



## List Of Requirements

## Conditions

<b>Scope Of Company</b>	Consultant	<b>Status of project</b>	Modification
<b>Type of Occupancy</b>	Health Care	<b>largest floor area</b>	More than 900 Sq mts
<b>No of Floors</b>	G+4 Or More	<b>Largest Basement Area</b>	More than 900 Sq mts
<b>No of Basements</b>	3 Or More	<b>largest Podium Area</b>	More than 900 Sq mts
<b>No of Podiums</b>	1 Or More	<b>LPG Tank</b>	None
<b>Diesel Tank</b>		<b>Capacity of LPG</b>	
<b>Total Occupant Load</b>	501 - 1000	<b>Storage Height</b>	
<b>Helipad</b>	None	<b>Type of Industry</b>	
<b>Material Stored</b>		<b>Process Involved</b>	
<b>Storage Arrangement</b>		<b>Nature of Occupancy</b>	
<b>Type Of The System</b>		<b>Total Area of Decor</b>	
<b>Type of Storage building</b>		<b>Type of LPG Usage</b>	
<b>Total Area of warehouses</b>			
<b>Total Height of the building including basements</b>		Less than 45 mts	
<b>Height of the building from fire access level</b>		More than 23 mts	

# Requirements List

## 1. CLASSIFICATION OF HAZARD

- 1.1. This facility is considered as Low Hazard for Life Safety Evaluation
- 1.4. This facility is considered as Light Hazard for Fire Protection considerations

## 2. FIRE DEPARTMENT ACCESS

- 2.1. Dubai Civil Defence Fire Access is acceptable at ground level, Podium level or Parking level but not at underground or through tunnel in any case.
- 2.2. Maximum distance of Fire Vehicle parking from entrance of the building shall be 15 m.
- 2.3. Maximum distance from any part of the building from Fire Access Road shall be 91 m if building is fully sprinklered and 45 m if building is not sprinklered
- 2.4. Maximum distance of Fire Vehicle parking from breeching inlet of the building Fire Water System shall be 18 m.
- 2.5. Minimum unobstructed width of the Fire Access shall be 6 m.
- 2.6. Minimum unobstructed vertical clearance for the Fire Vehicle shall be 4.5 m.
- 2.7. Dead-end at fire engine access road shall not exceed 45 m in length. If dead-end exceeds 45 m, turning facilities such as roundabouts shall be provided.
- 2.8. Turning facility for a fire engine, where required, shall have minimum inner radius of 7 m and a minimum outer radius of 11 m with outer clearance radius of 12 m.
- 2.9. Fire Access Roadways' specification such as Weight carrying capacity, Road grade, Width etc. shall be as per Chapter 2, UAE FIRE & LIFE SAFETY CODE OF PRACTICE.

## 3.A. CONSTRUCTION REQUIREMENTS FOR HIGHRISE BUILDINGS

- 3.A.1. Where building height from Fire Access level is between 23 m - 55 m, Elements of Structure (Exterior bearing walls, Interior bearing walls, Columns, Beams, Girders, Trusses, Arches, Floor-ceiling assemblies) shall be 2 hour rated.
- 3.A.2. Where building height from Fire Access level is between 55 m - 128 m, Elements of Structure (Exterior bearing walls, Interior bearing walls, Columns, Beams, Girders, Trusses, Arches, Floor-ceiling assemblies) shall be 3 hour rated.
- 3.A.3. Where building height from Fire Access level is more than 128 m, Elements of Structure (Exterior bearing walls, Interior bearing walls, Columns, Beams, Girders, Trusses, Arches, Floor-ceiling assemblies) shall be 4 hour rated.
- 3.A.4. Roof Assemblies, if any, shall be 2 hour Fire rated for buildings with height more than 23 m.
- 3.A.5. If there are elevators, maximum elevators allowed in one protected shaft is 4. Where more than 4 elevators are needed, they shall be accommodated in another protected shaft.
- 3.A.6. Atleast one protected FIRE LIFT having a minimum dimension of 1.8 m on any side, shall be provided in separate shaft from other elevators.
- 3.A.7. Openings through floors for RUBBISH CHUTES AND LAUNDRY CHUTES, if any, shall be separately enclosed by fire barrier walls.
- 3.A.8. RUBBISH CHUTES AND LAUNDRY CHUTES, if any, shall be permitted to open into rooms not exceeding 400 Sq ft (37.2 Sq m) in area used for storage, provided that the room is protected by automatic sprinklers.
- 3.A.9. Perimeter Fire Barriers, External Curtainwall system, Cladding Systems, Roofing Systems if any, should be a Civil Defence approved and internationally listed 'Assembly/System'. Materials, Suppliers and installers of such system should be registered and approved by Dubai Civil Defence.

3.A.9.1. Perimeter Fire Barrier Systems, if any, Ratings shall be established in accordance with ASTM E 2307 or EN 1364 Part 3 and 4 or NFPA 285 or other equivalent tests. (Please see Annexure A.1.21., UAE Fire and Life Safety Code of Practice for details)

3.A.9.2. External Cladding Systems, if any, shall be in accordance to any one of these. (a.) Class A when tested to ASTM E-84 (b.) Class 1 or A1 when tested to FM 4880 (c.) Class B1 or A2 when tested as per DIN 4102 and EN 13501-1 or ISO 9705 (d.) BS 8414 Parts 1 or 2 as appropriate and classified in accordance with BR135. (e.) 'Non Combustible' when tested to ASTM E 136 OR other equivalent test standards.

(Please see Annexure A.1.21., UAE Fire and Life Safety Code of Practice for details)

3.A.9.3. Glazing, if any, shall pass any of these test requirements. (a.) CPSC 16 CFR 1201, Safety Standard for Architectural Glazing Materials. (b.) NFPA 251, Standard Methods of Tests of Fire Resistance of Building Construction and Materials. (c.) BS 5357 or BS EN 357. AND Glazing having more than 9 Sq ft (0.84 Sqm) of exposed surface area of one side of one light shall have a minimum classification category of II of CPSC 16 CFR 1201.

(Please see Annexure A.1.21., UAE Fire and Life Safety Code of Practice for details)

3.A.9.4. Roofing Systems, if any, shall confirm to one of these. (a.) Class A or Class I rating when tested as per NFPA 256 or ASTM E 108 (b.) Class AA to BS 476-3:2004 or Class Broof T4 to EN 13501-5:2005+A1:2009 (c.) UL 790 approval (d.) Class 1 rating when tested as per FM 4470, FM 4471 or NFPA 276

(Please see Annexure A.1.21., UAE Fire and Life Safety Code of Practice for details)

3.A.10. Parking structures, if any, located within, immediately below, attached to, or less than 3000 mm (10 ft) from this building shall be separated by walls, partitions, floors, or floor-ceiling assemblies having fire resistance ratings of not less than 2 hours.

3.A.11. The 2 Hr separation, mentioned in clause 3A.10. is not required if distance between parking structure and main building is more than 30 ft (10 m) and is connected by pedestrian balcony or bridge or vehicle bridge.

3.A.12. For connected Parking structure, if any, Elements of Structure (Exterior bearing walls, Interior bearing walls, Columns, Beams, Girders, Trusses, Arches, Floor-ceiling assemblies and Roof Assemblies) , shall not have Fire Rating less than 2 hours.

3.A.13. If Parking and Repair operations, if any, are conducted in same structure, occupancy shall be submitted as Industrial.

3.A.14. If there is parking structure, the Offices/ other similar spaces related to its operation which are less than 300 Sq m (3000 Sq ft) in area, other than cashier or attendant booths, shall be separated from parking areas by walls or partitions that resist the passage of smoke.

3.A.15. In Parking Structure, if any, Floor surfaces shall be of noncombustible material and liquid tight.

3.A.16. All Stairs in this building shall be fully RCC enclosures.

3.A.17. OUTSIDE STAIRS are not allowed in this building.

3.A.18. SPIRAL STAIRS are not Allowed as means of egress.

3.A.19. FIRE ESCAPE LADDERS are not allowed as means of egress.

3.A.20. Minimum SEPARATION DISTANCE between 2 EXITS/EXIT STAIRS shall not be less than ONE-THIRD (1/3) the length of maximum overall diagonal dimension of the building floor, measured as a STRAIGHT LINE between the exits (Not the travel path).

3.A.21. All penetrations through fire barriers or floors and ceilings such as fire dampers, cable trays, piping etc shall be provided with penetration seals (fire stops), or other approved means having a fire protection rating consistent with the designated fire resistance rating of the barrier.

#### 4.B. REQUIRMENTS FOR OCCUPANT LOAD OF 501-1000 PER FLOOR

4.B.1. Minimum 3 means of egress are required, if Occupant Load is 501 -1000 people.

4.B.2. Minimum Exit stair width shall be 47 in. (1200 mm).

## 5. MEANS OF EGRESS REQUIREMENTS

### 5.1. GENERAL

5.1.1. Minimum 2 means of egress are required.

5.1.2. Minimum 2 means of egress are required, for Balconies, Mezzanine or Story.

5.1.3. In any part of the means of egress (Doors/ Corridors/ Stairs/ Ramps etc), Width should not be less than 36 in. (91 cm)

5.1.4. Head room in any part of means of egress should be not less than 7' 6" (2.3 m)

5.1.5. If there is elevation difference in the means of egress and the difference exceeds 21 in., the change in elevation shall be established by Ramps or Stairs.

