |



| Item | Type of Sub-station and Equipment | Location on Site or Property | Room / Space | Fire and Loss Prevention (LP) Requirements | | | |
|------|--|----------------------------------|---|---|---|---|---|
| | | | | Fire Protection System | Wall Enclosures (hrs/ mins) | Opening Protectives (hrs/mins) | Other Loss Prevention Requirements |
| | CONSUMER Distribution Substation | | | | | | |
| 2.5 | REMOTE Stations (GMT): Ground Mounted TX (Oil Type + Dry Type) + FP + MV Panel TX capacity: 500-800-1000-1250-1600 Kva | | U/G (Underground) TRANSFORMER (TX) ROOM | FM200 or Inert Gas Fire Suppression System PFE-Portable Fire Extinguishers, 1-no. Clean Agent or CO ₂ , 10lbs | 2-hrs (120mins) FRR fire rated enclosures. | 1.5-hrs (90mins) FPR: Doors, Windows & Penetrations. | (1) Exit/Safety Signs (Arabic & English format); (2) Penetrations of FRR fire rated enclosure & separation walls shall be sealed with fire resistant materials. (3) Mechanical sleeves (fire-rated, gas sealed & water-proof) provided at all cables entries and exits of wall. Not applicable (N/A) in areas where cable entry in substation by sand backfill and underground excavated. |
| | CONSUMER Distribution Substation | | | | | | |
| 2.6 | REMOTE Stations (PMT): Pole Mounted Tx. (Oil Type) 200 Kva | No Civil Building (On Pole only) | N/A - Not applicable | N/A - Not applicable | N/A - Not applicable | N/A - Not applicable | N/A - Not applicable |

NOTES.

| | |
|----|--|
| 1) | Fire safety signs shall be provided in both Arabic and English text. |
| 2) | Stand alone substations or those not part, within or attached to the building or structure and is 15.0 m away from any building or structure in the same or adjacent property, shall as a minimum, be provided the appropriate type and quantity of portable fire extinguishers in accordance with NFPA 10 for its fire suppression requirement. |
| 3) | Fire fighting, fire detection and fire alarm provisions of the substation shall be in accordance with QCDD requirements. |
| 4) | Fixed-or permanently opened wall openings (such as louvers, unprotected doors and unprotected windows, etc.) shall NOT be permitted. All penetrations on fire rated walls shall be sealed by fire resistant materials. |
| 5) | The Consultant/contractor shall comply with all the Fire and Loss Prevention requirements stated here in this document when applying for Substation approvals at QCD. The review and evaluation of Fire and Life Safety Plans and the conduct of inspection for the issuance of Fire Safety Certificate for Substations, shall be based on the Fire and Loss Prevention requirements stated in this document. The requirements stipulated in this document shall not be construed as KAHRAMAA (KM) requirement/s. Any additional Loss Prevention requirements not stated in this document will solely be under KM jurisdiction. QCDD and KAHRAMAA approvals shall be separate. |

LEGENDS.

| | | | |
|---------------|------------------------|-------------|-----------------------------------|
| A/G | Above Ground | FSFP | Free Standing Feeder Pillar |
| U/G | Under Ground | BOFP | Bolt On Feeder Pillar |
| B/W | Between | MV | Medium Voltage |
| N/A | Not Applicable | HV | High Voltage |
| VCB | Vacuum Circuit Breaker | FRR | Fire Resistance rating |
| OCB | Oil Circuit Breaker | FPR | Fire Protection Rating |
| RMU | Ring Main Unit | GF | Ground Floor |
| F SWT | Feeder Switch | PFE | Portable Fire Extinguishers |
| TX SWT | Transformer Switch | CO | Carbon Dioxide |
| TX | Transformer | AFSS | Automatic Fire Suppression System |
| FP | Feeder Pillar | | |





FIRE FIGHTING SYSTEM

NOTES



| FIREFIGHTING SYSTEM | | |
|---------------------|---|----------------|
| | Annex_FFS Notes | Revisions_2021 |
| Item | Provisions | Notes |
| 1.0 | Sprinklers maybe required in some building configurations based on the life safety assesment. (for example non compliance to travel distance limits . Or the Commodities in the building exceeded the MAQ and so on...). | |
| 2.0 | Fire Blanket shall be required on all kitchens and pantries with cooking appliance. | |
| 3.0 | Fifty(50)kg. Wheeled/Trolley type applicable fire extinguisher shall be required on all non-sprinklered industrial and storage occupancies with areas exceeding 100 m² | |
| 4.0 | Refers to sprinkler protection only (other system can be used as alternative). Comply with NFPA 13 for all other requirements not specified in this guidelines. | |
| 5.0 | Standpipe system to be used by fire department. Shall comply with NFPA 14 for all other requirements not specified in this guidelines. | |
| 5.1 | Maximum number of landing valves or outlet per floor : 100Ømm dia. Riser - two(2) 65Ømm outlets; 150Ømm dia. riser - four (4) 65Ømm outlets. | |
| 5.2 | Minimum flow at outlet : 250 gpm @ 100psi | |
| 5.3 | Breeching inlet or Fire Dept Connection shall be connected on the system side of the fire water supply check valve: 150Ømm - 4 way type (150Ø x 4-65Ø inlets); 100Ømm - 2 way type (100Ømm x 2-65Ømm inlets) (siamese type). | |
| 6.0 | Refers to 25mmØ hose reel to be used by occupants. Comply with NFPA 14 for all other requirements not specified in this guidelines, Min. @ 65psi | |
| 6.1 | Hose reel system only : 65Ømm (min.) riser to serve up to max. 4-hose reels per floor. | |
| 6.2 | Hose reels shall be connected in crossmains after the floor/zone control valve assembly(equiped with water flow switch) in sprinklered buildings. | |
| 6.3 | Provide on all floors when the building or portions of the building is protected with an automatic sprinkler system.. | |
| 7.0 | Fire pumps shall comply with NFPA 20 for all other requirements not specified in this guidelines. | |

| Item | Provisions | Notes |
|------|--|-------|
| 7.1 | Fifty (50) gpm hose allowance shall be added to sprinkler demand if one FHR per floor level is provided; 100 gpm if two or more FHR is provided per floor level. | |
| 7.2 | 500 gpm for one standpipe (65mmØ landing valve) and additional 250gpm per addition of standpipe up to max. 1250gpm | |
| 7.3 | 1000 gpm (maximum) is acceptable for combine (sprinkler/wet standpipe) system for non-storage building. | |





FIRE FIGHTING SYSTEM GUIDELINES

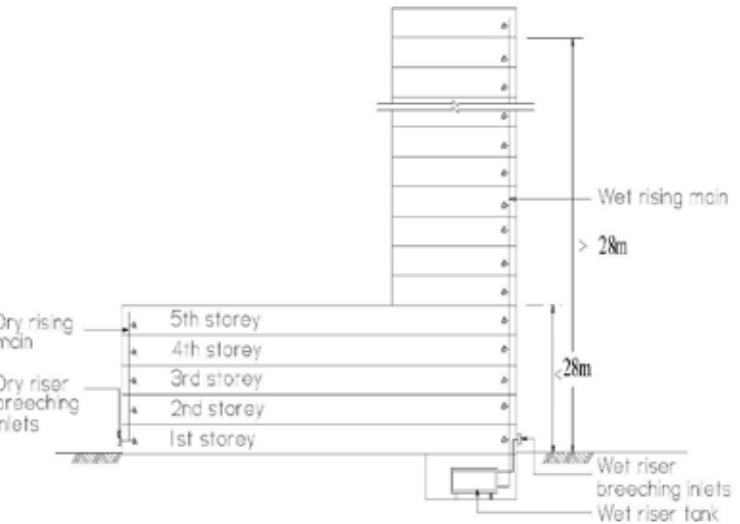
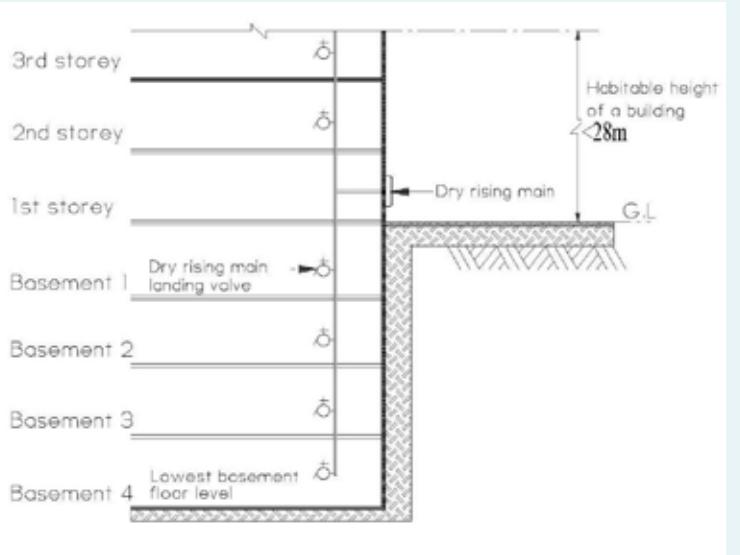


| FFS_G1 | | FIRE FIGHTING SYSTEM | |
|------------|--|----------------------|--|
| | Annex_FFS Guidelines | Revisions_2021 | |
| Item | Provisions | Notes | |
| 1.0 | FIRE PROTECTION WATER SUPPLIES | | |
| 1.1 | Water Supplies quantities shall be determined with the use of the fire code including the QCD Particular Requirements and the NFPA Water supplies shall be secure and dedicated for fire protection use only | Applicable Codes | |
| 1.2 | Fire Protection water storage tanks shall be constructed of non-combustible materials. They shall be constructed with compartments that allow maintenance without impairment to the system. Each compartment shall be not more than 50%. Water tank has to be approved from QCD Product and Equipment Safety Divisions. | Tank Construction. | |
| 1.3 | <p>The net effective capacity of the tanks(s) shall be sized to meet the minimum duration of flow for the fire protection systems determined in accordance with the applicable fire codes.</p> <p>The net effective capacity of the water tank shall be verified on the fire protection plans of the fire safety submission. These drawings shall clearly indicate size and allowances for fittings, freeboard, inlet pipe arrangement, overflow pipe, suction pipe and fittings, any allowances and the clear volume of water available for use by the fire protection systems.</p> <p>The effective capacity shall also be clearly indicated on the tank in lettering of a minimum height of 100 mm.</p> | Tank Capacity | |
| 1.4 | Each water tank shall have the following minimum attachments: | Tank Attachments | |
| 1.4.1 | Automatic infill such that the tank may be refilled from empty within a time period of 6 hours. In any case it shall not be less than the size of the KHARAMAA supply pipe. | | |
| 1.4.2 | Visual water level indicator of non-combustible construction. | | |
| 1.4.3 | Balance valve. | | |
| 1.4.4 | Drain valve having a minimum size shall be 80mm nominal diameter. | | |
| 1.4.5 | Suction connections. | | |
| 1.4.6 | Test return pipe(s). | | |
| 1.4.7 | Overflow pipe of minimum size, one diameter larger than the inlet pipe. | | |
| 1.4.8 | All pipe and other openings into the tank shall be fitted with devices to prevent the ingress of insects. | | |

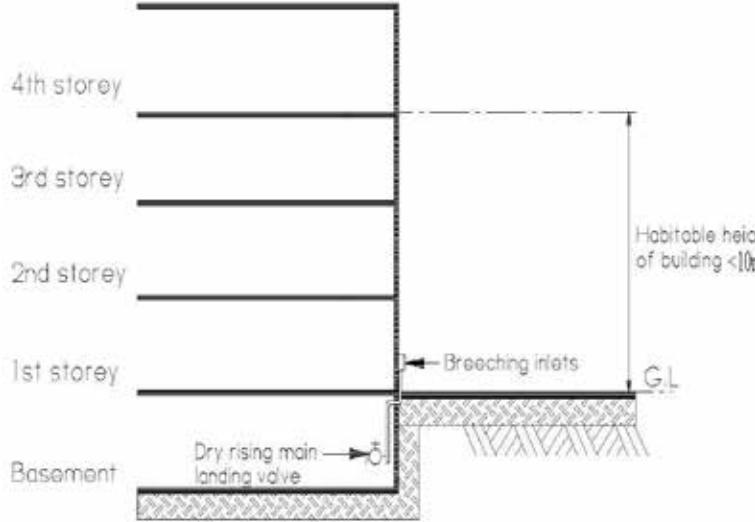
| Item | Provisions | Notes |
|------------|---|----------------------------------|
| 1.5 | 1.5 Fire pumps shall be listed for service or approved by an authority acceptable to the Qatar Civil Defence. Performance curves on which the system curve and duty point shall be submitted together with hydraulic calculations with the fire protection plans fire safety submission. | Fire Pumps |
| 1.6 | 1.6 Fire pumps shall be sized and selected in accordance with the NFPA 20 to meet the single largest system demand | Pump Size |
| 2.0 | RISING MAIN FOR FIRE FIGHTING | |
| 2.1 | The type of rising main system shall be provided appropriate to the building as follow: | |
| 2.1.1 | Dry Rising Mains | |
| 2.1.1.a | Any floor at habitable height beyond 9M and not exceeding 28M above ground level. | |
| 2.1.1.b | One basement exceeding 1115 square meters in gross floor area. | |
| 2.1.1.c | One basement less than 1115 square meters in gross floor area and ≥ 6.1 m below grade. | |
| 2.1.1.d | One up to four basement levels below Level of Exit Discharge (LED). | Type |
| 2.1.2 | Wet Rising Mains | |
| 2.1.2.a | For building having a habitable height exceeding 28M above the ground level. | |
| 2.1.2.b | More than Four basement levels below LED | |
| 2.1.3 | Separate dry and wet rising main systems in a building may be permitted by QCD | |
| 2.2 | Number and distribution of rising main shall be as follow: | |
| 2.2.1 | Provide in every required exit staircase as per NFPA 14-2019 Edition Section 7.4. | |
| 2.2.2 | Additional hose connection shall be provided in excess of 150 ft. (45.7 m), non-sprinklered and 200 ft. (61 m), sprinklered, travel distance from a hose connection to the most remote portion of the floor level as applicable and as per NFPA 14 (2019) SEC. 7.3.2 | Number |
| 2.2.3 | Subject to FF Operation Department requirements, as applicable | |
| 2.2.4 | Number (rising mains): One rising mains serving not more than 930 m ² (of any floor). | |
| 2.3 | Position of rising mains and associated landing valves shall be located and installed in each required Exit Staircase and the Landing valve of the rising main shall be installed between 1M and 1.4M relative to the finish floor level. | Location and Installation Height |



| Item | Provisions | Notes |
|-------|--|----------------------------|
| 2.4 | Minimum nominal bore of rising main shall be: | Size |
| 2.4.1 | 100mm diameter where the rising main does not exceed 28M in habitable height and serving only one landing valve per floor. | |
| 2.4.2 | 150mm diameter or higher where the rising main is in combination with the fire sprinkler system serving two or more landing valve per floor. | |
| 2.5 | The inlet to the rising main shall be located: | Breeching Inlet Connection |
| 2.5.1 | On an external wall or a boundary of a building and to be within 18M of the adjacent fire appliance access road. Each rising main shall be fitted within a breaching inlet with non-return valve directly at the foot of the same riser stack. | |
| 2.5.2 | As close as possible to the rising main they serve with any connecting pipe between the inlet and the vertical run of the rising main kept to a minimum and given a fall towards the drain valve. The total pressure loss of the dry rising main shall not exceed 6bars based on the design of water flow rate. This is correspond with maximum habitable height of 60M. | |
| 2.5.3 | In a conspicuous position readily visible and accessible to the firefighters. | |
| 2.6 | | Figure A |

| Item | Provisions | Notes |
|------|---|----------|
| 2.7 |  | Figure B |
| 2.8 |  | Figure C |



| Item | Provisions | Notes |
|-------|--|------------------------------|
| 2.9 |  | Figure D |
| 3.0 | CLEAN AGENT SYSTEM | Applicable Codes |
| 3.1 | The design, installation and testing of Clean Agent Systems shall be in accordance with these regulations and the latest edition of NFPA 2001. | |
| 3.2 | Only clean agents specifically approved by the Qatar Civil Defence (QCD) shall be used. | |
| 3.3 | The use of Carbon Dioxide (CO ₂) is prohibited without specific approval from the QCD. Such approval will only be granted on the basis of a formal engineering analysis that concludes to the satisfaction of the QCD, that alternative clean agents are not able to satisfactorily extinguish the fire. | |
| 3.1 | Containers/Cylinders storage location: | Location of Cylinders |
| 3.4.1 | Stored outside of the protected area or enclosure; accessible within 2m from the entrance of the protected area. | |
| 3.4.2 | Permitted to be located within or outside the hazard or hazards they protect. | |
| 3.5 | A Manual Override (mechanical / electrical) means of discharging the required agent shall be provided on the storage container. | Manual Actuation |

| Item | Provisions | Notes |
|--------|---|---------------------|
| 3.6 | Clean agent systems shall be operated automatically by a QCD approved automatic fire detection system. | Automatic Operation |
| 3.7 | The control panel shall comply with the following: | Control Panel |
| 3.7.1 | Located external to the protected areas | |
| 3.7.2 | Installed near the main entrance of the protected enclosure | |
| 3.7.3 | Connected to the Main Fire Alarm Panel with indication of Alarm, Gas Discharged and Fault indications. | |
| 3.8 | Clean Agent shall comply with the following: | Gas Discharge |
| 3.8.1 | Gas discharge shall only occur after predetermined time delay subject to approval by QCD. | |
| 3.8.2 | The time delay shall be interrupted by the operation of the Abort Switch and shall re-commence on release of such abort switch. | |
| 3.8.3 | Minimum time delay to discharge shall be twenty (20) seconds. | |
| 3.9 | Manual Release Push Button shall comply with the following: | Manual Release |
| 3.9.1 | Located external to the protected enclosure within 1.5M of the main entrance. | |
| 3.9.2 | More than one manual release push button may be required subject to the size and configuration of the protected enclosure. | |
| 3.9.3 | Operation of such shall cause instant release of the clean agent. | |
| 3.10 | Abort Switch shall comply with the following: | Abort Switch |
| 3.10.1 | Located within the protected enclosure and mounted within 1.5M from the main entrance. | |
| 3.10.2 | More than one abort switch may be required subject to the size and configuration of the protected enclosure. | |
| 3.10.3 | Upon continuous operation, shall interrupt the countdown timer. | |
| 3.10.4 | Upon release of abort switch, reset of countdown timer to discharge clean agent gas. | |
| 3.11 | Audible / Visible Notification devices shall be installed both inside and outside of the protected enclosure | Notification |



| Item | Provisions | Notes |
|--------|---|-------------------------|
| 3.12 | <p>“DO NOT ENTER – GAS DISCHARGED” illuminated signs shall be external to the protected enclosure and mounted above all entrances so as to be visible to any person entering. The lettering shall be a minimum of 50mm high. It shall be visible at all times of the day. The illumination shall be activated by a pressure switch fitted to the discharge piping.</p> <p>“EVACUATE NOW – GAS DISCHARGE” illuminated signs shall be provided above the exits of the protected enclosure. The lettering shall be a minimum of 50mm high. It shall be visible at all times of the day. Illumination shall be activated on commencement of the discharge time delay.</p> | Gas Discharge Signage |
| 3.13 | Enclosure shall comply with the following: | Enclosure Consideration |
| 3.13.1 | All enclosures protected by clean agent systems that are required by code to be provided with an extinguishing system, in the absence of sprinkler protection, must be constructed from 2-hour fire resistant elements. | |
| 3.13.2 | Subject to the location of the enclosure, its integrity (to be verified through testing) and the type and nature of the clean agent used, ventilation system to purge the gas after discharge may be required by QCD. Due consideration shall be given to this aspect of the system. | |
| 3.13.3 | All enclosures protected by clean agent systems must be subjected to an enclosure integrity test. The test must be conducted by a qualified tester acceptable to QCD. The test shall verify the ability of the protected enclosure to maintain the minimum design concentration for ten (10) minutes. The enclosure test must be witnessed by QCD. This is a pre-condition for issue of the building’s fire safety certificate. | |