5.1.6. If Egress path exceeds 30 in.(800 mm) above finished floor level, Guards and Handrail shall be provided.

5.1.7. Penetrations into and openings through an exit enclosure shall be prohibited except Fire doors, Electrical conduits, Ductwork and Equipment for stair pressurization, water & steam piping, Sprinkler piping and Standpipes.

5.1.8. Exterior Ways of Exit Access, where provided, shall be permitted by means of exterior balcony, porch, gallery, or roof that is at least 50 percent open and arranged to restrict the accumulation of smoke.

5.1.9. There shall be no fuel dispensing devices in parking structures. If such devices exist, the occupancy shall be evaluated in accordance with the requirements of "parking structure"

5.1.10. Any Room larger than 3000 sq ft (280 sq m) in total floor space shall have 2 exit access doors, except for Storage and Industrial occupancies.

### 5.2. DOORS

5.2.1. Clear width of a Door in means of egress should not be less than 36 in. (915 mm)

5.2.2. Clear width of a single door serving a stairway should be 2/3 of Stairway width.

5.2.3. Minimum Clear width of a door can be 28 in. (710 mm) if room is less than 70 Sq ft (6.5 Sq m)

5.2.4. Minimum clear width of a door can be 24 in. (610 mm) if the room is Bathroom.

5.2.5. Minimum height of a door should not be less than 6 ft 8 in. (2030 mm)

5.2.6. Doors in exit enclosure should swing in the direction of egress.

5.2.7. Doors in High Hazard areas should swing in the direction of egress.

5.2.8. Force to open door shall not exceed 133 N.

5.2.9. Force to operate latch shall not exceed 67 N.

- 5.2.10. HORIZONTAL SLIDING DOORS are Not Allowed in corridors.
- 5.2.11. HORIZONTAL SLIDING DOORS, if any, shall be self closing if located in Fire rated walls.
- 5.2.12. HORIZONTAL SLIDING DOORS are allowed on main entrance and exit only if occupant load is less than 300.
- 5.2.13. REVOLVING DOORS are not allowed as the sole means of egress.
- 5.2.14. REVOLVING DOORS are not allowed within 10 ft (3 m) from Stairs and Escalators.
- 5.2.15. REVOLVING DOORS where provided, shall be accompanied always with hinged standard door within 10 ft (3 m) in the same wall.
- 5.2.16. Doors shall not open directly onto a stair without landing of the size not less than door width size.
- 5.2.17. Doors of RUBBISH CHUTES AND LAUNDRY CHUTES, if any, shall open only to a room that is designed and used exclusively for accessing the chute opening.
- 5.2.18. Every bathroom door lock shall be designed to allow opening of the locked door from the outside in an emergency. The opening device shall be readily accessible.
- 5.2.19. ACCESS CONTROLLED DOORS Shall unlock upon loss of power.
- 5.2.20. ACCESS CONTROLLED DOORS are allowed only if building is Sprinklered.
- 5.2.21. For STAIRS if any, door assembly shall be 90 minutes Fire rated, Smokeproof, Self closing, with Wired Glass Panel, with Push Bar at Ground floor, without latches and with appropriate floor/ Area Label.
- 5.2.22. For CORRIDORS, door assembly shall be 90 minutes Fire rated, Smokeproof, Self closing, with Wired Glass Panel, with Push Bar at Ground floor and with appropriate floor/ Area Label.
- 5.2.23. For SERVICE DOORS if any, door assembly shall be 90 minutes Fire rated, Smokeproof, Self closing, with Wired Glass Panel, with Push Bar at Ground floor, latches and with appropriate floor/ Area Label.
- 5.2.24. For ACCESS PANEL DOORS if any, door assembly shall be 90 minutes Fire rated, Smokeproof, latches and with appropriate floor/ Area Label.
- 5.2.25. For ELEVATOR LOBBY DOORS if any, door assembly shall be 60 minutes Fire rated, Smokeproof, Self closing, with Wired Glass and labeled.
- 5.2.26. HORIZONTAL OR VERTICAL ROLLING SECURITY GRILLES OR DOORS if any, shall remain secured in the full open position during the period of occupancy by the general public.
- 5.2.27. HORIZONTAL OR VERTICAL ROLLING SECURITY GRILLES OR DOORS if any, shall be operable from within the space without the use of any special knowledge or effort.
- 5.2.28. If HORIZONTAL OR VERTICAL ROLLING SECURITY GRILLES OR DOORS or horizontal-sliding or vertical-rolling grilles are provided, not more than half of the means of egress shall be equipped with such exit means.

### 5.3. STAIRS, IF ANY

- 5.3.1. Stair Riser should be 4 in. (100 mm) to 7 in. (180 mm)
- 5.3.2. Minimum stair Tread Depth is 11 in. (280 mm)

5.3.3. Maximum height between landings 12 ft (3660 mm)

5.3.4. Decrease in the width of neither stairs nor landings not allowed in egress direction.

5.3.5. All doors at the stairs shall swing in direction of egress.

5.3.6. Minimum head room in the stairs should be 6 ft 8 in. (2030 mm)

5.3.7. Non-emergency equipment such as fan coil unit or AC equipment for stair enclosure cooling is not allowed to be installed in the stair enclosure.

5.3.8. Stairs from basements if any, and Stairs from typical floors intersecting at ground floor shall be separated fully with wall having same fire rating as of stairs.

5.3.9. Windows in the Stair enclosure shall be fixed and non-operable.

5.3.10. In CURVED STAIR, if any, Tread width shall be 11 in.(280 mm) at 12 in.(30.5 cm) from narrow edge.

5.3.11. WINDERS are not Allowed.

#### 5.4. HORIZONTAL EXITS, IF ANY

5.4.1. Every bridge or balcony serving as horizontal exit shall not be less than the width of the door to which it leads and shall be not less than 47 in.(1200 mm)

5.4.2. Doors in horizontal exit shall be self closing.

5.4.3. Ducts shall not penetrate the walls housing the horizontal exits.

5.4.4. Horizontal exits, if any, shall be housed in Fire barriers having a 2-hour fire resistance rating.

5.4.5. Floor area on either side of horizontal exit, if any, shall be minimum of 3 Sq ft (0.28 Sq m) per person and shall be sufficient for the occupants of both floor areas.

#### 5.5. RAMPS, IF ANY

5.5.1. Ramps, if any, shall be of Minimum width 44 in. (1220 mm), Maximum slope of 1 in 12 and Maximum Rise of 30 in. (760 mm)

5.5.2. Maximum height between the landings of ramps, if any, shall be 12 ft (3.7m)

5.5.3. Ramps are not allowed as means of egress unless for stages, nonpublic and ramped aisles.

5.5.4. In Parking areas if any, Ramps not subject to normal vehicular traffic where used as an exit are acceptable.

#### 5.6. EXIT ACCESS CORRIDOR/EXIT PASSAGEWAYS

5.6.1. Exit access corridor or exit passageways shall provide access to not less than 2 approved exits without passing through any intervening rooms.

5.6.2. Transoms, louvers, or transfer grilles in walls or doors of exit access corridor or exit passageways are not Allowed.

5.6.3. Penetrations in exit access corridor or exit passageways should be limited to Exit Doors, Electrical Conduits Ductwork, Water Piping, Sprinkler Piping and Standpipes.

5.6.4. Access to an exit shall not be through kitchens/ storerooms/restrooms/ workrooms/ closets/ bedrooms/ Rooms subject to locking.

5.6.5. If means of egress above and a story below if any, converge at intermediate story, the capacity of means of egress shall not be less than the sum of capacity of two means of egress.

## 5.7. EGRESS CAPACITY

5.7.1. Egress capacity for STAIRS, if any, shall not be less than 0.3 in. (7.6 mm) per person.

5.7.2. Egress capacity for RAMPS, if any, shall not be less than 0.2 in. (5 mm) per person.

## 5.8. DISCHARGE FROM EXITS

5.8.1. Exits shall terminate directly at a public way or at an exterior exit discharge.

5.8.2. The exit discharge shall be arranged and marked to make clear the direction of egress to a public way.

5.8.3. At least 50% of the Exit Discharge shall be directly outside the building through the corridor, protected with same Fire rating as of the building.

5.8.4. Not more than 50% of the required number of exits allowed through the level of Discharge.

5.8.5. Not more than 50% of the required egress capacity allowed through the level of Discharge.

5.8.6. If design demands, Discharge through roof is permitted if roof construction has fire resistance rating of 1 Hr and continuous & safe means of egress from roof are provided.

## 10.7. HEALTH CARE OCCUPANCY REQUIREMENTS

### 10.7.1. CONSTRUCTION/COMPARTMENTATION/FIRE RATING

10.7.1.1. For Health Care occupancies with elements of structure Fire Rating of 1 hour, Maximum floor area allowed is 1395 Sq m. And with Elements of structure Fire Rating of more than 2 hour, floor area can be unlimited.

10.7.1.2. For Ambulatory Health Care occupancies with elements of structure Fire Rating of 1 hour, Maximum floor area allowed is 3485 Sq m. And with Elements of structure Fire Rating of more than 2 hour, floor area can be unlimited.