FIRE ALARM SYSTEM NOTES



| FIRE ALARM SYSTEM | | |
|-------------------|--|----------------|
| N1 | ANNEX_FAS NOTES | Revisions_2021 |
| Item | Provisions | Notes |
| 1.0 | Definition-a system or portion of a combination system that consists of components and circuits arranged to monitor and annunciate the status of fire alarm or supervisory signal-initiating devices and to initiate the appropriate response to those signals. | |
| 2.0 | Main Graphic Announcer or Main Mimic Panel SHALL BE PROVIDED IN EVERY REQUIRED PROVISION OF FIRE COMMAND CENTER (FCC) OR EMERGENCY CONTROL CENTER (ECC). It shall be building as-built drawing plan, used red coloured LED's to indicate graphically the building, the floor, location of initiating device that is in alarm. This shall be located in Fire Command Center or where the the Main Fire Alarm Control Panel is located. | |
| 3.0 | Zone Chart or Fire Evacuation Plan required, shall be as-built drawing plan of the building and required in each of every floor of the common areas (e.g. lift lobby, corridor, etc.) whereas noticeable to the occupant / tenant / public. The plan shall indicate all manual initiating device, exit sign, and other applicable fire measure. | |
| 4.0 | Stand alone smoke alarms battery operated are permitted for Residential Villas and Outdoor Kiosk. | |
| 5.0 | Fire Alarm System shall be Addressable or Conventional Type as prescriptive. Consider to use conventional fire alarm system for low rise buildings as applicable. | |
| 6.0 | Consider to use conventional fire alarm system for low rise buildings as applicable. | |
| 7.0 | The Mechanical Ventilation System, Fire Suppression System, Graphic Announcer, Smoke Control, EPSS and other related Fire Detector Devices shall be Integrated/Interfaced to Main Fire Alarm Control Panel (MFACP) for monitoring and control. | |
| 8.0 | For Mercantile and Business: Fit-outs are permitted to use the Existing Fire Alarm System provision of the building with the following; a. Previously approved plan for FAS shall be submitted . b. Interfaced Module that covers all fire alarm devices for the fit-out shall be provided for monitoring of alarms in MFACP. | |
| 9.0 | Provide (as applicable) a narrative sequence of operation for Elevator Recall (in general notes) or in the I/O Matrix as per NFPA 72. | |



FIRE ALARM SYSTEM

GUIDELINES



| FIRE ALARM SYSTEM | | | |
|--------------------------|--|---------------------------------|--|
| FAS | ANNEX_FAS GUIDELINES | Revisions_2021 | |
| Item | Provisions | Notes | |
| 1.0 | Fire alarm systems shall be provided for buildings and structure that provide public access as applicable. See Guidelines for Fire Alarm System for reference. | Where and what required | |
| 2.0 | Fire Alarm Systems shall be designed and installed in accordance with the latest edition of NFPA 72 except as clearly modified by these requirements. Where ambiguities in either these requirements of the NFPA 72 exist, it shall be the responsibility of the engineering endorsing the fire safety plans to obtain clarification from the Qatar Civil Defence. | NFPA 72 | |
| 3.0 | All fire alarm system shall have the following: | System Architecture | |
| 3.1 | Main fire alarm control unit/panel (addressable / conventional type) | | |
| 3.2 | Main Indicating Mimic Panel shall use red colored Light Emitting Diode (LED) to indicate graphically the building, the floor, location and the initiating device that is in alarm; or if provided with PC based workstation, an information stating that graphic user interface (GUI) is integrated in the software/ application in lieu of the Main Indicating Mimic Panel. | | |
| 4.0 | Fire alarm control unit/panel shall be provided inside each building and located in any of the following: | Fire Alarm Control Panel | |
| 4.1 | Within a designated Fire Command Center | | |
| 4.2 | In the ground floor level at main entrance/reception lobby | | |
| 4.3 | In a continuous attended location where above mentioned are not available. | | |
| 5.0 | Zone Chart shall clearly depict the location of all fire zones, the type and location of all initiating devices with labels on that floor with a "YOU ARE HERE" indication and shall be provided on each floor of every building located within the firefighting lobby and smoke-stop lobby or common lobby in close proximity to the exit staircase. | Zone Chart | |



| Item | Provisions | Notes |
|-------|--|----------------------|
| 6.0 | <p>Detector Coverage shall comply with NFPA 72 & NFPA 101. REQUIRED Where building requires total (complete) detection coverage w/c includes inaccessible areas that are constructed of or contain combustible material, unless otherwise specified in NFPA 72: 17.5.3.1.2-2019.</p> <p>Detectors shall not be required in combustible blind spaces if any of the following conditions exist: (NFPA 72: 17.5.3-2019)</p> | Detectors |
| 6.1 | Where the ceiling is attached directly to the underside of the supporting beams of a combustible roof or floor deck. | |
| 6.2 | Where the concealed space is entirely filled with a noncombustible insulation. (In solid joist construction, the insulation shall be required to fill only the space from the ceiling to the bottom edge of the joist of the roof or floor deck.) | |
| 6.3 | Where there are small concealed spaces over rooms, provided that any space in question does not exceed 50 ft ² (4.6 m ²) in area. | |
| 6.4 | In spaces formed by sets of facing studs or solid joists in walls, floors, or ceilings, where the distance between the facing studs or solid joists is less than 6 in. (150 mm). | |
| | Exemption: Void space less than or equal to 400mm in depth/height shall not require detection. | |
| 7.0 | Manual call points shall be located within 1.5M of each fire exit. The initiating device shall be located such that no part of any floor is further than 30M from the nearest manual call point. | Manual Call Point |
| 8.0 | Fire alarm wiring shall be in accordance with the latest edition of NFPA 70 & 72. Where fire alarm wires are exposed and subject to possible damage from normal use of the occupancy, they shall be provided with mechanical protection. | Fire Alarm Cables |
| 9.0 | Power Supplies: | Primary Power Supply |
| 9.1 | Primary Power Supply shall be an alternating current (AC) supply from an authorized electricity provided and shall be exclusive to the alarm system. | |
| 9.1.1 | The primary power supply should be from the building emergency mains supply if such supply is available. | |
| 9.1.2 | The primary power supply shall be direct from the electrical distribution board and the circuit shall not be used for any other purpose. | |
| 9.1.3 | The protective isolating device controlling this circuit shall be clearly labeled to indicate that it controls the fire alarm system. | |



| Item | Provisions | Notes |
|-------|---|------------------------|
| 9.1.4 | It shall terminate inside the fire alarm panel or its integral power supply unit. No external intermediary switch shall be provided between the protective isolation device at the electrical distribution board and the fire alarm panel/integral power supply unit. | |
| 9.2 | Secondary Power supply shall be in the form of the following: | Secondary power Supply |
| 9.2.1 | Storage batteries, with an automatic charge. It shall be capable of operating the alarm system in the event of failure of the primary power supply and vice versa. | |
| 9.2.2 | Emergency Power Supply System (EPSS), if provided, shall be compliant to the latest edition of NFPA 70, 72 and 110 complete with power line diagram to show the automatic transfer switch. | |
| 9.3 | A fault warning shall be given in the event of failure of either primary or secondary power supply | Fault Indication |
| 9.4 | A battery charger of appropriate type and rating shall be provided to keep the storage batteries under constant voltage charge. | Fire Alarm Cables |
| 9.4.1 | The charger shall incorporate automatic control features with output designed to charge and maintain the batteries within the limits specified by the battery manufacturer, taking into account any quiescent load imposed by the associated system. | |
| 9.4.2 | The charger shall be designed and rated to so that a battery discharged to its final voltage can be recharged to at least 80% of its rated capacity within 24 hours and its rated capacity within another 48 hours. | |



(ACMV) AIR-CONDITIONING, VENTILATION AND SMOKE CONTROL



ACMV
AIR-CONDITIONING, VENTILATION AND SMOKE CONTROL

| N1 | ANNEX ACMV_N1 | Revisions_2021 |
|------------|--|----------------|
| Item | Provisions | Notes |
| 1.0 | Scope and Purpose | |
| 1.1 | This fire safety standard applies to natural and mechanical methods of smoke control where required by other fire safety standards of the Qatar Civil Defence Department. The purpose of this standard is to establish the minimum requirements in the design of smoke control system that are required to provide a tenable environment for escape, evacuation or relocation of occupants and compliment firefighting operations. | |
| 2.0 | General Design Requirements | |
| 2.1 | Buildings or structures or parts thereof that are required to have smoke control system shall be designed according to the latest edition of applicable NFPA codes/standard and this general fire safety requirements guidelines Annex ACMV_N1. The requirements of this guidelines annex shall be uphold in case of conflict with NFPA 92. | |
| 3.0 | Applications | |
| 3.1 | Smoke Control Systems are classified into two general categories as smoke containment and smoke management. | |
| 3.1.1 | Smoke Containment | |
| 3.1.1.1 | A smoke control method that employs mechanical equipment to produce pressure difference across smoke barriers. | |
| 3.1.2 | Smoke management | |
| 3.1.2.1 | A smoke control method that utilizes natural or mechanical systems to maintain a tenable environment in the means of egress from a large volume space or to control and reduce the migration of smoke between the fire area and communicating spaces. | |
| 4.0 | Methods of Smoke Control | |

| N1 | ANNEX ACMV_N1 | Revisions_2021 |
|---------|---|----------------|
| Item | Provisions | Notes |
| 4.1 | Pressurization Method | |
| 4.1.1 | <p>Controlling smoke by pressure differences across smoke barriers through the aid of mechanical means is one of the acceptable procedures in smoke control. This procedure does not require the maintenance of a tenable environment in the zone of fire origin.</p> <p>Design of pressurization system shall be in accordance with NFPA 92 and this standard.</p> | |
| 4.2 | Airflow Method | |
| 4.2.1 | <p>Engineering analysis which shall be performed to establish that usage of this procedure will not cause adverse effect to other portions of the smoke control system, further intensify the fire, disrupt flume dynamics and interfere with exiting.</p> <p>Design and application shall be in accordance with NFPA 92.</p> | |
| 4.3 | Exhaust Method | |
| 4.3.1 | Smoke control systems employing the exhaust method shall be designed in accordance with NFPA 92 and this guideline/ standard. The minimum height to which the smoke layer interface shall be designed shall be 1.83 m (6 ft) above any walking surface that forms part of the required egress system within the smoke zone. | |
| 4.4 | Smoke Containment (Pressurization) Systems | |
| 4.4.1 | Zoned Smoke Control System | |
| 4.4.1.1 | The minimum pressure difference across a smoke barrier shall be 12.5 Pa (0.05 in.w.g.) in fully sprinklered building. | |
| 4.4.1.2 | In non-sprinklered and other than fully sprinklered buildings, the minimum pressure difference shall be equivalent to two times the calculated maximum pressure difference that can be produced by the fire. | |
| 4.4.1.3 | The maximum pressure difference across a smoke barrier shall be determined by required door opening forces which shall not exceed 110 N. | |
| 4.4.1.4 | Zoned smoke control may be through mechanical or natural means; e.g. pressurization of the non-fire zone/s, mechanical exhaust or venting of the fire or smoke zone. | |
| 4.4.2 | Smoke Zone Exhaust (Depressurization) | |
| 4.4.2.1 | Smoke zone exhaust shall discharge to outside of the building. | |
| 4.4.2.2 | Mechanical or natural ventilation may be used. | |
| 4.4.3 | Reserved. | |
| 4.5 | Smoke-proof Enclosure (Exit Staircases) | |



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| Item | Provisions | Notes |
| 4.5.1 | Mechanical Pressurization Alternative | |
| 4.5.1.1 | Pressurization system for the exit staircase shall be a system independent and dedicated to the staircase. | See requirements/ conditions where permitted to be in combined system. |
| 4.5.1.2 | Stairwell pressurization system shall be designed so that a minimum 12.5 Pa pressure difference between the stairwell and the occupant/accommodation area or smoke zone is maintained for buildings that are fully sprinklered. | Where the pressurized exit staircase is being approached via a pressurized smoke-stop/fire fighting lobby, the pressure of the staircase must be adjusted accordingly to ensure pressure in the staircase is higher than pressure in the lobby. |
| 4.5.1.3 | Stairwell pressurization system shall be designed so that a minimum 25 Pa pressure difference between the stairwell and the occupant/accommodation area or smoke zone is maintained for buildings that are non-sprinklered or other than fully sprinklered. | |
| 4.5.1.4 | Pressurization air supply shall account allowance for open doors. A minimum 1 m/s airflow velocity shall be maintained across opened doors with the pressure difference across the other closed doors and the smoke zone not be lower than 12.5 Pa. | |
| 4.5.1.5 | Minimum allowance of two (2) doors open shall be permitted for residential apartments and business occupancies that are not classified as high rise and with at least two (2) separate and remotely located exit staircases. | |
| 4.5.1.6 | Minimum allowance of three (3) doors open shall be accounted to all exit stairwells in high rise buildings. | |
| 4.5.1.7 | Adequate relief of leaked air out of the occupant area or adjacent non-pressurized space shall be provided to avoid build-up of pressure in these areas. The relief could be through perimeter leakages or purpose-built relief vent or extraction system. | |
| 4.5.1.8 | The maximum pressure differential between the stairwell and the fire zone shall be determined by the required door opening force which shall not exceed 110 N. | |
| 4.5.1.9 | Pressurization air shall be supplied such that uniform pressure inside the stairwell is attained. | |
| 4.5.1.10 | Single injection system shall be permitted where the exit staircase connects not more than five (5) floor levels or depth of not more than 18 m, whichever is less, including basements. | |

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| Item | Provisions | Notes |
| 4.5.1.11 | Single injection system shall be permitted for exit stairwells connecting more than five (5) floor levels or depth of 18 m where engineering analysis confirms its applicability. | |
| 4.5.1.12 | Pressurization air can be supplied either at the top of the stairwell, the bottom, or at a location in between. Caution must be exercised when designing bottom injection system and consideration must be made with opened exterior doorways. | |
| 4.5.1.13 | Roof mounted propeller fans used for single injection stairwell pressurization systems should have tops that shield the fans from wind effects. | |
| 4.5.1.14 | Wall mounted propeller fans arrangement shall not be permitted in stairwell pressurization system installations. | |
| 4.5.1.15 | Pressurization air injection points in a multiple injection system shall be distributed not more than three (3) floor levels apart, but in no case shall exceed 11 m. | |
| 4.5.1.16 | Pressurization air supply intake shall be located away from building exhausts which can cause smoke from the building being injected to the exit stairwell. A minimum separation distance of five (5) meters, measured horizontally, shall be maintained between air intakes and exhausts. | |
| | Pressurization air supply intakes shall be oriented vertically by at least 1 m below building exhausts. | |
| 4.5.1.17 | Acceptable means for controlling the required pressure inside the stairwell shall be provided. | |
| 4.5.1.18 | Over-pressurization relief dampers, relief ducts, doors and the likes shall discharged directly to outside of the building. | |
| 4.5.1.19 | Analysis with the aid of network model must be performed for staircase in buildings with floor plans that vary much from floor to floor. | |



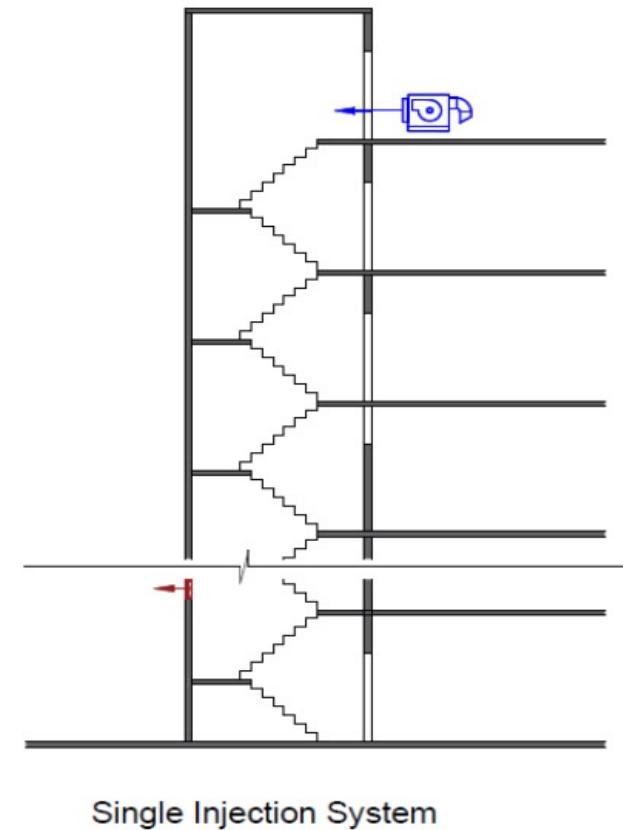
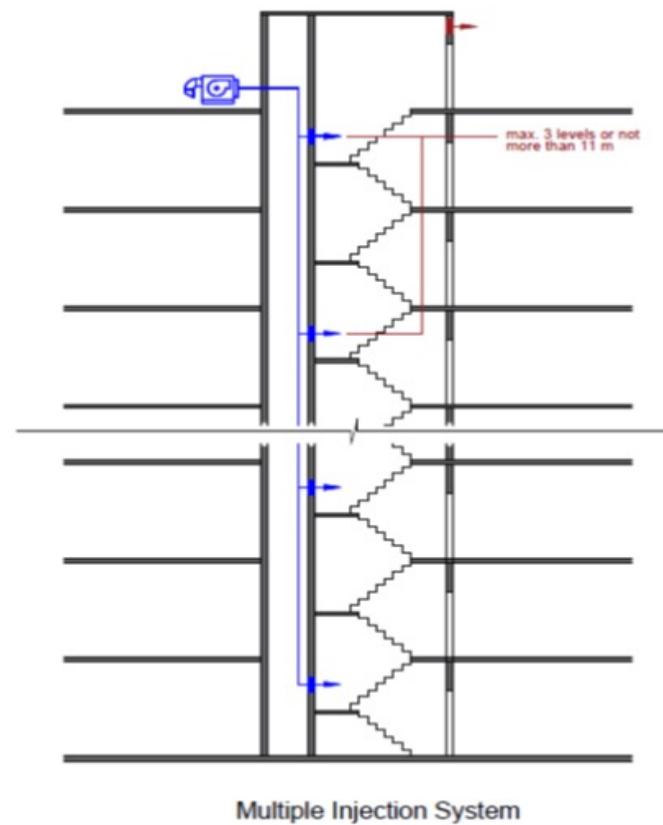


Figure 1. Example of Stairwell Pressurization System Arrangement

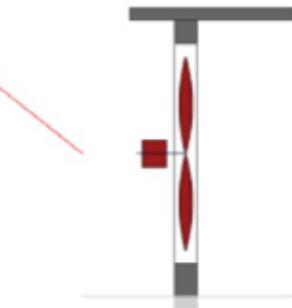
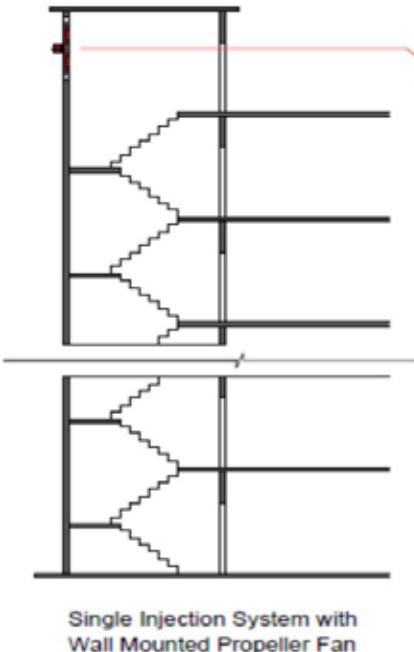
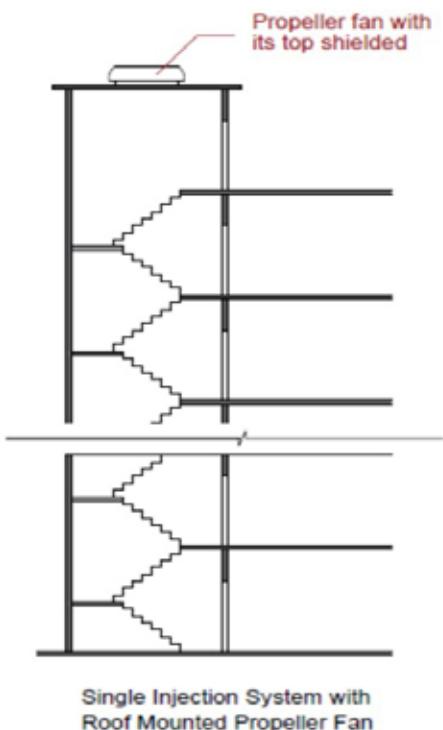


Figure 2. Single Injection System and Propeller Fan Application

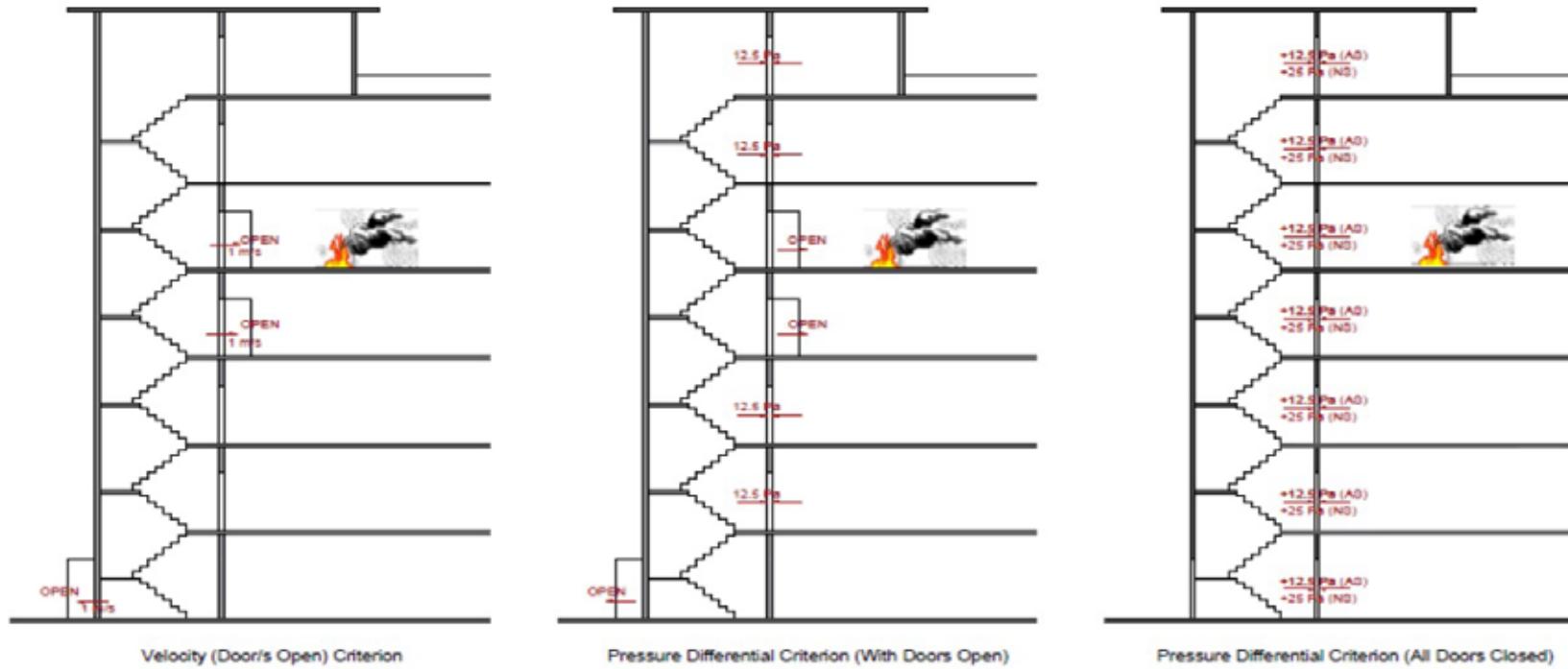
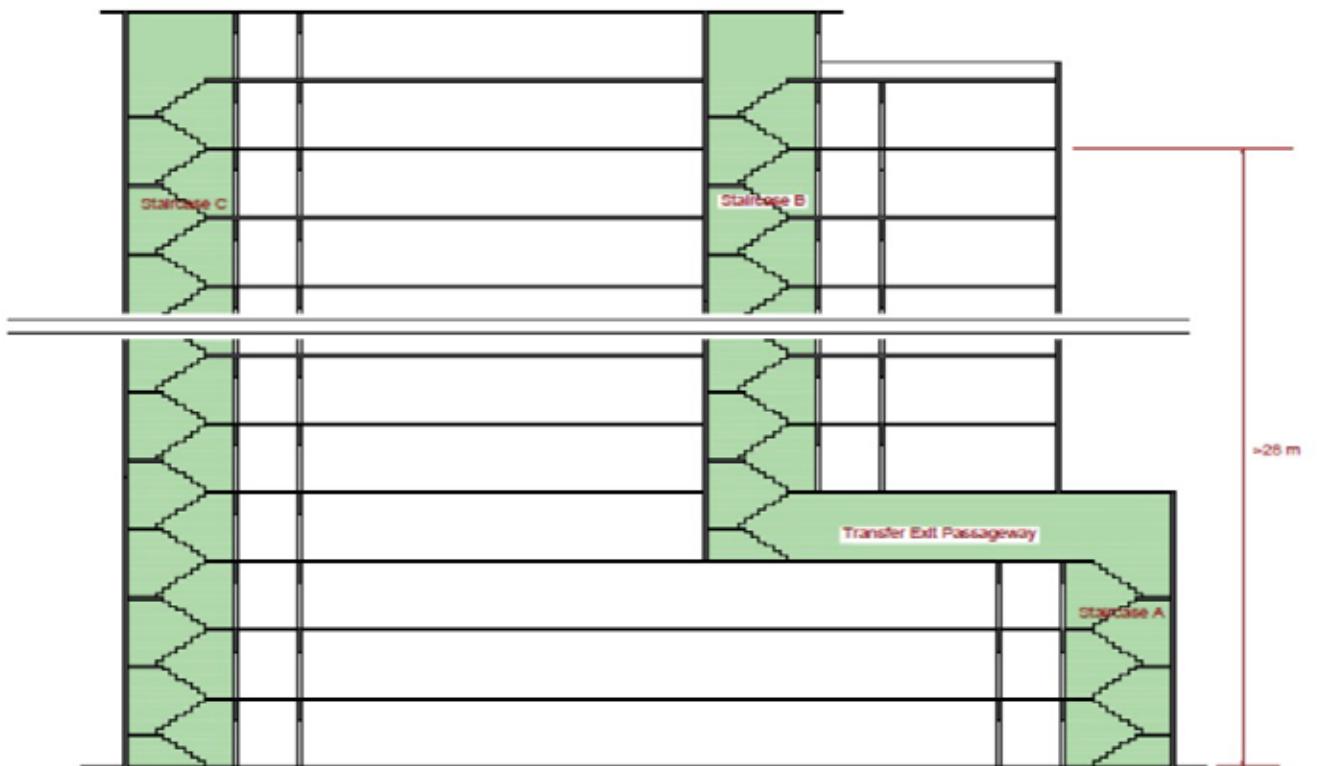


Figure 3. Manifestation of the Stairwell Pressurization System Criteria



Interconnecting Staircases and Transfer or Connecting Passageway

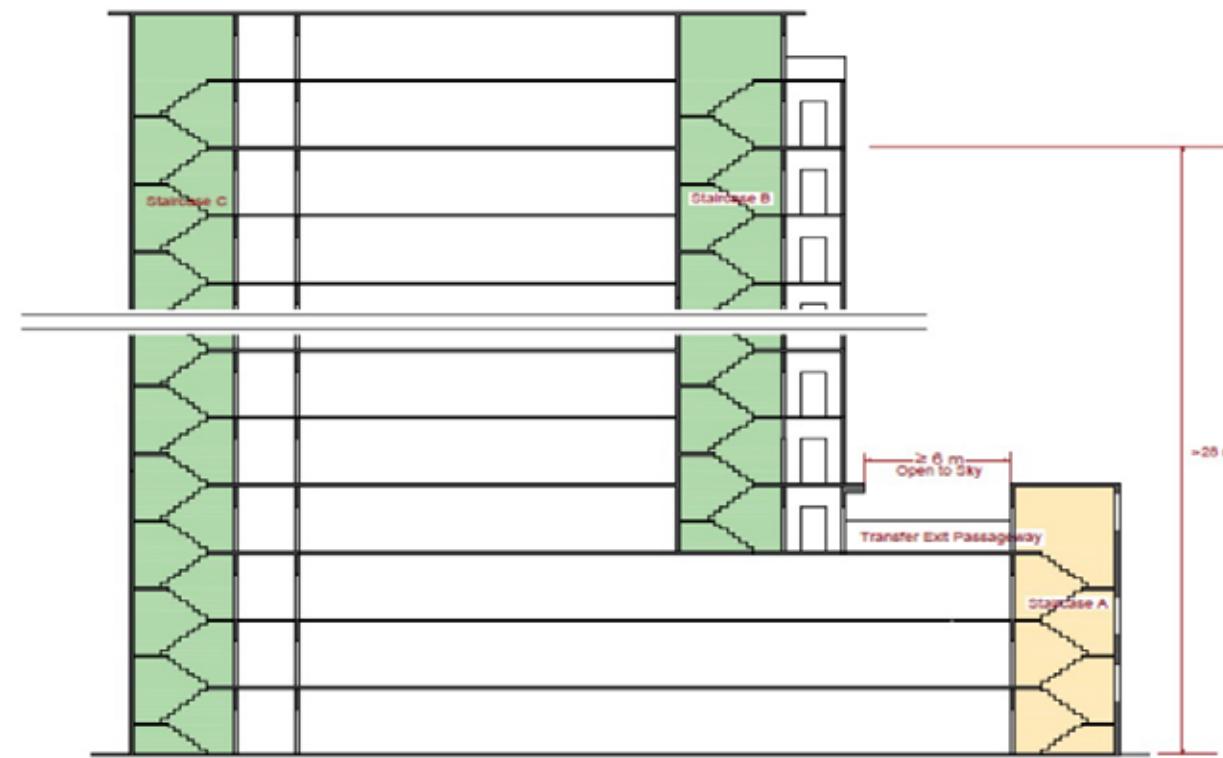
Situation 1. Internal staircase, enclosed transfer/connecting exit passageway and enclosed external staircase

* Staircase B and staircase A shall be considered as a single staircase sharing a common protected shaft. As staircase B is required to be pressurized, pressurization shall be extended to the transfer exit passageway and staircase A as well. Staircase A, though it is low, and along the external wall, cannot be naturally ventilated.

* Partial pressurization by pressurizing staircase B only and introducing a door across the transfer passageway so that staircase A is separated and be naturally ventilated is not acceptable. The level of protection throughout the shaft shall be the same.

Figure 4. Exit Staircases Connected by Enclosed Transfer Passageway



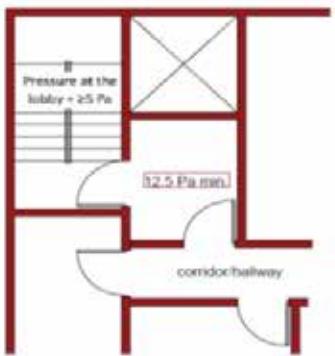


Interconnecting Staircases and Transfer or Connecting Passageway

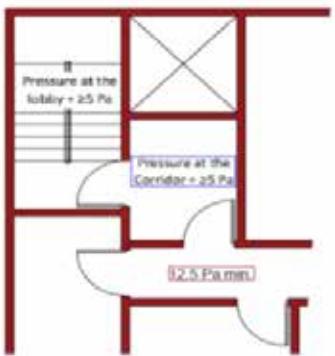
Situation 2. Enclosed Staircase, Open to Sky Transfer Exit Passageway and Naturally Ventilated or Pressurized Staircase

- * Staircase B, transfer exit passageway and staircase A is not considered as a single staircase.
- * Staircase B is pressurized.
- * Passageway open to the sky and the distance or length of the connecting open passageway from the discharge point of the first staircase to the next staircase is not less than 6 m.
- * Staircase A can be naturally ventilated or pressurized depending on the requirement for the type or classification of the staircase.

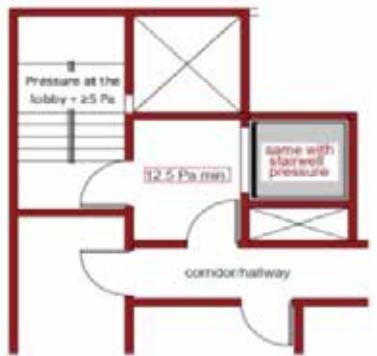
Figure 5. Exit Staircases Connected by Open Exit Passageway



Pressurization of staircase and associated lobby (AS)

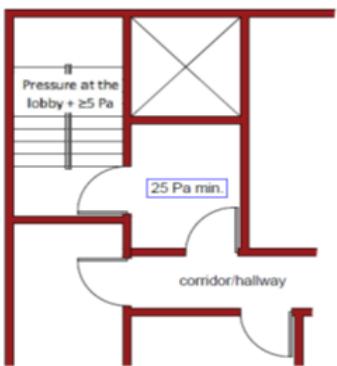


Pressurization of staircase, associated lobby and corridor (AS)

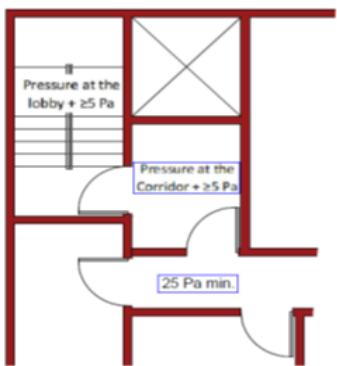


Pressurization of staircase, associated lobby and lift shaft (AS)

AS – Automatic Sprinklered

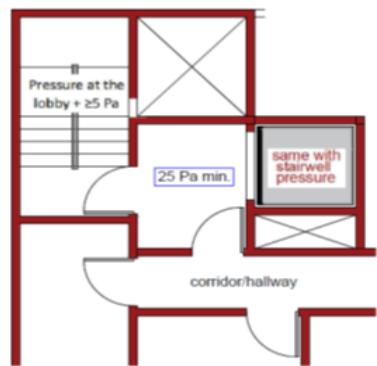


Pressurization of staircase and associated lobby (NS)



Pressurization of staircase, associated lobby and corridor (NS)

NS – Non-Sprinklered



Pressurization of staircase, associated lobby and lift shaft (NS)

Figure 6. Pressurization of Staircase, Lobby, Lift Shaft and Corridor: Minimum ΔP Requirements

Figure 7. PRESSURIZATION OF ESCAPE ROUTES



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| Item | Provisions | Notes |
| | <ul style="list-style-type: none"> - Minimum pressure difference of 12.5 Pa for building protected with automatic sprinkler system shall be maintained between the pressurized exit access closest to the smoke zone and a minimum increment of 5 Pa between each succeeding pressurized exit accesses along the escape route leading to the staircase. | |
| | <ul style="list-style-type: none"> - Minimum pressure difference of 25 Pa for building not protected with automatic sprinkler system shall be maintained between the pressurized exit access closest to the smoke zone and an a minimum increment of 5 Pa between each succeeding pressurized exit accesses along the escape route leading to the staircase. | |
| | * Calculation shall take into account the required number of doors to be opened simultaneously. | |

Illustration: Building Protected with Automatic Sprinkler System

Pressurizing staircase, lobby and corridor,



Pressurizing staircase and lobby,



Pressurizing staircase only,

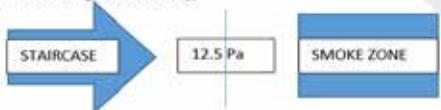
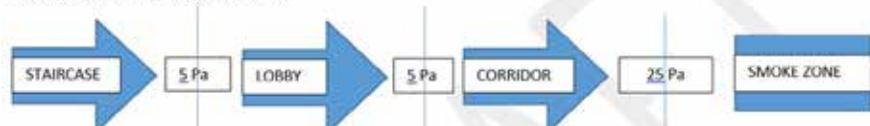


Illustration: Building Not Protected with Automatic Sprinkler System

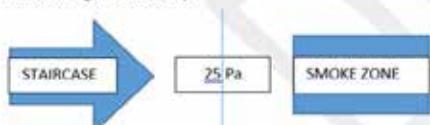
Pressurizing staircase, lobby and corridor



Pressurizing staircase and lobby



Pressurizing staircase only



* A pressure gradient shall be maintained between pressurized exit accesses, with pressure in the staircase as the highest.