10.7.1.3. For Health care facilities, Levels below the level of exit discharge shall be separated from the level of exit discharge by not less than Type II (111) construction.

10.7.1.4. For Health care facilities, Every story used by inpatients for sleeping or treatment shall be divided into more than 2 smoke compartments.

10.7.1.5. For Health care facilities, The size of smoke compartment shall be limited to area of not more than 22500 Sq ft (2100 Sq mts).

10.7.1.6. Health care suites shall be separated.

10.7.1.7. For Health care facilities, intervening Rooms to suites shall not be hazardous areas.

10.7.1.8. For Health care facilities, Hazardous areas within a suite shall be separated from the remainder of the suite.

10.7.1.9. For Health care facilities, Subdivision of suites shall be by means of noncombustible or limited-combustible partitions.

10.7.1.10. For Health care facilities, Occupants of habitable rooms within sleeping suites shall have exit access to a corridor without having to pass through more than one intervening room.

10.7.1.11. In Health care facilities, Sleeping Suites shall not exceed 5000 Sq ft (465 Sq mts).

10.7.1.12. In Health care facilities, Sleeping Suites can be up to 7500 Sq ft (700 Sq mts) if direct visual supervision are provided.

10.7.1.13. In Health care facilities, Non Sleeping Suites shall not exceed 10,000 Sq ft (929 Sq mts).

10.7.1.14. Health care facilities shall be designed and constructed to minimize "Fire Emergency Evacuation" of the occupants, who usually are physically or mentally inadequate.

10.7.1.15. In case of Additions/Modifications to the existing structure not complying to Health Care Occupancy requirement, shall be separated by Fire Barrier not less than 2Hr rating. Communicating openings in such barriers shall be limited to corridors and provided with self closing door assemblies.

## 10.7.2. OCCUPANT LOAD FACTORS (SQ M/PERSON)

10.7.2.1. For sleeping departments 11.1.

10.7.2.2. For Inpatient treatment departments 22.3.

10.7.2.3. For Ambulatory health care 9.3.

## 10.7.3. SPECIAL REQUIREMENTS

10.7.3.1. COMMON PATH shall be 30 m irrespective of building is with or without sprinkler system.

10.7.3.2. DEAD END shall be 9.1 m irrespective of building is with or without sprinkler system.

10.7.3.3. TRAVEL DISTANCE to exits shall be 61 m if building is sprinklered. And 45 m if building is not sprinklered.

10.7.3.4. PATIENT ROOM DOOR assembly shall be 60 minutes Fire rated, Smoke proof, Self closing, Lebeled and with latches.

10.7.3.5. Locks are not allowed unless, Door Key-locking devices that restrict access to the room from the corridor and that are operable only by staff from the corridor side shall be permitted.

10.7.3.6. If HORIZONTAL EXIT is provided, more than 30 Sq ft (2.8 Sq mts) per patient shall be provided within corridor, patient rooms, treatment rooms, lounge or dining areas, and other similar areas on each side of the horizontal exit.

10.7.3.7. In HORIZONTAL EXIT, if any, more than 6 Sq ft (0.56 Sq mts) per occupant shall be provided on each side of the horizontal exit for the total number of occupants in adjoining compartments on stories not housing patients confined to beds or litterborne patients.

10.7.3.8. When HORIZONTAL EXIT is provided in Health care facilities, the total egress capacity of the other exits (stairs, ramps, doors leading outside the building) shall not be reduced below one-third of that required for the entire area of the building.

10.7.3.9. A HORIZONTAL EXIT in health care facility involving a corridor of 8 ft (2440 mm) or more in width, shall have the opening protected by a pair of swinging doors arranged to swing in opposite directions from each other, with each door having a clear width of not less than 41½ in. (1055 mm), or by a horizontal-sliding door width of not less than 6 ft 11 in. (2110 mm).

10.7.3.10. A HORIZONTAL EXIT, if any, in health care facility, involving a corridor of 6 ft (1830 mm) or



more in width, serving as a means of egress from both sides of the doorway, shall have the opening protected by a pair of swinging doors arranged to swing in opposite directions from each other, with each door having a clear width of not less than 32 in. (810 mm), or by a horizontal-sliding door that with width not less than 64 in. (1625 mm).

10.7.3.11. Spaces shall be permitted to be unlimited in area and open to CORRIDOR if the spaces are not used for patient sleeping rooms, treatment rooms or hazardous areas.

10.7.3.12. In health care facilities, waiting areas shall be permitted to be open to CORRIDOR if aggregate waiting area in each smoke compartment is less than 600 Sq ft (55.7 Sq m) and Supervised by staff.

10.7.3.13. In Health care facilities, Gift shops and Kiosks less than 500 Sq ft (46.5 Sq m) shall be permitted to be open to CORRIDOR or lobby.

10.7.3.14. In Health care facility, group meeting or multipurpose therapeutic spaces shall be permitted to be open to CORRIDOR if space is not hazardous and does not obstruct the egress path.

10.7.3.15. For Health care facilities, AISLES, CORRIDORS AND RAMPS shall be not less than 8 ft (2440 mm) in width, unless Ramps are used as exits.

10.7.3.16. For Health care facilities, AISLES, CORRIDORS AND RAMPS shall be not less than 47 in. (1200 mm) if not intended for housing, treatment or for inpatient use.

10.7.3.17. In Health care facilities, every corridor shall provide not less than 2 exits without passing through intervening rooms or spaces other than corridors or lobbies.

10.7.3.18. In Health care facilities, Sleeping rooms (& Sleeping Suites) larger than 1000 Sq ft (93 Sq m), if any, shall have not less than 2 exit access doors remotely located.

10.7.3.19. In Health care facilities, every habitable room (& Sleeping Suites) with more than 8 patient beds, if any, shall have exit access door directly leading to exit access corridor unless rooms have doors leading directly to outside.

10.7.3.20. In Health care facilities, Non Sleeping Suites' exit access to corridor shall not pass through more than 2 intervening rooms.

10.7.3.21. In Health care facilities, Non Sleeping Suites larger than 2500 Sq ft (232 Sq mts), if any, shall have not less than 2 exit access doors remotely located.

10.7.3.22. In Health care facilities, where 2 means of egress is required for Non Sleeping Suites, one means of egress shall be permitted to be into another Suite if Suites are separated.

10.7.3.23. Fire and Evacuation strategy shall be developed for the Health Care facility and submitted to the owner and facility management.

## 30. COMMON REQUIREMENTS

### 30.1. ELEVATORS/LIFTS, IF ANY

30.1.1. 100% egress capacity shall be independent of elevators.

30.1.2. On every floor, there shall be an elevator lobby which should be arranged as a smoke barrier.

30.1.3. Elevator lobby Barriers shall have not less than 1 Hr Fire rating.

30.1.4. Lobby capacity shall be not less than 50 % of Occupant Load of the area served by the lobby.

30.1.5. Elevator lobbies shall have access to at least one exit.

## 30.2. GUARDS AND HANDRAILS

- 30.2.1. Guards shall be provided at the open sides of means of egress which exceeds 760 mm above the floor or grade below.
- 30.2.2. Height shall be not less than 1065 mm from the base surface to the top of guard.
- 30.2.3. Handrails should be within 865 mm - 965 mm from the surface of the tread.
- 30.2.4. Handrails shall be provided on both sides of Stairs, Spiral Stairs, Ramps, Bridges etc.
- 30.2.5. Handrails shall provide minimum 57 mm clearance from wall.

## 30.3. ILLUMINATION (NORMAL LIGHTING) OF MEANS OF EGRESS

- 30.3.1. Continuous illumination shall be provided for exits, exit corridors, exit stairs, ramps, aisles, escalators, walkways leading to publicways.
- 30.3.2. Automatic, motion sensor-type lighting switches permitted, if switch controllers are fail safe and set for minimum of 15 minutes operation.
- 30.3.3. Minimum illumination shall be of of 1 ft-candle (10.8 lux) for floor and walking surfaces.
- 30.3.4. Minimum illumination shall be of 10 ft-candle (108 lux) for stairs.
- 30.3.5. Photoluminiscent marking of Means of Egress' equipment & units shall be permitted to serve the function of illumination.
- 30.3.6. Battery operated electric lights & portable lamps/ lanterns shall not be used for primary illumination of means of egress.

## 30.4. EMERGENCY LIGHTING SYSTEM

- 30.4.1. Emergency Lighting System shall be provided throughout the facility.
- 30.4.2. Stand alone Self Contained Emergency Lighting Luminaries are not allowed.
- 30.4.3. Emergency Lighting System shall be with control panel for monitoring of each luminaries for Low battery, Fault etc.
- 30.4.4. Emergency Lighting shall be capable of functioning for not less than 3 hours in the event of failure of normal lighting.
- 30.4.5. Emergency Lighting shall serve in case of Interruption of normal lighting, public utility and outside electrical power supply.
- 30.4.6. Emergency Lighting shall serve in case of Manual or accidental opening of a circuit breaker or fuse.
- 30.4.7. Emergency Lights shall be spaced according to Manufacturer's instructions but in no case not less than 8 m.
- 30.4.8. Emergency Lighting shall provide initial illumination that is not less than an average of 1 ft-candle (10.8 lux) and at any point not less than 0.1 ft-candle (1.1 lux), measured along the path of egress at floor level.