* Airflow velocity of 1 m/s shall be maintained across opened doors in stairwell

Figure 7. PRESSURIZATION OF ESCAPE ROUTES



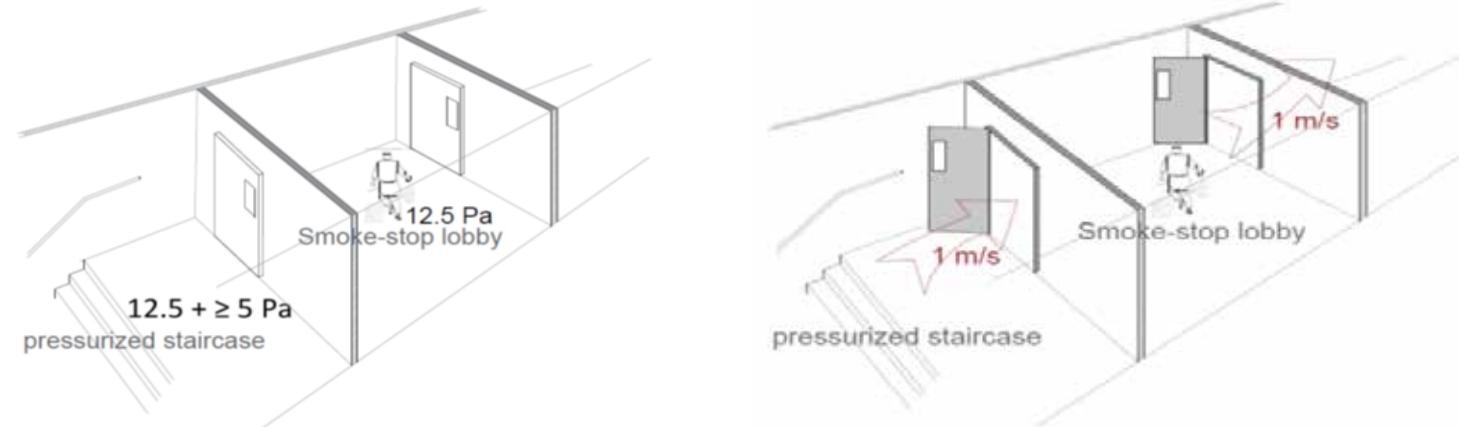


Figure 8. Pressure Differential and Velocity Criterion

| | | |
|---------|---|--|
| 4.5.2 | Natural Ventilation Alternative | |
| 4.5.2.1 | Exit staircases accessed through open and externally located vestibules or exterior balcony are deemed to satisfy natural ventilation alternative. | |
| 4.5.2.2 | <p>Exit staircases accessed through lobby or vestibule having openings with minimum net area of 1.5 sq. m (16 sq. ft.) or 25% of the floor area of the lobby or vestibule, whichever is greater, in a wall facing an outer yard, court or public way that is at least 6.1 m (20 ft) wide are deemed to satisfy natural ventilation alternative. The opening/s in the vestibule shall be located such that no portion in the space is farther than 9 m to an opening.</p> <p>The ventilation openings shall also be positioned such that its top is no farther than 300 mm from the slab of the landing or floor above; or the bottom part be at least 1.83 m (6ft)above the walking surface.</p> <p>Side hung windows opening outward a minimum of 30° capable of being opened automatically through remote control switch linked to the building fire alarm system is an acceptable arrangement.</p> | |

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| Item | Provisions | Notes |
| 4.5.2.3 | <p>Exit staircase with fixed or automatic ventilation opening at each floor/storey level in exit staircases located along perimeter walls of the building facing an outer courtyard or public way that is at least 6.1 m (20 ft) wide. Minimum dimension of the ventilation opening at each floor level shall be not less than 1.5 m² (16 ft²) located at the side of the stairwell exposed to external. The ventilation openings shall also be positioned such that its top is no farther than 300 mm from the slab of the landing or floor above; or the bottom part be at least 1.83 m (6ft)above the walking surface.</p> | Permitted for staircases in non-high-rise building that connect one below ground or basement level |
| 4.5.2.4 | <p>Exit staircases with fixed or automatic opening having a minimum net area of 1.5 m² (16 ft²) at the top of the stairwell shaft.</p> <p>For opening/s located along the external stair wall, the ventilation openings shall be positioned such that its top is no farther than 300 mm from the slab of the landing or floor above or be lower than 1.83 m (6 ft)above the walking surface.</p> | Permitted for: 1) staircases that connects six (6) storeys or 15 m habitable height, whichever is less, from ground level to above. 2) staircases the connects up to two floor levels below ground (but not exceeding 6m) and up to four floor levels (but not exceeding 9m habitable height). G+5, 2B+G+3 or less |



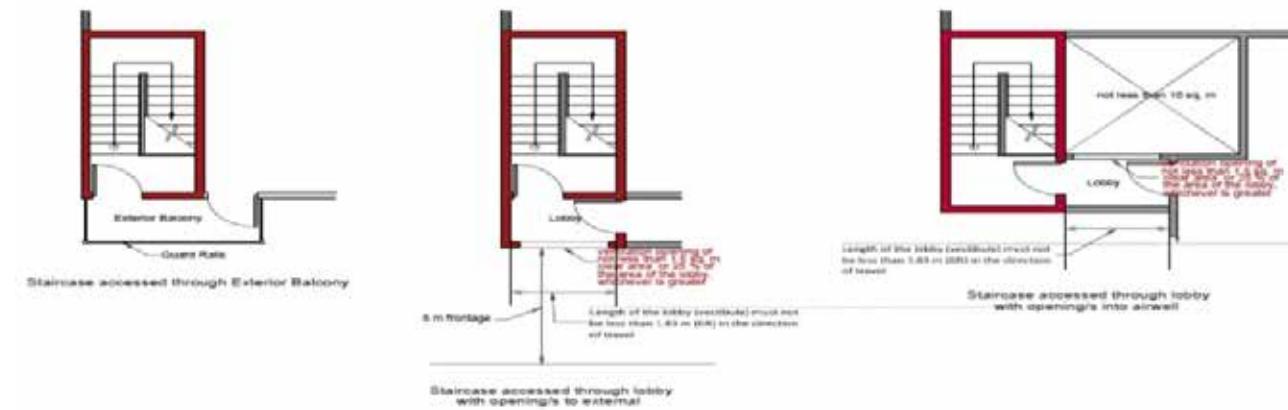
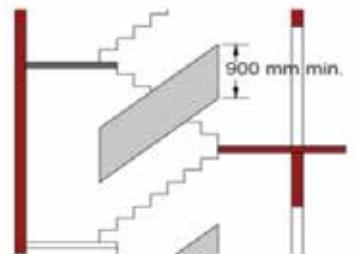
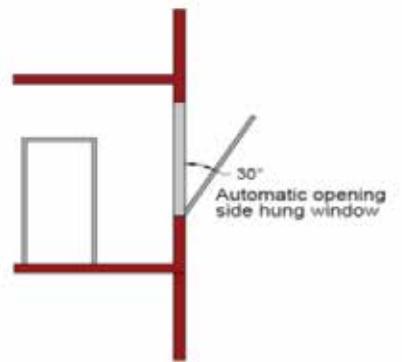
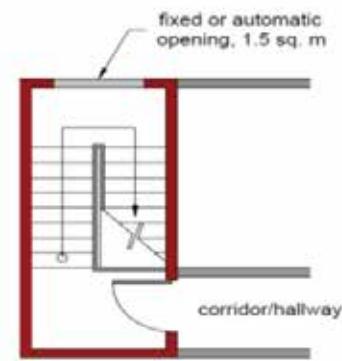


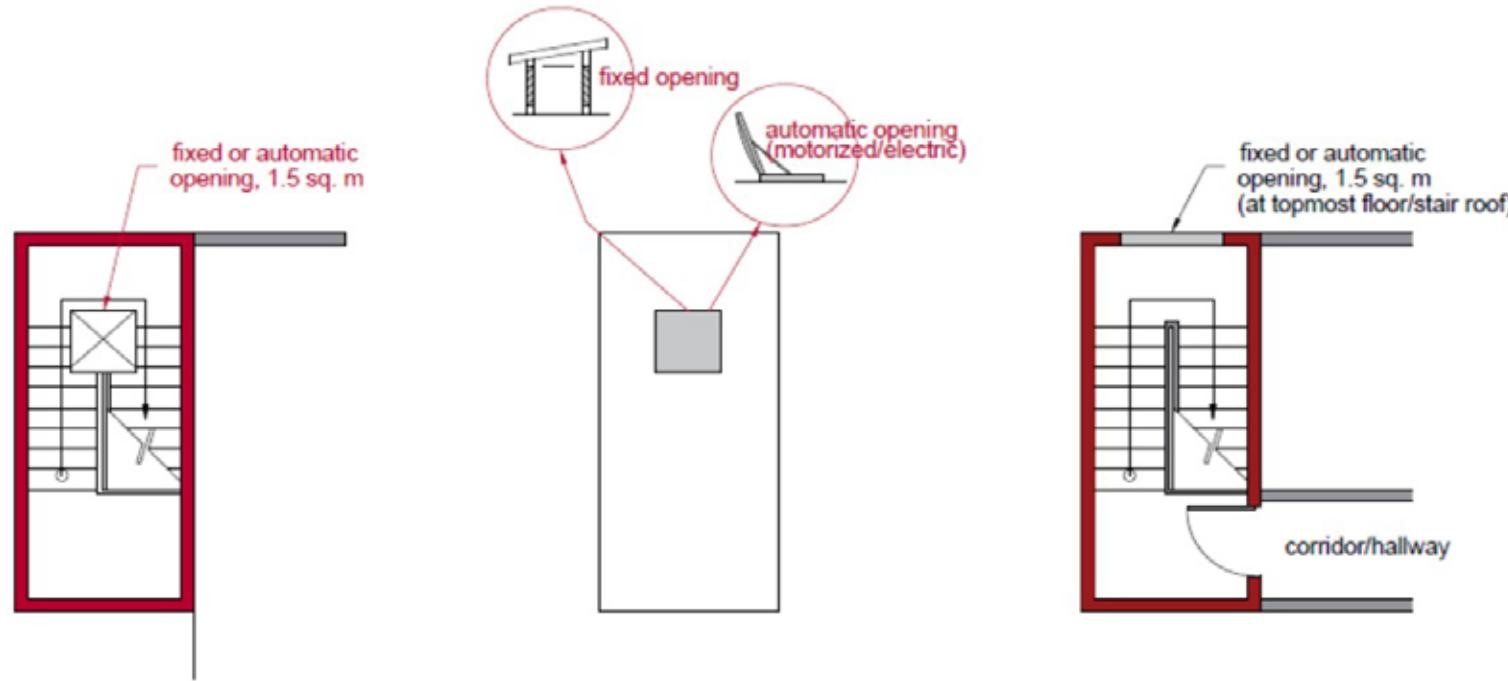
Figure 9A. Natural Ventilation Alternatives



Staircase with opening at each floor level

Figure 9B. Natural Ventilation Alternatives





Staircase with opening at the top

Figure 9C. Natural Ventilation Alternatives

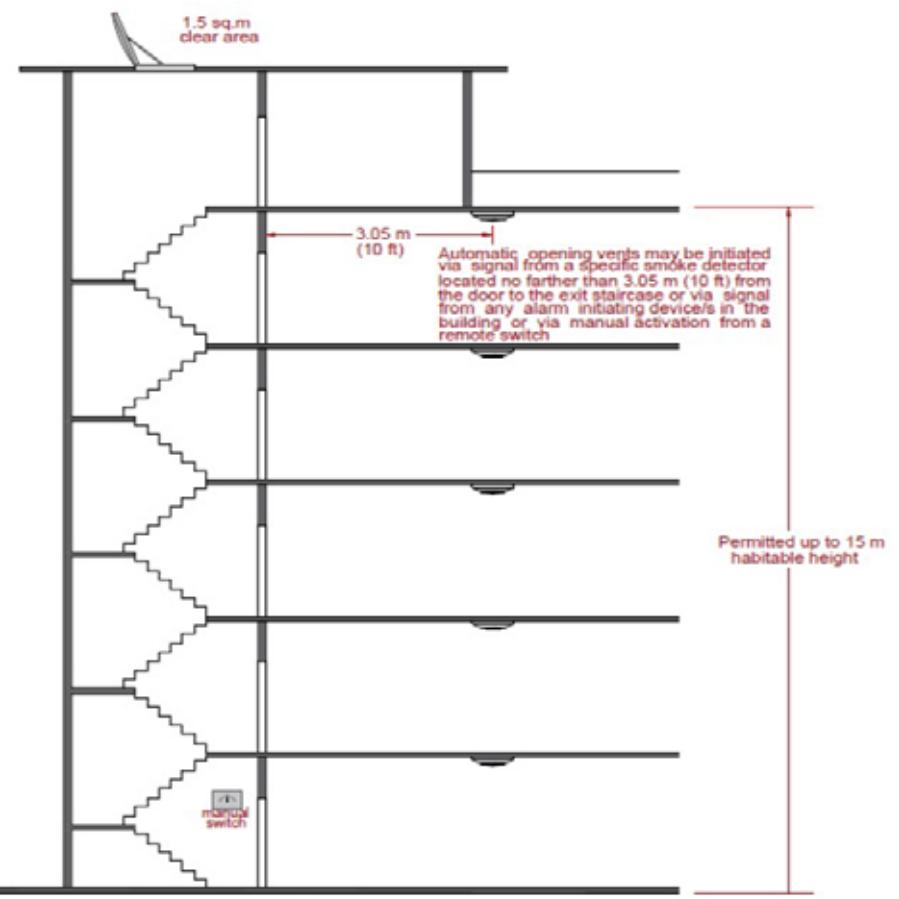


Figure 10. Staircase with Automatic Opening Vent (AOV), Arrangement and Controls

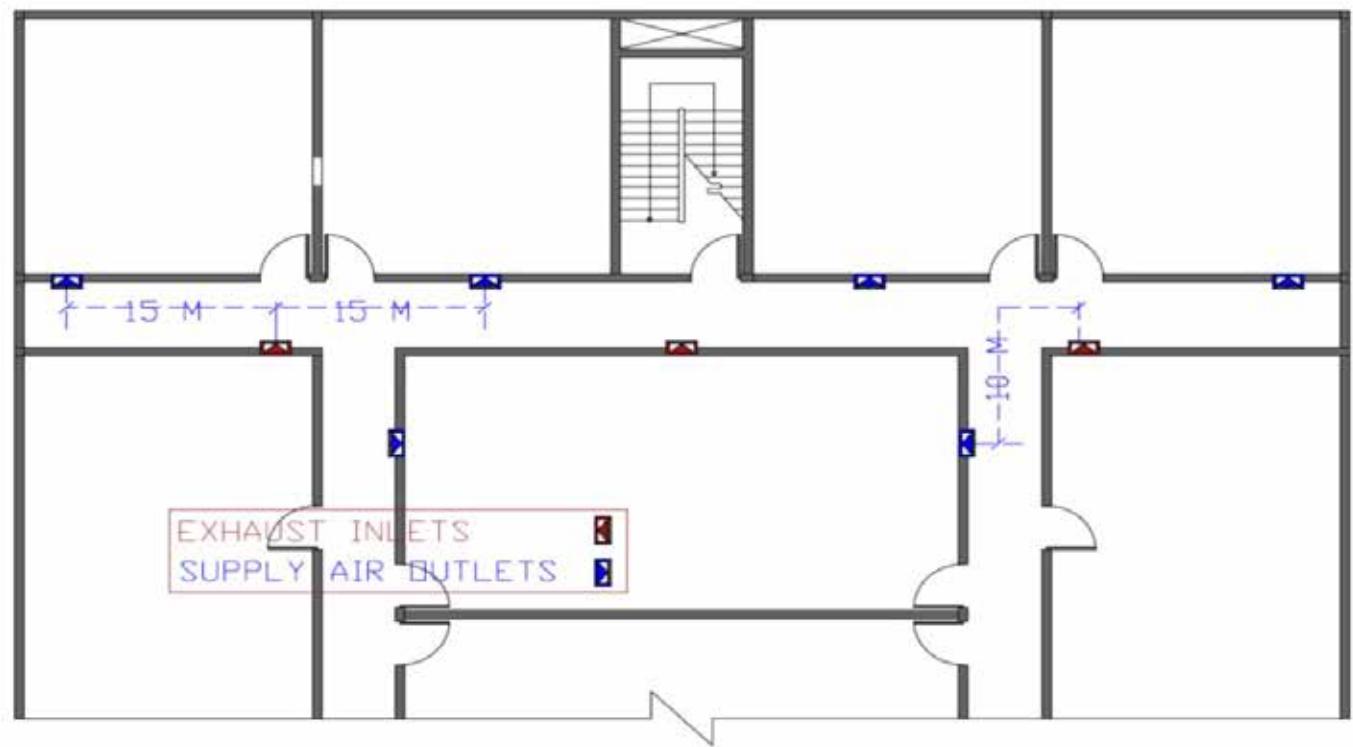


| N1 | ANNEX ACMV_N1 | Revisions_2021 |
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| Item | Provisions | Notes |
| 4.6 | Smoke-stop and Fire Fighting Lobbies, Fire Lift Shaft, Lift Shaft | |
| 4.6.1 | Mechanical Pressurization Alternative | |
| 4.6.1.1 | Pressurization system for smoke stop and fire fighting lobbies shall be a system independent and dedicated to these lobbies. | Note: See requirements/conditions where permitted to be in combined system. |
| 4.6.1.2 | Pressurization of the smoke stop/fire fighting lobby shall be designed such that same is capable of maintaining a minimum 12.5 Pa (0.05 in. w.g.) pressure difference between the smoke-stop/firefighting lobby and the occupant/accommodation area or smoke zone. | |
| 4.6.1.3 | The pressure in the smoke stop/fire fighting lobby shall in no case be higher than the pressure in the stairwell. Minimum pressure difference between the pressurized stairwell and pressurized lobby shall be 5 Pa. | |
| 4.6.1.4 | Air-conditioning and ventilation ducts shall not pass through smoke stop or fire fighting lobby. Where unavoidable, portion of the duct within the lobby shall be enclosed in construction having at least the same protection rating to that of the elements of the structure. | |
| 4.6.1.5 | Any part of the pressurization air supply duct not enclosed in protective shaft or running outside of the smoke stop or fire fighting lobby which it serves shall either be enclosed or constructed to provide a fire protection rating equal to that of the enclosure which it serve. | |
| 4.6.2 | Natural Ventilation Alternative | |
| 4.6.2.1 | Open and externally located lobbies are deemed naturally ventilated lobbies satisfying natural ventilation alternative. | |
| 4.6.2.2 | Lobbies having openings on external wall meeting all of the following conditions are deemed naturally ventilated lobbies satisfying natural ventilation alternative: | |
| a. | A minimum net area of 1.5 sq. m (16 sq. ft.) or 25% of the floor area of the lobby, whichever is greater | |
| b. | Openings are located as near as practicable to the ceiling with the top of the opening at least 0.3 m (1 ft) below the ceiling of the lobby | |
| c. | Openings are located not more than 9 m from any part of the lobby | |
| d, | Openings are facing an outer court, yard or public way that is at least 6.1 m (20 ft) width; or | |

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| Item | Provisions | Notes |
| d1. | When facing an air/light well, the well should be totally open to the sky and have an area of not less than 10 m ² with no sides less than 3 m | |
| Note (d.1) | Permitted in non-high rise building having no floor levels below ground. Air/light well starts from ground level only. | |
| 4.6.2.3 | Lobbies located one floor level and not more than 3.5 m below ground, may be ventilated through unobstructed openings having a minimum cross-sectional area of 1 m ² provided at the ceiling of the lobby and discharging directly to external of the building. Duct and/or shafts required to ventilate the lobby to external shall be constructed of materials having minimum 1 hr fire protection rating or equivalent rating of the lobby enclosure, whichever or greater. | |
| 4.6.2.4 | Smoke-stop or firefighting lobbies approached via cross ventilated corridors having openings of not less than 50 % of the superficial wall of the corridor located in at least two of its externally opposing walls and with no part on the floor space of the corridor is farther than 12 m from the ventilation openings are deemed to satisfy natural ventilation alternative. | Openings could be of fixed or automatic opening type |
| 4.6.3 | Reserved. | |
| 4.7 | Corridor Smoke Control System | |
| 4.7.1 | Corridor Mechanical Smoke Control System | |
| 4.7.1.1 | Smoke control system where required for internal corridor shall either be by means of mechanical or natural ventilation system. | |
| 4.7.1.2 | Mechanical smoke control for internal corridors shall either be by pressurization or smoke exhaust ventilation system, depending on which type designer deemed to be most favorable for the building. | |
| 4.7.1.3 | Corridor pressurization system shall be designed such that a minimum 12.5 Pa (0.05 in. w.g.) for sprinklered building and 25 Pa for non-sprinklered building, differential pressure is achieved between the corridor and the smoke zone. Pressure in adjacent pressurized escape accesses shall be adjusted accordingly such that pressure gradient with reference from the pressurized exit staircase as the highest down to the pressurized corridor is achieved. | |
| 4.7.1.4 | All doors opening into pressurized corridor shall be self-closing doors. | |
| 4.7.1.5 | Means for controlling pressure in the corridor must be provided. | |



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| Item | Provisions | Notes |
| 4.7.1.6 | <p>Smoke exhaust ventilation system for internal corridors must be designed for a minimum exhaust rate of 10 ACH with provisions for make-up/replacement air supply 80%-90% of exhaust flow rate.</p> <p>Natural means for make-up/replacement air supply via fixed or automatic openings from external shall be permitted.</p> | |
| 4.7.1.7 | Air supply outlets and smoke exhaust inlets shall be distributed on the opposite sides of the corridor strategically situated such that a sweeping motion of smoke being directed to the inlets is achieved effectively. | |
| 4.7.1.8 | Arrangement of the air supply outlets and smoke exhaust inlets shall be such that a smoke exhaust outlet is within 15 m (49.2 ft) distance from an air supply outlets when measured parallel and horizontally along the corridor. When located in the different direction in an intersecting corridor, distance of a smoke exhaust inlet to an air supply outlet must not exceed 10 m (32.8 ft) measured along the path. | |
| 4.7.1.9 | Smoke exhaust inlets shall be located having its lower part at least 1.83 m (6 ft) above the finished floor line. | |
| 4.7.1.10 | Air supply outlets must be located at elevation below smoke exhaust inlets. The lower part of an air supply outlet shall at least be 300 mm (1 ft) above the finished floor line with its higher part not exceeding 1 m (3.28 ft) above finished floor line. | |
| 4.7.1.11 | Exhaust inlets must be located at least 5 m away from fire stop doors or entrance to exits. | |
| 4.7.1.12 | Operation of the corridor smoke exhausts system shall be initiated by subsequent activation of smoke detectors within the corridor or sprinkler flow switch dedicated to the group of sprinklers serving the corridor only. | |
| 4.7.1.13 | The provision of corridor smoke exhaust ventilation system must take cognizance the possible effect to pressure differential and door opening force requirements of an adjacent pressurized escape access, such as a lobby or exit staircase. | |



MECHANICALLY VENTILATED CORRIDOR

Figure 11A. Corridor Ventilation Arrangement



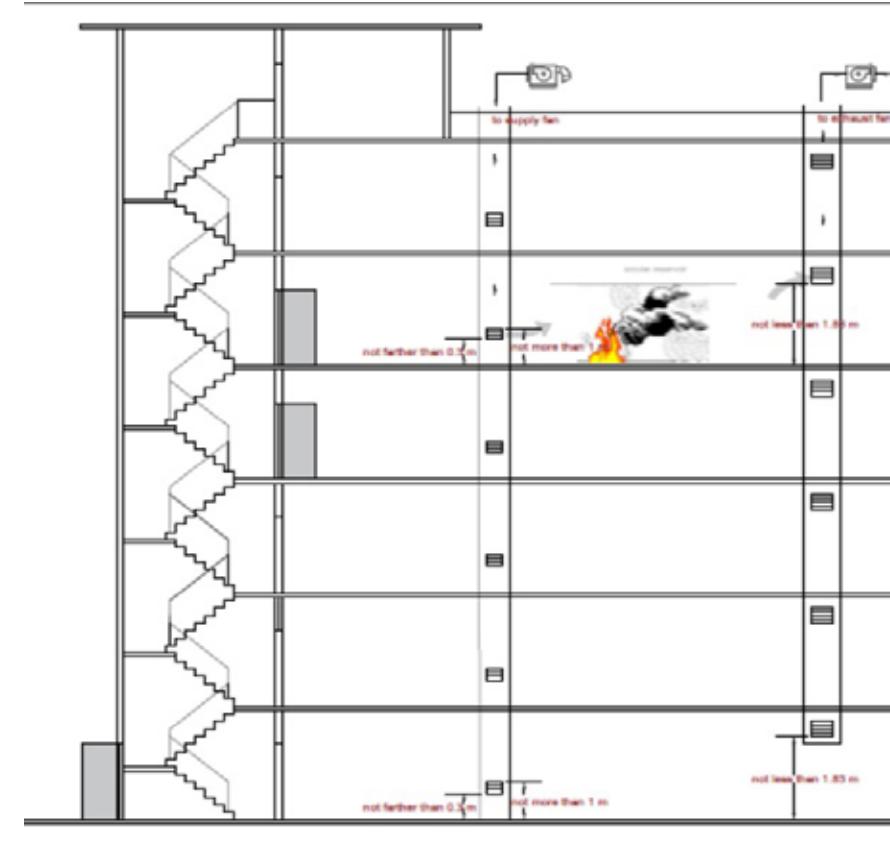


Figure 11B. Corridor Ventilation Arrangement

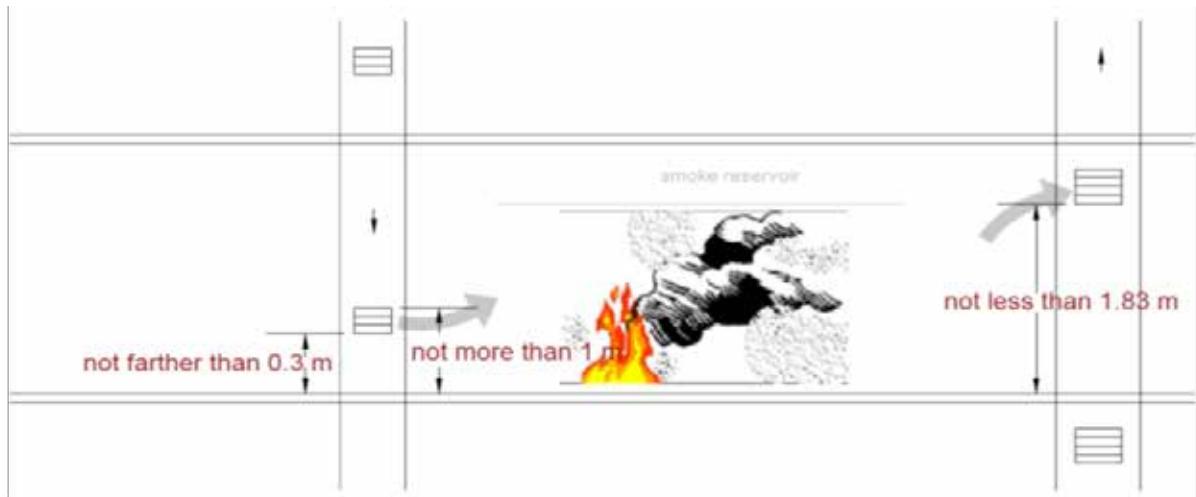
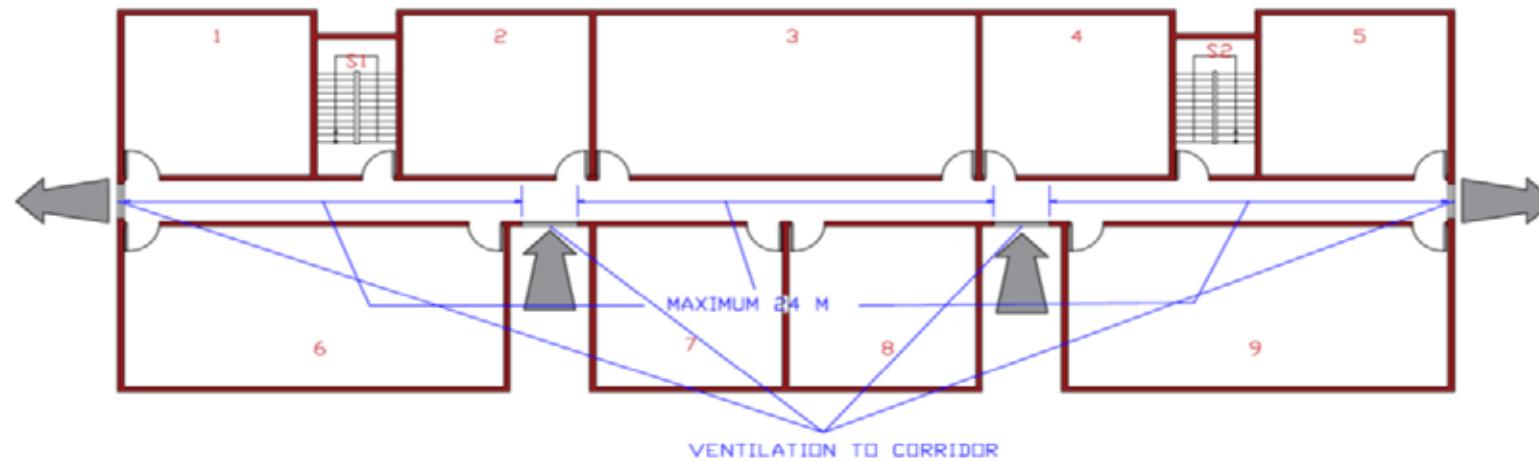


Figure 11C. Corridor Ventilation Arrangement

| | | |
|---------|---|--|
| 4.7.2 | Natural Ventilation Alternative | |
| 4.7.2.1 | Naturally ventilated corridors with ventilation openings having an area of not less than 50 % of the superficial wall of the corridor located in at least two of its externally opposing walls and with no part on the floor space of the corridor is farther than 12 m from the ventilation openings are deemed to satisfy natural ventilation alternative. | Openings could be of fixed or automatic opening type |
| 4.7.2.2 | Ventilated corridor through openings having an area of not less than 1.5 m^2 (16 ft^2), with the top of the opening located within 300 mm from the corridor ceiling, opening into a dedicated air shaft not less than 10 m^2 cross sectional area that is open to sky shall be permitted in non-high rise buildings. No dimension of the sides of the air shaft shall be less than 3 m. | |
| 4.7.2.3 | No part on the floor space of the corridor shall be farther than 12 m from a ventilation opening. | |





CROSS VENTILATED CORRIDOR VIA OPENINGS ALONG EXTERNAL WALLS

Figure 12A. Corridor Natural Ventilation

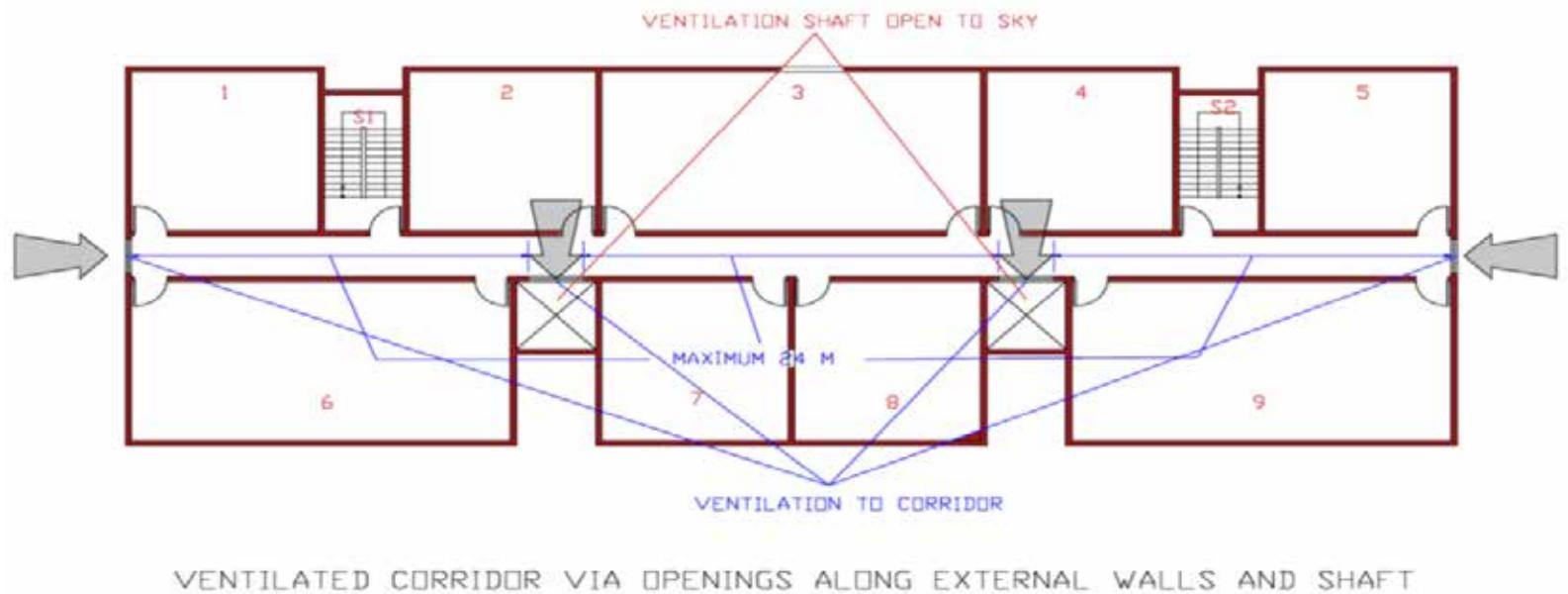


Figure 12B. Corridor Natural Ventilation



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| Item | Provisions | Notes |
| 4.8 | Refuge Floor Areas Smoke Control | |
| 4.8.1 | Pressurization of Refuge Floor Holding Areas | |
| 4.8.1.1 | A minimum differential pressure of 12.5 Pa shall be provided between the refuge floor holding area and the accommodation area or fire zone. | |
| 4.8.1.2 | A pressurized refuge floor holding area shall be adjacent to pressurized stair and/or lobby. The pressure in the refuge area shall in no case be greater than the pressure in the stair or lobby. | |
| 4.8.1.3 | A dedicated air supply system or the building HVAC system may be used as means for supplying the required airflow to pressurize the space. The HVAC system layout where used shall be coordinated with the compartmented refuge area. | |
| 4.8.2 | Natural Ventilation Alternative | |
| 4.8.2.1 | The refuge floor holding area may be ventilated naturally through permanent openings on at least two sides of external walls. The height of the opening shall not be less than 1200 mm and the total area of the openings not be less than 25 % of the floor area of the holding area. The openings shall be arranged such that no part of the holding area is farther than 9 m to any ventilation opening. | |
| 4.8.2.2 | Ventilation openings shall be located at least 1.5 m horizontally from and 3 m vertically above adjoining unprotected opening. | |
| 4.9 | Elevator Hoistway Pressurization | |
| 4.9.1 | Elevator shafts in high rise buildings not served by an enclosed simple lobby and opening into an internal common hallway or corridor shall be pressurized to provide a minimum 25 Pa pressure difference between the lift shaft and the occupant/accommodation area or smoke zone for buildings that are non-sprinklered or other than fully sprinklered. | |
| 4.9.2 | Elevator shafts in high rise buildings not served by an enclosed simple lobby and opening into an internal common hallway or corridor shall be pressurized to provide a minimum 12.5 Pa pressure difference between the lift shaft and the occupant/accommodation area or smoke zone for buildings that are fully sprinklered. | |
| 4.9.3 | Where permitted to have no fire lift lobby (or such as in existing building where the provision of fire lift lobby has not been explicitly required under the previous local codes), fire lift shafts opening into an internal common hallway or corridor shall be pressurized to provide a minimum 25 Pa pressure difference between the lift shaft and the occupant/accommodation area or smoke zone for buildings that are non-sprinklered or other than fully sprinklered. | |

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| Item | Provisions | Notes |
| 4.9.4 | Where permitted to have no fire lift lobby (or such as in existing building where the provision of fire lift lobby has not been explicitly required under the previous local codes), fire lift shafts opening into an internal common hallway or corridor shall be pressurized to provide a minimum 12.5 Pa pressure difference between the lift shaft and the occupant/accommodation area or smoke zone for buildings that are fully sprinklered. | |
| 4.10 | Carparks | |
| 4.10.1 | Conventional Mechanical Smoke Extract System/Smoke Purging System | |
| 4.10.1.1 | Mechanical ventilation/smoke control shall be provided for car parks located below ground or enclosed having floor area of more than 2000 m ² . | |
| 4.10.1.2 | Conventional mechanical smoke extract system or smoke purging system shall be designed for purpose of smoke clearance with the following objectives: | |
| 1.0 | Maintain smoke layer within the smoke zone to not lower than 1.8 m from the floor. | |
| 2.0 | Contain the within the smoke zone or an area not more than 1000 m ² from the center of the fire. | |
| 4.10.1.3 | Conventional mechanical smoke extract system or smoke purging system shall be designed in accordance with NFPA 88A and ASHRAE Handbook. | |
| 4.10.1.4 | Conventional Mechanical Smoke Extract System or smoke purging system shall be independent from any other system in the building and be designed to provide minimum exhaust rate of 6 ACH for general ventilation and 10 ACH under smoke mode. | |
| 4.10.1.5 | Each smoke control zone of the car park shall have its own extract fan or purging system. The system shall be arranged such that the required rate of extract for the smoke zone does not fall below 50% in the event of failure of any fan or group of fans in the system. | |
| 4.10.1.6 | Smoke exhaust inlets or extract points shall be arranged such that 50% of the exhaust capacity is at high level and 50% is at low level and evenly distributed over the whole car park. | |
| 4.10.1.7 | The system shall be designed and calculated such that velocity of air within escape routes and ramps does not exceed 5 m/s. | |
| 4.10.1.8 | Fresh or make up air supply shall be drawn directly from external with its intake located at least 5 m away from any exhaust discharge openings. Natural ventilation openings of at least 2.5 % of the floor area of the car park and equally distributed in at least two of its opposing sides may be deemed satisfactory substitute for the supply air requirement of the smoke purging system. | |



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| Item | Provisions | Notes |
| 4.10.1.9 | Supply air outlets and smoke exhaust inlets shall be distributed adequately over the car park. No portion in the car park must be farther than 12 m to a smoke exhaust inlet. | |
| 4.10.1.10 | Smoke exhausts shall be discharged directly to external and shall be located at least 5 m away from any air intake openings into the building. | |
| 4.10.1.11 | Smoke exhaust discharge openings/outlets termination points shall be located at least 3 m from property lines and operable openings into buildings. | |
| 4.10.1.12 | Where located on roofs and adjacent to exterior walls, smoke exhaust discharge openings/outlets termination points shall be located at least 1 m above exterior walls and roofs. | |
| 4.10.1.13 | Ventilation exhaust fans shall be suitable for operating at minimum 250 °C for a period of 2 hrs (120 minutes) or 300 °C for a period of 1 hr (60 minutes) . | |
| 4.10.1.14 | Exhaust ducts for the car park smoke purging system shall be fabricated from a minimum 1.2 mm thick, heavy gauge steel . | |
| 4.10.2 | Impulse Ventilation or Jet/Thrust Fans Assisted Car Park Smoke Exhaust Ventilation System | |
| 4.10.2.1 | Car park ventilation systems employing thrust fans shall be confirmed through performance based design approach. The use of computational fluid dynamics (CFD) fire modeling and the following input parameters shall be considered in the design. | |
| 4.10.2.2 | System must be designed with due consideration on the usage and condition in the car park. Design of the car park ventilation system shall be based on either of the objective of smoke clearance or smoke control, whichever is best appropriate for the type of car park. Acceptance criteria shall be based on the following: | |
| | System Designed as Smoke Clearance: | Purpose: * Assist fire service in clearing smoke * Reduce risk of flashover by ensuring smoke is kept at reasonably low temperature |
| a. | System designed and sized to clear the space once the fire has been brought under control within twenty (20) minutes | |
| b. | Visibility on area/s upstream of the fire of not less than 10 m | |
| c. | Maximum air/smoke temperature of 400 °C along path to exhausts | |
| d. | At least one viable route for fire fighters from external is available within the smoke logged area | |

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| Item | Provisions | Notes |
| | <p>System Designed as Smoke Control: At 1.8 m above the floor level and within 10 m radius of the design fire, the following shall be attained during the first twenty (20) minutes</p> <p>a. Minimum 10 m visibility upstream of the fire</p> <p>b. Smoke is contained within the defined zone boundaries or not more than 50% of the equivalent zone width is encroached by smoke on the adjacent smoke control zone where fire is located across a zone boundary</p> <p>c. Visibility on all other areas or zones outside the defined smoke path between fire source and extract points are more than 10 m</p> <p>d. Maximum air/smoke temperature of 250 °C along path to exhausts; all other areas outside the smoke logged area not exceeding 60 °C</p> | <p>Purpose:</p> <ul style="list-style-type: none"> * Control smoke movement * Protect means of egress from the car park to aid occupant escape or fire service in approaching the fire * Compensate for other requirements which were not met; e.g. provisions of automatic sprinkler system |
| 4.10.2.3 | The space in the car park shall be divided into smoke control zones with each zone not larger than 2500 m ² (excluding plant rooms, stair/lobby/elevator shaft and other circulation spaces) for purpose of smoke containment and faster location of fire. | |
| 4.10.2.4 | Each smoke control zone shall have its own exhaust system (jet fans, fresh air supply fans, smoke exhaust fans) designed to extract smoke from the fire affected zone. | |
| 4.10.2.5 | The exhaust rate of the fans must not be less than the bulk air movement from the jet fans in the particular smoke zone. | |
| 4.10.2.6 | Minimum design fire size for enclosed parking structures that permits only passenger cars shall be according to anticipated fuel load of one car but in no case be less than | |
| a. | 4 MW (14 m perimeter) for car parks protected by supervised automatic sprinkler system | |
| b. | 8 MW (20 m perimeter) for car parks not protected with supervised automatic sprinkler system | |
| 4.10.2.7 | Minimum design fire size for enclosed car parking structures that permits goods carrying vehicles shall consider the combined fuel load of the car and the goods. | |
| 4.10.2.8 | Assumed design fire for a car shall be flaming polyurethane. | |
| 4.10.2.9 | The design fire must be considered to be in the most onerous location, preferably the most remote location from the exhaust points and at a point in-between two zones for zoned systems. | |
| 4.10.2.10 | Duration of CFD simulation must be a minimum of 30 minutes. Grid size must be a maximum of 0.2 m x 0.2 m x 0.2 m within 10 m of the design fire and maximum 0.4 m x 0.4 m x 0.4 m for other areas. | |