30.4.9. Wires shall be fire rated. Unit equipment and battery systems for emergency luminaires shall be listed and approved by international testing laboratories.

30.4.10. If Central Battery Emergency Lighting is provided, System shall be in a cross-zoned arrangement with at least two separate circuits overlapping in each area.

30.4.11. Emergency Lighting Luminaires shall be dedicated. (Convertible Lighting Fixtures are not acceptable)

30.4.12. The Design, Material requirement and Installation of Emergency Lighting System shall comply with UAE FIRE & LIFE SAFETY CODE OF PRACTICE (CHAPTER 6).

### 30.5. EXIT SIGNS (MARKING OF MEANS OF EGRESS)

30.5.1. Approved Exit Signs and directional signs with a directional indicator showing the direction of travel shall be installed throughout the facility.

30.5.2. Exit Signs shall be easily visible from any direction of exit access.

30.5.3. Tactile signage shall be located at each exit door requiring an exit sign.

30.5.4. Access to exits shall be marked by approved signs.

30.5.5. Sign placement shall be within rated viewing distance of 100 ft (30 m).

30.5.6. Externally illuminated or internally illuminated floor proximity signs (Photoluminescent) shall be installed for floor proximity egress path marking.

30.5.7. Signs shall be located at a vertical distance of not more than 6 ft 8 in. (2030 mm) from above the egress opening to the bottom of the sign.

30.5.8. No decorations, furnishings, or equipment that impairs the visibility of a sign shall be permitted.

30.5.9. The Design, Material requirements and Installation of Exit Signs shall comply with UAE FIRE & LIFE SAFETY CODE OF PRACTICE, CHAPTER 5.

### 30.6. PORTABLE FIRE EXTINGUISHERS

30.6.1. Portable Fire Extinguishers shall be provided throughout the facility, in compliance with UAE FIRE & LIFE SAFETY CODE OF PRACTICE (CHAPTER 4, TABLE 4.3).

30.6.2. Portable Fire extinguishers shall be located along normal paths of travel, including exits from areas.

30.6.3. Gross weight of the Portable Extinguishers not exceeding 40 lb (18.14 kg) shall be installed such that the top of the fire extinguisher is not more than 5 ft (1.53 m) above the finished floor.

30.6.4. Gross weight of the Portable Extinguishers exceeding 40 lb (18.14 kg), except Wheeled types, shall be installed such that the top of the fire extinguisher is not more than 3.5 ft (1.07 m) above the finished floor.

30.6.5. All the Portable Fire Extinguishers shall be fully charged and ready for use in case of an emergency.

### 30.7. FIRE DETECTION AND ALARM SYSTEM

30.7.1. Addressable Automatic Fire Detection and Alarm System shall be provided throughout the facility.

- 30.7.2. Design and Installation of Fire Detection and Alarm System shall comply with UAE FIRE & LIFE SAFETY CODE OF PRACTICE (CHAPTER 8), NFPA 70, NFPA 72 and Manufacturer's recommendations.
- 30.7.3. Main Fire Alarm Control Panel (FACP) shall be located at manned areas under continuous supervision such as control rooms, security rooms, reception areas, BMS areas etc.
- 30.7.4. A fire alarm repeater panel shall be provided at Security Guard house, if any.
- 30.7.5. Fire detection and alarm system shall be a complete 'System' with appropriately calculated battery backup storage, efficient for 24 hours in 'normal condition' and 30 minutes in 'Fire Alarm condition'.
- 30.7.6. Fire Alarm interfaced operations such as release of hold-open devices for doors, pressurization of Stairwell / Elevator, Smoke management, unlocking of doors, Elevator recall, 24x7 relays & shutdown of equipment, shutdown of fuel supply etc. shall be arranged to be accomplished automatically without delay.
- 30.7.7. Manual fire alarm boxes (Manual Pull Stations) shall be installed at 200 ft (60 m) intervals on the travel path, natural exit paths near exit stairs and exit doors.
- 30.7.8. Unless otherwise justified by manufacturer's specifications, Point type detectors (Smoke, Multisensors or Heat, as per application) shall be spaced to comply with maximum coverage area of 83.6 sq m (900 sq ft). And in irregular areas or corridors, any corner of the area should be at a maximum distance of 6.3 m (20.6 ft) from the detector.
- 30.7.9. For ceilings having beams more than 350 mm (1.1 ft) depth, each beam pocket shall be provided with detectors as per spacing requirements.
- 30.7.10. Above false ceiling spaces with height more than 800 mm (2.6 ft) and Below raised floor spaces with height 350 mm (1.1 ft) shall be provided with optical smoke detectors, complete with remote response indicators.
- 30.7.11. Any above false ceiling and below raised floor spaces with hazardous or combustible content such as power cables, cable trays, ducts etc shall be provided with optical type smoke detectors, irrespective of height of the space.
- 30.7.12. Where partitions, if any, within rooms are of height more than 85% of the room ceiling height, areas separated by such partitions shall be considered as separate rooms and provided with detectors.
- 30.7.13. Detectors shall not be located in direct airflow or within 1 m (3 ft) of air supply diffuser or return air opening.
- 30.7.14. Duct Type smoke detectors, specifically listed for installation in air duct system should be provided at both the supply side and return side of air ducts of Air Handling Systems.
- 30.7.15. Maximum Detection Zone (With respect to 'Search area' and 'Mimic diagram') shall not be more than 2000 Sq. m.
- 30.7.16. For ceiling heights more than 12 m. (39.5 ft) and where spot type smoke detectors are not suitable because of ceiling height limitations or complex beam structures, Beam type smoke detectors shall be provided.
- 30.7.17. Beam detectors (Projected Beam) where installed shall be spaced at a maximum distance of 18 m (60 ft). The Transmitters and Receivers shall be located at a maximum distance of 4.5 m from wall. And the projected beam light shall be at a maximum parallel distance of 9 m from wall. Beam detectors where applicable, shall be utilized for application in the range of minimum of 5 m and maximum of 100 m. coverage.

30.7.18. Air Sampling type smoke detectors, where installed, shall be designed as per manufacturer's approved software based calculations (Fluid Dynamic Calculations). However, the maximum smoke transport time from the farthest sampling point shall not exceed 120 seconds. The Air Sampling Piping network throughout the area shall be identified with clear signage as "Smoke Detection Piping-Do not tamper".

30.7.19. Line Type Linear Heat Sensing Detectors shall be installed for the Cable Trays, Cable Trenches, Service and Cable Tunnels etc. designed and installed as per the Manufacturer's instructions.

30.7.20. During all times that the building is occupied, the fire alarm system, once initiated, shall activate an audible alarm throughout the occupancy, except where the facility management has an approved strategy not to do so. (Such as in Health Care or certain Assembly, Mall areas etc.)

30.7.21. Total Fire Alarm Notification sound level, mixed with local ambient sounds shall not be more than 110 dBA at the minimum hearing distance.

30.7.22. Sounder based Detectors shall be provided for the bedrooms and sleeping areas, if any, Except for Health care facilities.

30.7.23. Closed (Enclosed) Kitchen and Pantries, if any, shall be provided with Heat Detectors. Open Kitchen, Pantries (like in Studios), if any, shall be provided with Multi-Sensors.

30.7.24. Parking areas, Plant rooms, Basements, Swimming pool areas, Rooftop areas with equipment rooms and noisy areas, if any, shall be provided with sounders with flashers.

30.7.25. Weatherproof Audio Visual devices shall be installed at strategic locations outside the building.

30.7.26. Annunciation and colored Mimic Panel showing various zones of the building shall be provided at a location readily visible and accessible from the primary point of entry for emergency response personnel.

30.7.27. Dubai Civil Defence 24x7 interface shall be provided for the Fire Detection and Alarm System as per the UAE FIRE & LIFE SAFETY CODE OF PRACTICE (CHAPTER 16).

## 30.8. EMERGENCY VOICE EVACUATION SYSTEM

30.8.1. Emergency Voice Evacuation and Alarm System shall be provided throughout the facility, complying with the Chapter 7, UAE FIRE & LIFE SAFETY CODE OF PRACTICE.

30.8.2. Emergency Voice Evacuation system can be combined with public address or mass notification system with conditions that, the Emergency Voice Message shall override any public address or mass communication systems during an emergency. Also, the speakers and associated audio equipment are installed or located with safeguards to resist tampering or maladjustments of those components essential for intended emergency notification.

30.8.3. Voice evacuation shall be by means of clearly visible and audible signals and voice announcements, either live or prerecorded.

30.8.4. Emergency Voice Evacuation System Controls with necessary operating procedures shall be at the Emergency Command Centre or a central location accessible by building staff and emergency responders.

30.8.5. Voice Evacuation Speakers at Parking areas, Basements, Plant Rooms, Noisy areas shall be with flashers.

## 30.9. INTERIOR WALL AND CEILING FINISH

30.9.1. Interior wall and ceiling finish shall be either Class A or Class B.

## 30.10. INTERIOR FLOOR FINISH

30.10.1. Floor Finish shall be either Class I or Class II.

## 30.11. PROTECTION OF VARIOUS ROOMS AND HAZARDOUS AREAS

30.11.1. Boiler, Fuel-fired Heater rooms, Employee locker rooms, Gift or retail shops, Bulk laundries, Maintenance shops, Trash collection rooms, if any, shall be protected with 1 hour barrier and sprinklers.