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| Item | Provisions | Notes |
| 4.10.2.11 | The model or analysis shall assume no sprinkler activation for the design fire considered. | |
| 4.10.2.12 | Design shall include a margin of safety considering possible loss of thrust fans. The analysis shall include a sensitivity study that shows that even with the loss of a thrust fan nearest the fire, the acceptance criteria are still met. | |
| 4.10.2.13 | Exhaust fans must be configured such that failure of any single fan will not result in more than 50% reduction of air flow. | |
| 4.10.2.14 | Smoke exhausts shall be discharged directly to external and shall be located at least 5 m away from any air intake openings into the building. | |
| 4.10.2.14 | Smoke exhaust discharge openings/outlets termination points shall be located at least 3 m from property lines and operable openings into buildings. | |
| 4.10.2.16 | The smoke exhaust ventilation system fans shall have alternate source of power in accordance with Section 10 hereof. | |
| 4.10.2.17 | Where multiple levels of enclosed car parks are protected by the same ventilation system, the size of the equipment as well as the inlets and outlets for the make-up and exhaust air must be adequately designed to allow for simultaneous CO dilution of adjacent zones and other levels at the minimum rate of 6 ACH. | |
| 4.10.2.18 | The commissioning and acceptance testing of smoke control systems must be carried out in the presence of a QCDD inspector. The procedure must consist of hot smoke test prepared and carried out in accordance with AS 4391. For jet fans, BS 7346- Part 7 may be used as a guide. | |
| | Reserved. | |

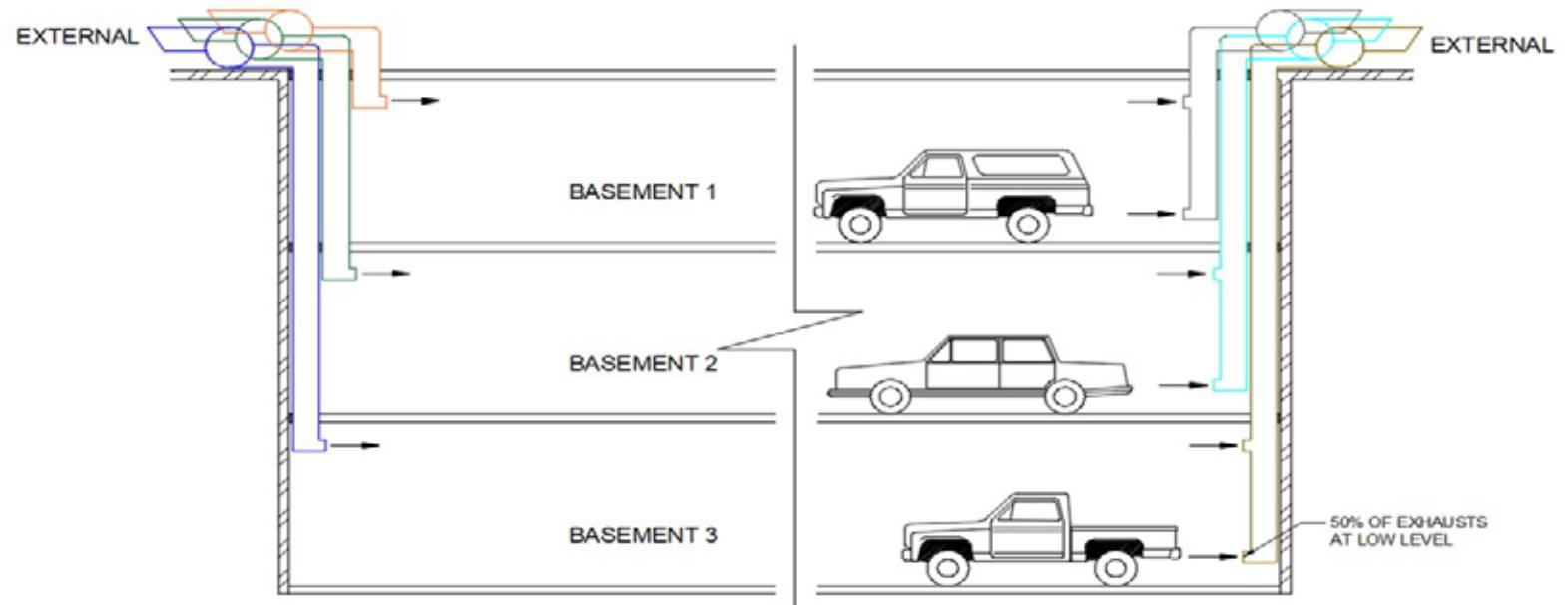
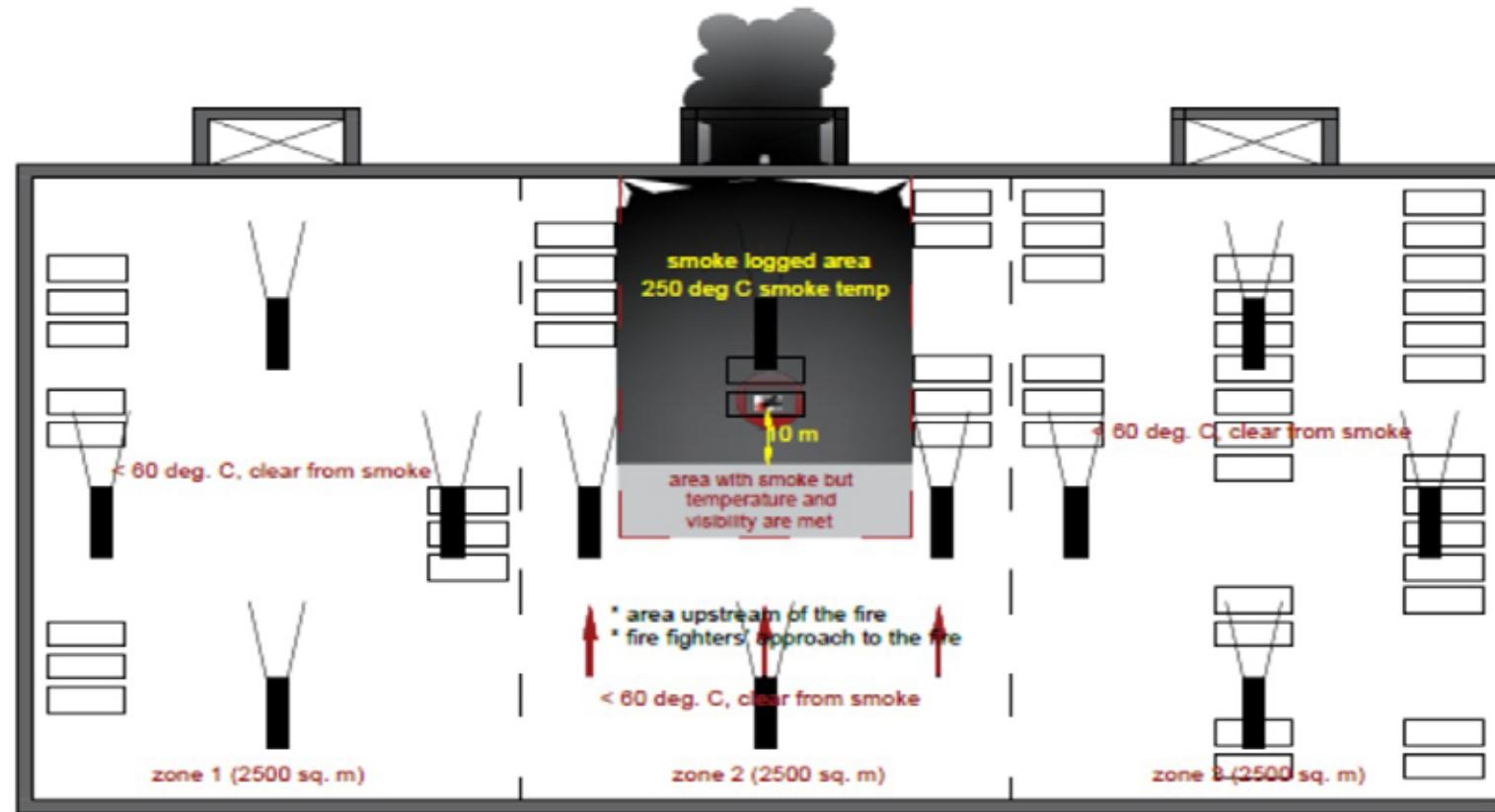


Figure 13. Ducted Below Ground Car Park Ventilation





Basement Car Park Smoke Control Zoning

Figure 14A. Jet Fan Assisted Car park Ventilation

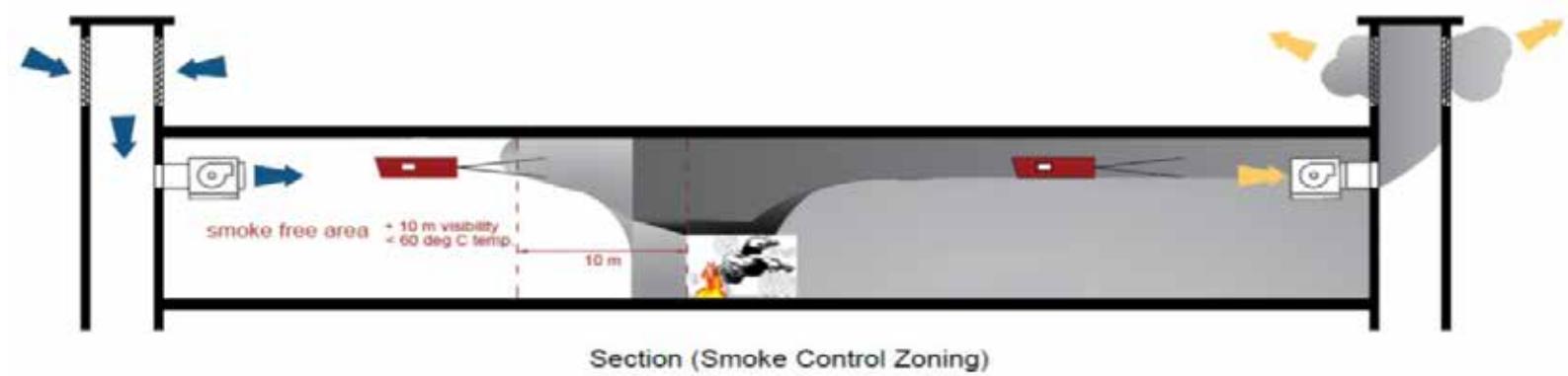


Figure 14B. Jet Fan Assisted Car park Ventilation



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| Item | Provisions | Notes |
| 4.10.3 | Natural Ventilation Alternatives | |
| 4.10.3.1 | Car parks classified as open parking structure or those meeting the openness requirements are not required to have mechanical ventilation system where all points on the car park is within 15 m to an opening; otherwise a CFD analysis proving that smoke stagnation would not result from the far distance of openings. | |
| 4.10.3.2 | Above ground car park ventilation through the cross ventilation approach shall have the opposing openings at distance not more than five (5) times the ceiling height. The aggregate opening area shall be at least 4% of the floor area of the car park with half of the required openings equally arranged between the two opposing sides. | |
| 4.10.3.3 | Use of Smoke Vents for Natural Dispersal of Smoke | |
| 4.10.3.4 | Provisions of smoke vents shall be permitted for car parks 2000 sq m or less that is enclosed or located not more than two (2) levels or 6 m below ground level, whichever is less. | |
| 4.10.3.5 | Smoke vents shall either be fixed open or automatically operable type. | |
| 4.10.3.6 | Number and sizes of vents shall be such that aggregate vent openings are equivalent to not less than 2.5% of the area of the floor being served. No smoke vent shall be smaller than 610mm (2 ft) in diameter or any of its sides. | |
| | (Note: The 2.5 % requirement is only for smoke dispersal in naturally ventilated car park. To cater for both general ventilation and smoke dispersal requirement, the aggregate vent openings must account to at least 5% of the floor area of the car park or a mechanical exhaust system providing 3 ACH may be added to supplement the general ventilation requirement with only having 2.5% openings). | |
| 4.10.3.7 | Vents shall be distributed along the perimeter, on the sides (e.g. below ground partially sunken car park) or ceiling level of the car park with the vents spaced no farther than 30 m from each other and that no portion on the floor is farther than 15 m to a vent. | |
| 4.10.3.8 | Venting may be through shafts or ducts that leads directly to outside. Where smoke ventilation shaft is used, or ducts are required to connect vents to discharge outlets, the shaft or duct should at least have one (1) hour fire resistance rating. | |
| 4.10.3.9 | Separate vent outlets shall be provided for each floor level. | |
| 4.10.3.10 | Vents shall discharge directly to external with its outlet located at least 5 m from any air intakes into the building. | |
| 4.10.3.11 | For aboveground installation, the bottom or lowest smoke inlet point/s of a smoke ventilation shaft or duct shall not be farther than four (4) floors to its discharge outlet/s to outside. | |

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| Item | Provisions | Notes |
| 4.10.3.12 | The smoke ventilation shaft or duct discharge outlet shall be located at least 1.5 m above the roof, 3 m away from building exit discharge or any other operable opening to the building. | |
| 4.10.3.13 | Smoke vents which are kept closed during normal or non-fire condition shall be designed to operate automatically. | |
| 4.10.3.14 | In car parks provided with automatic sprinklers, the provision of smoke vents shall be designed such that it does not affect the sprinkler activation. | |
| | Reserved. | |
| | | |

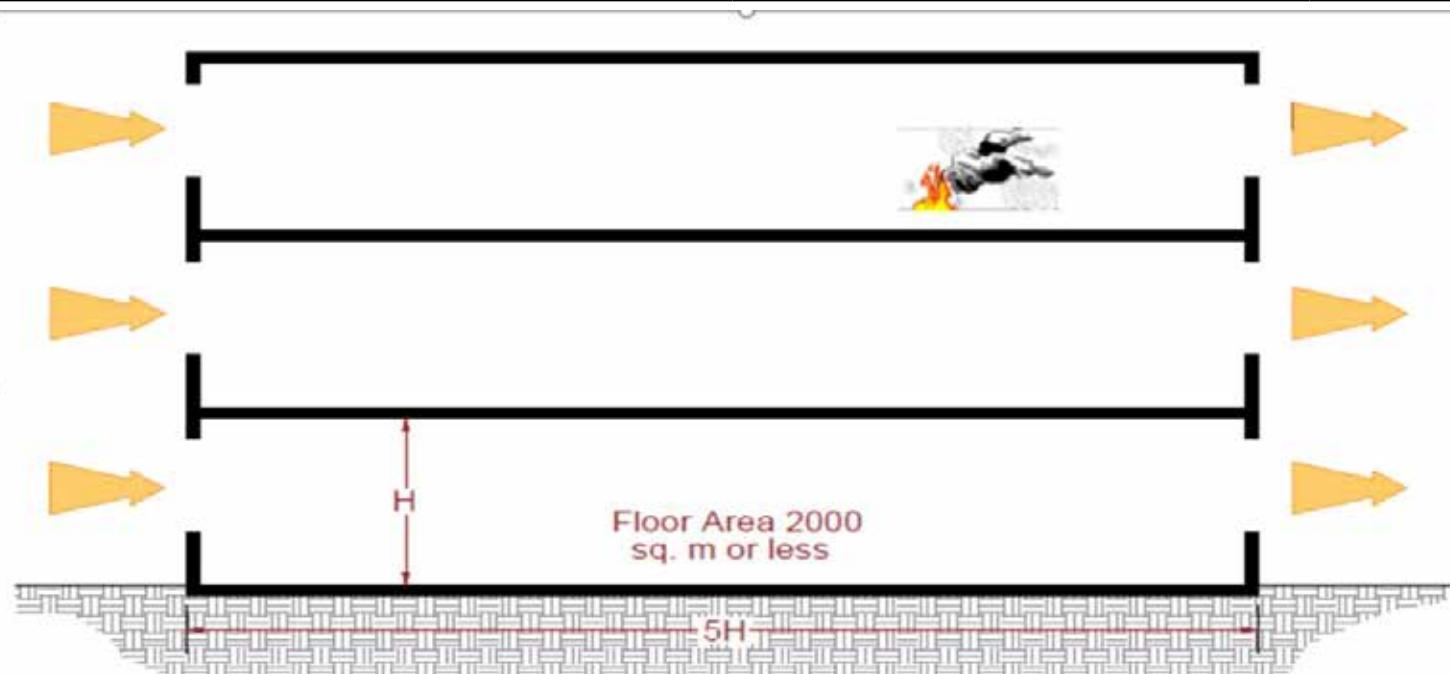


Figure 15A. Naturally Ventilated Car Park



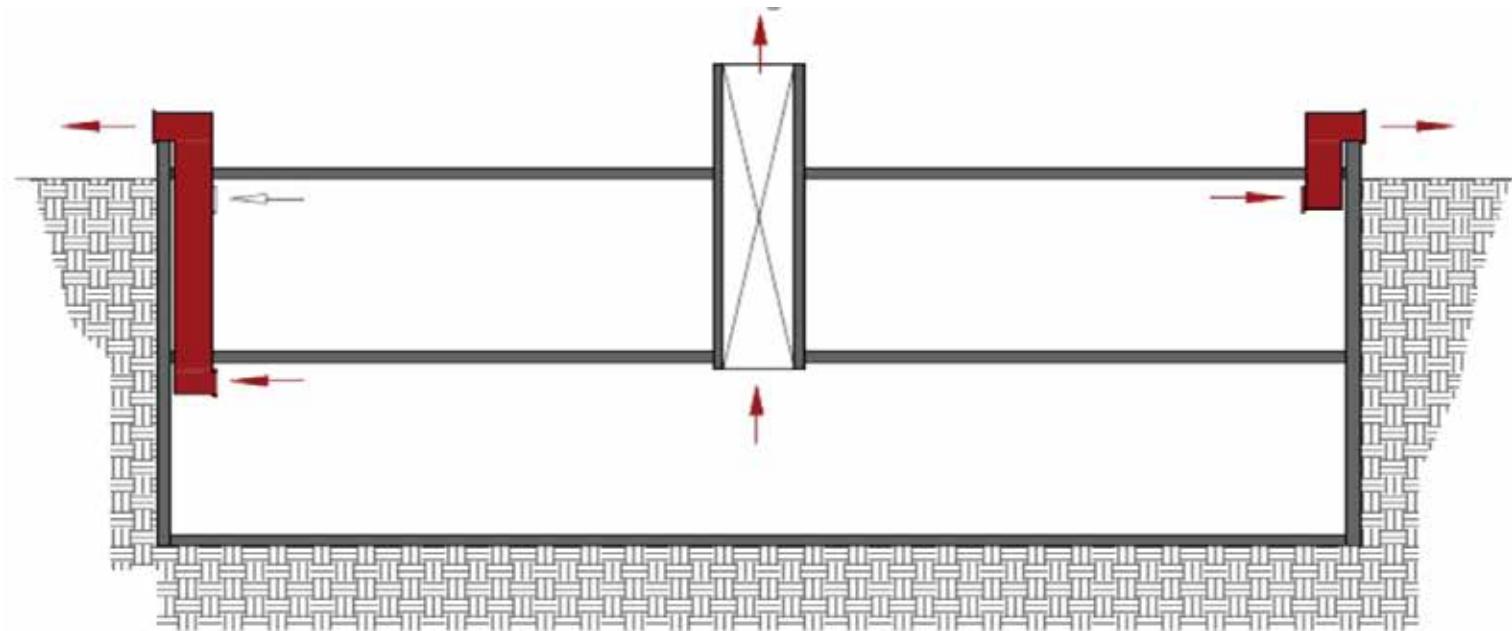


Figure 15B. Natural Ventilation of Employing Exhaust Shafts/Ducts

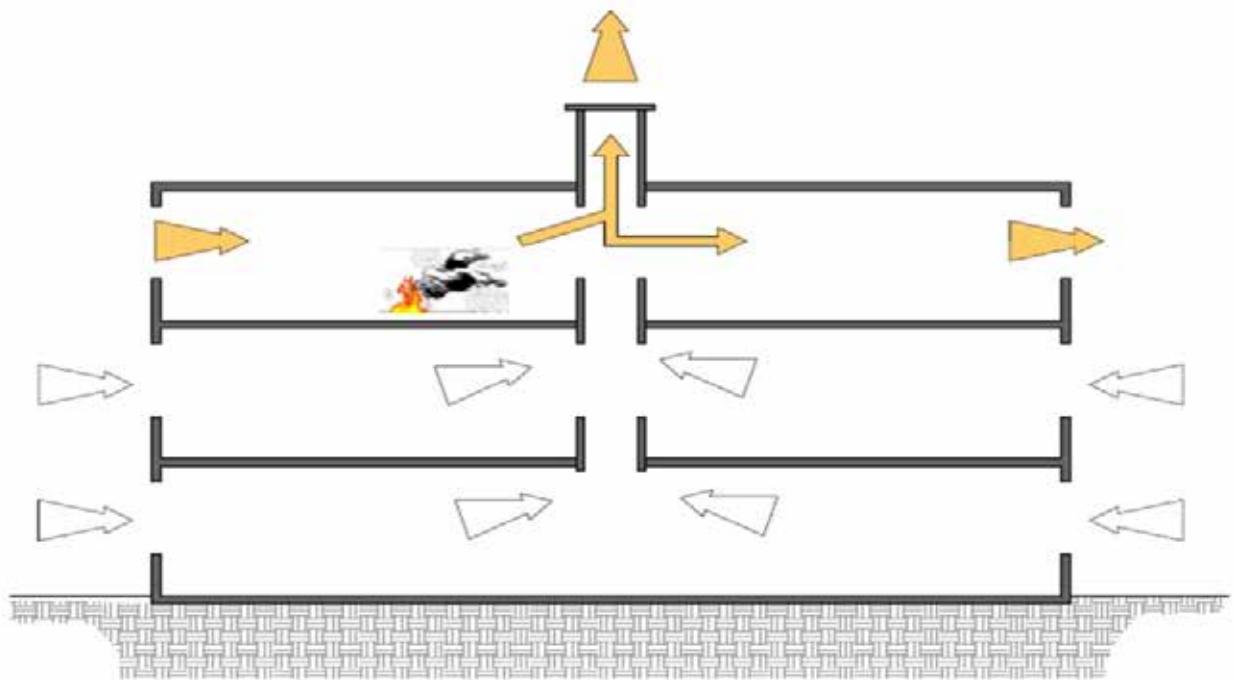


Figure 15C-1. Natural Ventilation with Exterior Openings and Interior Exhaust Shafts



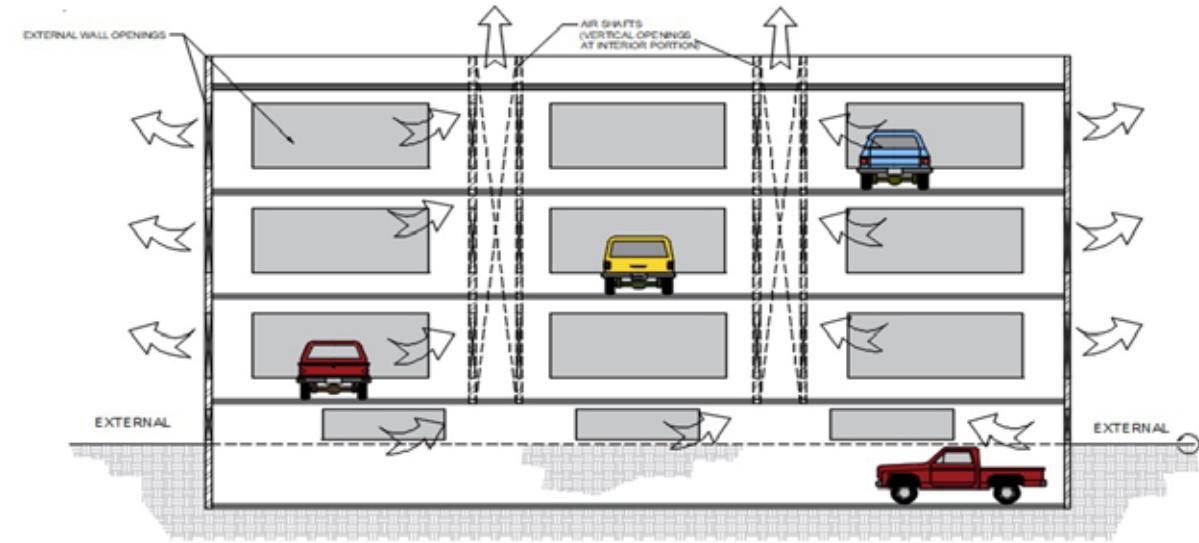
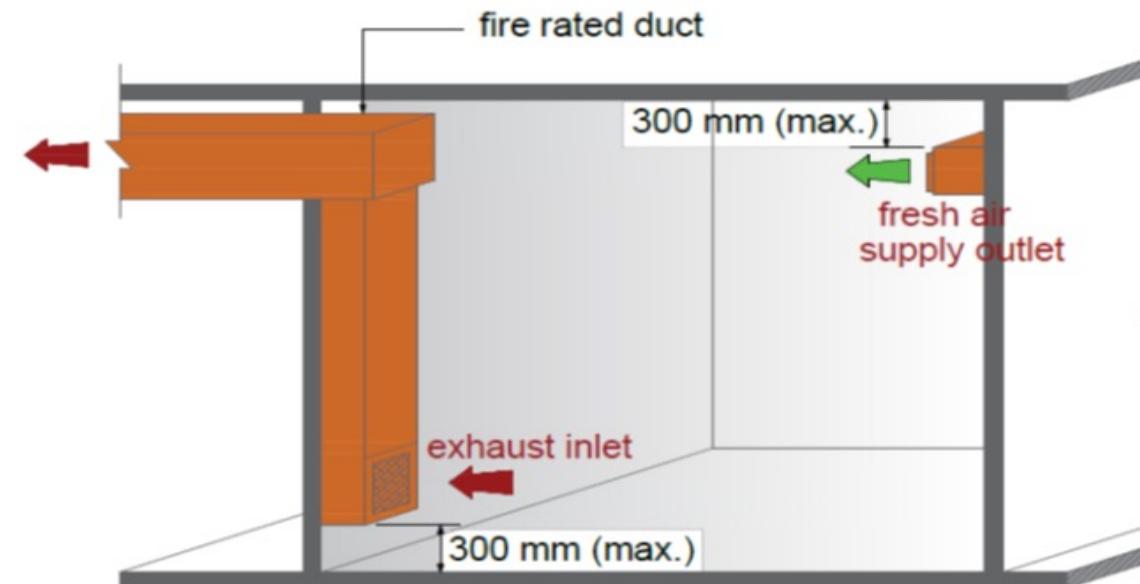


Figure 15C-2. Natural Ventilation with Exterior Openings and Interior Exhaust Shafts

| | | |
|--------|---|--|
| 4.11 | Atrium and Large Volume Spaces | |
| 4.11.1 | Smoke control system designed in accordance with NFPA 92 and this guideline shall be provided for atriums or floor openings in building that connects more than three (3) floor levels. | |
| | Exemption: Atrium or floor openings in Malls in which provision is required for more than two (2) floor levels. | |
| 4.11.2 | Smoke control system where required shall be either by natural means, mechanical or a combination thereof. | |
| 4.11.3 | Smoke control system shall be designed based on the following considerations: | |
| i. | appropriate design fire size | |
| ii. | maintaining the smoke layer interface above the highest unprotected opening to adjoining spaces, or 1.83 m (6 ft) above the highest walking surface open to the atrium | |
| iii. | make-up/replacement air supply limited to 1 m/s (200 ft/min) unless a high velocity is supported by an engineering analysis | |
| iv. | capable to operate for a min. period of twenty (20) minutes or 1.5 times the required safe evacuation time, whichever is less. | |

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| Item | Provisions | Notes |
| 4.11.4 | Design of smoke control systems for spaces with non-uniform cross-sections or complex geometries must be confirmed with the aid of computational fluid dynamics (CFD) programs. | |
| 4.11.5 | Natural smoke filling where adopted as means for smoke control shall be accompanied by engineering analysis justifying its viability or application in the building. | |
| 4.11.6 | Smoke control and ventilation must be designed according to NFPA 92, ASHRAE and other applicable engineering codes or standards. | |
| 4.12 | Machine Rooms, Fuel Tanks Rooms, Rooms Containing and/or Involving Use of Flammable and Explosive Substances | |
| 4.12.1 | Mechanical ventilation system designed for general ventilation shall be provided for all areas containing machines, fuel tanks, furnaces, forges, battery charging, storage and use of flammable and explosive substances, and other processes where flammable and explosive gases, fumes, dust or particles are likely to be produced. Ventilation system for these areas may be connected to emergency power supply system but need not be required to be connected to the building's fire alarm system. | |
| 4.12.2 | Mechanical ventilation system for rooms containing and/or involving the use flammable and explosive substances shall be independent and dedicated to the room only. | |
| 4.12.3 | Ventilation rate shall be as per ASHRAE or manufacturer's recommendation. | |
| 4.12.4 | Exhausts shall be direct to external and not less than 5 m away from any air intake openings. | |
| 4.12.5 | Ducts running outside the room shall either be enclosed by a structure or be constructed to provide at least the same protection rating as of the room being served or the room where it passes through, whichever is higher. | |
| 4.12.6 | Where duct risers are contained in a protective shaft containing ducts for other services, provisions shall be made to compartment the shaft to separate these ducts from the other service installations. | |
| 4.12.7 | Emergency ventilation ducts and ducts serving other areas in the building shall not pass through rooms containing or involving use of flammable and explosive substances. | |





Room with flammable vapor to be remove is heavier than air

Figure 16. Ventilation for Hazardous Vapor Removal

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| Item | Provisions | Notes |
| 4.13 | Industrial and Storage Buildings | |
| 4.13.1 | <p>Smoke control using mechanical ventilation system shall be provided for industrial and storage buildings protected by automatic sprinkler system.</p> <p>Table 4.13A shall be consulted of the type of mechanical system required.</p> | |
| 4.13.2 | Open space industrial and storage buildings with large areas shall be divided into separate zones using high level smoke barriers or draft curtains. Smoke control zones shall not exceed 2000 m ² if naturally ventilated and 2500 m ² if mechanically ventilated. | |
| 4.13.3 | Roof mounted automatic opening vents shall be permitted for industrial and storage buildings protected by automatic sprinkler system where justification through engineering analysis is made that operation of the vents will not cause any disadvantage effect in the sprinkler operation. | |
| 4.13.4 | <p>Smoke control for industrial and storage buildings shall be designed to meet the requirement of maintaining the smoke layer at or more than 1.83 m (6ft) above any walking surface in the building.</p> <p>A higher clear layer may be selected where limiting smoke damage to stocks is also desired.</p> | |
| 4.13.5 | Fixed openings on roof and external walls for natural dispersal of smoke shall not be permitted in buildings protected by automatic sprinkler system. | |
| 4.13.6 | Fixed openings either along the external walls or roof shall be permitted for natural dispersal of smoke in buildings not protected by automatic sprinkler system | |
| 4.13.7 | Vents either of the fixed or automatic opening type shall be arranged such that no portion in the building or smoke control zone is farther than the distance specified in Table 4.13B to a vent/opening measured horizontally or projected vertically in the case of roof mounted vents. | |
| 4.13.8 | Minimum clear area of openings for the vent shall not be less than 1.5 m ² with no dimension less than 610 mm (2 ft). | |
| 4.13.9 | <p>Supply points for the make-up air shall be located beneath the smoke layer interface.</p> <p>Minimum design depth of smoke layer shall be either of the following:</p> | |
| i. | Twenty (20) percent of the floor-to-ceiling height | |
| ii. | Based on engineering analysis | |



| N1 | ANNEX ACMV_N1 | Revisions_2021 |
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| Item | Provisions | Notes |
| 4.13.10 | For natural ventilation and for combined natural supply-mechanical exhaust ventilation system, make-up or replacement air supply either from openings along external walls or adjacent non-fire zones in a multi-zoned space shall be permitted. | |
| 4.13.11 | Smoke control system must be capable of being operated automatically and manually. In buildings protected with automatic sprinkler system, means of initiation shall be such that sprinklers operate first prior to heat or smoke removal in the building. | |

TABLE 4.13A. MINIMUM SMOKE CONTROL PROVISIONS FOR INDUSTRIAL AND STORAGE OCCUPANCIES

| Location and Compartment Size | Fire Protection | BUILDING HEIGHT, CATEGORIES AND CONFIGURATIONS | | | Minimum Requirement | |
|--|-----------------|--|---------------|---------------|--|--|
| | | Hazard Classification | | | | |
| | | Low | Ordinary | High | | |
| Aboveground Buildings | | | | | | |
| Less Than or Equal to 100 m ² | | | | | No Requirement | |
| > 100 to ≤ 500 m ² | Non-Sprinklered | Not Required | Not Required | Required | Smoke Vent of minimum % openings according to Table MV7-2B | |
| | Sprinklered | Not Required | Not Required | Not Required | Smoke Vent of minimum % openings according to Table MV7-2B | |
| > 500 to ≤ 1115 m ² | Non-Sprinklered | Not Required | Required | Not Permitted | Smoke Vent of minimum % openings according to Table MV7-2B | |
| | Non-Sprinklered | Not Required | Permitted | Required | Purging System | |
| | Sprinklered | Not Required | Required | Required | Smoke Vent of minimum % openings according to Table MV7-2B | |
| | Sprinklered | Not Required | Permitted | Permitted | Purging System | |
| > 1115 to ≤ 2500 m ² | Non-Sprinklered | Not Required | Required | Not Permitted | Smoke Vent of minimum % openings according to Table MV7-2B | |
| | Non-Sprinklered | Not Required | Permitted | Required | Purging System | |
| | Sprinklered | Not Required | Required | Not Permitted | Smoke Vent of minimum % openings according to Table MV7-2B | |
| | Sprinklered | Not Required | Permitted | Required | Purging System | |
| > 2500 to ≤ 4000 m ² | Non-Sprinklered | Required | Required | Not Permitted | Smoke Vent of minimum % openings according to Table MV7-2B | |
| | Non-Sprinklered | Permitted | Permitted | Required | Purging System | |
| | Sprinklered | Required | Required | Not Permitted | Smoke Vent of minimum % openings according to Table MV7-2B | |
| | Sprinklered | Permitted | Permitted | Required | Purging System | |
| > 4000 m ² | Non-Sprinklered | Required | Not Permitted | Not Permitted | Purging System | |
| | Non-Sprinklered | Permitted | Required | Required | Engineered Smoke Control System | |
| | Sprinklered | Required | Required | Not Permitted | Purging System | |
| | Sprinklered | Permitted | Permitted | Required | Engineered Smoke Control System | |
| Belowground Buildings | | | | | | |
| Less Than or Equal to 100 m ² | | | | | No requirement | |
| > 100 to ≤ 1115 m ² | Non-Sprinklered | Required | Required | Not Permitted | Smoke Vent of minimum % openings according to Table MV7-2B | |
| | Non-Sprinklered | Permitted | Permitted | Required | Purging System | |
| > 1115 m ² | Sprinklered | Not Required | Required | Required | Smoke Vent of minimum % openings according to Table MV7-2B | |
| | Sprinklered | Not Required | Permitted | Permitted | Purging System | |

Note : Refer to Annex ACMV-N1 for the design and installation requirements of identified smoke control/ventilation provisions.

TABLE 4.13B. VENT SIZES AND DISTANCES

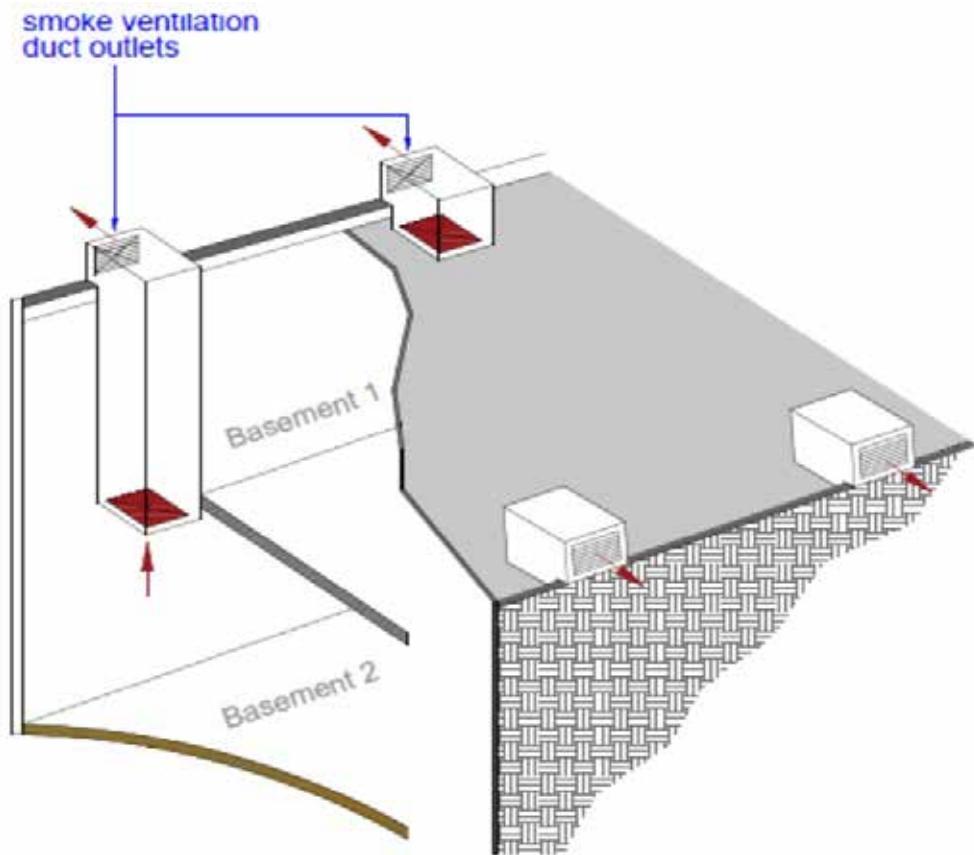
| Table MV7-2B. Smoke Vent Sizes and Distance Requirements | |
|--|---|
| Minimum Total Area of Vents/Openings (% of Floor Area) | *Horizontal Distance from Any Part on the Space to a Vent/Opening (m) |
| 5 | 15 |
| 10 | 18 |
| 15 | 21 |
| ≥ 20 | 24 |

Note :

- * No portion in the space shall be farther than indicated distance to a vent for a particular vent size.
- * Minimum clear area of openings for vent shall not be less than 1.5 m² with no dimension (sides or diameter) smaller than 600 mm.
- * In building protected by automatic sprinkler system, automatic opening vents (fusible link, motorized/electric) shall be used