30.11.2. In any facility, High-pressure boilers, refrigerating machinery of other than domestic refrigerator type, large transformers, or other service equipment subject to possible explosion shall not be located directly under or abutting required exits.

30.11.3. If Parking structures, if any, where petroleum gas is stored, handled or dispensed shall be designed in accordance with UAE FIRE & LIFE SAFETY CODE OF PRACTICE, CHAPTER 11, NFPA 58 (LPG).

30.11.4. If Parking structures, if any, where natural gas fuels are stored, handled or dispensed shall be designed in accordance with NFPA 52 (CNG).

30.11.5. In Parking structures, all open-flame heating equipment, if any, shall be located not less than 18 in. (455 mm) above floor.

30.11.6. Transformer, Generator Room, Plant Room, Fuel Tank Room, Boiler Room, and LV Room, if any, shall have 2 Hr Fire rated wall separation.

30.11.7. LV Room, Main Telephone Room, BMS Room, Server Room, Control Room, if any, shall be protected with Clean Agent Suppression System.

30.11.8. Generator Room, Paint Storage Room, Paint booth, Spray painting cabins, Flammable & Combustible Liquid Storage Room, if any, shall be protected with Foam Suppression System.

30.11.9. Any Laboratories that use chemicals shall be protected in accordance with NFPA 45.

30.11.10. Laboratories, if any, that have flammable or combustible materials & hazardous materials shall be protected in accordance with NFPA 99.

30.11.11. Soiled linen rooms, if any, shall have 1 Hr Fire rated wall separation and Sprinklers.

30.11.12. Anesthetizing locations, Medical Gas storage areas, if any, shall be protected in accordance with NFPA 99.

30.11.14. Elevator, Lift Machine Rooms, if any, in Sprinklered buildings shall be protected with Pre-action Sprinkler System.

30.11.15. Commercial cooking Kitchen, if any, shall be provided with Kitchen Hood Fire Suppression system.

## 30.12. STANDBY POWER (GENERATOR) SYSTEM

30.12.1. Standby Power shall be provided for the facility.

30.12.2. Diesel Generator, if any, shall be installed in separated and Foam protected room.

30.12.3. The standby power system shall be connected to Electric fire pump, Smoke control system, Emergency command center equipment, lighting and Elevators.

30.12.4. There shall be not less than one elevator serving all floors, with standby power backup, transferable to any elevator and mechanical equipment/Controls for smokeproof enclosures.

30.12.5. Maximum day tank diesel quantity allowed inside the building or structure is 5000 LTRS. (1350 Gallons).

### 31.A. SMOKE CONTROL SYSTEM

- 31.A.1. Engineered Smoke Control System and Stair pressurization shall be provided in the facility.
- 31.A.2. Pressurization shall be established with an approved engineered system with design pressure difference of not less than 12.5 Pa and with ability to maintain this pressure difference in wind or stack effect.
- 31.A.3. Pressure difference across stair doors shall not exceed that which demands a force of 133 N to open the door.
- 31.A.4. Design of the pressurization shall be for 4 number of fully open doors from stair to floors and 1 number of fully open door from stair to outside of the building.
- 31.A.5. Manual activation and deactivation of the stairwell pressurization shall be provided at Emergency Command center or Central Control Station or Fire Fighter's Smoke Control Station.
- 31.A.6. Multiple point injection system shall not be used for Stair pressurization of high rise buildings.
- 31.A.7. Zone smoke control (sandwich type pressurization) system shall be established, where if the alarm initiation is from the Exit corridor, then floor above and floor below the fire floor shall be pressurized. While, if the alarm initiation is not from Exit corridor but from inside spaces (such as Dwelling units, Tenant spaces, inside office spaces etc.), then floor above, floor below and the fire floor corridors shall be pressurized.
- 31.A.8. If smoke extraction is part of the Smoke Control strategy, Smoke extraction shall be initiated only in the Exit corridor and only when alarm is triggered by the Exit corridor fire detectors. While, alarm initiation is not from exit corridor but from interior spaces (such as Dwelling units, Tenant spaces, inside office spaces etc.), Smoke extraction shall not be triggered automatically.
- 31.A.9. Floor or Zone dependent smoke control systems shall automatically be activated by sprinkler waterflow or smoke detection system but shall also comply with clauses 31.A.7 and 31.A.8.
- 31.A.10. Zoned Smoke control systems shall not be activated by Fire Alarm Manual Pull Boxes. (Manual activation or deactivation of smoke control systems shall only be by Fire Fighters and trained facility management personnel through overriding switch)
- 31.A.11. An engineered Smoke Control System and Smoke extraction system shall be provided in all the underground spaces with occupant load more than 100 people, the enclosed basements and enclosed parking spaces.
- 31.A.12. Where 'elevator lobby with smoke doors' is not provided, all the elevator shafts shall be pressurized along with elevator lobbies and Exit corridors.
- 31.A.13. For atriums and large open spaces, if any, the Smoke Control System should ensure to keep the smoke layer 1830 mm above the highest floor level of exit access open to that atrium or open space.
- 31.A.14. Fire Fighters' Smoke Control Station shall provide control capability, overriding all other smoke control equipment/Controls.
- 31.A.15. Activation of a single smoke detector shall not trigger initiation of smoke control system or pressurization. Activation of second smoke detector shall initiate the smoke control and pressurization system.

31.A.16. Exit passageways, stairs, ramps, and other exits shall not be used as a part of a supply, return, or exhaust air system serving other areas of the building.

31.A.17. Air handling ducts which are part of smoke control system or designed to function for smoke extracting shall be 2 hour fire rated.

31.A.18. Air connectors, if any, shall not pass through floors and any wall, partition or enclosure of vertical shaft that is required to have 1 hour fire resistance or more.

31.A.19. Jetfans if provided as part of smoke control strategy, shall be in accordance with CFD analysis and DCD approval.

31.A.20. As a smoke purging strategy, minimum of 9 air changes per hour shall be established.

31.A.21. Fire Dampers, Smoke Dampers, Combination Dampers, Design, Installation and Operation of Smoke Control/ Extraction Systems shall be in accordance with Chapter 10, UAE FIRE AND LIFE SAFETY CODE OF PRACTICE and Manufacturer's instructions.

31.A.22. Smoke extract fans, if any, shall be capable of operating effectively at 400 deg C for 2 hours.

## 31.F. STAIRCASE PRESSURIZATION

31.F.1. Engineered Stair pressurization shall be provided in the facility.

31.F.2. Pressurization shall be established with an approved engineered system with design pressure difference of not less than 12.5 Pa and with ability to maintain this pressure difference in wind or stack effect.

31.F.3. Pressure difference across stair doors shall not exceed that which demands a force of 133 N to open the door.

31.F.4. Design of the pressurization shall be for 4 number of fully open doors from stair to floors and 1 number of fully open door from stair to outside of the building.

31.F.5. Manual activation and deactivation of the stairwell pressurization shall be provided at Emergency Command Center or Central Control Station or Fire Fighter's Smoke Control Station.

31.F.6. Multiple point injection system shall not be used for Stair pressurization of high rise buildings.

31.F.7. Stair Pressurization Systems shall be in accordance with Chapter 10, UAE FIRE AND LIFE SAFETY CODE OF PRACTICE and Manufacturer's instructions.

## 40.E. WET RISER SYSTEM

### 40.E.1. REQUIREMENTS

40.E.1.1. Wet Riser System (CLASS III System), with Fire Hose station consisting of either Fire Hose Reel/Rack of 25 mm/40 mm outlet in combination with 65 mm Landing Valve outlet shall be provided throughout the facility.

40.E.1.2. 'Hose stations' (Combination of Hose Reel/Rack outlet and Landing Valve outlet) shall be located inside or immediately outside stair enclosure at typical floors and beside each exit way at the ground floor. Additional Hose Stations shall be distributed throughout at 30 m 'travel distance' intervals.

40.E.1.3. The Landing Valve shall be installed at a height of not less than 900 mm and not more than 1200 mm from the finished floor level while the Fire Hose Reel/Rack outlet shall be installed at a height of not less than 1200 mm and not more than 1500 mm from the finished floor level.



40.E.1.4. Minimum flow and residual pressure at the hydraulically most remotely located Landing Valve shall be 250 gpm (946 LPM ) at 6.9 bar (100 psi ).

40.E.1.5. Minimum flow and residual pressure at the hydraulically most remotely located Hose Reel/Hose Rack shall not be less than 6.5 gpm (24.6 LPM) at 4.5 bar (65 psi).

40.E.1.6. Maximum pressure at any point in the system shall not exceed 12 bar (175 psi). If static pressure exceeds 12 bar (175 psi) at any Landing Valve connection, Pressure Reducing Stations (PRV) shall be introduced with necessary bypass connections to restrict pressure to 12 bar (175 psi).

40.E.1.7. Maximum pressure at any Hose and Landing Valve outlets shall be restricted to 6.9 bar (100 psi) with in-built Pressure Regulating Devices.