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| Item | Provisions | Notes |
| 4.14 | Basement Smoke Control (Occupancies Other than Car Park) | |
| 4.14.1 | Fixed or automatic smoke vents shall be provided where the aggregate floor area of each of the basement storey does not exceed 2000 m ² and consists of not more than two floor levels only. | |
| 4.14.2 | Engineered smoke control system shall be provided where the aggregate floor area of each of the basement storey exceeds 2000 m ² or consisting more than two floor levels. | |
| 4.14.3 | Plant and equipment room, car and equipment storage area, commercial cooking and workshops with floor area not exceeding 280 m ² , compartmented from the rest of the basement floor and have adequate access for fire fighting, shall not be required to have provisions for smoke control. | |
| 4.14.4 | Plant and equipment room, car and equipment storage area, commercial cooking and workshops with floor area exceeding 280 m ² but not exceeding 2000 m ² shall be provided smoke vents or smoke purging system at the minimum rate of 10 ACH. | |
| 4.14.5 | Smoke venting or smoke purging at the rate of 10 ACH shall be acceptable in lieu of an engineered system for compartmented service areas such as laundries, office and store rooms (restricted to occupants or staff). | |
| 4.14.6 | Purging system shall be activated by the building fire alarm system. Provision for remote manual activation/deactivation shall be provided at the fire command center or location approved by QCDD. | |
| 4.14.7 | Number and sizes of vents shall be such that aggregate vent openings are equivalent to not less than 2.5% of the area of the floor being served. No smoke vent shall be smaller than 610mm (2 ft) in diameter or any of its sides. | |
| 4.14.8 | Vents shall be distributed along the perimeter, on the sides (e.g. below ground partially sunken basement) or ceiling level with the vents spaced no farther than 30 m from each other and that no portion on the floor is farther than 15 m to a vent. | |
| 4.14.9 | Where ducts are required to connect vents to discharge outlets, the duct shall either be enclosed in structure or constructed to give at least one (1) hour fire resistance. | |
| 4.14.10 | Separate vent outlets shall be provided for each floor level. | |
| 4.14.11 | Vents shall discharge directly to external with its outlet located at least 5 m from any air intakes into the building. | |
| 4.14.12 | Smoke vents which are kept closed during normal or non-fire condition shall be designed to operate automatically. | |
| 4.14.13 | Basement protected by approved automatic sprinkler system, the provision of smoke vents shall be designed such that it does not affect the sprinkler activation. | |
| | Reserved. | |



Basement with Smoke Vents Connected to Ducts

Figure 17. Basement with Smoke Vents Connected to Ducts



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| Item | Provisions | Notes |
| 5.0 | Fire Command Center, Fire Pump and Generator Room | |
| 5.1 | Fire Pump Room and Generator Room | |
| | Where located within the building, independent and dedicated ventilation system shall be provided for the fire pump room and generator room. | |
| 5.1.1 | Where provided, mode of mechanical ventilation of the fire pump room and generator room shall comply with the following: | |
| i. | Continuous or intermittent ventilation at the rate of 6 ACH during which fire pump or generator is not operating. | |
| ii. | Ventilation at the rate of 10 ACH when the fire pump or generator is operating | |
| 5.1.2 | Exhaust fans shall be rated for hot gases at minimum of 250 °C for 2-hrs. | |
| 5.1.3 | Supply air shall be drawn directly from external with its intake point located at least 5 m from any exhaust discharge openings. | |
| 5.1.4 | Mechanical ventilation system ductworks shall be independent of any system ductworks serving other parts of the building. Any part of the system ductworks that runs outside room being served shall either be enclosed or constructed to provide fire protection rating of at least 2-hrs. | |
| 5.1.5 | Where duct risers are required to be contained in a protected shaft, they shall be separated or provisions shall be made to compartment them from other ducts or service installations within the shaft space. | |
| 5.1.6 | Emergency ventilation ducts, air-conditioning and general ventilation ducts serving other areas in the building shall not pass through the fire pump room or generator room | |
| 5.1.7 | Mechanical ventilation system for the generator and fire pump room shall have provisions for secondary or emergency power supply. | |
| | Reserved. | |
| 5.2 | Fire Command Center (FCC) | |
| 5.2.1 | Air-conditioning and ventilation system where required for the Fire Command Center (FCC) shall have ductworks independent of any system ductworks serving other parts of the building. Any part of the system ductworks that runs outside of the FCC being served shall either be enclosed or constructed to provide fire protection rating of at least 2-hrs. | |
| 5.2.2 | Where required, mechanical ventilation of the fire command center shall either be one of the following: | |
| i. | pressurizing the room through supply mode only at 10 ACH | |

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| Item | Provisions | Notes |
| ii. | ventilation at the minimum rate of 6 ACH with both supply and exhaust directly from and to external of the building | |
| 5.2.3 | Mechanical ventilation shall be independent and dedicated to the room only. | |
| 5.2.4 | No other ventilation ducts, except those for the protection of the room shall pass through the fire command center room. | |
| 5.2.5 | Reserved. | |
| 6.0 | Kitchen Exhaust System | |
| 6.1 | Exhaust system for kitchens in hotels, food courts, restaurants and the likes shall be independent of those serving other parts of the building and shall comply with the following requirements | |
| i. | Hoods and ducts for exhausts shall be installed no closer than 500 mm from any unprotected combustible materials or items in the space | |
| ii. | Ducts for kitchen exhaust system shall have at least 1 hour fire protection rating. | |
| iii. | Exhausts shall discharge directly to external far from any air intake openings by at least 5 m. | |
| iv. | Exhausts ducts that runs outside of the kitchen shall either be enclosed in a structure or be constructed to provide at least the same fire protection rating as of the kitchen enclosure or that of the space where its passes through, whichever is higher. | |
| v. | Where exhaust duct risers are required to be contained in a protected shaft, they shall be separated or provisions shall be made to compartment them from other ducts or service installations within the shaft space. | |
| vi. | Fire damper shall not be fitted in kitchen exhaust ducts. | |
| 6.2 | Common kitchen exhaust system shared by number of small restaurants, food and beverage outlets and the likes shall be permitted provided the following requirements and conditions are meet: | |
| i. | The kitchens are located within the same storey or floor level. | |
| ii. | The aggregate floor area of the restaurant, food and beverage does not exceed 1000 m ² . | |
| iii. | The aggregate area or zone served by the common kitchen exhaust system does not exceed 2000 m ² . The length of the zone containing the group of restaurants, food and beverage outlets does not exceed 50 m | |
| 6.2.1 | Sharing of kitchen exhaust system in food courts shall be permitted where the food court is under a single ownership/operator. This is ensure that no confusion arises as to who is responsible for the maintenance of the whole system or any part thereof. | |



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| Item | Provisions | Notes |
| 6.3 | Kitchen exhaust ducts that runs outside of the building shall be located with a minimum horizontal separation distance of 3 m to an unprotected opening that is oriented perpendicular to the duct. A minimum separation distance of 1.5 m shall likewise be provided where the exhaust duct and unprotected opening are on the same plane. | |
| 6.3.1 | The kitchen exhaust duct shall be shielded with a construction having at least 1/2 hr fire protection rating where the above separation distance requirements are not met. | |
| 6.4 | Kitchen exhaust ducts shall be located from unprotected LPG cylinders with a separation distance of at least 3m. Similarly, kitchen exhaust ducts shall be located no less than 600 mm from vaporizer or any liquid phase LPG pipeline | |
| 6.4.1 | Above separation distances shall be permitted to be decreased where kitchen exhaust ducts have fire protection rating of not less than 2-hrs or the LPG cylinders are enclosed in a construction of minimum 2-hrs protection rating. | |
| 6.5 | Maintenance, cleaning and degreasing of kitchen hood and exhaust ducts shall be performed on a regular basis at least once every year. | |
| 6.6 | Reserved. | |
| 7.0 | Substation. | |
| 7.1 | Control rooms, switchgear rooms and cable spreading rooms should have provisions for smoke venting or dispersal. | |
| 7.2 | Smoke exhaust ventilation shall be provided in belowground or basement levels. | |
| 7.3 | Fire damper shall be provided at location where ducts passes through fire rated walls, partitions and floors. | |
| 7.4 | Ducts shall not pass through designated exit staircase. | |
| | Reserved. | |
| 8.0 | Battery Rooms. | |
| 8.1 | Battery rooms shall be provided ventilation to limit concentration of hydrogen to below 1 percent of the volume of air in the room. Related air inlets and outlets of the ventilation system shall be located and adequately distributed so that no stagnant regions in the space being ventilated occurs. | |
| 8.2 | Adequate hydrogen gas detectors shall be provided inside the room for monitoring hydrogen concentration and activating ventilation system when necessary to ensure the allowable hydrogen concentration in the room is not exceeded. Display panels showing status and readings of detectors shall be located outside near entrance to the room. | |

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| Item | Provisions | Notes |
| 8.3 | Fire damper shall not be fitted in the essential ventilation system ducts. Ducts that have to pass through other compartment shall have 2-hrs protection rating. | |
| 8.4 | Essential fans and associated electrical controls shall have provisions for secondary power supply. | |
| 8.5 | <p>Air-conditioning and general ventilation system for the battery room should be independent and dedicated for the room only.</p> <p>Where inevitable and to be derived or shared from system serving other areas in the building, only supply of the needed air requirement shall be sourced from the shared unit/s. No provisions for return or air recirculation shall be made where air-conditioning and ventilation is derived from shared units. .</p> | |
| | Reserved. | |
| 9.0 | Smoke Control Panel. | |
| 9.1 | The fire fighter's control panel shall provide control capability over the equipment of the smoke control system in the building by: | |
| i. | ON-AUTO-OFF control over individual equipment of the smoke control system that can also be controlled from other sources in the building | |
| ii. | OPEN-AUTO-CLOSE control over individual dampers relating to smoke control system that can also be controlled from other sources in the building. | |
| iii. | ON-OFF or OPEN-CLOSE or START-STOP control over smoke control system and other critical equipment associated with fire or smoke emergency and that can only be controlled from the fire fighter's control panel | |
| 9.2 | Switch for manual control of the system shall be of rotary selector type | |
| | Reserved. | |
| 10.0 | Equipment. | |
| 10.1 | Equipment such as, but not limited to, fans, ducts, dampers, control units and devices shall be listed, suitable for its intended use and approved by QCDD. | |
| 10.2 | All smoke control system equipment shall be installed in accordance with its listing and manufacturer's recommendations. | |
| 10.3 | Equipment, control wiring, power wiring and ductwork for smoke proof enclosure protection must be located in accordance with one of the following: | |



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| Item | Provisions | Notes |
| i. | Exterior to the building and directly connected to the smoke proof enclosure or connected to the smoke proof enclosure by ductwork enclosed by 2 hours fire barriers or horizontal assemblies. | |
| ii. | Located in the smoke proof enclosure with the intake or exhaust directly from and to external or through ductwork enclosed in 2-hours fire barriers or horizontal assemblies. | |
| iii. | Located within the building, separated from the remainder of the building by 2-hours fire barriers or horizontal assemblies. | |
| 10.4 | Any duct that are part of the pressurization system must be protected with at least the same fire resistance rating as required for the space being served. | |
| 10.5 | Smoke exhaust fans shall be capable of operating effectively at 250 °C for 2 hours or 300 °C for 1 hour. | |
| 10.6 | Mechanical smoke control systems that are designed as a combined system or which are used to serve multiple smoke control zones (e.g. stairwell and its associated smoke-stop lobby) shall have both a standby power supply and equipment, such as standby fan. | |
| i. | One additional fan is required as standby fan for each system feed by a single fan. | |
| i.i | Where a particular control zone is being protected by a mechanical smoke control system having two or more fans of equal capacity, the system could be backed up by an additional fan having the same capacity of the other fans. | |
| iii. | Where a particular control zone is being protected by a mechanical smoke control system having more than one fan of different capacities, the system could be backed up by an additional fan having the same capacity as of the largest fan. | |
| 10.7 | Variable supply fans or dampers used in controlling airflow to meet pressure differential requirements shall have the capability of achieving between 90% and 110% of the new volumetric requirements within five (5) seconds of a door being opened or closed. | |
| 10.8 | Wiring and cables to be used for smoke control application shall be fire rated with minimum fire resistance rating of 2-hrs. | |
| | Reserved. | |
| 11.0 | Fire Dampers, Smoke Dampers, Combination Fire-Smoke Dampers | |
| 11.1 | Only listed and approved fire dampers, smoke dampers and combination fire-smoke dampers shall be used for fire protection applications. Its application shall include the following : | |
| i. | Fire Walls | |

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| Item | Provisions | Notes |
| ii. | Fire Barriers | |
| iii. | Fire Partitions | |
| iv. | Smoke Barriers | |
| v. | Smoke Partitions | |
| | *Fire dampers are required where ducts penetrates fire barrier (have 2hrs or higher fire resistance ratings). | |
| | *Smoke dampers are required where ducts penetrate fire partitions or smoke barriers (normally have 1 hr fire resistance ratings) | |
| | *Combination fire smoke dampers are required where ducts penetrates barriers serving both purpose as fire barrier and smoke barrier; e.g. shaft enclosure | |
| 11.2 | Fire damper installation shall be as follows: | |
| i. | Walls, partitions or floors with less than 3 hrs fire resistance ratings : (*2 hrs fire damper where available), 1 1/2 hr fire damper. | |
| ii. | Walls, partitions or floors with 3 hrs or more fire resistance ratings : 3 hrs fire damper | |
| 11.3 | Modification of fire or smoke damper in the field shall not be allowed unless the same is determined suitable by the testing and approving authorities. | |
| 11.4 | Installed fire dampers, smoke dampers or fire-smoke dampers shall be accessible for inspection and servicing. | |
| | Reserved. | |
| 12.0 | Detection and Control Systems | |
| 12.1 | Fire detection systems required to provide control signals to mechanical smoke control systems or elements thereof shall conform with NFPA 72. Such detection systems together with its control units shall be listed for smoke control applications and its specific use. | |
| | Reserved. | |
| 13.0 | Smoke Control System Activation | |
| 13.1 | Automatic activation of smoke control systems shall be through one or more of following initiating methods: | |
| a. | Sprinkler water flow switch | |
| b. | Smoke detection system | |



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| Item | Provisions | Notes |
| c. | Heat detection system | |
| | Analysis on the possible effect of the smoke control (ventilation) system on the sprinkler system response shall be considered in the design. | |
| 13.2 | Provisions for manual activation/deactivation or override shall be provided for all smoke control systems. Manual switches shall be of rotary selector type and shall be located in the fire command center or location agreed with the authority having jurisdiction. | |
| | Reserved. | |
| 14.0 | Power Supply System | |
| 14.1 | Smoke control systems shall be supplied with two (2) power sources. Primary power shall be from the normal building power supply system but shall have separate or independent connection from the building non-fire safety related installations. Secondary power supply shall be from an approved standby power supply system complying with NFPA 101. | |
| 14.2 | Transfer from the normal to full standby power shall be automatic and within 60 seconds of failure of the primary power supply. | |
| 14.3 | Wiring for operation and control of smoke control systems shall be connected ahead of the main disconnect and protected against possible exposure to fire. | |
| 15.0 | Inspection and Acceptance Testing | |
| 15.1 | The acceptance testing of smoke control systems must be carried out in the presence of a QCDD inspector. Each smoke control system shall be inspected and tested in accordance with NFPA 92, ASHRAE Guideline 1.5 and other relevant standards acceptable to QCDD. | |
| | Reserved. | |

REFERENCES



References, Referral Codes, and Standards (Latest Editions unless specified):

- NFPA 1, Fire Code.
- NFPA 10, Standard for Portable Fire Extinguishers.
- NFPA 11, Standard for Low-, Medium-, and High-Expansion Foam.
- NFPA 13, Standard for the Installation of Sprinkler Systems.
- NFPA 14, Standard for the Installation of Standpipe and Hose Systems.
- NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection.
- NFPA 16, Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems.
- NFPA 17, Standard for Dry Chemical Extinguishing Systems.
- NFPA 17A, Standard for Wet Chemical Extinguishing Systems.
- NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection.
- NFPA 22: Standard for Water Tanks for Private Fire Protection
- NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances.
- NFPA 30, Flammable and Combustible Liquids Code.
- NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages.
- NFPA 33, Standard for Spray Application Using Flammable or Combustible Materials.
- NFPA 45, Standard on Fire Protection for Laboratories Using Chemicals.
- NFPA 54, National Fuel Gas Code.
- NFPA 58 Liquefied Petroleum Gas Code.
- NFPA 61, Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities.
- NFPA 69, Standard on Explosion Prevention Systems.
- NFPA 70, National Electrical Code.
- NFPA 72, National Fire Alarm and Signaling Code
- NFPA 80, Standard for Fire Doors and Other Opening Protectives.
- NFPA 82, Standard on Incinerators, Waste, Linen Handling Systems, and Equipment.
- NFPA 85, Boiler and Combustion Systems Hazards Code.



- NFPA 88A, Standard for Parking Structures, 2019 edition.
- NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems.
- NFPA 92, Standard for Smoke Control Systems.
- NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.
- NFPA 99, Health Care Facilities Code.
- NFPA 99B, Standard for Hypobaric Facilities.
- NFPA 101, Life Safety Code, 2018 Edition
- NFPA 105, Standard for Smoke Door Assemblies and Other Opening Protectives.
- NFPA 110, Standard for Emergency and Standby Power Systems.
- NFPA 111, Standard on Stored Electrical Energy Emergency and Standby Power Systems.
- NFPA 140, Standard on Motion Picture and Television Production Studio Soundstages, Approved Production Facilities, and Production Locations.
- NFPA 150, Standard on Fire and Life Safety in Animal Housing Facilities.
- NFPA 170, Standard for Fire Safety and Emergency Symbols.
- NFPA 204, Standard for Smoke and Heat Venting.
- NFPA 220, Standard on Types of Building Construction.
- NFPA 221, Standard for High Challenge Fire Walls, Fire Walls, and Fire Barrier Walls.
- NFPA 303, Fire Protection Standard for Marinas and Boatyards.
- NFPA 307, Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves.
- NFPA 400, Hazardous Materials Code.
- NFPA 407, Standard for Aircraft Fuel Servicing.
- NFPA 409, Standard on Aircraft Hangars.
- NFPA 415, Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways.
- NFPA 418, Standard for Heliports.
- NFPA 484, Standard for Combustible Metals.
- NFPA 495, Explosive Materials Code.
- NFPA 501, Standard on Manufactured Housing.



- NFPA 502, Standard for Road Tunnels, Bridges, and Other Limited Access Highways.
- NFPA 664, Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities.
- NFPA 703, Standard for Fire Retardant-Treated Wood and Fire- Retardant Coatings for Building Materials.
- NFPA 704, Standard System for the Identification of Hazards of Materials for Emergency Response.
- NFPA 750, Standard on Water Mist Fire Protection Systems.
- NFPA 820, Standard for Fire Protection in Wastewater Treatment and Collection Facilities.
- NFPA 909, Code for the Protection of Cultural Resource Properties – Museums, Libraries, and Places of Worship.
- NFPA 914, Code for Fire Protection of Historic Structures.
- NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems.
- NFPA 2010: Standard for Fixed Aerosol Fire-Extinguishing Systems
- NFPA 5000, Building Construction and Safety Code.
- ASME A17.1/CSA B44, Safety Code for Elevators and Escalators.
- FM GLOBAL DATA SHEETS_FMDS 02-00 Installation Guidelines for Automatic Sprinklers 2020
- FM GLOBAL DATA SHEETS_FMDS 03-26 Fire Protection for Non-storage Occupancies 2020
- ICC/ANSI A117.1, Accessible and Usable Buildings and Facilities.
- BSI/BS 7346-7, Components for Smoke and Heat Control System.
- AS 4391, Smoke Management System – Hot Smoke Test.
- SCDF Singapore Fire Code.
- ASHRAE – American Society of Heating, Refrigerating and Air-Conditioning Engineers.
- SOCIAL DEVELOPMENT, Ministry of Social Development and Family (MSDF)
- KAHRAMAA, Qatar General Electricity and Water Corporation (QGEWC)
- BALADIYA, Ministry of Municipality (MM-Building Permit Section)
- GDCD, Qatar Civil Defense (QCD) Fire Safety Guidelines and Annex, 2015 edition.



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