40.E.1.8. Minimum flow for the first vertical Wet Riser Standpipe shall be 500 gpm (1893 LPM). Flow rates for each additional Wet Riser Standpipes shall be 250 gpm (946 LPM). But the total flow rate demand need not exceed 1250 gpm (3785 LPM) in a Non-Sprinklered Building's Wet Riser System.

40.E.1.9. Minimum flow for first horizontal Wet Riser Standpipe that is serving three or more Landing Valve connections shall be 750 gpm (2840 LPM). And minimum flow for two horizontal Wet Riser Standpipes that are serving three or more Landing Valve connections shall be 1000 gpm (2840 LPM).

40.E.1.10. For vertical Wet Risers, Hydraulic calculations shall satisfy the requirement of 250 gpm flow at 6.9 bar for two most remote or top most landing valves on most remote Standpipe and in addition for one most remote or top most landing valve of the adjacent standpipe. For Horizontal wet standpipes, Hydraulic calculations shall satisfy the requirement of 250 gpm at 6.9 bar for three most remote landing valves.

40.E.1.11. Maximum flow demand for any Wet Riser Standpipe System in a fully sprinklered building need not exceed 1000 gpm (3785 LPM), unless the Sprinkler water demand exceeds 1000 gpm (3785 LPM).

40.E.1.12. Wet Riser Standpipe piping shall be completely independent and separate from sprinkler or other water system piping, if any. And Multiple vertical Landing Valve outlets in each floor shall be served by independent Wet Risers.

40.E.1.13. Pipe sizes shall be based on Hydraulic calculations but shall not be less than 150 mm diameter for the main Wet Riser Standpipe and 65 mm diameter branch piping for a single Landing Valve outlet in vertical wet riser systems.

40.E.1.14. For Horizontal wet riser systems, if any, where main line is serving more than three 65 mm landing valve outlets, it shall be not less than 150 mm in diameter.

40.E.1.15. Design and Installation of Wet Riser System shall comply with UAE FIRE & LIFE SAFETY CODE OF PRACTICE (CHAPTER 9) and Manufacturer's recommendations.

#### 40.E.2. FIRE PUMP

40.E.2.12. PUMP CAPACITY shall be 500 gpm for a Single Vertical Wet Riser and 750 gpm for Two Vertical Wet Risers, 1000 gpm for Three Vertical Wet Risers and 1250 gpm for more than Three Vertical Wet Risers with pressure capacity as per Hydraulic calculations.

40.E.2.13. PUMP CAPACITY shall be 750 gpm for first horizontal Wet Riser Standpipe, if any, that is serving three or more Landing Valve connections. PUMP CAPACITY shall be 1000 gpm for two horizontal Wet Riser Standpipes, if any, that are serving three or more Landing Valve connections, with pressure capacity as per Hydraulic calculations.

40.E.2.14. PUMP CAPACITY shall be 1000 gpm with pressure capacity as per Hydraulic calculations, for any number of Wet Risers if the building is fully sprinklered and served by the same Fire Pump set.

### 40.F.1. REQUIREMENTS

- 40.F.1.1. Complete facility shall be provided with Wet Type Automatic Sprinklers System.
- 40.F.1.2. Pre-action or Dry type Sprinkler System is acceptable for freezer rooms, cold storage rooms, Operation theaters, sensitive equipment rooms and similar areas, if any, where water damage, if system activated is considerable.
- 40.F.1.3. The sprinkler system shall include independent water supply riser, alarm check valve, breeching inlet, floor zone control valves, feeder main piping, cross main piping, branch piping and sprinkler heads.
- 40.F.1.4. A supervised control valve shall be installed at bottom of each sprinkler riser on upstream side of an Alarm check valve for isolation of the corresponding riser for repair & maintenance purposes.
- 40.F.1.5. An approved pressure gauge shall be installed on bottom & top of each sprinkler riser and Alarm check valve with a control valve (gauge cock) having drain arrangement.
- 40.F.1.6. An automatic air release valve shall be installed at top most point of each riser with an isolation ball valve.
- 40.F.1.7. Pressure relief valves shall be installed on a gridded wet sprinkler system to relieve the pressure when exceeds 12.1 bar.
- 40.F.1.8. The minimum operating pressure of any sprinkler for determining the water supply requirements shall be not less than 0.5 bar (7 psi) in the light hazard occupancy and 1.0 bar (psi) in the ordinary hazard occupancies.
- 40.F.1.9. The maximum operating pressure in a sprinkler system shall not be more than 12 bar.
- 40.F.1.10. If the ceiling void above the false ceiling is more than 80 cm, sprinkler heads shall be provided for the ceiling void.
- 40.F.1.11. A drain riser shall be installed beside the sprinkler system riser pipe.
- 40.F.1.12. The Inspector's Test valve, not less than 25 mm diameter in size having an orifice diameter to give a flow equal to or less than one sprinkler, shall be provided.
- 40.F.1.13. The number of sprinkler heads allowed per pipe size shall be in accordance with Table 9.6., Chapter 9 of UAE FIRE & LIFE SAFETY CODE OF PRACTICE.
- 40.F.1.14. Maximum area limitation of sprinkler system zones and duration of water supply shall be as per table 9.7 & section 14 of Chapter 9, UAE FIRE & LIFE SAFETY CODE OF PRACTICE.
- 40.F.1.29. Design density, Hazard classification, Hose stream allowance, Sprinkler coverage, Design and Installation shall be according to relevant sections of UAE FIRE & LIFE SAFETY CODE OF PRACTICE, Chapter 9 and Manufacturer's recommendations.

### 40.F.2. FIRE PUMP

- 40.F.2.21. If Section 40.E is applicable to your project and hydraulically calculated 'Sprinkler and/or Water Spray and or Deluge System Water Demand' does not exceed that of Wet Riser Water Demand, PUMP CAPACITY (Flow and Pressure) shall be as per Section 40.E.2.
- 40.F.2.22. If section 40.E. is not applicable to your project, PUMP CAPACITY (Flow and Pressure) shall be based on Hydraulically calculated 'Sprinkler and/or Water Spray and or Deluge System Water Demand' and 'Hose allowances' as per Chapter 9, UAE FIRE AND LIFE SAFETY CODE OF PRACTICE.

### 40.F.3. FIRE WATER TANK

- 40.F.3.1. Fire water shall be potable with acceptable quality.
- 40.F.3.2. The fire water tanks shall be provided with a filling connection directly from DEWA with a float operated valve for automatic refilling.
- 40.F.3.3. The fire water tanks shall be provided with drain arrangement, overflow connection, access manhole, ladders, level indicators, low level switch, etc.
- 40.F.3.4. Fire water tanks shall be constructed and located such that the fire pump sets get flooded water supply in case of fire pumps are horizontal centrifugal type.
- 40.F.3.5. Tank Materials are limited to Concrete, Steel or Fiberglass reinforced plastic and shall withstand the unit weight of water of 1000 kg per cubic meter.
- 40.F.3.6. The discharge pipe size shall not be less than 6 in. (150 mm) for tanks up to and including a 25,000 gal (94.63 m<sup>3</sup>) capacity and shall not be less than 8 in. (200 mm) for capacities of 30,000 gal to 100,000 gal (113.55 m<sup>3</sup> to 378.50 m<sup>3</sup>), or 10 in. (250 mm) for greater capacities.
- 40.F.3.7. FIRE WATER TANK CAPACITY shall be sufficient for 60 minutes (1 Hour) Fire Fighting operation.

### 40.G. FIRE HYDRANT SYSTEM

#### 40.G.1. REQUIREMENTS

- 40.G.1.1. Yard Hydrant system with dedicated pump set and dedicated Fire water tank shall be provided.
- 40.G.1.2. Yard Hydrant system shall satisfy the flow requirement of 500 gpm with 6.9 bar pressure at the two most remote Hydrants.
- 40.G.1.3. Hydrants shall be located along the Fire Access path or exterior road accessway with a separation distance between Hydrants as per section 5.2, Chapter 2, UAE FIRE & LIFE SAFETY CODE OF PRACTICE.
- 40.G.1.4. Dead end mains shall be avoided by providing looping for the Hydrants network.
- 40.G.1.5. Fire Hydrants shall be 6 in. wet barrel type.
- 40.G.1.6. Barricades shall be provided for the Fire Hydrants to safeguard.
- 40.G.1.7. Design and Installation of Fire Hydrants shall be as per relevant sections of Chapter 2 and Chapter 9, UAE FIRE & LIFE SAFETY CODE OF PRACTICE.
- 40.G.1.15. Fire Pump shall comply with all the requirements specified in 'FIRE PUMP' section above.
- 40.G.1.16. PUMP CAPACITY shall be 1000 gpm with pressure capacity as per Hydraulic calculations.
- 40.G.1.17. Fire Water Tank shall comply with all the requirements specified in 'FIRE WATER TANK' section above.
- 40.G.1.18. Fire Water Tank CAPACITY shall be sufficient for 120 minutes (2 Hour) Fire Fighting operation.
- 40.G.2.1. Shall comply with all the requirements specified in 'FIRE PUMP' section.
- 40.G.2.2. PUMP CAPACITY shall be 1000 gpm with pressure capacity as per Hydraulic calculations.

40.G.3.1. Shall comply with all the requirements specified in 'FIRE WATER TANK' section.

40.G.3.2. Fire Water Tank CAPACITY shall be sufficient for 120 minutes (2 Hour) Fire Fighting operation.

#### 40.Y. FIRE PUMP ARRANGEMENT

40.Y.1. Fire Pump set shall essentially be located at the lowest level of the hazard they are serving (Downward feeding of Fire Protection Systems with Fire Pumps located at floor above the hazard level is not allowed)

40.Y.2. Fire 'Pump set' shall consist of one electrically driven 'main duty pump', one diesel driven 'standby pump' and one electrically driven 'Jockey pump' complete with 'Controller' and accessories.

40.Y.3. 'Pump set' shall be capable of delivering required gpm & pressure as per hydraulic calculations.

40.Y.4. Fire rated Electrical cabling for Fire pump controller shall be through dedicated cable tray, protected route and dedicated junction box.

40.Y.5. Fire pump controller shall be located in the pump room.

40.Y.6. Fire pumps shall start automatically and shut-off manually.

40.Y.7. Fire Pumps shall operate at less than or equal to 140% of its rated head capacity.

40.Y.8. The Automatic Transfer Switch (ATS) from duty power source to standby power source shall be dedicated and located near Fire Pump Controller in the Pump Room.

40.Y.9. Fire Pump room shall be located such that it is easily accessible by Civil Defence Fire Fighters during emergencies. Hence, CAT ladders are not allowed to access pump rooms. permanent standard stairs shall be provided.

40.Y.10. Outdoor Fire Pump Sheds, if any, shall be located at least 15 m from the hazard or building.

40.Y.11. Minimum Fire Pump Room size shall be adequate with 1 m clearance around the pump installation for access, ventilation and maintenance.

#### 40.Z. WATER TANK ARRANGEMENT

40.Z.1. Fire water shall be potable with acceptable quality.

40.Z.2. The fire water tanks shall be provided with a filling connection directly from DEWA with a float operated valve for automatic refilling.

40.Z.3. The fire water tanks shall be provided with drain arrangement, overflow connection, access manhole, ladders, level indicators, low level switch, etc.

40.Z.4. Fire water tanks shall be constructed and located such that the fire pump sets get flooded water supply in case of fire pumps are horizontal centrifugal type.

40.Z.5. Tank Materials are limited to Concrete, Steel or Fiberglass reinforced plastic and shall withstand the unit weight of water of 1000 kg per cubic meter.

40.Z.6. The discharge pipe size shall not be less than 6 in. (150 mm) for tanks up to and including a 25,000 gal (94.63 m<sup>3</sup>) capacity and shall not be less than 8 in. (200 mm) for capacities of 30,000 gal to 100,000 gal (113.55 m<sup>3</sup> to 378.50 m<sup>3</sup>), or 10 in. (250 mm) for greater capacities.

40.Z.7. FIRE WATER TANK CAPACITY shall be sufficient for 60 minutes (1 Hour) Fire Fighting operation.

## 41. OTHER FIRE PROTECTION SYSTEMS' REQUIREMENTS

### 41.A. PREACTION SPRINKLER SYSTEM

41.A.1. Pre-action or Dry type Sprinkler System is acceptable for Lift Machine Rooms, Freezer rooms, Cold Storage rooms, Operation theaters, Electronic/ Computer equipment rooms and similar rooms, if any, where water damage from system activation is considerable.

41.A.2. A double interlock pre action system shall be provided, which admits water to sprinkler piping upon operation of both detection devices and automatic sprinklers.

41.A.3. The system size for double interlock preaction systems shall be designed to deliver water to the system test connection in no more than 60 seconds, starting at the normal air pressure on the system, with the detection system activated and the inspection test connection fully opened simultaneously.

41.A.4. Sprinkler piping, pressure integrity and fire detection devices shall be automatically supervised.

41.A.5. All preaction systems shall maintain a minimum supervising air or nitrogen pressure of 7 psi (0.5 bar).

41.A.6. Where pendent and sidewall sprinkler heads are required, such sprinklers shall be installed on return bends to prevent water trapping.

41.A.7. Pre-action systems shall not be gridded.

41.A.8. The automatic water control valve shall be provided with hydraulic, pneumatic, or mechanical manual means for operation that is independent of detection devices.

41.A.9. An approved pressure gauge shall be installed on bottom & top of each Pre-action/Deluge valve and on air supply to these valves with a control valve (gauge cock) having drain arrangement.

41.A.10. Hydraulic release systems, if any, shall be designed and installed in accordance with manufacturer's requirements and listing.

41.A.11. System water control valves and supply pipes shall be protected against freezing if serving Cold rooms and Freezers.

41.A.12. The automatic Fire Detection System, where used, to activate pre-action system shall be as per section 30.7.

41.A.13. The listed quick-opening device shall be located as close as practical to the dry pipe valve in Dry type sprinkler System.

41.A.14. Design, Installation shall be as per relevant sections of UAE FIRE & LIFE SAFETY CODE OF PRACTICE.

### 41.B. FOAM SYSTEM

41.B.1. Low-expansion foam shall be provided to protect outdoor storage tanks, interior flammable liquid hazards, loading racks, diked areas, and nondiked spill areas, if any.

41.B.2. Medium- and high-expansion foam systems shall be provided for Ordinary combustibles and/ or Flammable and combustible liquids, if any.

41.B.3. Only high-expansion foam system shall be provided for Liquefied natural gas/ Tanks, if any.

41.B.4. Medium- and high-expansion foam systems shall not be used on fires in the Chemicals, such as cellulose nitrate, that release sufficient oxygen or other oxidizing agents to sustain combustion, Energized unenclosed electrical equipment, Water-reactive metals such as sodium, potassium, and NaK

(sodium-potassium alloys), Hazardous water-reactive materials, such as triethyl-aluminum and phosphorus pentoxide and Liquefied flammable gas.

41.B.5. Design and installation of Foam suppression system shall be according to Hydraulic calculations and shall comply with Chapter 9, UAE FIRE & LIFE SAFETY CODE OF PRACTICE and Manufacturer's instructions.

41.B.6. Design densities, Duration of discharge etc., shall be according to the Table 9.44, Table 9.45 and relevant sections of UAE FIRE AND LIFE SAFETY CODE OF PRACTICE., Chapter 9.

41.B.7. 15% additional foam quantity shall be added to the theoretically calculated foam quantity as correction factor for hydraulic balance.

41.B.8. For wet pipe, dry pipe and Preaction foam systems the total design area shall be 5000 Sq ft (465 Sq m) and for deluge and foam water spray systems, design area shall be over the entire hazard.

41.B.9. Foam-generating equipment shall be located as close as possible to the hazard(s) it protects, but not where it will be unduly exposed to a fire or explosion.

41.B.10. The Foam proportioning system shall satisfy actual calculated system discharge demand at the proper foam percentage for the most hydraulically demanding condition as well as for the least hydraulically demanding condition.

41.B.11. Foam liquid pressures shall be at least equal to the highest anticipated water pressure.

41.B.12. The temperature of the foam concentrate lines and components shall be maintained within the storage temperature limits specified for the foam concentrate.

41.B.13. In automatic systems, foam concentrate injection shall be activated automatically by, or concurrently with, activation of the main water supply control valve. Manual operating means shall be designed for this same purpose.

41.B.14. Sprinkler spacing shall not exceed 100 ft<sup>2</sup> (9.3 m<sup>2</sup>) per sprinkler or exceed 12 ft (3.7 m) spacing between sprinklers on a branch line or between branch lines.

41.B.15. The temperature rating of sprinklers shall be within the range of 250°F to 300°F (121°C to 149°C) where they are located at the roof or ceiling.

41.B.16. Automatic detection equipment, whether pneumatic, hydraulic, or electric, shall be provided with complete supervision arranged such that failure of equipment, loss of supervising air pressure, or loss of electric energy results in clear notification of the abnormal condition.

#### 41.C. CLEAN AGENT SYSTEM

41.C.1. Clean agent systems shall be designed with DCD approved Manufacturer's design software and shall comply with requirements of Chapter 9, UAE FIRE & LIFE SAFETY CODE OF PRACTICE and Manufacturer's instructions.

41.C.2. Pre-engineered systems from DCD approved manufacturer and specification are acceptable.

41.C.3. Clean agent can be Inert gas or Chemical Gas. Inert gases are Nitrogen, Argon, Carbon Dioxide or mixtures of these. Examples of Chemical gases are FM-200, HFC 227, NAFS 125 and Novec.

41.C.4. Carbon Dioxide is not allowed in occupied areas and buildings because of its toxic properties.

41.C.5. Hazard enclosure integrity shall be ensured and extra agent quantity shall be added for leakage compensation.

41.C.6. Ventilation and air circulation systems shall be shutdown except those required to ensure safety, such as cooling of vital process equipment, ventilation for containment of hazardous materials, smoke control etc.

41.C.7. Clean agent cylinders/ agent bank should be stored near the hazard in a temperature controlled area.

41.C.8. Only one cylinder size and one filling pressure should be used in an installation.

41.C.9. Discharge nozzles shall be arranged such that a homogeneous mixture of the required concentration of gas is applied to the hazard within the required time.

41.C.10. If the hazard height exceeds 5 m, intermediate level of nozzles should be installed to achieve even distribution of the clean agent.

41.C.11. Pressure relief valve location and installation shall be such that its operation shall not cause hazard to personnel or affect ventilation systems.

41.C.12. The maximum area coverage of the nozzle shall not exceed 30 Sq m., unless otherwise justified by the manufacturer.

41.C.13. The design of pressure relief vent shall be calculated by the Manufacturer's system design software.

41.C.14. Maximum total discharge duration shall be within 60 seconds for Inert Gases and 10 seconds maximum for Chemical Gases.

#### 41.D. WET CHEMICAL SYSTEM

41.D.1. Wet Chemical systems shall be provided, designed with DCD approved Manufacturer's design software/specifications/manual and shall comply with requirements of UAE FIRE & LIFE SAFETY CODE OF PRACTICE, Chapter 9 and Manufacturer's instructions.

41.D.2. Pre-engineered systems from DCD approved manufacturer and specification is acceptable.

41.D.3. Where flammable liquid or gas is protected with this system, all the ignition source shall be arranged to shut off prior to the application of Wet Chemical (To prevent reignition).

41.D.4. Maximum discharge time for the total Wet Chemical flooding system shall be 30 seconds.

41.D.5. An audible or visual indicator shall be provided to indicate that the system has operated, that personnel response is needed, and that the system is in need of recharge.

41.D.6. The building owner(s) shall be responsible for the protection of a Kitchen Hood common exhaust duct(s) used by more than one tenant. Consultant/Contractor shall make sure that the building owner is informed about this requirement.

41.D.7. Systems shall be installed to ensure the simultaneous operation of all systems protecting the Kitchen hoods, plenums, or both, and associated cooking appliances located below the hoods.

41.D.8. Manual means of actuation shall be provided and such means for manual actuation shall be mechanical and shall not rely on electrical power for actuation.

41.D.9. A fusible link or heat detector shall be provided above each protected cooking appliance and in accordance with the extinguishing system manufacturer's listing.

41.D.10. Exhaust fans and dampers are not required to be shut down upon extinguishing system actuation.

41.D.11. Any gas/Electrical/LPG appliance not requiring protection but located under the same ventilating equipment shall be automatically shut off upon actuation of any extinguishing system.

41.D.12. The system shall be interfaced with the Fire Alarm Control Panel.

#### 41.E. WATER SPRAY SYSTEM

41.E.1. Automatic Water Spray System shall be provided for LPG Tank, Oil-filled Transformer, Cable Trays, Cable Spreading Rooms, Cooling Towers, Oil Tanks, Flammable Liquid/Gas Tanks etc, if any.

41.E.2. All system components shall be listed for and rated for the maximum working pressure to which they are exposed, but not less than 12.1 bar (175 psi ).

41.E.3. All system components shall be located so as to maintain minimum electrical clearances from live parts, as instructed by the manufacturer.

41.E.4. Water Spray Nozzles shall be open and the selection of the type and size of spray nozzles shall be made with proper consideration given to discharge characteristics, physical character of the hazard involved, ambient conditions, material likely to be burning, and the design objectives of the system.

41.E.5. Water Spray Nozzles shall be selected and positioned in such a way as to maximise the spray pattern.

41.E.6. Valves controlling the water supply to water spray systems shall be supervised in the normally open position.

41.E.7. All water spray system pipe and fittings shall be installed so that the system can be drained.

41.E.8. At least one manual actuation device independent of the manual actuation device at the system actuation valve shall be installed for all automatic systems.

41.E.9. Approved Pressure gauges shall be installed Below the system actuation valve, above and below alarm check valves, On the air or water supply to pilot lines.

41.E.10. The automatic Fire Detection System, where used, to activate Water Spray system shall be as per section 30.7.

41.E.11. Where pilot sprinklers are used as detection devices, the selection, temperature rating etc shall be based on hazard evaluation and as per Chapter 9, UAE FIRE AND LIFE SAFETY CODE OF PRACTICE and NFPA 15.

41.E.12. Nozzle spacing (vertically or horizontally) shall not exceed 3 m.

41.E.13. A single Water Spray system shall not protect more than one 'Fire Area'.

41.E.14. Design Density, Water demand calculation, System design, Installation shall be as per Chapter 9, UAE FIRE AND LIFE SAFETY CODE OF PRACTICE, NFPA 15 and Manufacturer's instructions.

41.E.15. The system piping shall be Hydraulically calculated and the water can be tapped from the Main Fire Fighting network and Fire Pump provided the Fire Pump satisfies the flow and pressure demands of this system.

#### 51. SUPPORTING DOCUMENTS TO BE ATTACHED WITH THIS APPLICATION

##### 51.1. CONSULTANTS

51.1.1. The detailed built-up area calculation in A4 size and PDF format shall be attached.

51.1.2. If the facility has LPG system proposal , Owner's declaration letter specifying the usage of LPG, such as for Cooking, Heating, Industrial etc. shall be attached in A4 size, PDF format.

51.1.3. If the LPG system is not intended in the project and the proposal is for other cooking methods such as Electric appliances, the consultant has to attach owner's declaration for the same in A4 size, PDF format. Without the undertaking letter of the owner, approval can not be obtained.

#### 70. OTHER CIVIL DEFENCE REQUIREMENTS

70.1. All the Companies and their employees engaged in Designing, Procuring, Executing, Testing and Commissioning this project with respect to Life Safety, Fire Safety and Emergency Services shall be Approved and Registered by Dubai Civil Defence.

70.2. All the Materials, Systems, Assemblies, equipment, Products and Accessories, with respect to Life Safety, Fire Safety and Emergency Services shall be Listed, Approved and Registered by Dubai Civil Defence Material Approval Department.



70.3. Fire Safety during the construction and execution of this project shall be in accordance with CHAPTER 12, UAE FIRE & LIFE SAFETY CODE OF PRACTICE.

70.4. Fire water system piping, if any, shall be painted with DCD approved red colour.

70.5. LPG system piping, if any, shall be painted with DCD approved yellow colour.

70.6. If any structure/Special structure/Equipment/Installation to be qualified as 'Temporary' or 'Temporary arrangement', shall be occupied, used or demonstrated for a period less than 6 months from the date of erection or construction.

#### 70.7. ONLINE DRAWING SUBMISSION REQUIREMENTS

70.7.1. All drawings attached for review shall be in PDF FORMAT. PDF file name shall be only English and numeric characters WITHOUT SPACE, clearly mentioning the last digits of application number, floor number, Type of System etc. for example, 10049xFirst floorxAxFaxFFxVaxEMxSM (Depicting clearly the last digits of APPLICATION NUMBER and it is First Floor, Architecture, Fire Alarm, Fire Fighting, Voice Alarm, Emergency Lighting and Smoke Control Layout)

70.7.2. All the PDF floor plans, system drawings floorwise shall be rotated for straight view and combined into a single PDF file with multiple pages to enable scrolling (MERGED into a single file with file name as in clause 70.7.1.)

70.7.3. Submissions not complying to clauses 70.7.1. and 70.7.2. shall not be reviewed. (Please refer to e-ENGINEERING USER MANUAL for more details.)

#### 80. MIXED AND INTERMINGLED OCCUPANCIES

80.1. If there are mixed and intermingled occupancies in this facility, the Occupant Load, Commonpath, Dead-ends, Travel Distances in these sub occupancies shall be as per Table 3.6A & Table 3.6B, Chapter 3, Means of Egress of UAE FIRE & LIFE SAFETY CODE OF PRACTICE.

80.2. If there are Mixed and Intermingled occupancies at any floor/s of this facility, Construction, Number of Exits per floor, Number of Exits per room, Fire Alarm, Fire Fighting, Emergency Lighting, Voice Evacuation System, Smoke Control System shall be as per the Main predominant occupancy.

80.3. If there are Mixed or Intermingled occupancies at ground floor or intermediate floors of this building, additional Fire Hose Cabinets, as per the predominant occupancy Fire Fighting system, shall be provided to reach every corner of the Mixed occupancies.

80.4. If there are Mixed and Intermingled occupancies at the ground floor or at Discharge level of this facility, the exit discharge of the main predominant facility shall not pass through these sub Mixed and Intermingled occupancies.

#### 90. REQUIREMENTS NOT APPLICABLE TO THIS PROJECT

90.1. The requirements of section 40.G. FIRE HYDRANT SYSTEM is not mandatory to this project if the total plot area is LESS THAN 20,000 SQ M.

90.2. The requirements of section 41.C. CLEAN AGENT SYSTEM is not applicable to this project if the facility is not fully sprinklered and has no Main Electrical Rooms, LV Rooms, Main Server Rooms, Control Rooms, BMS Rooms and Main Telephone Rooms.

90.3. The requirements of section 41.B. FOAM SYSTEM is not applicable to this project if the facility is not fully sprinklered and has no Diesel Generator Room, Paint booth or storage of Flammable Liquids, solids and Gases.

90.4. The requirements of section 41.D. WET CHEMICAL SYSTEM are not applicable to this project if this building has no Commercial Kitchen, Restaurant or Commercial Cooking arrangements.

90.5. The requirements of section 41.A. PRE-ACTION SPRINKLER SYSTEM are not applicable to this project if this building is not fully sprinklered and has no Elevator/ Lift Machine Room.

90.6. The requirements of section 41.E. WATER SPRAY SYSTEM are not applicable to this project if this building is not fully sprinklered and has no LPG Tank on roof, at intermediate level or above ground.